GIGABYTE™

GIGABYTE Direct Liquid Cooling Solution

GIGABYTE Direct Liquid Cooling solution focuses on innovative breakthroughs in AI, HPC and cloud computing, delivering outstanding efficiency in heat dissipation while achieving high system availability and stability.

GIGABYTE Direct Liquid Cooling Solution

GIGABYTE offers both independently developed and third-party Direct Liquid Cooling (DLC) solutions designed for high-density computing in data centers. The advanced cooling system operates by allowing direct contact between heat-generating components, such as CPUs and GPUs, and a cold plate connected to tubes with coolant inside, effectively removing heat from the server through a more efficient and rapid method. Compared to traditional air-cooled systems, DLC transfers heat at a much higher rate, ensuring overall system performance and stability.

GIGABYTE DLC solutions can be easily integrated with both liquid-to-air and liquid-to-liquid coolant distribution units (CDUs), requiring minimal modifications to existing cooling hardware in data centers. Another option for easier adoption of new cooling solutions is deploying Rear Door Heat Exchangers (RDHxs). Compatible with both DLC servers and air-cooled servers, this design offers an ideal solution for gradually transitioning from air-cooling infrastructure to DLC data centers. These designs effectively help customers meet the increasing demands for greater heat dissipation at a reasonable cost and with ease of deployment.

To simplify the validation process, GIGABYTE also provides pre-tested, rack-scale DLC solutions with included software, which are easy to deploy and performance-optimized while still offering customizable options. With GIGABYTE servers and components from our trusted partners, we are committed to providing simple solutions for anyone looking for quick adoption of the latest cooling alternatives.

Cooling Challenges for AI, HPC, and Cloud Computing

Following the booming numbers in cloud computing services, artificial Intelligence (AI) has also started to become mainstream in every part of our daily lives. Combining the high-performance computing (HPC) needed in the field of scientific research, data centers worldwide continue to grow in number and scale. As the demand for computing power rapidly expands with limited space to be utilized, data centers are forced to come up with a much higher density solution, bringing unprecedented loads to the traditional air-cooling system design. Furthermore, the vibration generated by cooling fans in a server may result in damage to server components such as HDDs, and the noise could potentially damage the hearing of workers that routinely maintain IT hardware.

It is estimated that data centers now consume approximately 1% of the world's electricity, with the average power usage effectiveness (PUE) being in the range of 1.4 to 1.6. This number indicates that around 33% of the facility power is spent not on powering the IT hardware itself but on facility costs, including a majority part on air conditioning. DLC is a much more efficient way of transferring heat away from electrical components, and since air cooling equipment within a server, such as large fans and heat sinks, is no longer required, liquid cooling systems can fit into a more compact design, potentially supporting a much greater density of CPUs and GPUs in limited space.

Overall, the popular and standardized DLC technology has been proven effective throughout the past few years, and it is now a mature technology suitable for all scales of applications from small-sized data centers and smaller HPC cluster deployments to exascale computing facilities.

DLC Solution Composition

Dry-break Quick Connect Couplings

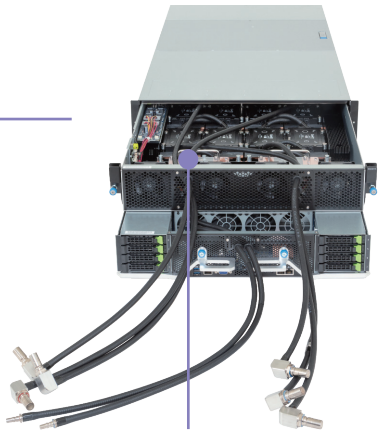
Rack Manifolds

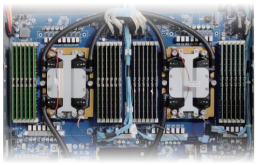
Coolant Distribution Units (CDUs)

DLC Rack

Power Distribution Units (PDUs)

