LiquidCool Solutions

Rack-Based Immersion with Direct Flow

PRODUCT CATALOGUE

The heat is on. We'll keep you cool.

The leader in immersion cooling technology

Total Liquid Immersion with Directed Flow (direct-to-chip) in a standard 19-inch vertical rack.



Powerful

Up to 4kW per server

Versatile

Data centres to harsh environments

Advanced

65 patents and more pending

Customised

Brand & form factor agnostic



Designed for deployment in standard 19-inch racks, the LCS ZPS offers maximum scalability and high capacity cooling for applications where liquid cooling is required.

2U and 3U
Rack Servers

Standard 19"
Rack Compatible

4kW and 6kW
Cooling Capacity

Patented TIDF
Single-Phase Dielectric Cooling

Best Fit For

- Data Centre
- Edge
- AI
- High Performance Computing

Why It Stands Out

- Intel® and AMD® platforms available
- Connects to existing facilities cooling infrastructure
- Quiet operation
- Water is not consumed
- PUE 1.04*

*See catalogue for server rack requirements.

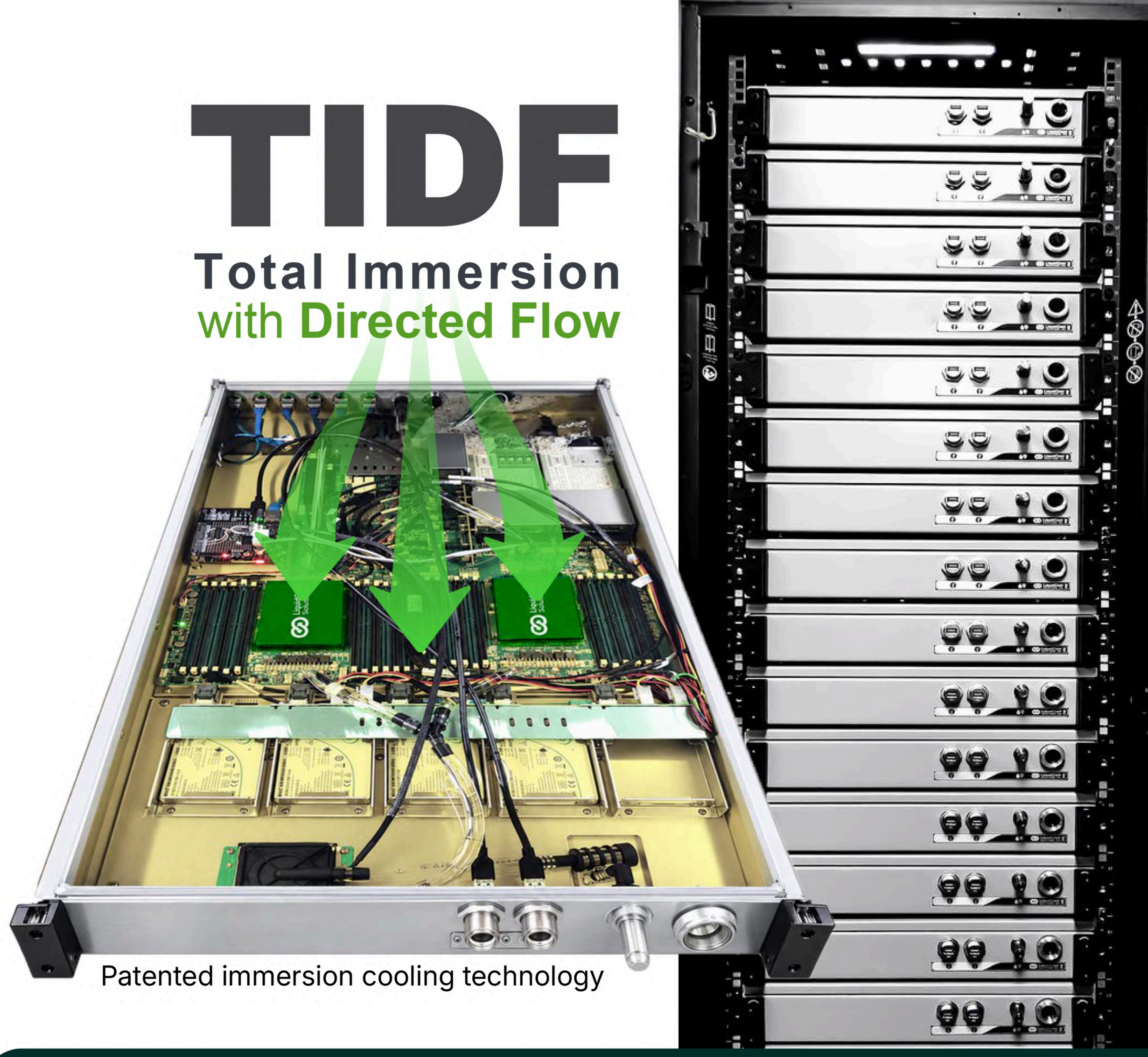
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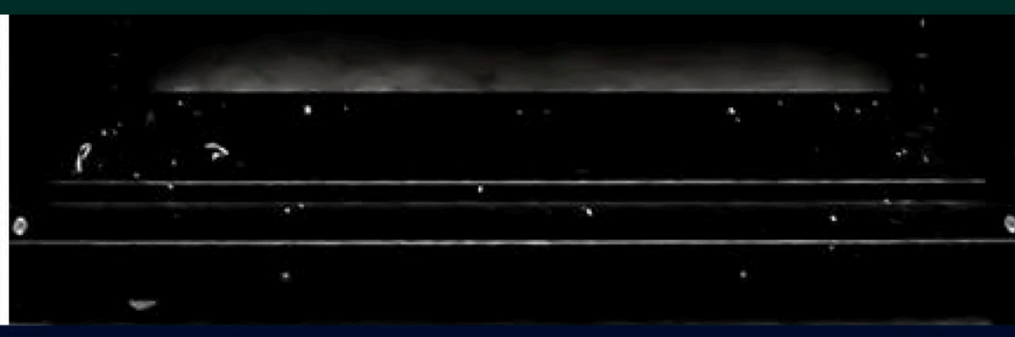
TIDF

Total Immersion with Directed Flow



Patented immersion cooling technology

The **LCS ZPS** chassis is sealed and filled with single-phase **dielectric fluid**. During operation, a continuous, regulated flow directs the fluid to the hottest component first. The fluid then absorbs heat from the remaining immersed electronics before circulating to an external heat exchanger for cooling and return. The fluid has **zero Global Warming Potential** (GWP) and can be easily pumped into or out of the chassis for servicing and reuse.



For additional heat exchange options and sizing, see the "Rack Heat Exhange System", page 15.

