



## SiteX EC Containment Cooling™

AUTOMATED COOLING TECHNOLOGY FOR EFFECTIVE  
AND EFFICIENT HIGH-DENSITY COMPUTING

Take an Intelligent Path™ ...

*Husky Energy, National Geo-Space Intelligence Agency, Army Corp of Engineers, General Dynamics, Oracle, Dell and CGI Canada  
are a few companies that have selected Opengate EC systems to automate data center cooling and maximize energy efficiency –*



## SiteX EC™ Containment Cooling Series

Patents Pending

Automated cooling technology for effective and efficient high-density computing

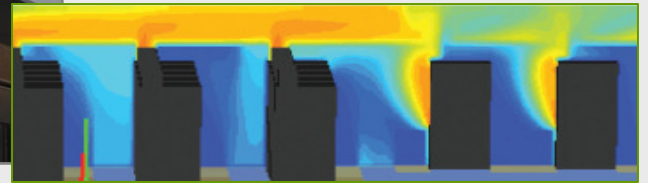
### Data Center Wide Managed Cooling Distribution



Scalable  
Quick Deployment

Ultra-Efficient  
High-Density Cooling

- Normalized IT thermal environment
- Automated & fully utilized cooling infrastructure
- Deploy high density racks anywhere
- Scale to 30kW without disrupting IT operation



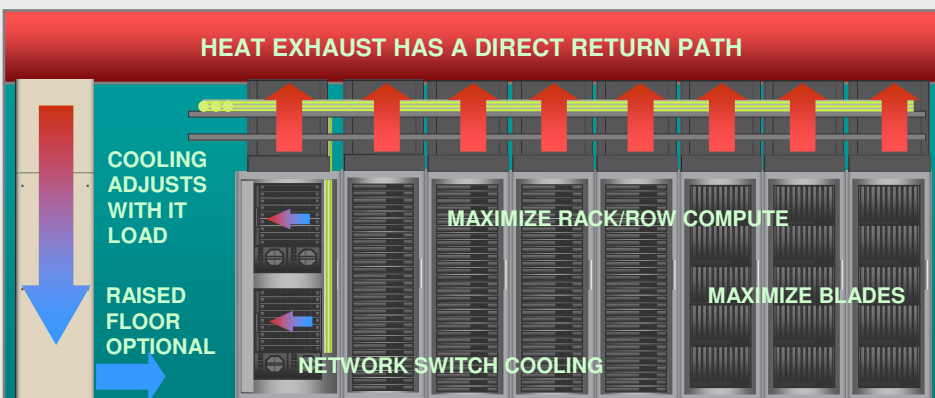
Today's Data Center plans to build new or retrofit existing space requires planners and stakeholders to keep facility costs at a minimum while providing an efficient and green facility. Because customers occupying data center space will have varying requirements, the cooling solution must be highly flexible as well as scalable to help promote faster break even status. A system must allow quick deployment, automation for cooling operation and maximum efficiency as these effect cash flow for the IT operation.

## An Opengate EC Data Center

Many data centers are not adequately equipped to handle the additional cooling requirements for high-density equipment. This is resulting in undesirable conditions such as recirculation or mixing of hot and cool air, poorly controlled humidity and costly wasted cooling capacity. The Opengate EC Data Center allows maximum data center efficiency while effectively controlling your data center thermal environment. Opengate EC dynamically scales to the IT load, providing real-time cooling consumption detail while maintaining exact control of your cooling supply based on the actual IT cooling demand.

Containment Cooling reduces total cost of ownership by addressing three areas that impact data center profitability; energy consumption, real estate utilization and operational overhead. Opengate technology automates cooling within the data center regardless of the density or location of the IT equipment and without the manual overhead typically required to maintain a safe thermal environment. By automating and managing the cooling, Opengate systems eliminate over-supply, increase performance of the CRAC/AHU, improve chiller plant performance and extend free cooling hours. Performance is independent of cooling supply methodology or room design.

