



Solution Reference: 1L88R

AI Starter Kit 1: Liquid to Air Direct to Chip Retrofit

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1 Executive Summary

Vertiv™ 360AI Solutions uniquely combine deep domain expertise in power architectures, thermal management, remote management, and seamless service delivery to enable rapid deployment of infrastructure for AI applications and high-performance computing.

Your goals for high-density, floorspace optimization, sustainability and efficiency became our teams' key design criteria, focusing their efforts on designing the solution that exceeds your goals and expectations with seamlessly integration into your environment. Our world class solutions and engineering team delivered on this promise, and our services team fully supports it with their unmatched expertise and global footprint.

2 General Technical Description

This high-density solution is sized for IT load of 88 kW across 1 rack, assuming 70 kW of direct to chip liquid cooling capacity and 18 kW traditional air-cooling (i.e., 80:20 liquid and air split). The cooling solution is a liquid-to-air standalone cooling unit, assuming operating conditions including a supply air temperature of 75°F (24°C) at 45% relative humidity, a technical water side at 96°F (35.6°C) supply at 1.5 LPM/kW of 25% propylene glycol.

Included products are a heavy-duty rack that houses rack PDUs, manifolds, and top-of-rack management appliance, as well as other accessories necessary for integration and normal data center operation.

Also included are comprehensive deployment services for installation, fluid-fill, recurring a warranty service such as warranty inspection, start-up, and acceptance testing. Optional services include workforce training on thermal management operation and servicing.

2.1 System Capacity

Rack (s)	Total Solution Capacity	Load Per Rack
1	88 kW	88 kW

2.2 Technologies Used

Cooling Method	Heat Rejection type
Direct-to-chip (liquid)	Air

3 Material list

Qty.	SKU	Description
1	XDU070	Liquid-to-Air CDU: Liebert XDU070 Coolant Distribution Unit
1	RM124	Rack Manifold: Manifold assembly in-rack 36U medium flow
1	LT460-Z20	Zone Leak Detection Sensors: Leak Detection Kit, 20' cable
2	VP7UA002	Rack PDU: Switched Outlet Level Monitoring, 80 A, 240/415 V WYE, 57.6 kW, Vertical, (36) Combi C13/C19, Hardwired
1	VR9357	Heavy Duty Rack: VR-HD 48U 800 mm x 1200 mm
1	RDU501	1U Liebert RDU501 Intelligent Infrastructure Management Appliance
1	POESwitch24Port	1U POE Switch for Solutions

Material list only includes major components, other supporting peripheral components such as the hoses, valves, cable, adapter kits, etc. would be part of final quote document.

4 Solution Pictures

4.1 Front Quarter View



The images shown are for illustration purposes only and may not be an exact representation of the product.

