

The Arctic Gator System™

Arctic Gator Introduction

The Arctic Gator System incorporates multiple new or existing single air to air HVAC systems within a building or group of buildings by converting them to a single Arctic Gator solution-based system. The result is a higher system efficiency, lower electrical demand, lower maintenance cost, no Freon within the conditioned space and greater system functionality.

Principals of Operation

The Arctic Gator System eliminates the need for multiple air to air systems operating independently to maintain temperatures throughout a building or buildings. Instead, each independent condensing unit is incorporated into a single chilled solution loop system. This provides the capacity to maintain set-point temperatures throughout a building without the need for independent condensing units. This level of consolidation allows for dynamic modulation of the System Condensing units to maintain the building or buildings temperatures more efficiently. A single condensing unit can maintain the comfort level in single or multiunit buildings with minimal electrical demand (Kwd) while sequencing other condensing units on and/or off as the heat/cooling load increases or decreases to meet temperature set-points.

Benefits

Digital sequencing of the condensing units in a single chilled solution loop system has proven much more effective and efficient than single air to air systems working independently. The system dramatically lowers the electrical demand (Kwd). It saves the customer energy cost and the electrical utility company the need for higher demand infrastructure.

Freon use in buildings using the Arctic Gator System has been reduced by up to 65%. In fact, “no” Freon enters the conditioned space. The system solution is biodegradable and contains nontoxic materials.

The system can also be used to heat and significantly reduce or eliminate the need for less efficient supplemental heat. This aids the customer in reducing Kwh consumption, operating and maintenance cost.

Applications

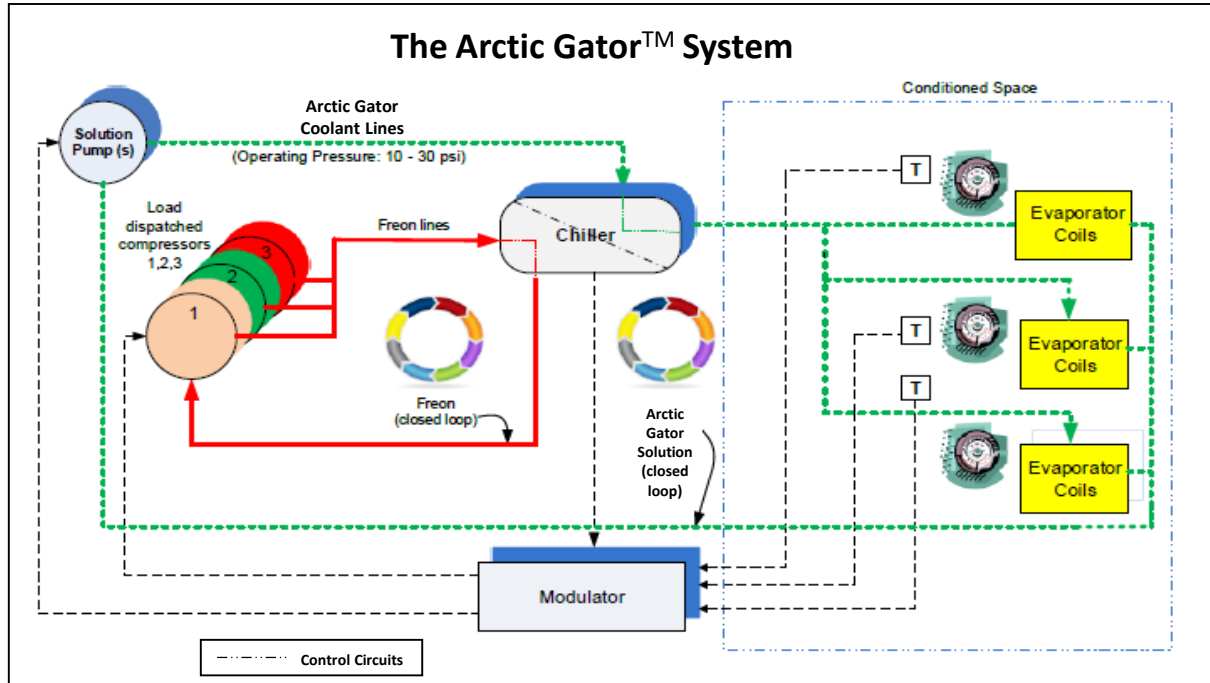
The primary market for The Arctic Gator System includes existing general service demand customers with Kwd loads of 21 to 400 Kwd. General Service and business consumers with load profiles fitting this criteria can expect 25% or greater reductions in billed Kwd demands, less exposure to freon, smaller carbon footprints, extended equipment life, lower maintenance cost and greatly improved system functionality.