### Total automation and flexibility for high-density computing



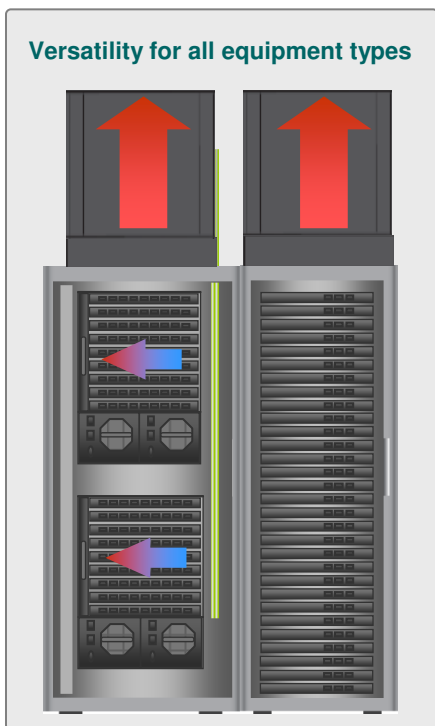
# Simplified and practical implementation - Intelligently manage data center growth with scalable modular systems

One system capable of 0-30 kW racks loads - independent of precision cooling or AHU vendor, rack vendor or management software platform.

With higher density equipment now being deployed, the volume of air being pulled through the IT equipment rack is exceeding the volume of cool air being distributed at the face of the rack. Achieving desired flow rates from aisle vents or floor tiles in front of every IT rack on the floor is complex and highly dynamic. Excessive use of 56% open floor grates to achieve today's higher flow rates greatly effects under floor pressure. Even with computational fluid dynamics modeling, it is difficult to predict the effects on local floor pressures due to adding and moving floor grates.

Opengate EC Systems normalize the data center so that all air delivered to the space is available for the IT equipment. All IT exhaust heat is contained, measured and returned to the facility's cooling units. Quickly deploy SiteX EC systems, attach to any rack enclosure, scale to 30 kW without disruption and communicate with existing management software for real-time cooling capacity assessment and management.

Opengate eliminates the need for supplemental cooling and allows fewer cooling units with fewer mechanical and electrical interconnects - simplifies maintenance and keeps water or Glycol loops at the perimeter of the facility.



## Modular & Intelligent hot-swap devices

- Automatic scaling to IT cooling demand
- Efficiency plus status reports and alarms based on predetermined thresholds

Chassis/Duct



Host



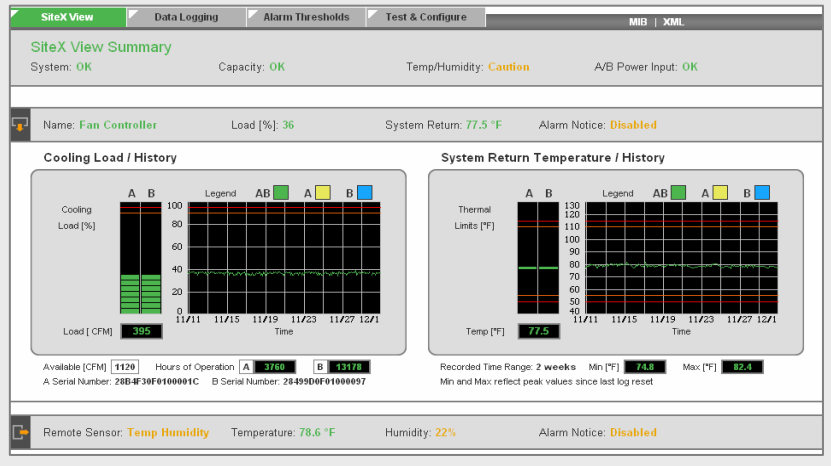
Hot Swap - Automatic Identification



Fan Cartridge

## Opengate EC Web Enabled & SNMP Software

- Real-time cooling capacity monitoring with historical trending
- Integral return temperature plus remote temperature humidity sensor capability - SNMP traps and email alerts with escalation



## Versatility for all IT Equipment Types

Cool ultra-efficient servers which are designed closer to their thermal limits, blades and even multiple large network switches placed in a 30" wide rack. EC Systems automatically scale to the IT load type and can be configured to provide a blanket of cool air along the side of network switches, heat is exhausted out through the EC system.