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LCS ZP5300

GPU / AI / HPC

3U high-density server platform



Virualisation, software-defined

Form Factor
3U Rackmount

Use Case
High-density 3U liquid immersion servers for AI inference, machine learning, HPC, cloud computing, virtualisation, software-defined infrastructure, storage and enterprise applications

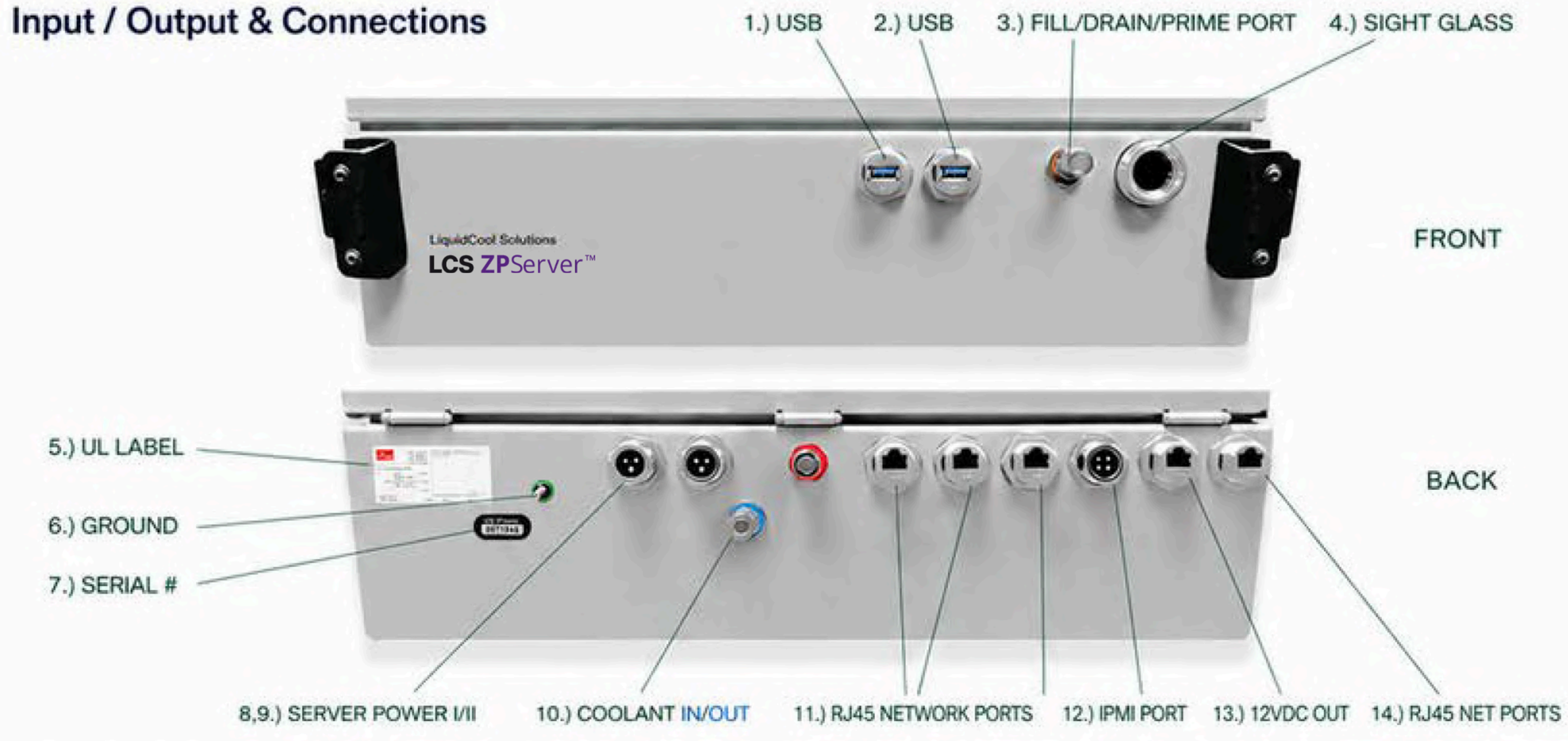
Key Applications
Virtualisation, software-defined storage, AI inference and machine learning, cloud computing, enterprise servers

Specification	LCS ZPS 5310	LCS ZPS 5320
Platform	**Intel**	**AMD**
Processor	Dual Socket E (LGA-4677) 5th Gen Intel Xeon / 4th Gen Intel Xeon Scalable processors Supports Intel Xeon CPU Max Series with high bandwidth memory (HBM) Up to 64C/128T Up to 320MB Cache per CPU	Dual processor(s) AMD EPYC 9004 / 9005 Series Processors *AMD EPYC 9005 Series drop-in support requires board revision 2.x Up to 320C/640T
GPU	Max GPU Count: Up to 4 double-width GPUs Supported GPU: NVIDIA PCIe RTX A6000 ADA	Max GPU Count: Up to 3 double-width GPUs Supported GPU: NVIDIA PCIe RTX A6000 ADA
System Memory	Slot Count: 32 DIMM slots Max Memory (1DPC): Up to 4TB 5600MT/s ECC DDR5 RDIMM Max Memory (2DPC): Up to 8TB 4400MT/s ECC DDR5 RDIMM	Slot Count: 24 DIMM slots Max Memory (1DPC): Up to 6TB 4800MT/s ECC DDR5 RDIMM Max Memory (1DPC): Up to 6TB 6000MT/s ECC DDR5 RDIMM Max Memory (1DPC): Up to 6TB 6400MT/s ECC DDR5 RDIMM
Drive Configuration	Default: Total 8 drives 8 NVMe or Solid State drives M.2: 2 M.2 NVMe slots (M-key 2280/22110)	Default: Total 8 drives 8 NVMe or Solid State drives M.2: 2 M.2 PCIe 3.0 NVMe slots (M-key 2280/22110)
Expansion Slots	PCI-Express (PCIe) Configuration: 4 PCIe 5.0 x16 FH / 10.5"L double-width slots 2 PCIe 5.0 x16 AIOM slots (OCP 3.0 compatible) CXL Support: Up to 4 CXL 1.1 x16/x8 devices M.2: 2 M.2 NVMe slots (B+M-key 2280/22110)	Default: additional unlisted options are available 1 PCIe 5.0 AIOM slot (OCP 3.0 compatible) Option A*: 1 PCIe 5.0 x16 FHFL double-width slot 1 PCIe 5.0 AIOM slot (OCP 3.0 compatible) Option B*: 2 PCIe 5.0 x8 FHFL slots 1 PCIe 5.0 AIOM slot (OCP 3.0 compatible)
On-Board Devices	NVMe: NVMe RAID 0/1/5/10 support (Intel VROC RAID key required) Chipset: Intel C741 Network Connectivity: Via AIOM	Chipset: System on Chip Network Connectivity: Via AIOM
Input / Output	LAN: 1 RJ45 1 GbE Dedicated BMC LAN port USB: 2 USB 2.0 ports 2 USB 3.0 ports (Header)	LAN: 1 RJ45 1 GbE Dedicated BMC LAN port USB: 2 USB 3.0 ports

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Product specifications may change without notice.