Revolutionary improvements in AC performance.

The Arctic Gator System is an innovative fusion of HVAC and industrial refrigeration principles that changes the basic math of AC performance, including:

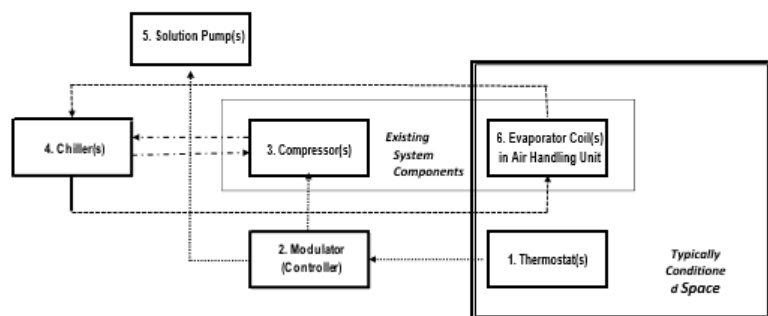
Improved system capacity / efficiency:	<i>3X to 4X increase (conventional commercial system cooling capacity = 250 sf/ton. Arctic Gator cooling capacity = 800 to 1,000 sf/ton)</i>
Reduction of demand power consumption:	<i>Minimum 25% reduction in demand power consumption</i>
Reduction in refrigerant use:	<i>50+% reduction of refrigerants in system; total elimination of refrigerants in occupied space</i>
Reduction in system pressure:	<i>35% lower high-side pressure; 50% lower low-side pressure</i>
Reduction in power costs:	<i>Historically, greater than 25% reduction in monthly electric bill</i>
Reduction in installed system cost:	<i>25% to 40% lower cost, versus conventional system replacement</i>
Reduction in system complexity:	<i>Fewer compressors, fans and other mechanical components</i>

Proof of Change in the Refrigerant Flow



The Arctic Gator™ System (Showing Modified Components of Existing HVAC Unit)

