

FAQs

1. **What is Digi-CRAC™?** Digi-CRAC/H™ is an aftermarket innovation for data center air conditioning units and air handler units.
2. **What are the benefits of using a Digi-CRAC/H™?** Energy savings of up to 30% or more for a DX unit and up to 60% for chilled water units.
3. **What is the typical payback period?** The typical payback period is between two to four years. This may vary depending on the climate zone, data center, and the incentives or rebates provided by the utility.
4. **What does the Digi-CRAC/H™ do?** The Digi-CRAC/H™ matches the dynamic nature of the cooling loads of a data center with capacity modulation.
5. **Can the Digi-CRAC/H™ be installed in any data center?** Yes, the Digi-CRAC™ can be installed in any data center.
6. **What is the communication protocol that comes with the Digi-CRAC™?** The Modbus RTU RS485 communication protocol.
7. **How does the Digi-CRAC/H™ save energy?** A typical annual data center load is between 40% to 80% of the design cooling capacity. If the compressor lift is reduced and the system runs at lower speeds, the capacity of the existing heat exchanger is expanded. This increased capacity results in a 20% to 30% compressor energy savings. Following the cube rule of the fan law for power vs. speed, running a CRAC unit at a speed of 80% results in a fan power savings of 50%.

FAQs

8. **How does the emergency bypass system work?** Each Digi-CRAC/H™ is equipped with a built-in emergency bypass system that automatically reverts the system back to its original state.
9. **How does the Digi-CRAC/H™ control CRAC/H units with humidification and reheat capabilities?** The Digi-CRAC/H™ receives information on the humidifier and reheat status and responds by controlling the speed of the compressor/fan accordingly.
10. **After implementation of Digi-CRAC/H™, does the original controller of the existing CRAC/H unit remain in use?** Yes, the existing controller remains. The Digi-CRAC/H™ and the existing controller work together to control the CRAC/H unit. All visibility, control, and data management capabilities of the existing system remain. The Digi-CRAC/H™ intercepts cooling calls and sends them to the corresponding components (fan & compressor).
11. **Does the Digi-CRAC/H™ have networking capabilities?** Yes, it has networking capabilities.
12. **What procedures are needed to maintain CRAC/H units equipped with Digi-CRAC/H™?** A biannual system maintenance check-up of the CRAC/H unit is needed to ensure that the cooling fan and/or compressors are properly functioning and free of obstructions.

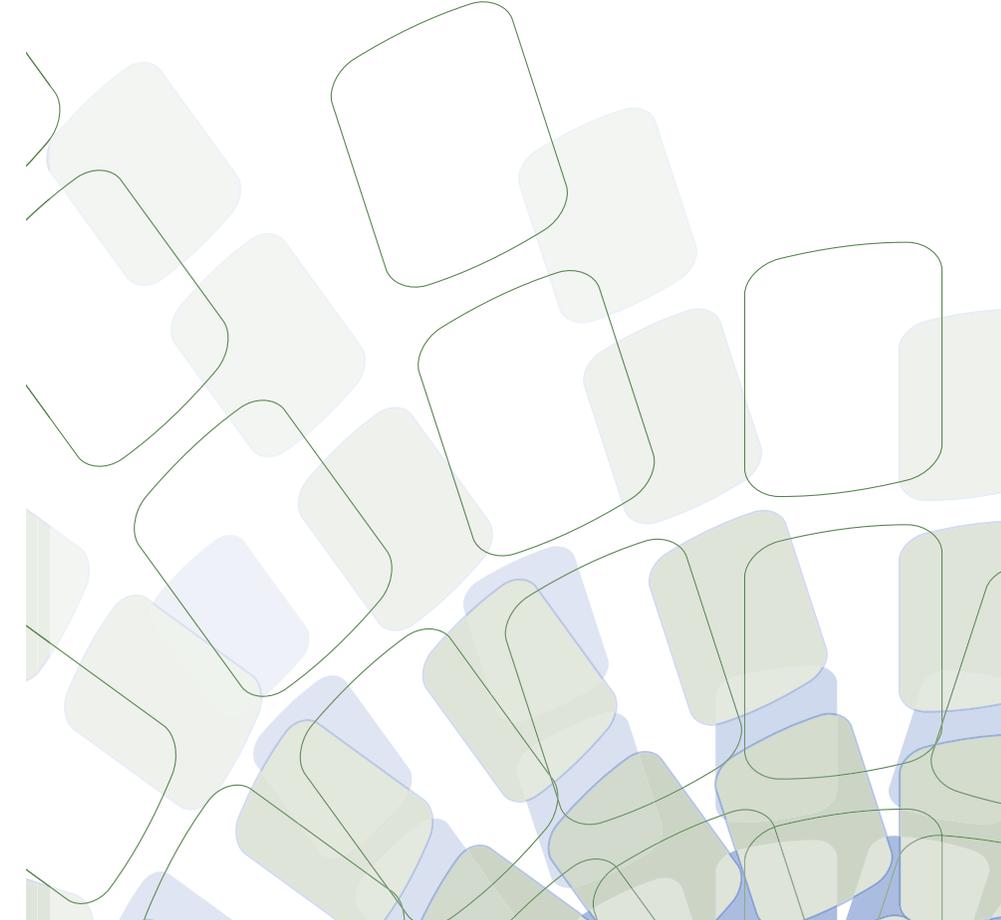
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Digi-CRAC/H™