4.2 Back Quarter View

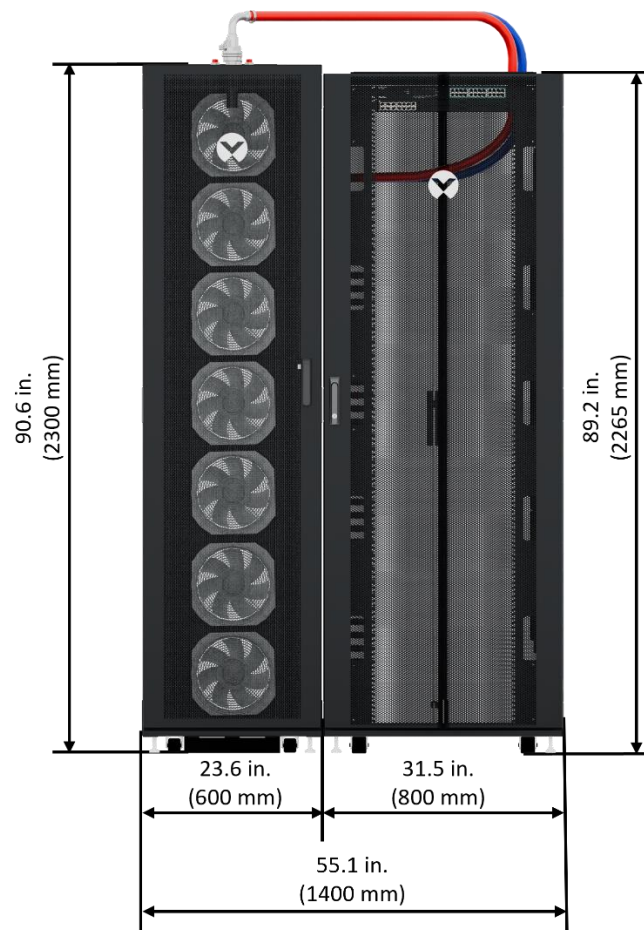


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4.3 Top View

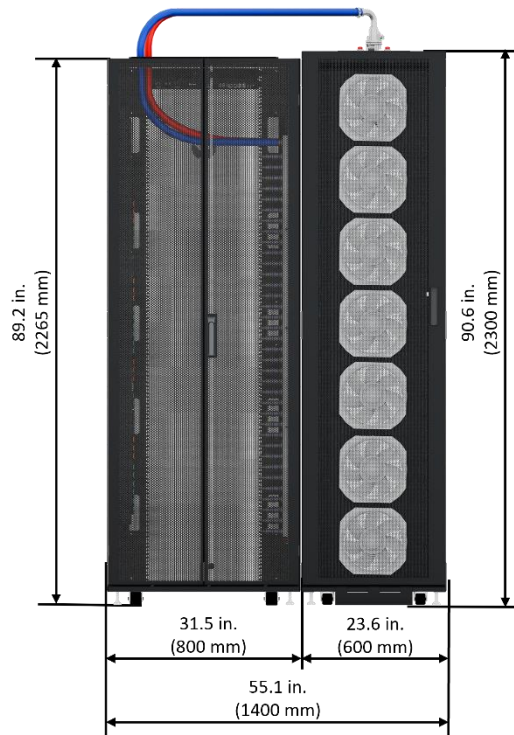


4.4 Front View

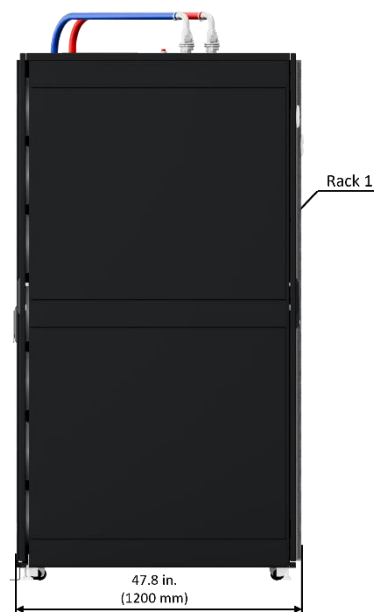


*The images shown are for illustration purposes only and may not be an exact representation of the product.
Nominal dimensions, reference submittal drawings for exact dimensions*