DLC Servers





Passive Cold Plate Loops & Leak Sensor Boards

Project name	DL83-GP0	DL83-GP1	DL83-GP2	DL83-GP3	DL83-GP4	DL83-HD0	DL83-HD1
DLC Server	G593-SD0-LAX1 G593-SD1-LAX3 G593-ZD1-LAX1 G593-ZD1-LAX3 G593-ZD2-LAX1 G593-SX1-LAX1 G593-ZX1-LAX1	G4L3-SD1-LAX3 G4L3-ZD1-LAX3	G4L3-SD1-LAX5 G4L3-ZD1-LAX5	G363-SR0-LAX1 G363-SR0-LAX4 G363-ZR0-LAX1 G363-ZR0-LAX4 (without redundant)	G383-R80-LAP1 (without redundant)	H263-S62-LAW1 H263-S63-LAW1 H273-Z80-LAW1 H273-Z81-LAW1 H274-S60-LAW1 H274-S61-LAW1 H374-A80-LAW1 H374-A81-LAW1	H273-Z85-LAZ1 H274-A81-LAZ1 (without redundant)
Max. support unit	4	8	8	11	8	2U: 16 3U: 10	15
Manifold	Motivair 25ST7-4000ZF-M4R	Motivair 25ST7-4001Z2-M4R	Motivair 25ST7-4001Z1-M4R	Motivair 25ST7-4000ZY-M4R	Motivair 25ST7-4000ZZ-M4R	Motivair 25ST7-4000ZG-M4R	Motivair 25ST7-4000ZG-M4R
CDU	Motivair CGB20 25ST7-4000Z2-M4R	Motivair CGB20 25ST7-4000Z2-M4R	Motivair FD83 25ST7-4000ZV-M4R	Motivair CGB20 25ST7-4000Z2-M4R	Motivair CGB20 25ST7-4000Z2-M4R	Motivair CGB20 25ST7-4000Z2-M4R	Motivair CGB20 25ST7-4000Z2-M4R
PDU	nVent 25CRH-03K001-C0R QPA: 2	nVent 25CRH-03K001-C0R QPA: 4	Anderson 125A Smart PDU QPA: 4	nVent 25CRH-03K001-C0R QPA: 2 without redundant	nVent 25CRH-03K001-C0R QPA: 2 without redundant	nVent 25CRH-03K001-C0R QPA: 2 without redundant	Anderson 125A Smart PDU QPA: 2 without redundant
Rack	nVent 25EC5-DL8304-H0R front manifold	nVent 25EC5-DL8304-H0R front manifold	nVent 25EC5-DL8304-H0R front manifold	nVent 25EC5-DS8300-H0S rear manifold	nVent 25EC5-DS8300-H0S rear manifold	nVent 25EC5-DS8300-H0S rear manifold	nVent 25EC5-DS8300-H0S rear manifold
Coolant	PG25	PG25	PG25	PG25	PG25	PG25	PG25

Why GIGABYTE DLC Solution

All-in-one & fully optimized

Providing an all-in-one rack solution tailored for customers seeking a complete, high-performance setup.

Flexible & reliable

Tested with various brands to allow customers to customize configurations using products from verified partners.

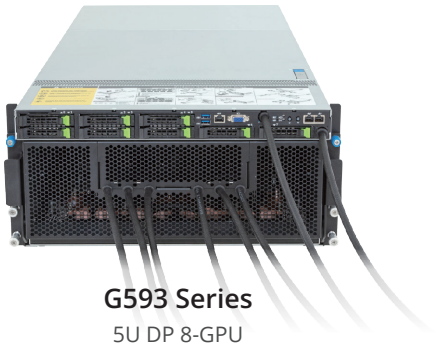
Faster delivery at a lower cost

Ensuring shorter lead times and competitive pricing while maintaining the high-quality performance and services offered by GIGABYTE and its partners.

Another Step Toward Green Computing with GIGABYTE DLC Solution

GIGABYTE DLC technology further demonstrates our commitment to sustainability. Compared to air cooling solutions, the DLC solution is more energy efficient, as seen in its low PUE value. It eliminates the need for additional server fans, and the passive cold plates and CDUs enable precise control of the system's operating temperature. This results in a significant decrease in lost energy and noise. At the same time, the lower and stable component temperature extends the hardware lifespan.

The GIGABYTE DLC solution not only provides innovative technical solutions but also reflects GIGABYTE's leadership in advancing technology, tackling heat dissipation challenges, and pursuing sustainable development. It enables clients to achieve environmental sustainability aligned objectives and usher in green computing. Additionally, it facilitates rapid deployment for businesses, streamlines client verification and evaluation processes, saves time, and reduces operational costs.

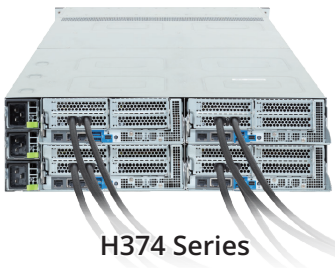


G593 Series
5U DP 8-GPU
NVIDIA HGX™ H200/H100
AMD Instinct™ MI300X

G4L3 Series
4U DP 8-GPU
NVIDIA HGX™ B200/H200
AMD Instinct™ MI300X/MI325X

G363 Series
3U DP 4-GPU
NVIDIA HGX™ H200/H100

G383-R80
3U 4-APU
AMD Instinct™ MI300A



H374 Series
3U 4-Node DP
Intel® Xeon® 6

H274/H273/H263 Series
2U 4-Node DP
Intel® Xeon® 6
5th/4th Gen Intel® Xeon®
AMD EPYC™ 9005/9004

Learn more at **https://www.GigaComputing.com/en**

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