

Data Center Temperature and Humidity Solutions



Overview

With edge controllers like ControlByWeb®, temperature and humidity data is captured instantly, logged, and available for review anytime—reducing the risk of overheating or other temperature-related failures.

Key Takeaways

Optimal data center conditions are typically 18–27°C (64–80°F) with 40–60% relative humidity to ensure equipment reliability and prevent damage.

Recommended Temperature Ranges

Data centers should maintain an ambient temperature between 18°C and 27°C (64°F to 80°F) for general IT equipment operation, according to ASHRAE guidelines. For environments with low risk of copper and silver corrosion, a narrower range of 18–21°C (64–69.8°F) is preferred.

Maintaining these temperatures helps prevent overheating, hardware failure, and reduces the risk of thermal stress on sensitive components.

Recommended Humidity Ranges

Relative humidity should be kept between 40% and 60%, with a dew point of 5.5–15°C (41–59°F). This range balances the risk of electrostatic discharge (ESD) at low humidity and condensation or corrosion at high humidity.

In areas with high corrosion risk, the upper humidity limit may be reduced to 50–60%. Consistent humidity control is critical for long-term equipment reliability and uptime.

Sensor Placement and Monitoring

Effective monitoring requires temperature and humidity sensors at multiple points, including: Rack-level intake and outtake (top, middle, bottom of each rack) Ambient room locations (center, near doors, and potential hot zones) Near cooling units and raised floor plenums ASHRAE recommends at least 3 sensors per rack for intake and outtake, while some studies suggest 6 sensors per rack for optimal coverage. Monitoring ensures early detection of cooling failures and prevents hotspots that could compromise equipment performance.

Airflow and Hot/

Cold Aisle Management

Proper air management is essential to maintain uniform temperature and humidity. Hot and cold aisle containment strategies help direct airflow efficiently, reducing energy costs while keeping intake air within recommended ranges. Equipment in hot aisles may experience higher temperatures, so monitoring and specifying equipment for these conditions is important.

Summary

Maintaining 18–27°C (64–80°F) temperature and 40–60% relative humidity is critical for data center reliability. Continuous monitoring, strategic sensor placement, and effective airflow management help prevent equipment failure, reduce energy costs, and extend the lifespan of IT infrastructure.

Article Content

Temperature and humidity controls for Data centers

CAREL offers solutions for specific temperature and humidity monitoring and control for Data centers.

Temperature Monitoring for Data Centers: Best Guide

This comprehensive guide examines the best temperature monitoring for data centers systems available in 2026, comparing traditional approaches with

Data Center Temperature Monitoring | Server Room Temp Monitor

With edge controllers like ControlByWeb®, temperature and humidity data is captured instantly, logged, and available for review anytime—reducing the risk of overheating or other temperature-related failures.

Data Center Temperature Monitoring Systems

Using strategically placed sensors, our system tracks temperature, humidity, and power usage in real-time. Any deviations trigger instant alerts, enabling immediate intervention to maintain

Data center cooling systems and technologies and how they work

Explore the various ways data center cooling systems can maintain optimal temperature and humidity levels to protect equipment in your computing facility.

ASHRAE Launches Comprehensive Data Center Resources Hub

ATLANTA (August 26, 2024) – ASHRAE today launched a new Data Center Resources page to help professionals maintain optimal temperature and humidity levels in data centers, where servers and

Protect Servers with Temperature Monitoring Systems ELPRO

Maintaining optimal environmental conditions in server rooms and data centers is critical to protecting valuable IT assets and ensuring business continuity. Learn about temperature and humidity

Data Center Environmental Monitoring

A modular solution from Vaisala takes your measurement system to a whole new level of productivity and flexibility. A modular temperature and humidity measurement solution for critical buildings can be

ASHRAE Recommended Data Center Temperature

Data centers that are operating outside of ASHRAE recommended temperature and humidity ranges are at direct risk for potential disaster.

Energy-saving constant temperature and humidity unit

JAPAN: Panasonic Environmental Engineering has launched an energy-saving constant temperature and humidity unit for testing and research institutions. These indoor units precisely

Equipment Thermal Guidelines for Data Processing Environments

Data centers that have non-ESD floors and where people are allowed to wear non-ESD shoes may want to consider increasing humidity given that the risk of generating 8 kV increases slightly from 0.27% at

Temperature recorder, temperature data logger, temperature

Zhengzhou Freshliance Electronics Corp., Ltd Zhengzhou Freshliance Electronics Corp., Ltd., an ISO9000-certified enterprise founded in 2015, specializes in the research and development,

Data center

Utah Data Center (2013) A data center is a facility used to house computer systems and associated components, such as telecommunications and storage systems. Data centers are critical

Weather Data Center

Information includes monthly and annual percentiles, to provide seasonally representative combinations of temperature, humidity, and solar conditions. These data are also available through a subscription

BeaconTrax - Innovative Bluetooth Solutions - Innovative Tracking Solutions

Sensors are perfect for critical applications like monitoring cold chain logistics, temperature & humidity-controlled rooms. Industrial plants can efficiently collect sensitive information on machinery vibration,

Fluke Solutions for Reliable Server Room Operations

In a server room, downtime is not an option — and precision is not a luxury. Behind every stable data center, there are reliable tools that help engineers monitor, test, diagnose, and protect ...

Data Logger & Data Acquisition Solutions from CAS DataLoggers

Data loggers range from 1 to 900 channels and can record temperature, humidity, force/strain, pressure, flow, voltage, current, resistance, vibration and other digital signals, including serial (RS-232/RS

Vertiv Geist™ Environmental Monitoring

Keep an eye on remote conditions in critical areas for environmental factors including temperature, humidity, airflow, door position, power and much more.

Contact Us

Continue your research online:

Website: <https://metramarket.es>

Technical inquiry: <https://metramarket.es/contact.html>

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