Input / Output & Connections



Specification	LCS ZPS 5310	LCS ZPS 5320
Network	UP TO 4 10GbE	
Power Supply	2x 2600W Redundant Titanium Level (96%)	2x 1600W Redundant Titanium Level (96%) power supplies
System BIOS	BIOS Type: AMI 64MB SPI Flash	BIOS Type: AMI 32MB SPI Flash EEPROM
Management	SuperCloud Composer® Supermicro Server Manager (SSM) Supermicro Update Manager (SUM) Supermicro SuperDoctor® 5 (SD5) Super Diagnostics Offline (SDO) Supermicro Thin-Agent Service (TAS) SuperServer Automation Assistant (SAA) New! *(Requires paid subscription with SM)	
PC Health Monitoring	CPU: Monitors for CPU Cores, Chipset Voltages, Memory Temperature: Monitoring for CPU and chassis environment	System health monitor Temperature: Monitoring for CPU and chassis environment
Dimensions and Weight	3U Chassis Dimensions - 447.7 x 129.29 x 812.8mm (17.63" x 5.09" x 32") 3U Chassis Wet Weight: approximately 35.9kg (79 lbs) 3U Chassis Dry Weight: approximately 19.05kg (42 lbs)	
Dielectric fluid capacity	3U Chassis: 24.6L (6.5 Gallons)	
Available Colour	ANSI 61 Grey	
Environment	Non-operating: -30°C to 60°C (-22°F to 140°F) Relative Humidity: 8% to 90% (non-condensing) Operating ambient air: 0°C to 60°C (32°F to 140°F) *Facilities cooling liquid: 10°C to 40°C (50°F to 104°F) (*Range may vary depending on the coolant specifications and flow rates.)	
Motherboard	SuperMicro X13DEM	SuperMicro H13DSH
Chassis	LCSZP3U LiquidCool Solutions Zero Pressure chassis	

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LCS ZP3200

Enterprise and Virtualisation

2U cloud server platform



Form Factor

2U Rackmount

Use Case

2U liquid immersion serves designed for enterprise compute, virtualisation, software-defined storage, cloud computing, and general server workloads requiring NVMe storage, PCIe expansion, and flexible networking.

Key Applications

Virtualisation, software-defined storage, AI inference and machine learning, cloud computing, enterprise servers

Specification	LCS ZPS 3210	LCS ZPS 3220
Platform	**Intel**	**AMD**
Processor	Dual Socket E (LGA-4677) 5th Gen Intel® Xeon® / 4th Gen Intel® Xeon® Scalable processors supports Intel Xeon CPU Max Series with high bandwidth memory (HBM) Up to 64C/128T Up to 320MB Cache per CPU	Dual processor(s) AMD EPYC™ 9004/9005 Series Processors (* AMD EPYC™ 9005 Series drop-in support requires board revision 2.x) Up to 320C/640T
System Memory	Slot Count: 32 DIMM slots Max Memory (1DPC): Up to 4TB 5600MT/s ECC DDR5 RDIMM Max Memory (2DPC): Up to 8TB 4400MT/s ECC DDR5 RDIMM	Slot Count: 24 DIMM slots Max Memory (1DPC): Up to 6TB 4800MT/s ECC DDR5 RDIMM (AMD EPYC™ 9004 Series Processor, MB R1.x/R2.0/R2.01) Max Memory (1DPC): Up to 6TB 6000MT/s ECC DDR5 RDIMM Max Memory (1DPC): Up to 6TB 6400MT/s ECC DDR5 RDIMM
Drive Configuration	Default: Total 8 drives 8 NVMe or Solid State drives M.2: 2 M.2 NVMe slots (M-key 2280/22110)	Default: Total 8 drives 8 NVMe or Solid State drives M.2: 2 M.2 PCIe 3.0 x4 NVMe slots (M-key 2280/22110)
Expansion Slots	PCI-Express (PCIe) Configuration: Default 1 PCIe 5.0 x16 FHHL slot 2 PCIe 5.0 x16 FH/10.5"L slots 1 PCIe 5.0 x16 AIOM slot (OCP 3.0 compatible) M.2: 2 M.2 NVMe/SATA slots (B+M-key 2280/22110)	Default 1 PCIe 5.0 x16 FHHL slot 2 PCIe 5.0 x16 FHHL slot 1 PCIe 5.0 x16 AIOM slot (OCP 3.0 compatible)
On-Board Devices	NVMe: NVMe RAID 0/1/5/10 support(Intel® VROC RAID key required) Chipset: Intel® C741 Network Connectivity: Via AIOM	System on ChipNetwork Connectivity: Via AIOM
Input / Output	LAN: 1 RJ45 1 GbE Dedicated BMC LAN port 2 USB 3.0 port(front)	LAN: 1 RJ45 1 GbE Dedicated BMC LAN port USB: 2 USB 3.0 ports

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Input / Output & Connections



Specification	LCS ZPS 3210	LCS ZPS 3220
Network	UP TO 4 10GbE	
Power Supply	2x 1200W Redundant Titanium Level (96%)	2x 1200W Redundant Titanium Level (96%)
System BIOS	BIOS Type: AMI 64MB SPI Flash	BIOS Type: AMI 32MB SPI Flash EEPROM BIOS Features: ACPI 6.4 UEFI 2.8
Management	SuperCloud Composer® Supermicro Server Manager (SSM) Supermicro Update Manager (SUM) Supermicro SuperDoctor® 5 (SD5) Super Diagnostics Offline (SDO) Supermicro Thin-Agent Service (TAS) SuperServer Automation Assistant (SAA) New! *(Requires paid subscription with SM)	
PC Health Monitoring	CPU: Monitors for CPU Cores, Chipset Voltages, Memory Temperature: Monitoring for CPU and chassis environment	System health monitor Temperature: Monitoring for CPU and chassis environment
Dimensions and Weight	2U Chassis Dimensions - 447.7 x 84.1 x 812.8mm (17.63" x 3.31" x 32") 2U Chassis Wet Weight: approximately 25.9kg (57 lbs) 2U Chassis Dry Weight: approximately 13.6kg (30 lbs)	
Dielectric fluid capacity	2U Chassis: 18.17L (4.8 Gallons)	
Available Colour	ANSI 61 Grey	
Environment	Non-operating: -30°C to 60°C (-22°F to 140°F) Relative Humidity: 8% to 90% (non-condensing) Operating ambient air: 0°C to 60°C (32°F to 140°F) *Facilities cooling liquid: 10°C to 40°C (50°F to 104°F) (*Range may vary depending on the coolant specifications and flow rates.)	
Motherboard	SuperMicro X13DEM	SuperMicro H13DSH
Chassis	LCSZP2U LiquidCool Solutions Zero Pressure chassis	

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Product specifications may change without notice.