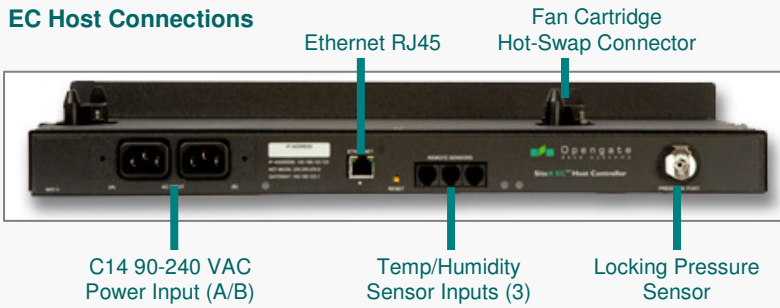
# EC System Specifications & Details

EC System details are provided below. For more information on system performance or site requirements, contact an authorized Opengate Integrator or Unity Cooling Partner.

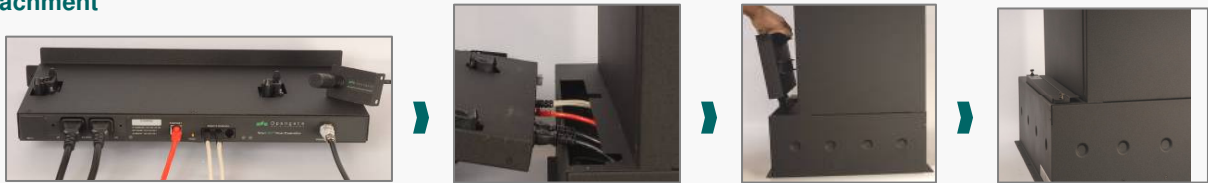
## EC5-EC30 GENERAL SPECIFICATIONS

Dual Input: 90-240 VAC, 50/60 Hz, IEC C14
Power(EC20): 150 watts @ 80% capacity
Cooling (EC20): 1637 CFM @ 80% capacity
Physical: 8" Height x 23.5" Width x 14" Depth
Weight: 42 pounds
Regulation: Pressure based closed-loop PID
Override: 100% fan speed fault response
Temp: Exhaust plus 3 remote temp + humidity
Display: Capacity / Temperature / System
Network: HTTP / HTTPS / SNMP / DHCP
Regulatory: UL, cUL 60950, CE
Warranty: 1 Yr

### EC Host Connections



### EC Host Attachment



### EC Power Use

EC20 Capacity [% of total]	EC20 Flow Rate [CFM]	EC20 Power [watts]
40	814	43
60	1220	77
80	1627	152
100	2034	263

### Pressure Sensor



### EC20 Fan Cartridge



SiteX EC Containment Cooling	Automated cooling technology for effective and efficient high-density computing
EC5 SYSTEM	0-5kW System – Ducting ordered separately
EC10 SYSTEM	0-10kW System – Ducting ordered separately
EC20 SYSTEM	0-20kW System – Ducting ordered separately
EC30 SYSTEM	0-30kW System – Ducting ordered separately
EC1002-XX	EC System Duct, specify length up to 120"
EC1002-DC1	EC System Inter-Duct Connector 24/600 Rack
EC1002-DC2	EC System Inter-Duct Connector 30/750 Rack
PCA001	Power Cord Adapter 5 FT C13 to C14
EMS15	Remote Temperature Humidity Sensor, 12 Ft Cord

EC Systems include Chassis Assembly, EC Host, EC Fan Cartridge and EC Pressure Sensor. System ducting, remote temperature sensors and input power cords are site specific and specified/ordered separately. For flexible round or custom ducting options, contact an Opengate Integration Partner.

# Complete control and automation of high-density cooling systems

Today, cool supply air is over provisioned and delivered below the recommended ASHRAE low end limit to create the proper temperatures at the top of the IT rack. Aisle or rack containment methods are being deployed however, without proper management, hot air leakage and cold air bypass is still excessive. Hot air leakage from the IT rack to the intake of the IT equipment and excess cool air bypass in the data center will limit your ability to increase rack density, raise supply air temperature, control the environment and improve cooling efficiency.

**Cooling delivered based on rack demand**  
 Contact an Opengate Unity Cooling partner to learn more

ALL RACK AIRFLOW DEMAND  
 ALL RACK AIRFLOW SUPPLY

View inside rear door - top of rack  
 Control sensor located at rack center

## Maximize flexibility and day-to-day cooling operation

Rack density and location is divorced from cooling sources allowing IT adds/removes without disrupting IT operation or environment conditions. Start with an EC5 and upgrade to the EC10, EC20 or EC30 by simply swapping cartridges. Real-time cooling and power load detail allows capacity assessment and planning. Receive early alarm notification through a secure Ethernet connection with multiple email or SNMP trap recipients. Maximize rack/row compute density placing high-density racks anywhere without adversely effecting the computing environment. Maximize density - absolutely no hot spots.