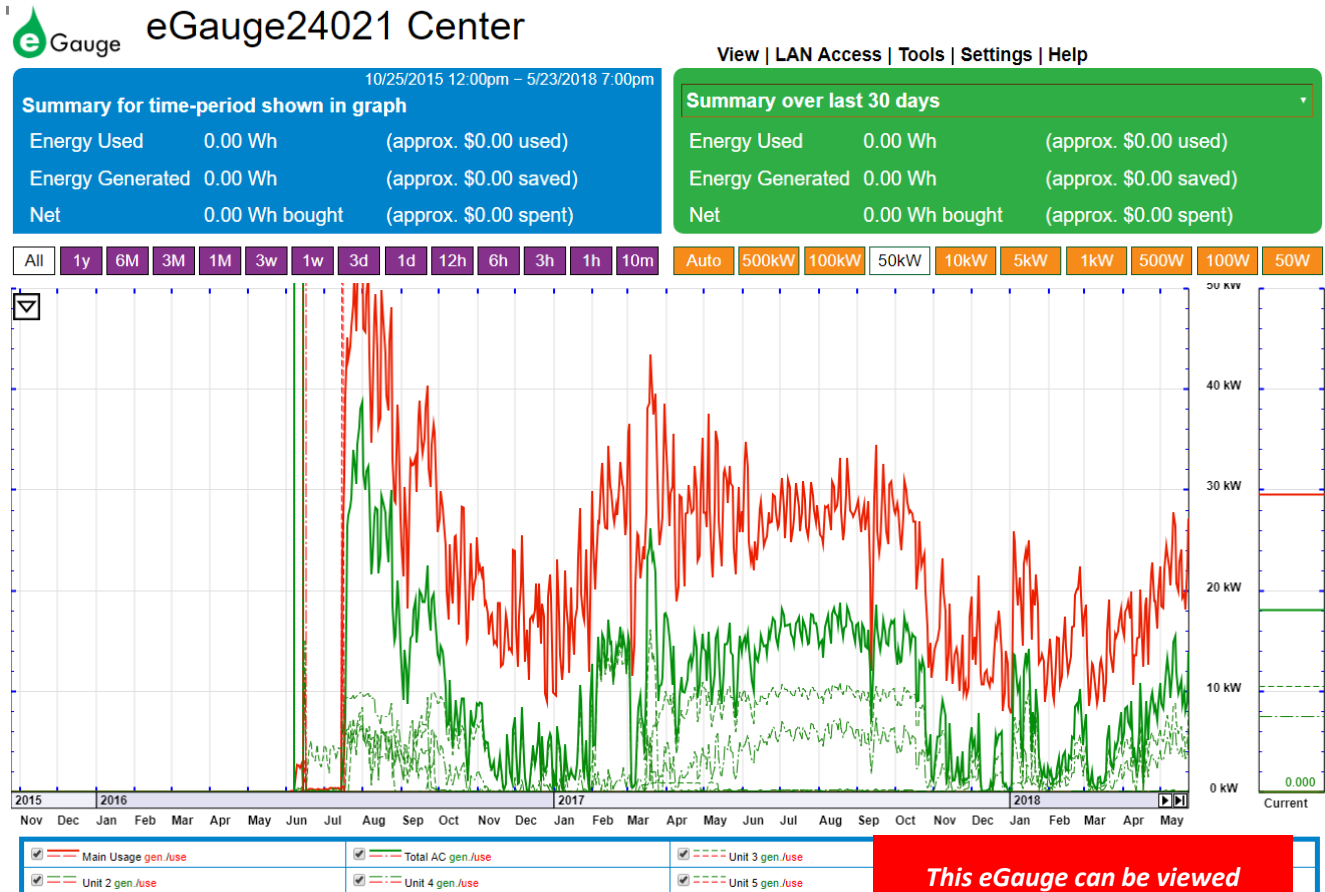
1. **Thermostat(s):** The thermostat(s) detects a temperature change outside of specified set points and signals the controller. Thermostat(s) may also be outside of conditioned space.
2. **Controller:** The controller receives input from the thermostat and sends output to the compressors and the solution pump via low voltage wire and relays.
3. **Compressor(s):** Compressors pump the aerosol refrigerant to a higher pressure and temperature. From there it enters a condensing unit
(Not shown, also known as a heat exchanger) where it cools and condenses the aerosol refrigerant. The aerosol refrigerant is then pumped to the chiller.
4. **Chiller(s):** The chiller transfers the heat from the aerosol refrigerant to the liquid refrigerant.
5. **Solution Pump(s):** The solution pump circulates the liquid refrigerant from the evaporator coil(s) to the chiller(s).
6. **Evaporator Coils in the Air Handler Unit:** The evaporator coils are used as a heat exchanger with the liquid refrigerant
Transferring temperature to air via the blower fans in the air handling unit. The air handling unit is typically located inside conditioned space.
7. **Liquid Refrigerant Loop:** The liquid refrigerant is a water based, non-corrosive, non-fouling, non-toxic solution that circulates in an insulated liquid refrigerant loop between the chiller(s) and the evaporator coil(s). The liquid refrigerant loop may be made of a variety of piping and insulation materials and may contain various check valves, transfer valves, etc.
8. **Aerosol Refrigerant Loop:** The aerosol refrigerant (typically chlorofluorocarbons such as Freon or Puron) is the original refrigerant in the system modified to circulate in a loop between
The chiller and the compressor (and the condenser, not shown). The aerosol refrigerant loop is insulated and is typically copper, and may contain various check valves, transfer valves, etc.
9. **Low Voltage Signal Wire:** The signal wire takes inputs from the thermostats and, if necessary, other sensing devices to the controller. The controller then signals one or more compressor(s) and the solution pump to activate and/or change speed through relays or signals to other secondary control systems.