LCS ZP1200

Edge and General Compute

2U edge server platform



Form Factor

2U Rackmount

Use Case

2U single-socket liquid immersion platforms for enterprise compute, database/storage, data centre optimised workloads, firewall applications, virtualisation, and edge/cloud computing service

Key Applications

Virtualisation, Cloud Computing, Enterprise servers, Data Centre Optimised, Database Storage, Firewall Applications and Edge

Specification	LCS ZPS 1210	LCS ZPS 1220
Platform	**Intel**	**AMD**
Processor	Single Socket E (LGA-4189) 3rd Gen Intel® Xeon® Scalable processors Up to 40C/80T Up to 60MB Cache	Single processor(s) AMD EPYC™ 8004 Series Processor Up to 64C/128T
System Memory	Slot Count: 8 DIMM slots Max Memory (1DPC): Up to 2TB 3200MT/s ECC DDR4 RDIMM/LRDIMM Supports Intel® Optane persistent memory 200 series	Slot Count: 6 DIMM slots Max Memory (1DPC): Up to 768GB 4800MT/s ECC DDR5 RDIMM
Drive Configuration	Default: Total drives 8 8 PCIe 4.0 NVMe M.2: 1 M.2 PCIe 3.0 x2 NVMe slot (M-key 2280/22110)	Default: Total drives 8 8 NVMe M.2: 2 M.2 PCIe 3.0 x4 NVMe slots (M-key 2280/22110)
Expansion Slots	Default2 PCIe 5.0 x16 FHFL slots 1 PCIe 5.0 x8 in x16 LP slot	Default 2 PCIe 5.0 x16 FHFL slots 1 PCIe 5.0 x16 LP slot
On-Board Devices	NVMe: NVMe RAID 0/1/5/10 support (Intel® VROC RAID key required) Chipset: Intel® C741 Network Connectivity: 2 RJ45 1GbE with Intel I210	Chipset: System on Chip Network Connectivity: 2 RJ45 10GBASE-T with Broadcom BCM57416
Input / Output	LAN: 2 RJ45 1 GbE LAN ports 1 RJ45 1 GbE Dedicated BMC LAN port (IPMI shared on LAN port 1) 2 USB 3.2 Gen1 Type-A ports (front) TPM: 1 TPM header	LAN: 1 RJ45 1 GbE Dedicated BMC LAN port 2 RJ45 10GBASE-T LAN ports USB: 2 ports (front) TPM: 1 TPM Onboard / port 80

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LCS ZP1212

5th Generation Intel Compute

2U edge server platform



Form Factor

2U Rackmount

Use Case

2U liquid immersion server for newer Intel-based general compute, virtualisation, cloud computing, data centre optimised workloads, and database/storage applications requiring DDR5 memory and PCIe 5.0 expansion.

Key Applications

Virtualisation, Cloud Computing, Data Centre Optimised, Database/ Storage.

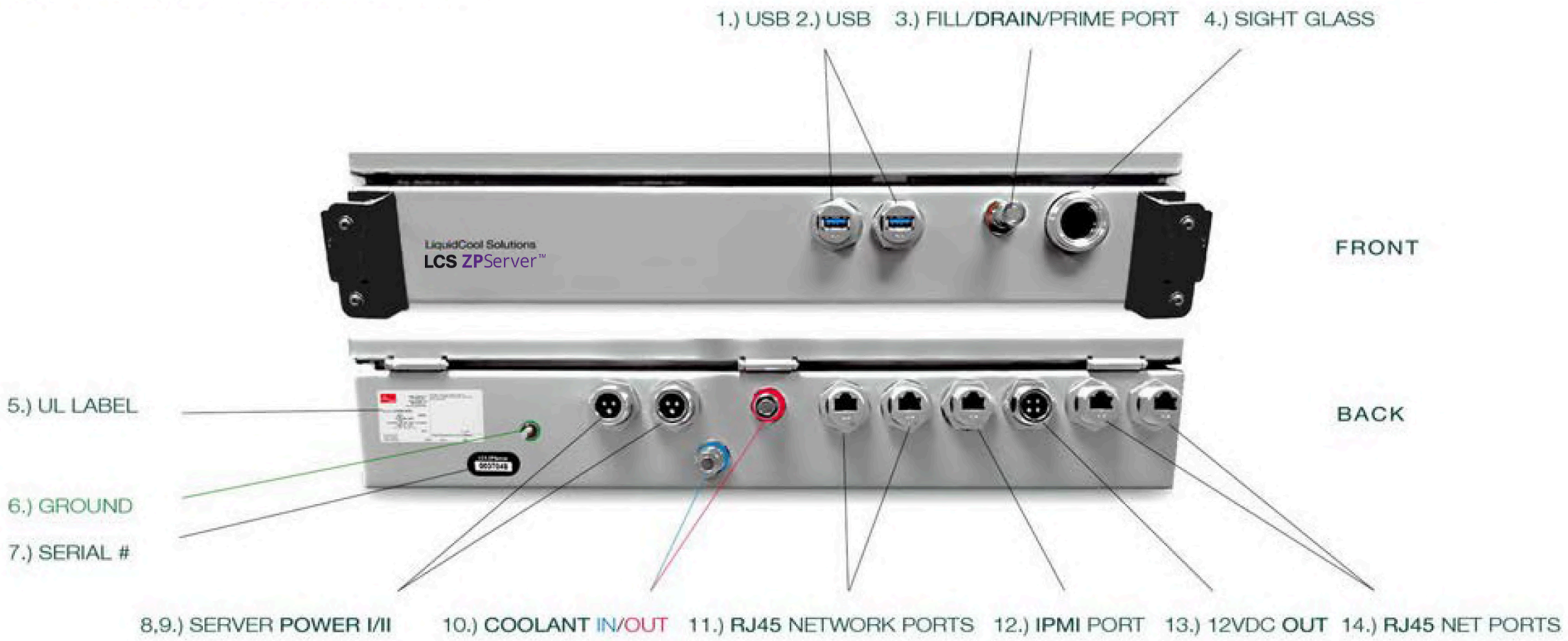
Specification	LCS ZPS 1212
Platform	Intel
Processor	Single Socket E (LGA-4677) 5th Gen Intel® Xeon® / 4th Gen Intel® Xeon® Scalable processors Up to 52C/104T; Up to 300MB Cache
System Memory	Slot Count: 8 DIMM slots / Channel Max Memory (1DPC): Up to 2TB 5600MT/s ECC DDR5 RDIMM
Drive Configuration	8 NVMe* *NVMe support may require additional storage controller and/or cables M.2: 1 M.2 PCIe 3.0 x2 NVMe slot (M-key 2280/22110)
Expansion Slots	Default 2 PCIe 5.0 x16 FHFL slots 1 PCIe 5.0 x8 in x16 LP slot
On-Board Devices	NVMe: NVMe RAID 0/1/5/10 support (Intel® VROC RAID key required) Chipset: Intel® C741 Network Connectivity: 2 RJ45 1GbE with Intel I210
Input / Output	LAN: 2 RJ45 1 GbE LAN ports 1 RJ45 1 GbE Dedicated BMC LAN port (IPMI shared on LAN port 1) 2 USB 3.2 Gen1 Type-A ports (front) TPM: 1 TPM header
Network	Up to 4 10GbE
Power Supply	2x 860W Redundant Titanium Level (96%) power supplies
System BIOS	BIOS Type: AMI 32MB SPI Flash
PC Health Monitoring	CPU: Monitoring for CPU and chassis environment

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Input / Output & Connections