Energy Savings for Computer Room Air Conditioning and Air Handler Units



Digi-CRAC/H™

The Digi-CRAC/H™ technology is an aftermarket innovation for data center air conditioning and air handler units created to lower energy usage. It can be installed in both DX and chilled water coil units.

The Digi-CRAC/H™ provides savings of 30% or more for the compressor and fan of a DX unit and fan power savings of up to 60% for chilled water units.

The Digi-CRAC/H™ matches the dynamic nature of data center cooling loads with capacity modulation. Due to longer system run-cycles, it creates data centers with ideal indoor temperature and humidity conditions.

Key Features

- » Integrates with the existing management system of the CRAC/H unit
- » Automatic emergency bypass system
- » Demand response functionality
- » Soft start/stop for the fans and compressors
- » Easy installation inside existing CRAC/H units or on the wall

Applications

The Digi-CRAC/H™ can be applied to CRAC/H units with the following specifications:

- » Size: 3-30 tons
- » Brands: Lieber/ Stultz / APC / ETC
- » Units with multiple fans and compressors
- » Water, glycol, or air-cooled condensers
- » DX coil evaporator
- » Scroll or reciprocating compressor
- » Power: 200V-240V/3ph/50Hz,60Hz/380V-480V/3ph/50Hz,60Hz

Benefits of the Digi-CRAC/H™

- » Reduces the PUE (Performance Usage Effectiveness) rating to 1.5
- » Improves system energy efficiency by 30-40% (2,000-3,000 kWh/ton-yr)
- » Reduces thermal stress on mission critical equipment
- » Reduces peak electrical demand by up to 50% (0.3-0.6 kW/ton)
- » Runs at 80% speed at peak times with a 30% savings due to reduced compressor lift
- » Soft start/stop functionality extends the lifespan of the fans & compressors
- » The Digi-CRAH™ creates a fan power savings of 60-70%



Case Study

FACILITY:
DATA CENTER
BEIJING, CHINA

Building Information
» Function: Data center

System Information
» Space temperature requirement of 18-26°C
» Three (3) 25-ton DX units with two compressors

Project Date
» January 2013

DIGI-CRAC™

- » M&V for baseline mode (2 week pre-period)
- » M&V for energy efficiency mode (2 week post period)
- » Installed return air registers and return air duct work for Lab Room #3
- » Improved the reliability and stability of the HVAC system
- » Reduced maintenance costs and prolonged the equipment life

BENEFITS

- » Improved system reliability
- » Energy savings:
CRAC 1 (**38.3%**)
CRAC 2 (**39.7%**)
- » Project simple payback:
1.8-2.1 years

As a result of this successful demonstration, Bes-Tech, Inc. installed seventeen additional Digi-CRAC™ units.