## Real-time reporting of rack air consumption

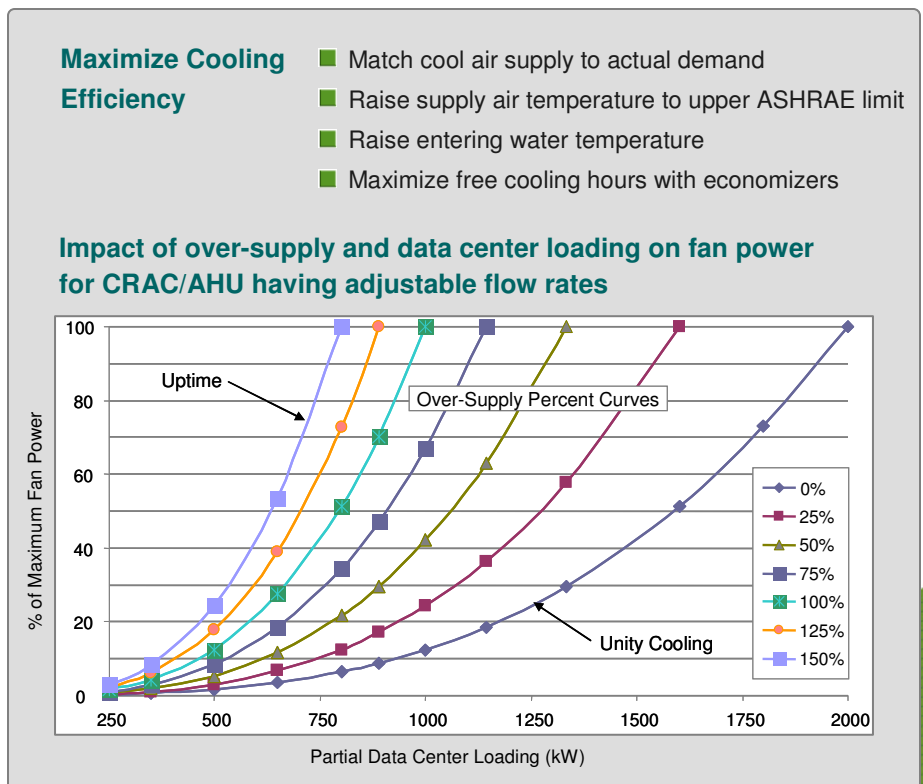
Rack air data is aggregated across the entire data center and used to automatically or manually turn CRAC/H units on or off, or is utilized to control CRAC or air handler fans.

# Unity Cooling™ – the future for automated & green computing

“Ideally, the control system would seamlessly scale the cooling supply in real time as a function of the IT equipment load” - Green Grid, October 2008

100% cooling utilization has a significant effect on maximizing the life of data centers. When over-supplying cooling, the impact to business is a realized load that is significantly less than the design load. Excess airflow, low CRAC/H capacity due to low supply/return temperatures, and low chiller plant efficiency and hours of economizer operation all contribute to unrealized capacity. Partitions to separate cool supply from hot return air without proper management techniques will create issues for IT equipment operation, allow too much leakage or bypass air from racks or contained aisles and hamper environment stability and energy saving efforts.

Fully utilize cooling and maximize rack density to gain maximum use of existing real estate. Continue using larger and cost effective AHUs with reduced installation and service costs. Achieve greater availability with fewer electrical and mechanical components and a data center free of hot air recirculation. Dynamically match cooling supply 1:1 with your IT cooling demand and maximize chiller plant efficiency and hours of economizer operation - design your facility knowing you can fully utilize all available cooling.