Specification	LCS ZPS 1210	LCS ZPS 1220
Network	UP TO 4 10GbE	
Power Supply	2x 750W Redundant Platinum Level (94%) power supplies	2x 860W Redundant Titanium Level (96%) power supplies
System BIOS	BIOS Type: AMI 32MB SPI Flash	BIOS Type: AMI 32MB SPI Flash EEPROM
Management	SuperCloud Composer® Supermicro Server Manager (SSM) Supermicro Update Manager (SUM) Supermicro SuperDoctor® 5 (SD5) Super Diagnostics Offline (SDO) Supermicro Thin-Agent Service (TAS) SuperServer Automation Assistant (SAA) New! *(Requires paid subscription with SM)	
PC Health Monitoring	CPU: Monitor for CPU Cores, Chipset Voltages, Memory Temperature: Monitoring for CPU and chassis environment	Status monitor for speed controlTemperature: Monitoring for CPU and chassis environment
Dimensions and Weight	2U Chassis Dimensions - 447.7 x 84.1 x 812.8mm (17.63" x 3.31" x 32") 2U Chassis Wet Weight: approximately 25.9kg (57 lbs) 2U Chassis Dry Weight: approximately 13.6kg (30 lbs)	
Dielectric fluid capacity	2U Chassis: 18.17L (4.8 Gallons)	
Available Colour	ANSI 61 Grey	
Environment	Non-operating: -30°C to 60°C (-22°F to 140°F) Relative Humidity: 8% to 90% (non-condensing) Operating ambient air: 0°C to 60°C (32°F to 140°F) *Facilities cooling liquid: 10°C to 40°C (50°F to 104°F) (*Range may vary depending on the coolant specifications and flow rates.)	
Motherboard	SuperMicro X12SPW-TF	SuperMicro H13SSW-NT
Chassis	LCSZP2U LiquidCool Solutions Zero Pressure chassis	

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Product specifications may change without notice.

LCS SMALL-SCALE SOLUTION

LCS SSS™

Immersion computing, at the edge.

A compact, self-contained platform for application-configured edge computing.

- 24U rack
- 3-6 LCS 2U ZP Servers
- Integrated system monitoring
- Configured for your application

Total Liquid Immersion with Directed Flow™



A COMPLETE SMALL-SCALE PLATFORM

Purpose-built for rapid deployment



1 **Touchscreen Display**
Monitoring and control

2 **Scalable Configuration**
3-6 LCS 2U ZP Servers

3 **TIDF Liquid-immersion**
Cooling technology

4 **Compact Footprint**
Standard 24U rack

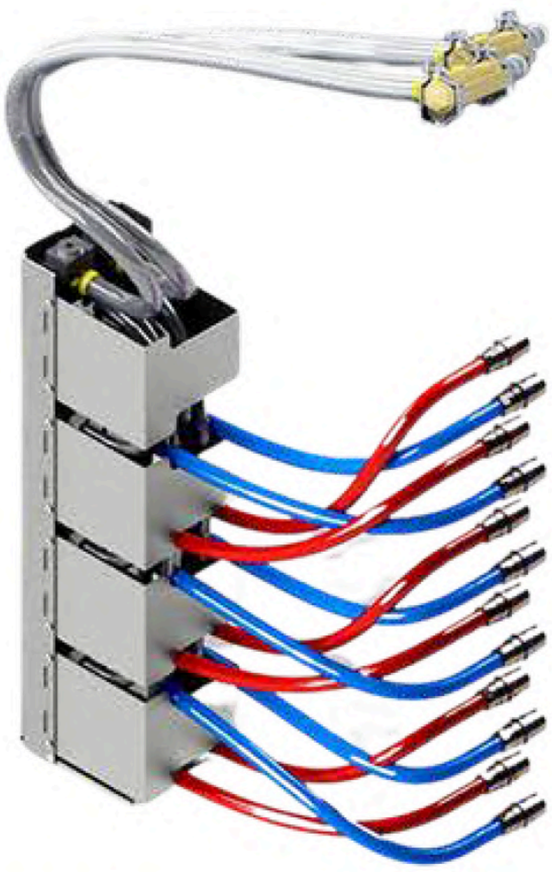
5 **Quiet Operation**
Less than 55 dBA

WHY SSS™

- Compact edge deployment
- Application-configured compute
- Rack-based immersion architecture

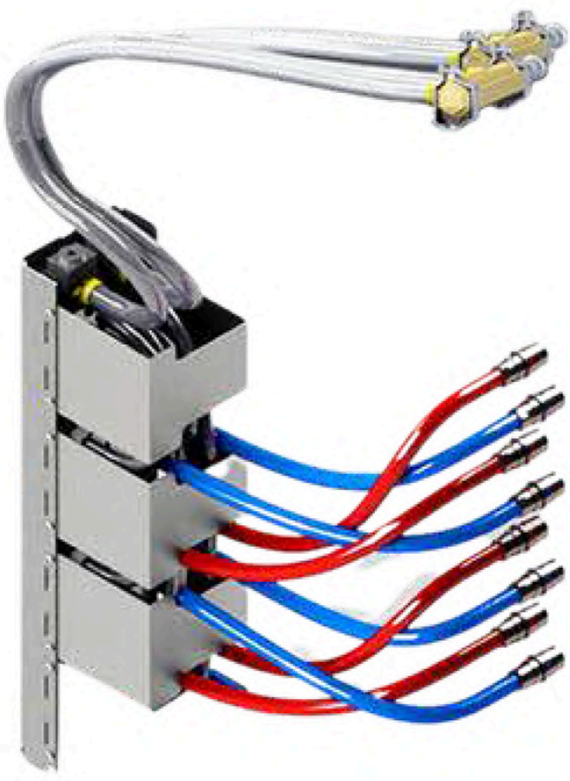
Configuration shown is representative. Final system is configured for the application.