4.5 Rear View

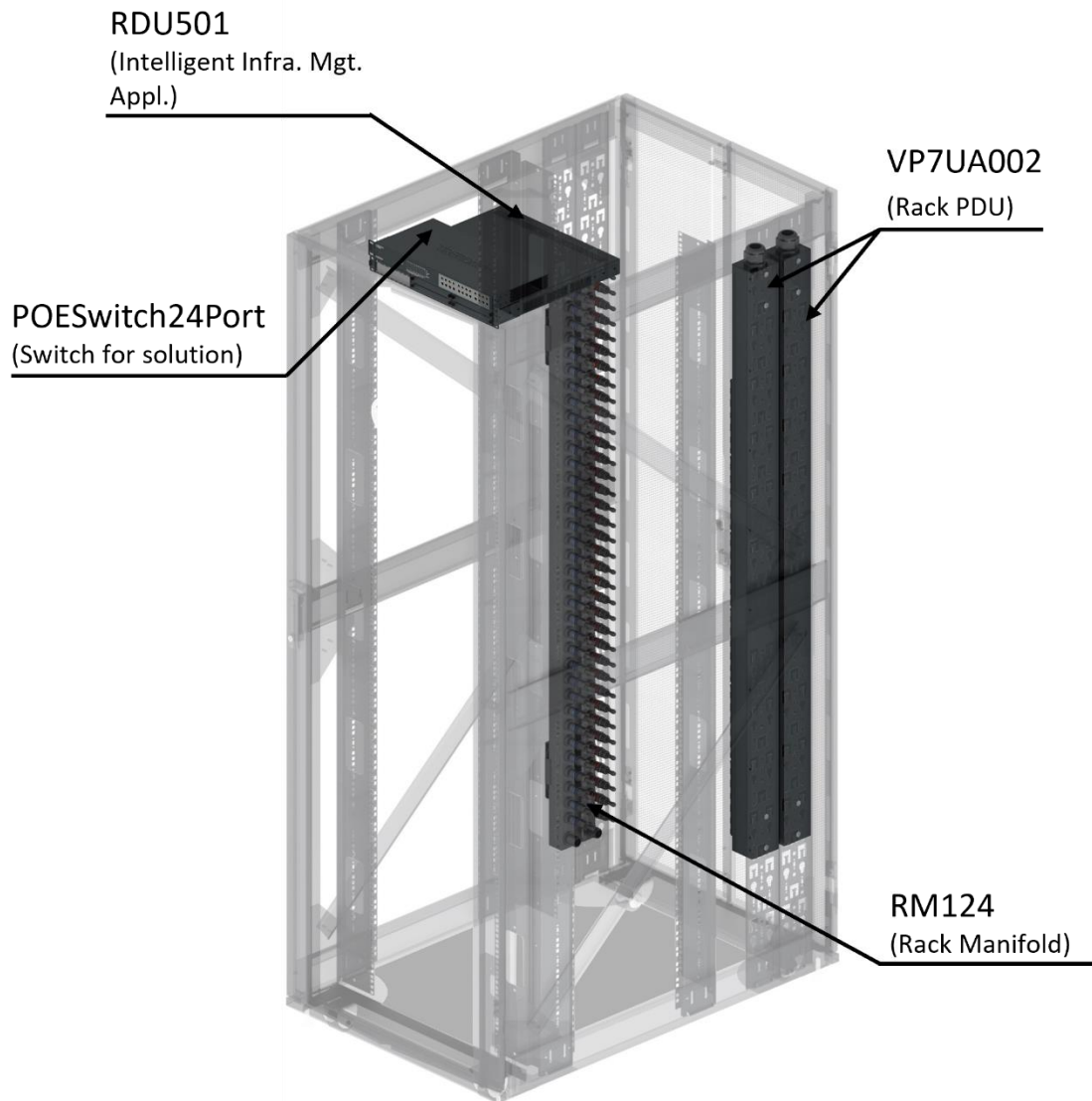


4.6 Side View



*The images shown are for illustration purposes only and may not be an exact representation of the product.
Nominal dimensions, reference submittal drawings for exact dimensions*

