

# Rack Immersion Liquid Cooling Operation Guide



## Overview

Rack-Mounted Immersion Cooling: Servers are submerged in non-conductive dielectric fluid within a rack-sized tank. The fluid absorbs heat, then circulates to a built-in heat exchanger. Specs: Capacity: 50-100kW/rack; fluid temperature: 30-45°C; PUE range: 1. Enterprises are adopting high-performance computing (HPC) for artificial intelligence (AI) and machine learning (ML) model training and inference, causing a fast rise in chip, server, and rack densities, power consumption, and heat levels. Air cooling alone can't abate hot-running equipment. Coolant Distribution Unit (CDU) – Contains the pumping system that circulates the coolant to the cold plates cooling down the CPUs, GPUs, and DIMMs. Liquid cooling leverages the higher thermal transfer properties of water or other fluids to support efficient and cost-effective cooling of k-mounted servers. Supermicro provides total liquid-cooling solutions. Each LiquidRack™ consists of two 12U slide-out drawers, each with its own heat exchanger and pump arrangement. The heated coolant then. Rack manifolds, critical components in liquid cooling solutions, ensure reliable coolant distribution across servers while maintaining modularity and standardization.



## Article Content

### LiquidRack™

In an immersion cooling system, the heat transfer efficiency of the liquid varies at each component, which leads to a large temperature difference in the tank. The simulation result demonstrates that the

### Immersion Cooling: Top 5 Design and Deployment

During the evolution of liquid cooling, we saw direct-to-chip liquid cooling solutions. Today, high-density, modular single-phase immersion cooling

### Liquid and Immersion Cooling Options for Data Centers

Long proven for mainframe and gaming applications, liquid cooling is expanding to protect rack-mounted servers in data centers worldwide. Vertiv has created a

### Immersion Liquid Cooling System

single cabinet has a variety of U-position and cooling capacity specifications, and can be combined with multiple cabinets to meet the needs of diverse application scenarios.

### VERTIV WHITE PAPER

In cases where rack densities are gradually creeping up to the threshold at which liquid cooling becomes a necessity, facility operators will have to weigh the benefits that can be achieved by moving to liquid

### grc\_ebook\_-\_the\_definitive\_guide\_to\_single-phase\_immersion\_cooling

GRC immersion cooling eliminates frosty hot-cold aisle arrangements, and adds a silent work environment, too, which makes it easy to problem-solve right at the rack.

### Data Center Cooling: Best Methods Guide

Rack densities are increasing, and so are demands for highly efficient heat removal. Learn more about in-row, in-rack, immersion and direct-to-chip cooling and their

### SUPERMICRO RACK SCALE LIQUID COOLING SOLUTIONS

COMPONENTS OF AN EFFICIENT LIQUID COOLING SOLUTION Supermicro's liquid cooled rack solution consists of several components that are designed in-house to achieve the highest level of

### A Guide to Data Center Liquid Cooling

Selecting the Right Liquid Cooling Strategy for Your Data Center Operators With several liquid cooling systems available—each suited to different

### Immersion liquid cooling for electronics: Materials, systems ...

The current work systematically reviews the research progress on immersion cooling technology in electronic device thermal management, including the properties of immersion coolants,

### Liquid Cooling Rack Manifold Guidelines and Specifications

Rack manifolds, critical components in liquid cooling solutions, ensure reliable coolant distribution across servers while maintaining modularity and standardization. This article explores...

### Supermicro Total Rack Scale Liquid Cooling Solutions

Supermicro's pioneering total Liquid-Cooling Infrastructure enables customers to obtain everything that is required for a modern data center from a single vendor. The Supermicro liquid-cooling rack

A review of the immersion liquid cooling technology for high ...

Traditional air cooling, with its limited efficiency, is increasingly inadequate to meet current demands. Immersion liquid cooling (ILC) has thus emerged as a critical research focus in data center

### Rack-Scale Liquid Cooling Solutions | Supermicro

Dive into Liquid Cooling Server solutions, providing efficient thermal management. Ideal for high-performance computing, ensuring optimal operation.

Immersion cooling technology development status of data center ...

In order to solve the data center cooling system of high energy consumption and high heat flow density needs, immersion cooling technology came into being, this paper is mainly on the

### SUPERMICRO RACK SCALE LIQUID COOLING SOLUTIONS

As the Rack becomes the new unit for scalable computing, engineering a liquid cooled rack requires careful planning and expert assembly. A liquid cooling solution needs to be flexible enough to handle

### Liquid Cooling | Center of Expertise for Data Center

Liquid cooling is highly valuable in reducing energy consumption of cooling systems in data centers. We survey the landscape on different deployments of liquid

### Emergence and Expansion of Liquid Cooling in Mainstream Data

Full or hybrid liquid cooling enables dense, high-power racks, essential to achieve the performance of these data centers using a reasonable number of racks within the real estate available in a typical

### Data Center Rack Cooling Guide to Efficiency and

For data center managers, IT engineers, and facility operators, this is the ultimate guide to overcoming thermal challenges and maximizing the

## Guidelines for Using Water-Based

stallation and operation of using a water-based heat transfer fluid in liquid-cooled computer racks. The guidelines include details on the heat transfer fluid and wetted materials that are used for quick

## A Guide to Data Center Liquid Cooling

This guide explores the leading liquid cooling solutions in use today—rear door heat exchangers, direct-to-chip cooling, and immersion

## Deploying liquid cooling in the data center

Adopting Liquid Cooling at Existing Data Centers The future of IT thermal management has arrived, and it's a hybrid of air and liquid cooling technologies. Enterprises are adopting high-performance

## Immersion cooling systems: Advantages and

Immersion cooling absorbs 100% of rack heat — but room cooling remains essential for air quality and humidity management. Rack densities are

## Deploying liquid cooling in the data center

Liquid-cooled systems are often used with air-cooling systems to cool racks at higher densities. Here's high-level guidance any team can use to navigate the process of developing a hybrid air-liquid

## Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.tomor.eu>

Email: [info@tomor.eu](mailto:info@tomor.eu)

Phone: +49 69 2381 5497

Address: Am Hauptbahnhof 10, 60329 Frankfurt am Main, Germany

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