Legend

- 7. Liquid Refrigerant Loop
- 8. Aerosol Refrigerant Loop
- 9. Low Voltage Signal Wire

Graph showing reduction in KWD / Proof of Existing System



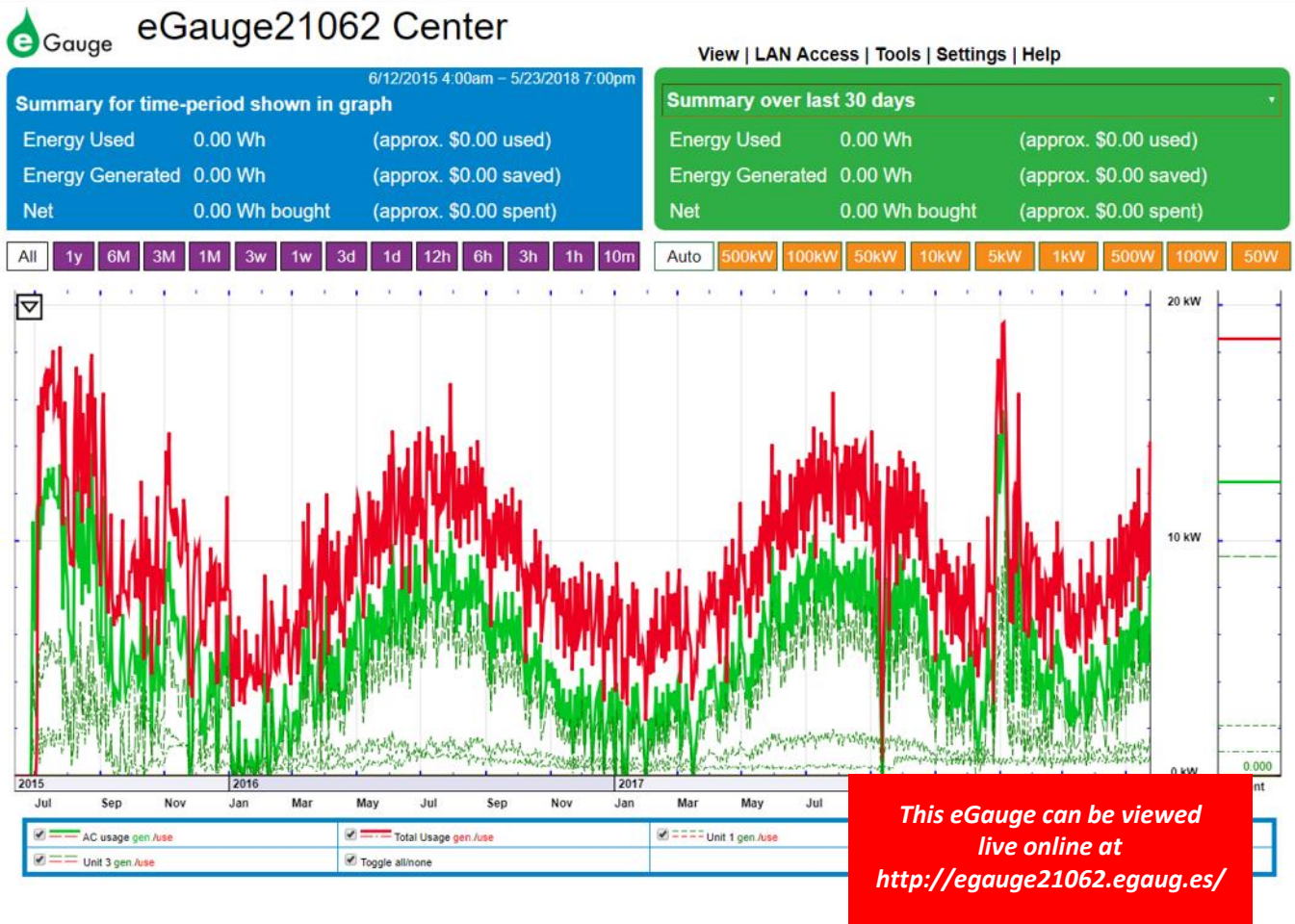
This eGauge can be viewed live online at <http://egauge24021.egaug.es/>

