Product Brief

Intel’s Open IP Immersion Cooling - Single Phase - 12U

The single-phase immersion cooling solution initiated by Intel has a 12U tank, which can be scaled to 24U, 36U, 48U, and so on. Features scalable from edge data centers to hyper scale data centers.

Compatible with both 19-inch and 21-inch servers.

Intel’s Open IP Immersion Cooling Reference Solutions Specification	
Tank	
Form Factor	12 U
Dimension	815.5 mm (L) x 871.0 mm (W) x 1333.0 mm (H)
Weight (without Coolant)	236 kg
Floor Loading Capacity (Tank + CDU)	1200 kg/m^2
Power	No power required for tank (Server power supply by PDU or power busbar)
Number of Immersed System	Support from 1U to customer design requirement (Server, Switch, OOB, and so on)
Note: More than 48U will be a customization	

The reference design has a cooling capacity of 15 kW, which is scalable up to 180 kW and higher also tailored to customer needs. It can be upgraded according to customer's system cooling capacity requirements.

Cooling Distribution Unit (CDU)				
Cooling Capacity	15 kW	30 kW	60 kW	100 kW
Dimension	994.2 mm (L) x 817.5 mm (W) x 1750.0 mm (H)	TBD	1208.0 mm (L) x 877.0 mm (W) x 1750.0 mm (H)	TBD
Weight (without Coolant)	300 kg	TBD	440 kg	TBD
Coolant Filling Volume	19.6 L	TBD	48.0 L	TBD
Water Side Connection Specification	Flange DN40 DIN PN16	TBD	Flange DN50 DIN PN16	TBD
Redundant Feature	Yes	Yes	Yes	Yes
Filtering System	Yes	Yes	Yes	Yes
Monitoring System	Yes	Yes	Yes	Yes
Power Specification	1x3P3W+G 380 VAC/15A (four-core wire) or 1x3P3W+G 220 VAC/20A (four-core wire)	1x3P3W+G 380 VAC/20A (four-core wire)	1x3P3W+G 380 VAC/30A (four-core wire)	1x3P3W+G 380 VAC/50A (four-core wire)
Main Power Consumption	2.2 kW	4.4 kW	8.0 kW	15.0 kW
Design	Standalone and disaggregated architecture			
Plate Heat Exchanger Parameters - Water Side				
Inlet Temperature	33 °C	33 °C	33 °C	33 °C
Outlet Temperature	38 °C	38 °C	38 °C	38 °C
Flow Rate	43.4 LPM	86.7 LPM	173.5 LPM	289.1 LPM
Pressure Drop	2.2 kPa	2.4 kPa	3.4 kPa	2.7 kPa
Plate Heat Exchanger Parameters - Coolant Side (for example, FC40 side)				
Inlet Temperature	43 °C	43 °C	43 °C	43 °C
Outlet Temperature	38 °C	38 °C	38 °C	38 °C
Flow Rate	92.2 LPM	184.5 LPM	367.0 LPM	615.0 LPM
Pressure Drop	21.0 kPa	20.8 kPa	29.3 kPa	27.8 kPa
Note: More than 100 kW will be a customization				

Intel has also released a modular server design optimal for and validated with Intel's Open IP Immersion Cooling solutions. The compute module and I/O module are decoupled so that the lower-power or extended-temperature specification modules are placed on the top of the tank while the high-power and low-

temperature specification modules are placed on the bottom of the tank–a placement principle, which increases heat dissipation efficiency.

Server System in Tank	
Form Factor	Support from 1U to customer design requirement (Compute, Storage, GPU nodes)
Processor	Support Intel® Xeon® Scalable Processor
Memory	Follow System Design
Memory Speed	Follow System Design
Storage	HDD not recommended
Power Supply	PSU without Fan and Fan Control (Suggest working with PSU Supplier)
PCI Express* (PCIe*) Adapter	Follow System Design (Active Cooling not recommended, suggest working with add-on Card Supplier)
Cooling	Remove system fan and disable fan control (FW/SW)
I/O (per Node)	Recommend front access I/O
Platform Feature	Follow System Design

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12U@15kW Chiller Recommendation (Optional)

The chiller is optional for 12U tank in-lab environment if there is no cooling tower supply. If the tank is larger than 12U, Intel highly recommends the cooling tower.

Intel's Open IP Immersion Cooling Server Deployment Kit Specifications	
Chiller Recommendation (Optional)	
Dimension	756.0 mm (L) x 756.0 mm (W) x 2255.0 mm (H)
Weight (without Coolant)	262 kg
Cooling Capacity	17.5 kW
Power Output	3 phases / 380V / 60 Hz
Power Consumption	5.45 kW
Environmental Temperature	from 10 to about40 degrees
Cooling Temperature Range	from 10 to about30 degrees
Tank Water Volume	120L
Note: No redundant and filtering system (For in-lab server development, validation, and debug)	

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