ZutaCore® HyperCool®

6U Water Heat Rejection Unit

Product Datasheet

March 2023

FEATURES

- 19” rack mountable unit with a 6U by 40” depth form factor.
- Supports up to 100 kW rack power at W3 32°C water inlet temperature.
- Use of a non-conductive refrigerant.
- Low pressure (< 3 bar).
- Monitor operations and control adjustments via a touch screen interface or over the network.
- N+1 redundancy of pumps.

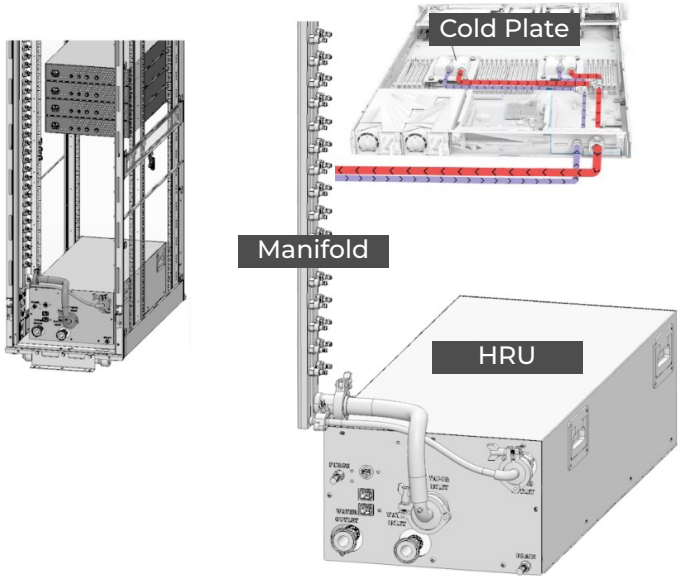
ADVANTAGES

- Fully automatic operation, analysis, and adjustments.
- Quick and easy installation with minimal setup.
- Installed with detachable, secure connections for easy maintenance.
- Safe, non-conductive refrigerant.

ZutaCore® HyperCool® is a direct-on-chip (waterless) dielectric liquid cooling solution for cooling a server’s heat emitting components such as CPU, GPU, and FPGA.

ZutaCore HyperCool is a dielectric, two-phase direct-on-chip system, consisting of the following sub-systems:

- **ZutaCore HyperCool Heat Rejection Unit (HRU)**: a self-contained system placed inside a standard 19” server rack which can handle up to 100 kW rack power in total.
- **ZutaCore HyperCool Manifold:** a self-contained manifold that fits into standard and custom racks.
- **ZutaCore HyperCool Dielectric Cold Plate:** assembled onto heat emitting components such as CPUs and GPUs.
- **ZutaCore HyperCool Service Unit:** (not shown) a self contained system used to pump liquid refrigerant into the HRU and to purge non-condensable gases out of the system.
- **ZutaCore HyperCool Software Defined Cooling (SDC):** (not shown) monitoring and controlling the operation of racks, servers and HRUs.



Heat Rejection Unit (HRU) Installation Requirements

1. The HRU is placed inside the server rack, at the bottom of the rack.
2. A ½” tri clamp tube connects from the HRU’s liquid fitting to the Manifold.
3. A 2” tri clamp tube connects from the HRU’s vapor to the Manifold.
4. 1” pipes connect to facility water inlet and outlet.

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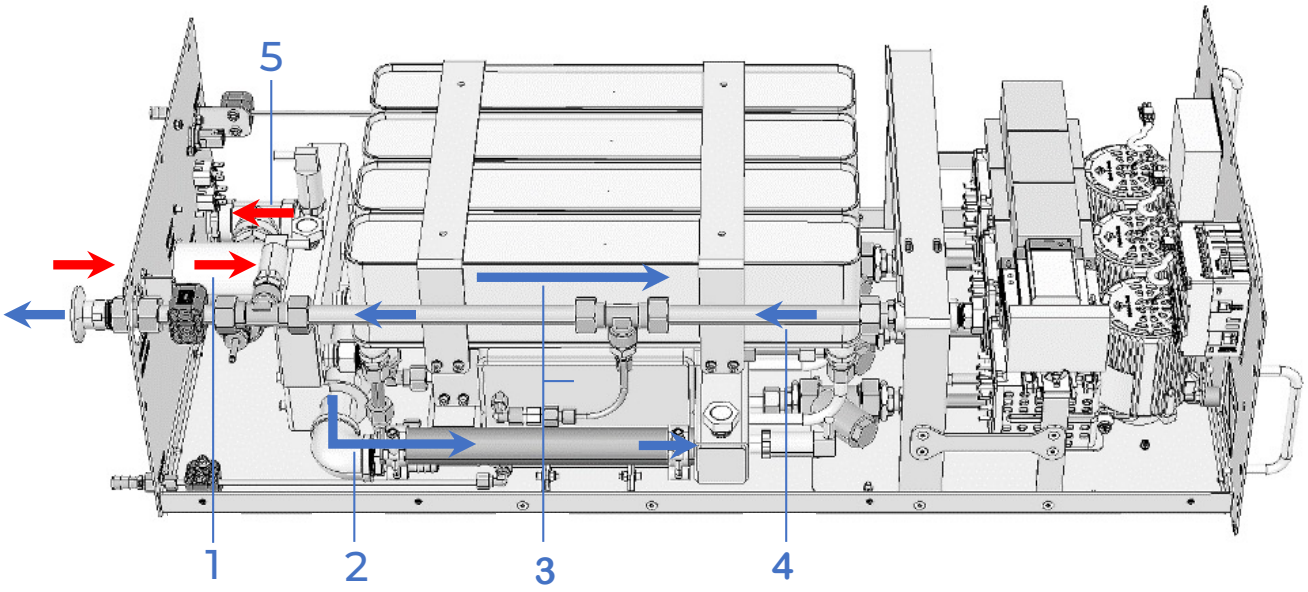
6U Heat Rejection Unit (HRU) Water Overview