SCALABLE HEAT EXCHANGE MANIFOLD



MHA 6-NODE

For 2U ZP Server
LCS 3200 & 1200 Series



MHA 4-NODE

For 3U ZP Server
LCS 5300 Series

Scalable Design - Start with one

MHA 6-NODE

Supports
up to
6 Servers



Standard
19" Rack



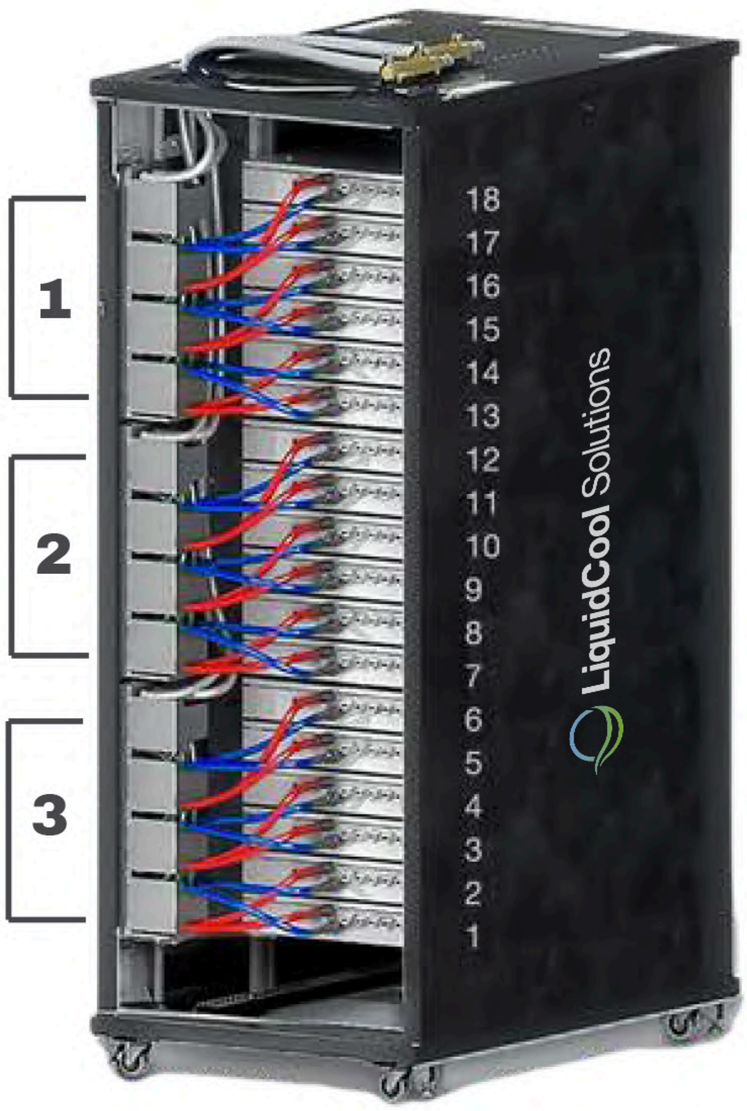
MHA 4-NODE

Supports
up to
4 Servers

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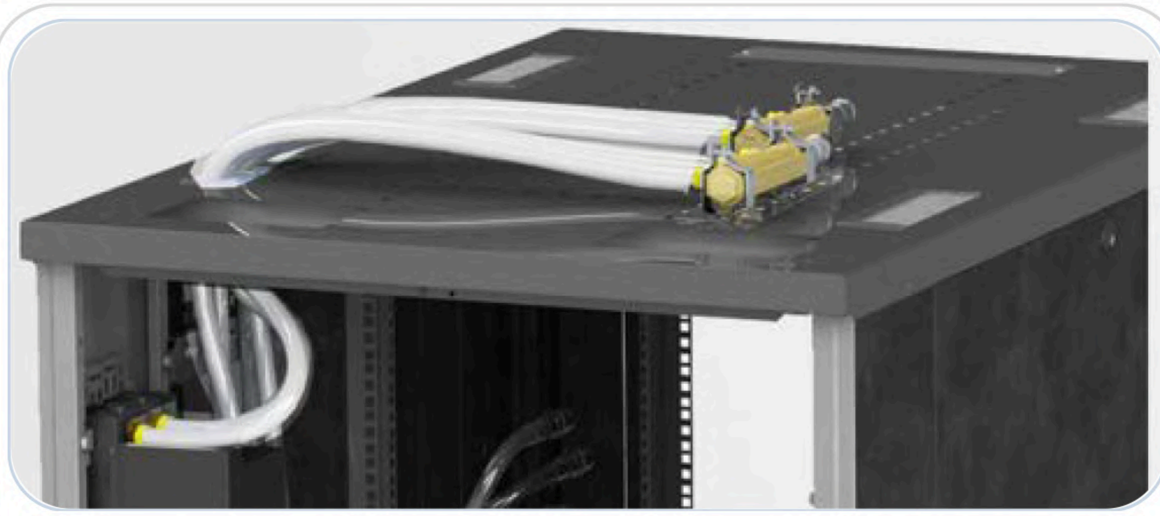
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SCALE TO A FULL RACK



MHA 6-NODE

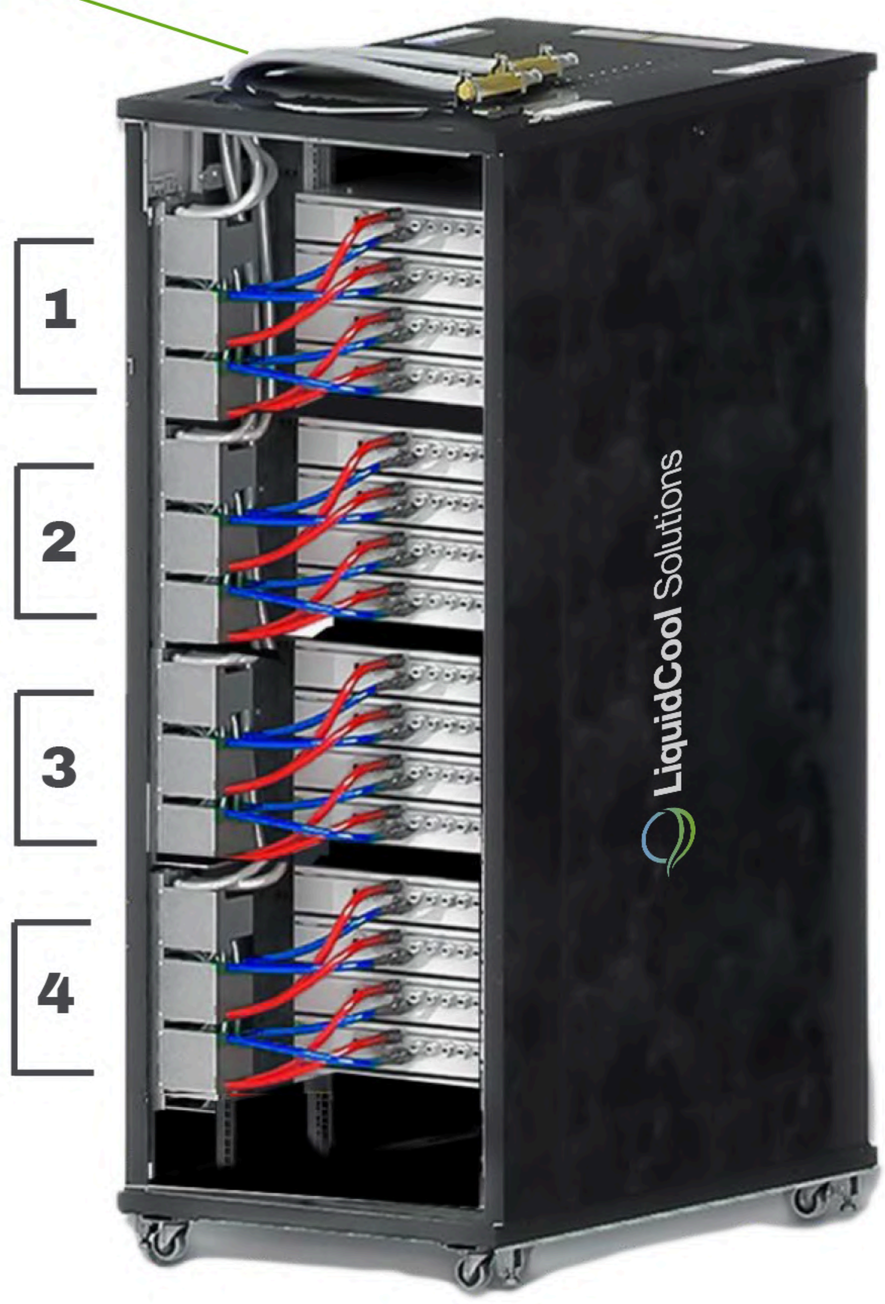
3 sets of assemblies
Up to **18 LCS 2U** ZPServers
Standard **42U** rack