# Maximize real estate – data center cooling and space utilization

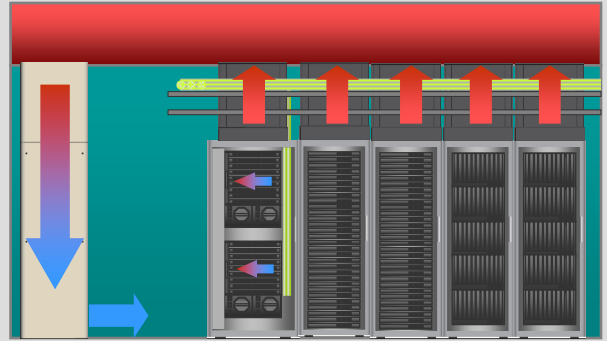
When Opengate's managed cooling distribution strategy is utilized, the greatest savings is likely to come from your ability to maximize data center real estate and other resources by maximizing rack and floor density while using existing or familiar cooling systems, such as perimeter cooling or air handlers. This is particularly useful for maximizing energy efficiency as the data center floor is only partly loaded; the greater savings is recouped earlier in the life of the data center. Finally, an intelligently managed system, by definition, provides real-time reporting, alarm notification, capacity assessment and planning for the data center operator and individual customers in a colocation environment.

## Space & Cooling Utilization

Redundancy for the entire space can be handled with just one or two AHUs as the data center is one shared space from a cooling perspective. This provides the ultimate flexibility during growth. Additional AHUs can be added to take advantage of the cube fan laws and at any time. Any customer in this shared environment can be granted the ability to utilize more cooling resources through the deployment of higher density IT equipment in smaller footprints. Opengate Systems allows for varying rack load density, regardless of rack location and EC modules can be hot-swapped to allow 30 kW per rack.

### Maximize Real Estate Utilization

- Design facility knowing full cooling utilization is available
- Maximize compute density without creating hot-spots
- AHU, rack and management software neutral



# EC System – quick installation and growth

Many cooling systems do not easily expand as the rack loads increase or as racks are added to the floor. In fact, most leading suppliers only offer different systems depending on your rack density!

## Opengate EC is one scalable system 0-30 kW per rack load

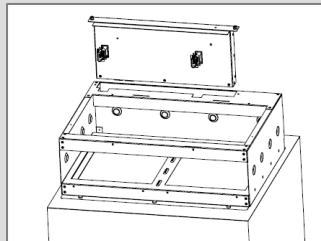
independent of precision cooling or AHU vendor, rack vendor or management software platform. EC Systems are compatible with and have been installed with the following; Dell, EMC, HP, Oracle Exadata, Cisco, IBM, Sun, APC racks, Eaton Foreseer, Data Aire, Stulz, Liebert, DCR, Electrorack, NER, Wrightline, Chatsworth,. Contact an authorized Opengate Integrator or Unity Cooling Partner to get up to date information on system compatibility.

## Quick row deployment / growth

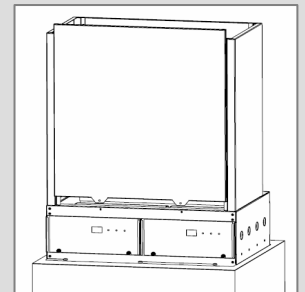
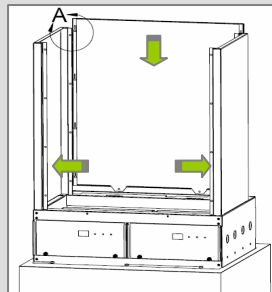
Install in minutes and quickly trim ceiling around entire row. Add racks to rows, extending as needed. Multiple rack heights and sizes only effect EC position and duct length.

### Quick installation for 24 inch/600mm & 30 inch /750mm wide rack standards

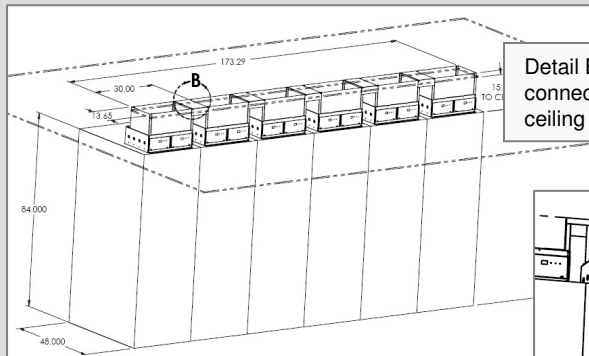
Attach chassis to rack top, drop in EC Host



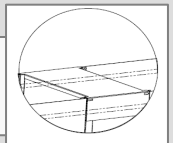
Slide in EC Fan Cartridges, attach exhaust duct,



### Quickly deploy rows and add racks without disrupting IT operations



Detail B: Inter-duct connector allows one ceiling opening per row



View from below ceiling

