

Modular Data Center Temperature Standards



AI Overview

Optimal modular data center temperatures should generally be maintained between 18°C and 27°C (64°F to 81°F), with high-density servers requiring 18°C to 22°C (64°F to 72°F) for reliable operation.

Recommended Temperature Ranges

ASHRAE guidelines recommend maintaining data center temperatures between 18°C and 27°C (64°F to 81°F) to balance hardware reliability and energy efficiency. For high-density racks, a narrower range of 18°C to 22°C (64°F to 72°F) is advised to prevent overheating and ensure consistent performance. Temperatures that are too high can lead to hardware failures, downtime, and increased operational costs, while excessively low temperatures may cause condensation and electrostatic discharge (ESD) issues.

Cooling and Airflow Strategies

Effective temperature management relies on airflow optimization and containment strategies:

- Cold and hot aisle containment: Racks are arranged in alternating rows to separate cold air intake from hot air exhaust, preventing mixing and ensuring cool air reaches critical components.
- Airflow management: Proper ducting, blanking panels, and raised floors help direct air efficiently, reducing hotspots and improving cooling efficiency.

Article Content

ASHRAE TC9.9 Data Center Power Equipment Thermal Guidelines

Data Center Power Equipment Thermal Guidelines and Best Practices Whitepaper created by ASHRAE Technical Committee (TC)

Data center temperature and humidity guidelines

ASHRAE maintains a recommended list of humidity and temperature level standards for data centers. Discover which

ASHRAE TC 9.9 Thermal Guidelines for IT Equipment Explained

Complete guide to ASHRAE TC 9.9 thermal guidelines for data centers. Learn temperature, humidity ranges, and

Data Center Temperature Standards

As guidance for data center designers and operators on important topics such as optimal data center temperature

00 ReferenceCard portrait

Typical requirements: minimum temperature is 15°C, maximum temperature is 32°C, minimum RH is 20%, maximum RH is 80%,

Mastering data centre efficiency with ASHRAE standards

Learn more about how ASHRAE standards improve data centre efficiency, optimise temperature control, cut energy

Best Practices Guide for Energy-Efficient Data Center Design

This guide provides an overview of best practices for energy-efficient data center design which spans the categories of information

Thermal Guidelines and Temperature Measurements in Data Centers

Each individual data center needs to set its own standard for intake temperatures. Key industry guidelines provide

The ASHRAE Thermal Guidelines for Data Centers Past, Present,

- The recommended envelope gives guidance to data center operators on maintaining high reliability and also operating their data

General guidelines for data centers

The key to heat load management of the data center is to provide inlet air temperatures to the rack that meet the manufacturer's

Best Practices Guide for Energy-Efficient Data Center Design

This can lead to designs that are simply scaled up versions of standard office space approaches or that reuse strategies and

ASHRAE TC9.9

Most data centers contain dis-similar types of equipment with widely differing air flow requirements, power dissipation, and

Data Center Temperature Guidelines and Best Practices

Maintaining temperatures in a Data Center within recommended guidelines is crucial in preventing the company from

HVAC Cooling Systems for Data Centers

Abstract Air-conditioning systems for data centers are designed for year-round cooling with very high cooling intensity per square foot

ASHRAE STANDARDS AND PRACTICES FOR DATA CENTERS

ASHRAE is actually international and publishes the most comprehensive range of information available for the

Data Center Power Equipment Thermal Guidelines & Best Practices

ASHRAE TC9.9 whitepaper on thermal management for data center power equipment. Includes guidelines, best

Data Center Environmental Standards: A Guide | DataSpan

DataSpan helps you meet data center environmental standards with monitoring solutions for temperature, humidity

What Temperature Should Your Data Center Be?

Optimize your data center temperature with ASHRAE guidelines, temperature sensors, and environmental

Avoid server overheating with ASHRAE data center guidelines

Finding the right operating temperature is a key component to avoid server overheating. ASHRAE data center

Thermal Guidelines and Temperature Measurements in Data Centers

This document initially develops a list of generalized thermal best practice recommendations as a first step towards

Data Center Temperature & Humidity Standards | BradyID

Discover data center temperature and humidity standards to reduce downtime, improve efficiency, and protect equipment in high

Data Center Temperature Standards

What Are the Temperature Standards for Data Centers? While Standard 90.1 offers useful recommendations for data

MDC Presentation MB

Designing electrical systems for prefabricated modular data centers presents several unique challenges due to their modular, pre

Equipment Thermal Guidelines for Data Processing Environments

Classes A3, A4, B, and C are identical to those included in the 2011 edition of Thermal Guidelines for Data Processing Environments.

Key Data Center Design Standards, From NFPA to ASHRAE

Discover how data center design standards enhance your center's efficiency, reliability, & sustainability while meeting

ASHRAE TC 9.9: Data Center Thermal Guide | 2026

These guidelines, published in the Thermal Guidelines for Data Processing Environments, provide the temperature

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