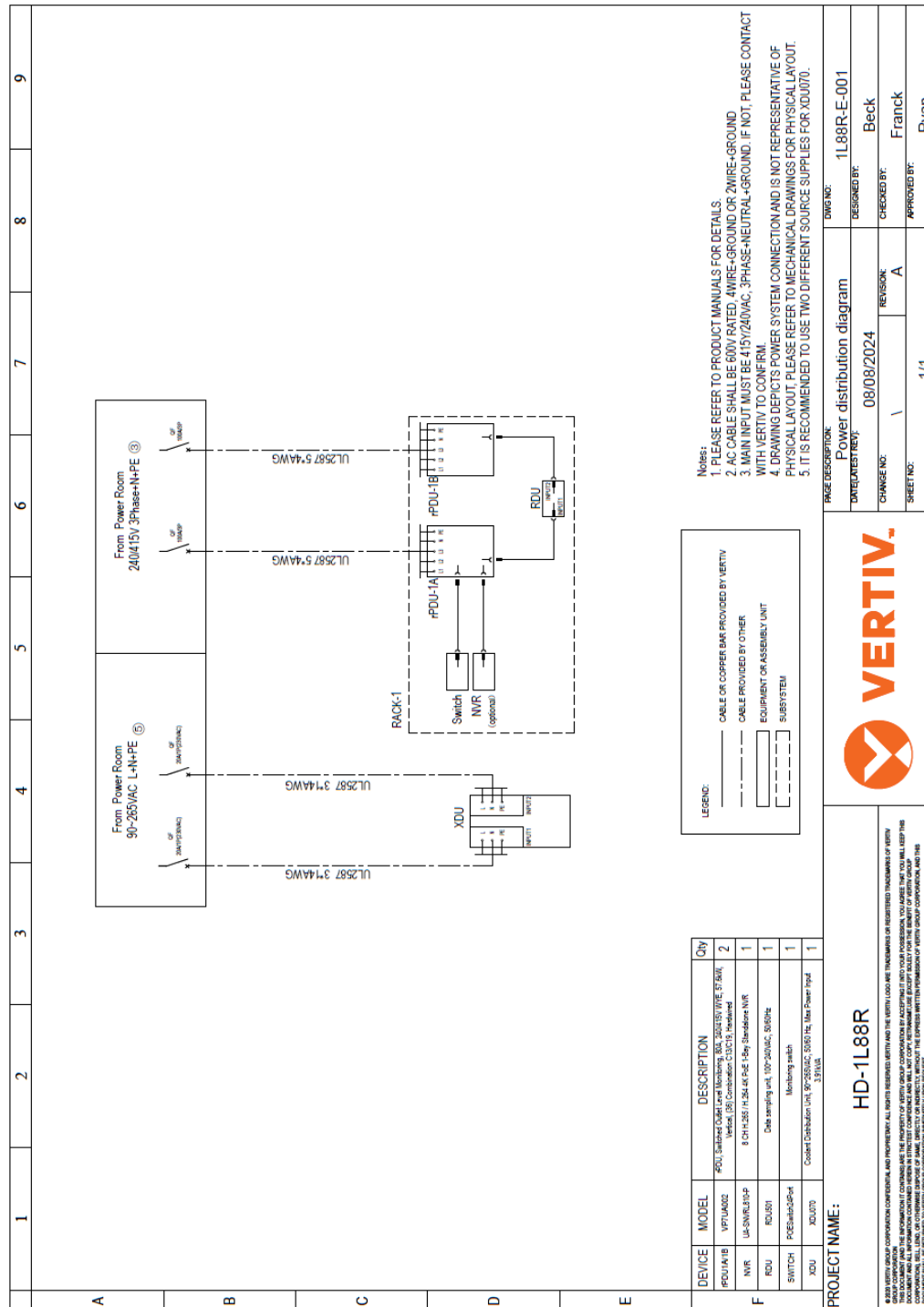
4.7 VR Rack ISO View



The images shown are for illustration purposes only and may not be an exact representation of the product.

