Computer Room Air Conditioning

NIPSCO ENERGY EFFICIENCY PROGRAMS FOR BUSINESSES

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Unlocking Energy Efficiency: How High Efficiency HVAC Systems Can Reduce Power Consumption

Data centers are the backbone of our digital world but often consume large amounts of energy. Some of the largest data centers use up to 40 MW of electricity, enough to power 32,000 homes.[1]

While around 50% of a data center's electricity is used to power its IT equipment, 25-40% is used for crucial HVAC cooling to maintain the computer room's delicate environment.[2]

Despite advances in efficiency, many centers still waste energy due to inefficient cooling practices. Installing and maintaining a high performing HVAC system is a unique solution to enhance energy efficiency and reliability for your business.

What is their purpose?

Computer Room Air Conditioning units, or CRAC units, are specialized air conditioning systems designed to maintain precise control over optimal temperature, humidity and airflow within data centers and server rooms. They play a crucial role in preventing overheating and ensuring the reliable operation and longevity of sensitive IT equipment.

How do they work?

CRAC units operate by drawing warm air from a data center, cooling it using refrigerant or chilled water, and then distributing the cooler air back into the space, while simultaneously managing humidity either through ducts or a raised floor system. Energy-saving techniques like variable speed fans and containment systems allow CRAC systems to deliver necessary cooling while minimizing energy consumption.

Sources

[1] https://www.energystar.gov/products/ask-the-experts/energy-efficiency-data-centers-still-important

[2] https://www.energy.gov/eere/iedo/energy-efficient-cooling-control-systems-data-centers

What are the benefits of using and optimizing computer room AC units?

Precise temperature control.
Provides targeted cooling to areas with high heat loads to prevent overheating and hardware damage.

Equipment longevity.
May help extend the lifespan of servers and other IT equipment, reducing the need for frequent replacements.

Efficient humidity regulation.
Controls humidity levels, preventing static electricity or condensation, both harmful to sensitive equipment.

Promotes energy efficiency.
Modern units are designed to be energy efficient, using advancing cooling methods to reduce power consumption.

Enhanced reliability.
Built-in redundancy features can offer reliable operation, ensuring continuous cooling even during peak times.

Potential for scalability.
Systems can be easily scaled up or down based on the size and cooling needs, providing flexibility during growth.

NIPSCO's energy efficiency programs are administered by TRC, a third-party implementation specialist that helps homes and businesses save energy.

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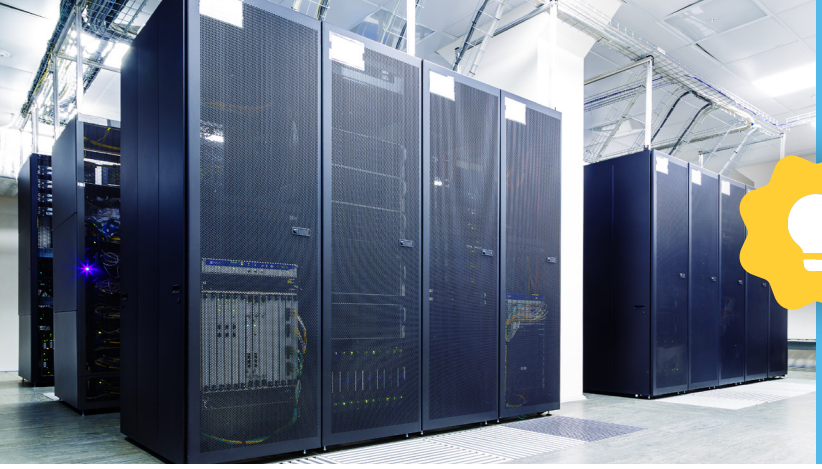
NIPSCO Energy Efficiency



Energy-Saving Tip

Small increases in temperature set points can lead to significant energy savings. By raising the set point temperature within safe operational ranges (typically recommended between 64.4°F to 80.6°F for most data centers), CRAC units can reduce their cooling effort, leading to more efficient energy use.[3]

Sources

[3] https://www.energystar.gov/products/data_center_equipment/5-simple-ways-avoid-energy-waste-your-data-center/raise-temperature

Local Hospital Finds a Cool Solution to Save

- Incentives Earned: **$404,677**
- Total kWh Saved: **4,175,879 kWh**
- Final Project Cost*: **$1,206,785**
- 1st Year ROI*: **80%**
- Payback*: **1.25 Years**

* With incentive

Upgrades included: New Construction installation of interior and exterior lighting, an HVAC system for occupant comfort heating and cooling, and an energy-efficient cooling system for a large server room space. The customer installed seventy tons of refrigerant cooling for the server space, which was 30% more efficient than the code baseline required units and accounted for an annual savings of 396,880 kWh. These water-cooled air conditioning units have 24/7 cooling capability and were installed both on the floor and in the ceiling, reducing the amount of square footage needed in IT spaces.

Saving 4,175,879 kWh is equal to:

693.9 vehicles removed from the road

5,828.2 homes powered for one month

1,129.1 tons of landfill CO_2 emissions eliminated

Local Government Center Cools Down Spending with New Computer Room A/C Units

- Incentives Earned: **$2,136**
- Total kWh Saved: **19,415 kWh**
- Final Project Cost*: **$1,966**
- 1st Year ROI*: **109%**
- Payback*: **0.92 Years**

* With incentive

Upgrades included: Replacement of existing older computer room air conditioning units with more energy-efficient and maintenance-friendly equipment. New air conditioning units provided zone-controlled space cooling and were connected via a BACnet interface to the owner's Building Management Systems (BMS) to allow process automation, performance monitoring, and safety alert warnings for high space temperature. The project included 16 tons of cooling, accounting for an annual savings of 19,415 kWh.

Saving 19,415 kWh is equal to:

3.2 vehicles removed from the road

27.1 homes powered for one month

5.2 tons of landfill CO_2 emissions eliminated

Get started saving!

Now that you know more about the savings computer room air conditioning can bring in, visit **trcsavesenergy.com/TradeAlly/TradeAllySearch** to find an experienced contractor or contact a TRC Field Engineer in your area by visiting **trcsavesenergy.com/Home/ContactUs** or calling TRC at **1-800-299-2501**.

Avoid Energy Waste

Scan the QR code with your mobile device to discover five quick and easy ways to avoid energy waste in your data center. Share these with your team and begin implementing today. Or visit: **bit.ly/WaysToAvoidWaste**

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