TRM

Top-of-rack manifold set
Connects to the Facility Loop
1 set per rack

See next page



MHA 4-NODE

4 sets of assemblies
Up to **16 LCS 3U** ZPServers
Standard **48U** rack

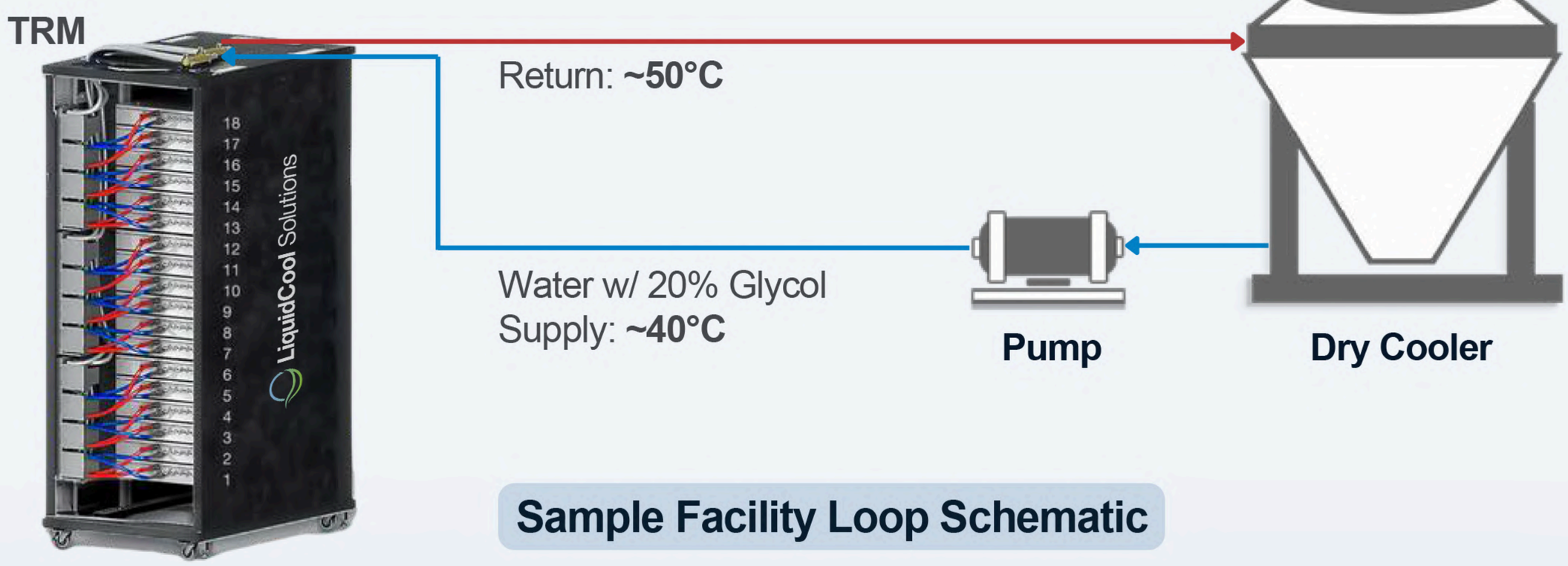
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RACK HEAT EXCHANGE SYSTEMS

Liquid-to-Liquid

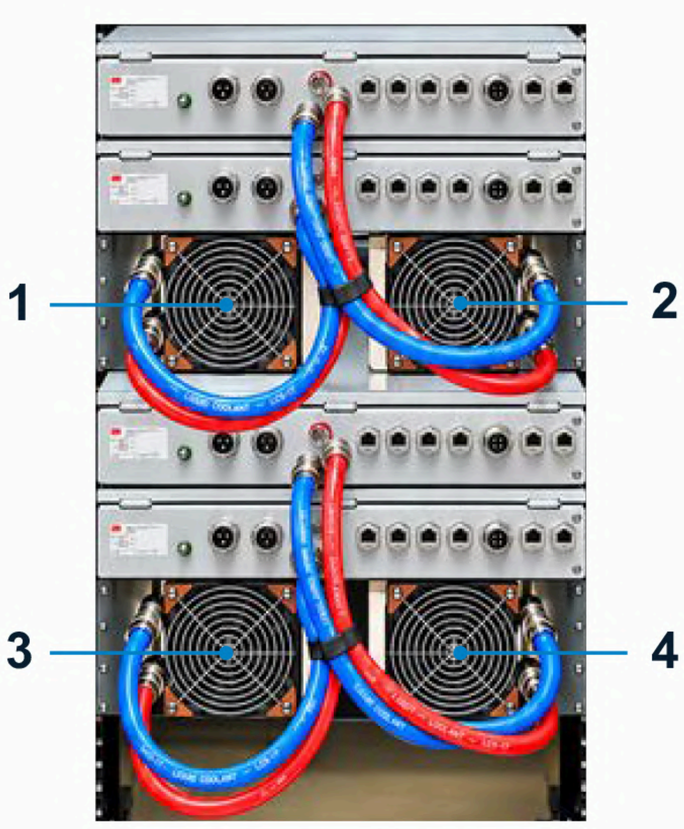
Facility-connected heat rejection



Sample Facility Loop Schematic

Liquid-to-Air

Rack-integrated heat rejection
for SSS Configurations



Four in-rack radiator option



Quite operation
<55dB

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STANDARD PARTS AND KITS

Racks
Recommended Server Racks

24U
(AR3104) APC NetShelter SX 24U 600mm Wide x 1070mm

42U
(AR2580) APC NetShelter SV 42U Rack Cabinet, 800mm Wide x 1200mm

48U
(AR2587} APC NetShelter SV 48U 800mm Wide 1200mm Deep Enclosure with Sides Black



Rails
LCS P0074540

Supermicro MCP-290-00172-0N 2U non-tip rail set, quick release, default for 2U & 3U 17.6"W, 26.5"-33.5" D