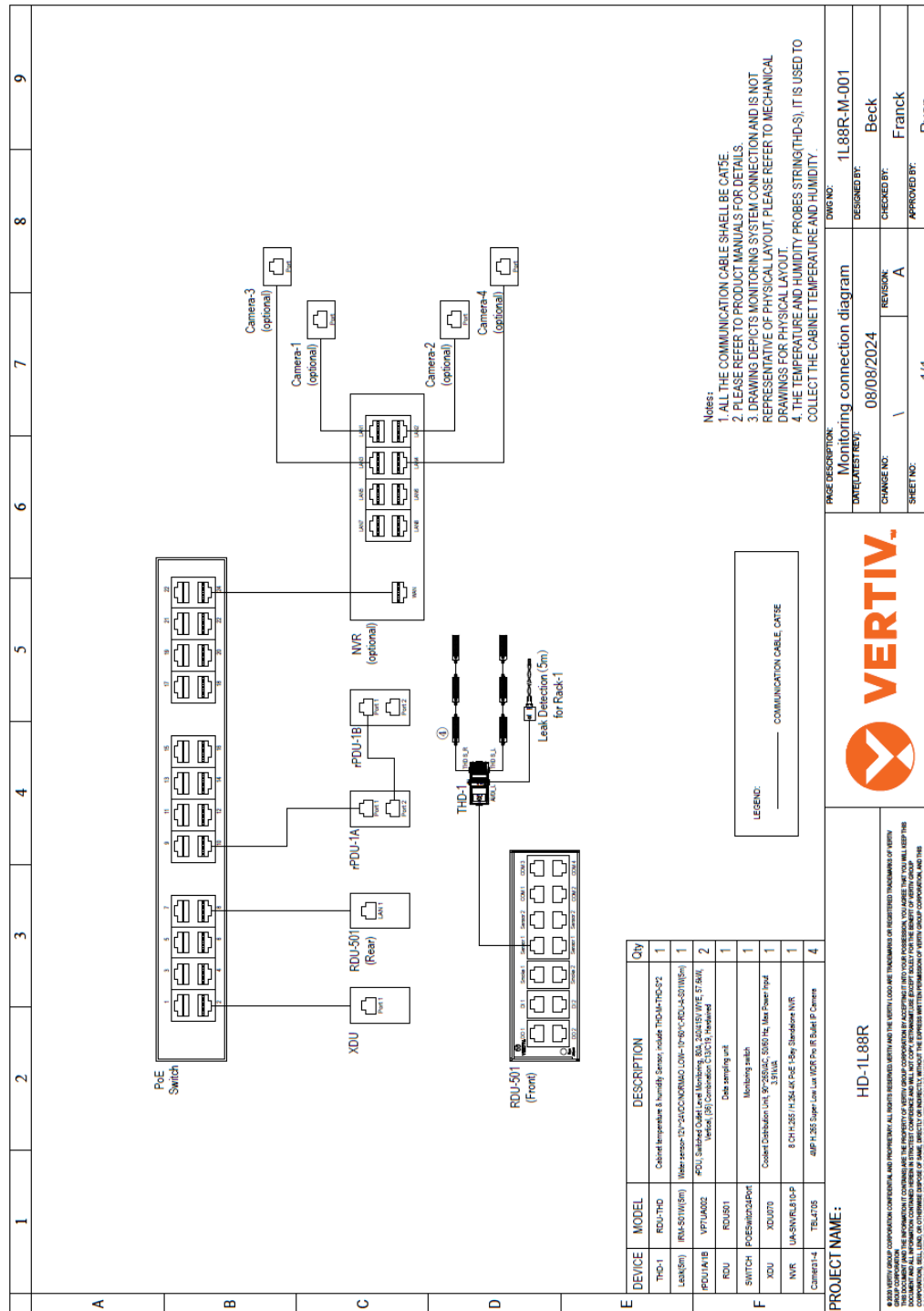
5 Technical Description

5.1 Single Line Diagram

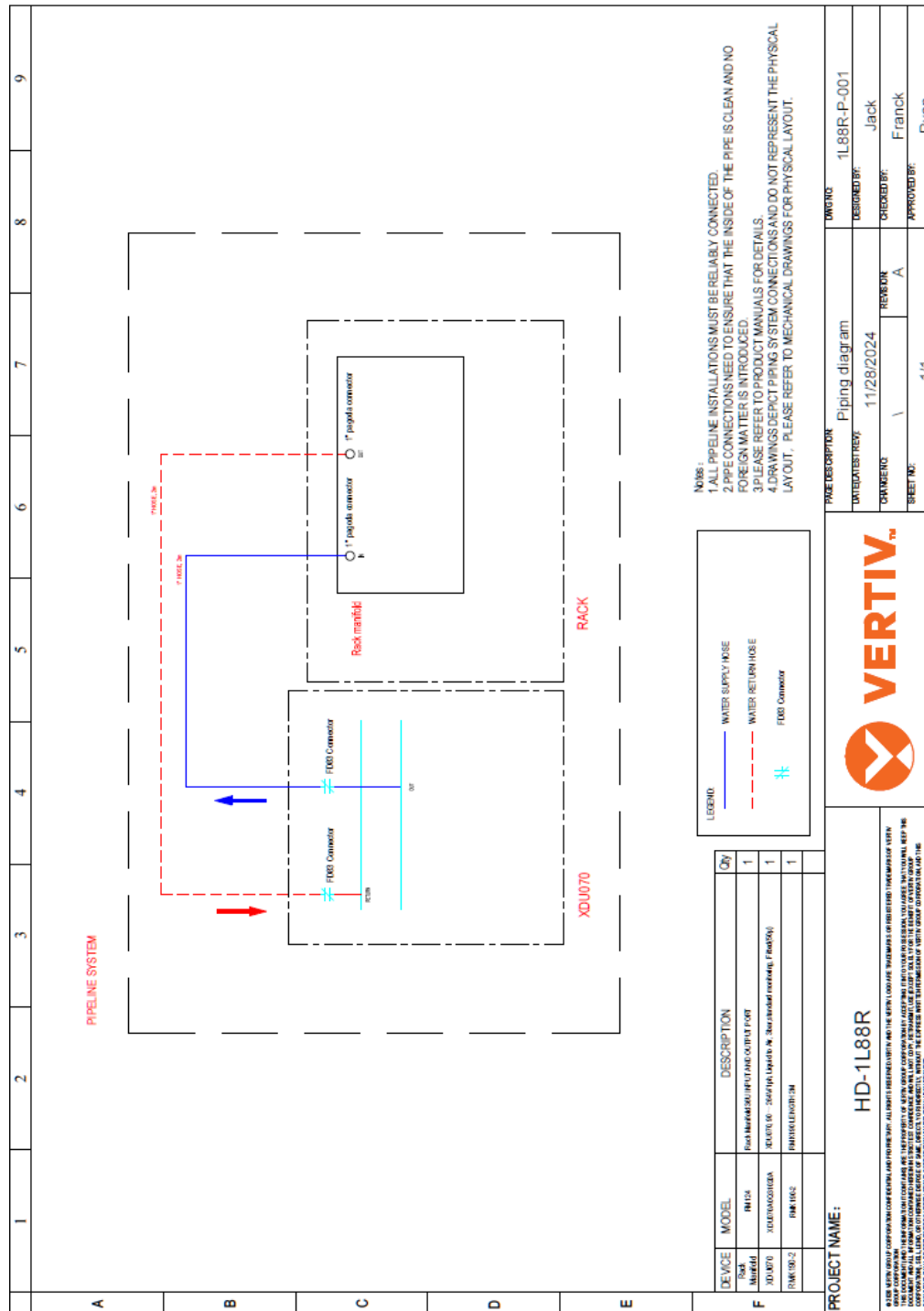




5.2 Monitoring Diagram



5.3 Piping Diagram



6 Technical Specifications

6.1 Product weight

SKU	Quantity	Weight (per SKU)	Total weight
XDU070 (CDU)	1	899 lbs (408 kg)	899 lbs (408 kg)
RM124 (Rack manifold)	1	83 lbs (38 kg)	83 lbs (38 kg)
VP7UA002 (Rack PDU)	2	22 lbs (10 kg)	44 lbs (20 kg)
VR9357 (Heavy Duty Rack)	1	560 lbs (254 kg)	560 lbs (254 kg)

6.2 Maximum Static load capacity of rack

SKU	Maximum Static load capacity
VR9357 (Heavy Duty Rack)	4248 lbs (1927 kg)