The 6U HRU water can support up to 100 kW rack power. The HRU consists of the following subsystems:

- **Condensing subsystem:** responsible for condensing the vapor that flows from the servers (through the Manifold) back into liquid refrigerant.
- **Liquid refrigerant collection and delivery subsystem:** responsible for collecting liquid refrigerant from the condenser and pumping it back to the servers.
- **Water-cooling subsystem:** through this subsystem cold water from the facility's water supply flows to the condenser to cool the refrigerant and then flows back to the facility water system.
- **Internal control system:** monitors system parameters and controls the system performance. Connects to the central system control software via API and network.



1. Heated **vapor refrigerant** flows from the servers towards the **condenser.**
2. Cold facility water flows to the **condenser.**
3. Vapor refrigerant flows through the **condenser** coils to condense into liquid which flows into the **buffer tank.**
4. **Liquid refrigerant** is pumped out of the **buffer tank** and back to the servers.
5. Hot water flows from the **condenser** back to the facility water supply.

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6U HRU Water Specifications

- Fully contained build, including electrical components and control system
- All weted materials are dielectric refrigerant compatible
- System seal types: FKM (Viton), or compression fittings, or Loctite 577
- Cooling capacity supports up to 100 kW rack power

Environmental

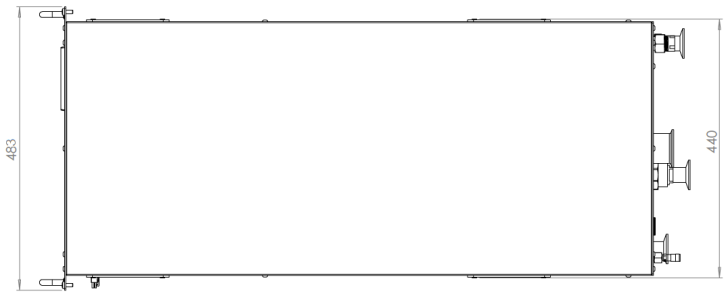
Overall System		Refrigerant	
Operating temperature:	5°C - 45°C (41°F - 113°F)	**Type:**	Dielectric Refrigerant
Max working pressure:	3 bar (refrigerant), 4.5 bar (cooling water)	**Temperature working range:**	2°C - 65°C (36°F - 149°F)
Humidity:	20% - 70%	**Buffer tank capacity:**	8L
Waterproof rating:	NEMA Type 1	**Safety:**	Non-conductive, non-corrosive, non-flammable, non-toxic
Other:	Thermal insulation and vibration dampening (optional)	**Environmental properties:**	Zero ozone depletion potential, low global warming potential

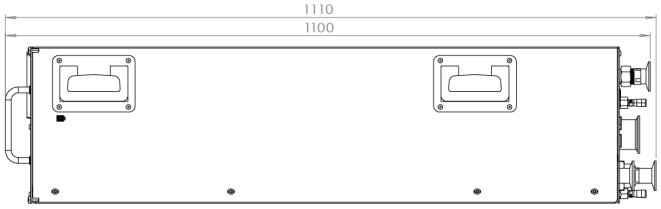
Pipe and Electrical Connections

Vapor and Liquid Tube Connections - Type and Diameter		Electrical Connections - Electrical and Communications	
Vapor Inlet:	Tri-clamp 2” flange	**Power connections:**	N+1 phase redundancy; 120-230 VAC at 50/60 Hz [120 VAC by special order]
Liquid Outlet:	Tri-clamp ¾” flange	**Power consumption:**	< 0.5 kW
Water (cold inlet/hot outlet)	Tri-clamp 1” flange	**Communication protocol:**	RJ45 based TCP/IP communication

Physical Dimensions - HRU Dimensions and Weight

Width: 440mm (17 5/16”)
Length: 1100mm (43 5/16”)
Height: 266mm (10 15/32”)
Weight: 90kg (199 lbs.) dry





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