16,000 sf Animal Shelter (Alachua County):

- Streamlined system from 10 compressors to only four, reducing the use of refrigerant proportionately
- All five zones in the building now run constantly at desired temperatures: three at 70°, one at 68°, and one at 82°
- The increased efficiency dropped average monthly demand consumption to from as high as 90 kWh to below 50 kWh
- The average monthly electric bill was reduced from as high as \$6,000 to about \$3,500
- The Arctic Gator retrofit was less than 40% of the cost of a new air-to-air system

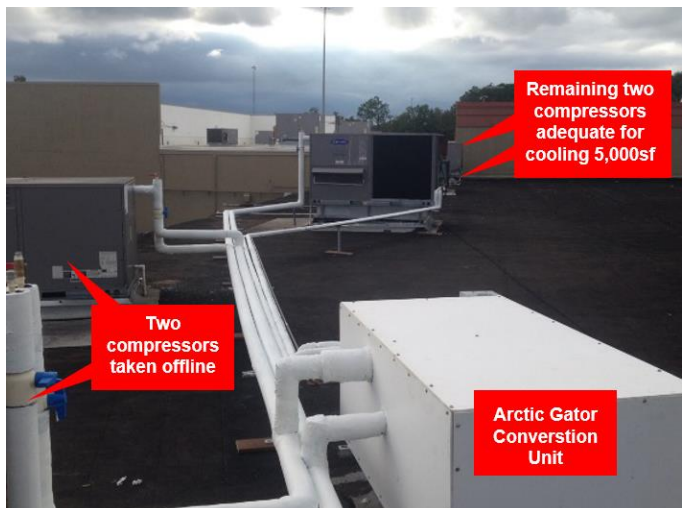


Graph showing reduction in KWD / Proof of Existing System



5,000 sf Retail Store (Duval County):

- Streamlined system from four compressors (total 20 tons) to two compressors (total 10 tons)
- Dropped steady temperature to 68° without increased utility costs
- Dropped kW hours nearly in half to 19 kW
- The Arctic Gator retrofit saved over 35% of the cost of a new air-to-air system



There are numerous reasons to choose Demandside Energy Solutions for your next HVAC solution. To better address this important question, we have prepared a brief list of benefits to be expected from the conversion to a Demandside Energy Solutions. It is our belief that our systems meet or exceed the following valid requirements.

Valid Requirements	
1	Supplemental heat strips are no longer required
2	Freon usage is greatly reduced with no Freon in occupied spaces.
3	Thermal Solution is non-toxic
4	Improved indoor air temperature stability
5	Compressor tonnage is significantly reduced
6	Better managed evaporator operation
7	Cooling fluids can operate below 32 degrees.
8	Internal space heat transfer within the conditioned space
9	Increased life expectancy of equipment
10	Reduced maintenance cost
11	The permanent elimination of surplus equipment.