6.3 Operation & Storage conditions

Operation conditions	Operation temperature range: 32°F to 104°F (0°C to 40°C)
	Operation relative humidity range: 10% to 90% RH (non-condensing)
Storage conditions	Storage temperature range: -40°F to 158°F (-40°C to 70°C)
	Storage relative humidity range: 5% to 93% RH (non-condensing)

7 Product Specification

7.1 Liebert® XDU070 Coolant Distribution Unit

Designed to remove barriers to liquid cooling in an air-cooled environment the Vertiv™ Liebert® XDU070 Coolant Distribution Unit is a liquid-to-air heat exchanger for direct to chip cooling applications that offers easy, cost-effective deployment in any data center.



Key Benefits:

- Deploy liquid cooling with or without access to chilled water on site.
- Deliver exceptional direct-to-chip cooling capacity with up to 70+ kW to accommodate high density racks.
- Utilize existing air-cooling infrastructure while supporting liquid cooling applications.
- High quality and reliability with redundant pumps, built-in filtration, and unit-to-unit communication capabilities.

Product Summary:

Main Unit Quantity	1
Model Number	XDU070A0K41020
Nominal Cooling Capacity	70 kW
Cooling Type	Liquid to Air
Voltage	120 V / 1 ph / 60 Hz
Pressure Relief Valve	4 Bar
Monitoring	Standard
Connection Adapter	None
Secondary Filtration	Fitted (50 µ)

Accessories:

Water Detection Rope	Water Detection Rope 33 ft (10 m)
Hose Kits	Hose - 2.0 m (6.5 ft) length with Sanitary Flange

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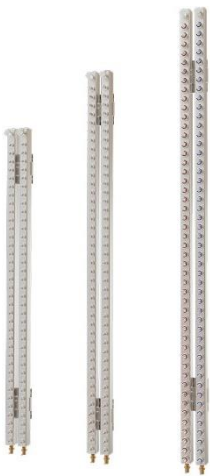


7.2 Vertiv™ CoolChip Fluid Network

The Vertiv™ CoolChip Fluid Network is an in-rack manifold that provides a reliable, clean, and effective route between server and coolant distribution unit. Mounting in the zero-U space of any industry-standard rack, the stainless-steel rack manifolds were designed with dripless quick disconnects and multiple coupling sizes for easy install and highly tailored to any deployment size.

Key Benefits:

- Meet various deployment needs with multiple configurations.
 - Ensure high cooling availability and efficiency with several coupling options for proper sizing.
 - Universal mounting bracket speeds installation
 - Assured cleanliness with vacuum brazed stainless-steel construction and factory validated precleaning process.



Main Features:

- Stainless Steel Construction provides a durable and robust product.
- Multiple Sizes and Flow Rates allow for customization of your liquid cooling deployment.
- Universal Mounting Bracket enable mounting on any industry-standard rack.
- Dripless Quick Disconnects ensure quick and safe installation and service operation.
- Air Bleeder Valve eases installation complexity and increases system efficiency, maximizing the amount of cooling fluid in the circuit.
- Integrated Drain Valve allows for easy installation and maintenance.
- Top or Bottom Connections enable configuration in the field, adding flexibility to the install and application.

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7.3 Liebert® LT460 Zone Leak Detection Sensors

The zone leak detection sensor modules install quickly and work simply for reliable warning of potentially hazardous moisture conditions. The supervised zone leak detector uses up to 100 feet of flexible Liebert® moisture sensing cable, offering protection from unwanted leaks. Designed for use with Liebert LT500Y leak detection cable, the Liquitect 460 is the ideal solution for perimeter sensing or serpentine coverage of small areas. Selectable modes of operation provide flexible alarming options and protection for the cable. Selectable alarm delays minimize false-positive conditions.

Key Benefits:

- Dual output relays can signal to a local alarm panel, a remote building management system, or to Liebert® SiteScan™ Web.
 - Selectable alarm delays allow reporting customization.
 - Perimeter sensing or serpentine coverage of small area.