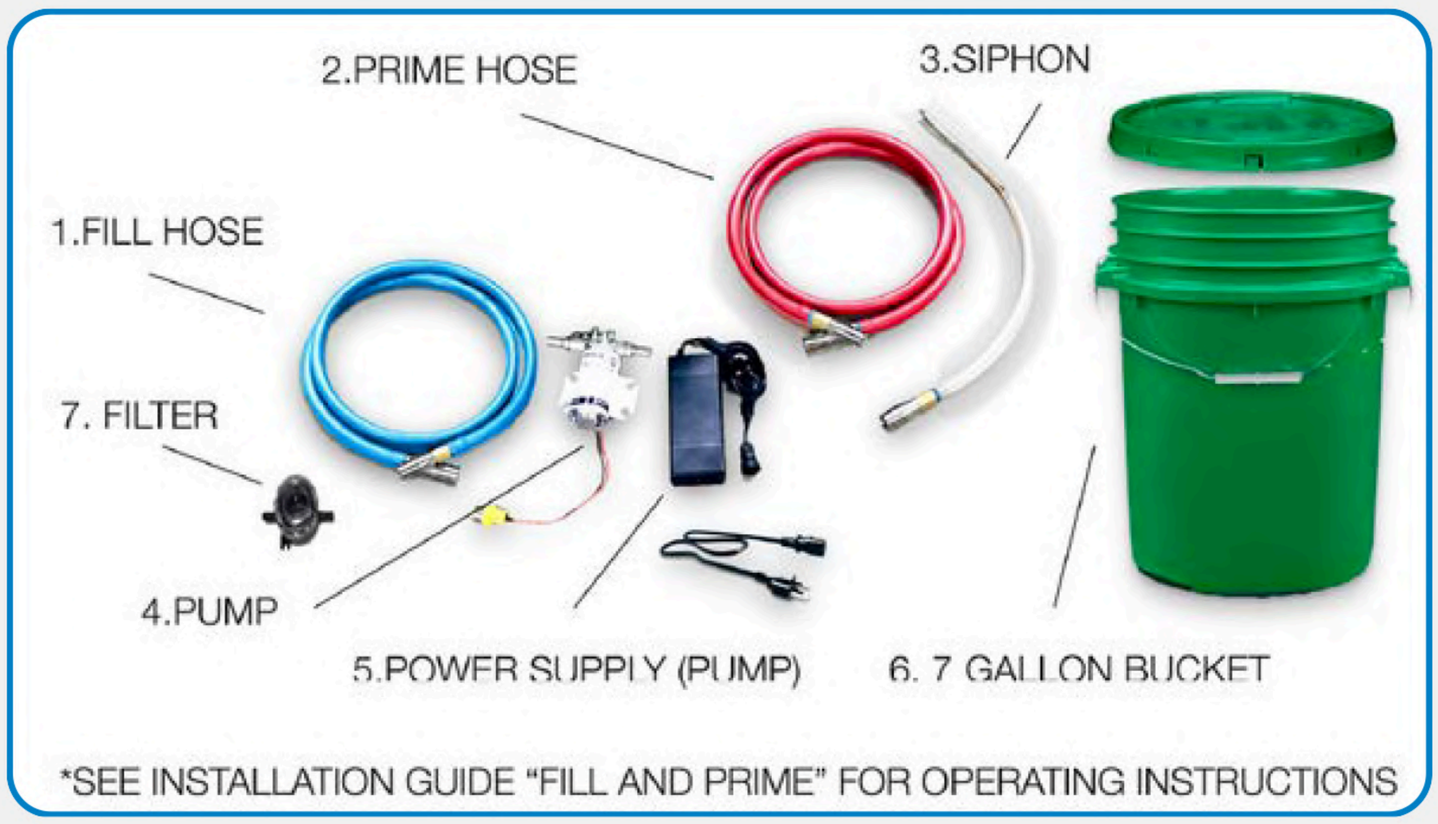
Mountings
LCSP0047419

2U, 3U, server rack mounting ear assembly



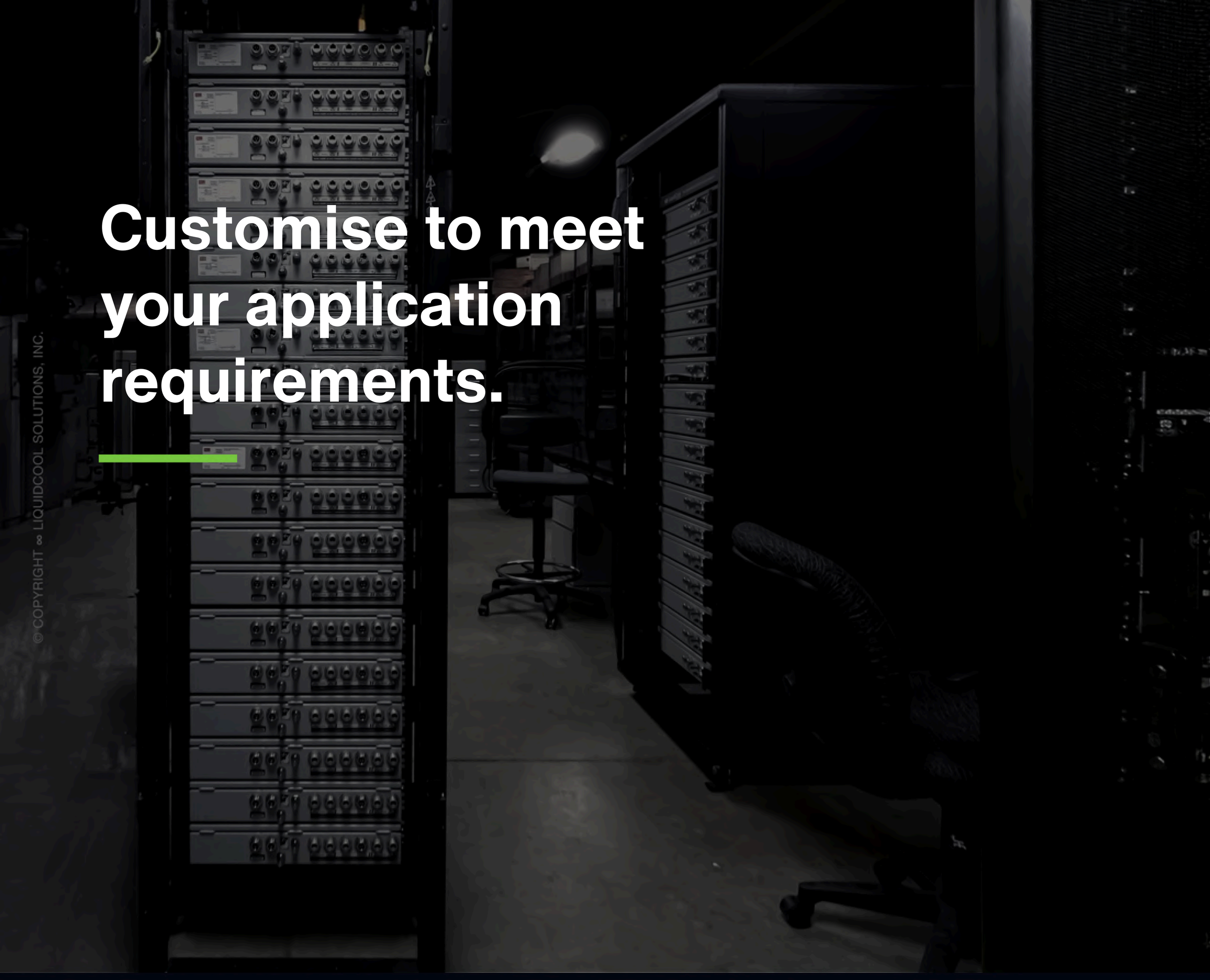
Fill, Prime, Drain Kit*
LCSFILL01

1. Fill Hose
2. Prime Hose
3. Siphon
4. Pump
5. Power Supply (Pump)
6. 7 Gallon Bucket
7. Filter



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Product specifications may change without notice.



Customise to meet your application requirements.

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