Main Features:

- Zone leak detection sensor.
- Monitors up to 100 feet of leak detection cable.
- Reports to local or centralized monitor panels.
- Installs easily.

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7.4 Vertiv™ Geist™ VP7UA002 rPDU

Upgradeable Switched Outlet Level Monitored rPDUs provide reliable power distribution to critical IT equipment while delivering individual outlet level control and a comprehensive view of outlet level power usage via remote network access. Includes environmental monitoring capabilities to obtain real-time environmental metrics.

Product Summary:

- rPDU, Switched Outlet Level Monitoring, 80 A, 240/415 V WYE, 57.6 kW, Vertical, (36) Combination C13/C19, Hardwired, Black Powder Coat.

Key Benefits:

- Remotely reboot outlets to power cycle unresponsive IT equipment or increase runtime of critical equipment upon power failure with outlet-level control.



- Reliable power distribution with local and remote outlet-level power monitoring options offers quick access to critical power usage information down to the device level to evaluate energy usage trends and maximize uptime.
- Environmental monitoring capabilities with the addition of optional environmental sensors ensure users have critical infrastructure data at their fingertips to prevent climate-related equipment failure and system downtime.
- Fault-Tolerant Daisy Chaining with RSTP simplifies intelligent rPDU connectivity and ensures data is reported even when a break in the network chain occurs. Supports up to 40 rPDUs.
- Daisy-chain up to 50 devices on a single IP address and reduce deployment time with self-configuration of downstream devices.

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7.5 Liebert RDU501

The Liebert® RDU501 is an intelligent infrastructure management solution from Vertiv that allows data center administrators to monitor environmental conditions and infrastructure appliances such as UPS, precision cooling units, generator sets, etc.

The RDU501 is a premium infrastructure gateway appliance equipped with out-of-band access to service processors as well as serial console management capabilities.

Fast Deployment:

- R 2.5D SmartSolutions Modelling with drag-and-drop interface.



Environmental Monitoring:

- Heat, Power and Assets Monitoring Dashboard.
- Thermal Management (including CRAC teamwork).
- Power Management.
- Security Management.
- Alarm and Data Reports.

IT Management Monitoring

- Remote and local server management via IPMI 2.0 protocol
- Serial Console Management (Out-of-band access)
- Automated Startup and Shutdown of IT servers.

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8 Service Summary

SKU name	Description
VRTLC-1L88R-SITE-ASSESS	SITE ASSESSMENT FOR 1L88R INSTALLATION
VRTLC-ENG-1L88R	LIQUID COOLING ENGINEERING SERVICES 1L88R
VRTLC-INSTMATL-1L88R	LIQUID COOLING INSTALLATION MATERIAL 1L88R
VRTLC-INSTLAB-1L88R	LIQUID COOLING INSTALLATION LABOR 1L88R
VRTLC-MVS-1L88R	LIQUID COOLING MOVING AND STORAGE 1L88R
VRTLC-PROJMGT-1L88R	LIQUID COOLING PROJECT MANAGEMENT 1L88R
VRTLC-CUSTDEM-1L88R	1L88R OPERATIONAL DEMONSTATION/CUSTOMER ORIENTATION
WI-10HR4	Warranty Inspection
DAPRPDU-GE1	Dist Assur Pkg Geist R-PDU or RTS Single
1WL THERMLAB-H-EBS	WarrantyLaborLWCoverageH
XDU070YC	2PM ONLY 8X5 XDU070
VRTLC-L2	L2 - Delivery, QA/QC, Installation Assembly
VRTLC-L3	L3 - Start-up and Site Acceptance Testing
VRTLC-1L88R-FILL-DOW	Labor to Fill 1L70R with DOWFrost 25% Propylene Glycol
VRTLC-1L88R-FLUID-DOW	Fluid to Fill 1L70R with DOWFrost 25% Propylene Glycol