CoolChip CDU 121

Installation and Commissioning Guide

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/en-us/support/ for additional assistance.

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1 Important Safety Instructions

CAUTION: Always check for water, wastewater, or any liquid accumulation on the floor or beneath the unit before and after operation or maintenance. Fluids can cause slip hazards and may damage the equipment. Ensure that the area is clean, dry, and free of obstructions to maintain a safe working environment.

1.1 General

Mechanical and electrical equipment such as coolant distribution units (CDUs) present potential mechanical and electrical hazards. All safety, installation, operation and maintenance instructions must be adhered to. Any work on or use of the equipment must only be carried out by technically competent personnel who are fully trained. This product is designed to minimize all potential hazards by restricting access through unit casings, doors and covers while equipment is operational.

Before carrying out maintenance work, ensure that:

1. Equipment is switched OFF.
2. Equipment and controls are disconnected from the electrical supply.
3. All rotating parts such as pumps and 3-way valve have come to rest.
4. The unit is furnished and cleaned, pressurized with nitrogen, free of any contaminant and ready to be filled with the coolant required.

If there is any doubt regarding safety, installation, operation or maintenance instructions, contact Vertiv for clarification and advice. See Technical Support and Contacts on page 29.

1.2 Installation and Handling

Installation and operation must be conducted in accordance with local and national regulations and normal codes of good practice. When moving or lifting the product, caution must be observed to ensure the safety of personnel. Use only the appropriate lifting equipment.

1.3 Application

This product is to be used indoors only and must be only used for the application it was designed for. This product must not be used in a hazardous environment.

1.4 Warranty

Failure to comply with the Vertiv's installation, maintenance and operation instructions may affect the reliability and performance of the unit and invalidate any warranty.

1.5 Electrical Connection

WARNING! This unit is powered by high voltage. Serious injury or death can occur. Power supplied to this product must be provided with an external means of isolation.

Electrical connections must be carried out in accordance with local and national regulations by a qualified electrician. In particular, the disconnection of all AC sources shall only be carried out by qualified electricians. Never make any electrical connections inside the unit or to the unit unless the electricity supply has been switched OFF at the disconnect (isolator).

1.6 Replacement Parts

Any parts replaced during maintenance or servicing must be the same specification as those being replaced and should only be obtained from Vertiv. The use of incorrect replacement parts may affect the operation or reliability of the unit and invalidate any warranty.

WARNING! Before any maintenance operations, make sure that the power supply of the unit is disconnected.

1.7 Waste Disposal

Any waste or single use materials must be disposed of in a responsible manner and in strict adherence to local and national environmental regulations. For details, consult local environmental agencies.

1.8 Documentation

Installation and commissioning guide together with operation and maintenance guide, application and planning guide and electrical diagram must remain with the unit always.

2 Agency

2.1 Product Standards and Approvals

Vertiv products, when installed and operated in accordance with this document, comply with the Low Voltage Directive 2014/35/EU (applicable only to AC version units), and EMC Directive 2014/30/EU for CE marking, as well as the Electrical Equipment (Safety) Regulations S.I. 2026 No. 1101 (applicable only to AC version units) and the Electromagnetic Compatibility Regulations S.I. 2016 No. 1091 for UKCA marking. Additionally, this product is cULus listed for the appropriate voltage models, with certification under UL 62368-1, 3rd Edition, and CSA C22.2 No. 62368-1:19, 3rd Edition. Certificates are available upon request. File number: E202715.

2.2 RoHS Compliance

Vertiv certifies that all products manufactured and supplied by Vertiv are fully REACH and RoHS compliant in accordance with EN IEC 63000 and the directive 2011/65/EU revised directive (EU) 2015/863 and (EC) 1907/2006.

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3 Product Description

Please refer to the following submittals located in Submittal Drawings on page 31.

Table 3.1 Submittals

Document Number	Title
20000653	CoolChip CDU Standard Features
20000654	CoolChip CDU Cabinet Dimensional Data AC & DC Unit
20000655	CoolChip CDU Connection Location AC Version
20000656	CoolChip CDU Piping Schematic
20000657	CoolChip CDU Electrical Connection DC Unit
20000658	CoolChip CDU Leak Detection Rope AC & DC Unit
20000659	CoolChip CDU Component Location Diagram DC Version
20000660	Ship Loose Accessories AC and DC Version
20000703	CoolChip CDU Connection Location DC Version
20000704	CoolChip CDU Electrical Connection AC Unit
20000705	CoolChip CDU Component Location Diagram AC Version

3.1 General

This document describes the physical and electrical characteristics of the Vertiv™ CoolChip CDU 121 for installation and commissioning purposes.

The CoolChip CDU 121 contains a secondary closed loop circuit that provides a supply of cooling fluid to IT equipment, either through indirect cooling (such as rack mounted rear door heat exchangers), or direct cooling (such as cold plates at chip level).

The secondary circuit is a low pressure sealed system with the heat removed from the high heat density areas of IT equipment rejected to an external cooled fluid source (primary circuit) via a low pressure drop plate heat exchanger.

The secondary circuit ensures that the cooling fluid in a data center environment can be kept to a minimum volume, is closely controlled for flow, pressure and temperature (with optional condensation control) and can be accurately maintained for fluid quality (with filtration and additives).

The primary cooling source can be a chilled fluid system (either dedicated or from building system), fluid cooler, cooling tower or dry air cooler, depending on the desired secondary temperature and heat transfer duty. For more information, see Vertiv™ CoolChip CDU 121 Application and Planning Guide SL-80276.

3.2 Vertiv™ CoolChip CDU 121 Model Number Nomenclature

Table 3.2 CoolChip CDU 121 Model Number

Digit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Model No	X	D	U	1	0	0	W	B	Q	P	A	0	7	0	2	0	S	0	0	S	1	4	N	0	0

Table 3.3 CoolChip CDU 121 Model Number Definitions

Digit	Feature	Value	Description
1,2,3	Family name	XDU	Product family
4,5,6	Unit model	100	Base model
7	Cooling Type	W	Liquid to liquid
8	Unit revision	B	Revision B
9	Voltage	Q	110 V - 120 V, 208 V - 240 V, 1 PH, 50/60 Hz
		D	46 V - 52 V DC
10	Power input	P	IEC power inlet, dual Input
		3	OCP v3 power connector, single input
11	Controller	A	Standard controller
12	Placeholder	0	Placeholder
13	Display	7	7-in. touchscreen display
14	Placeholder	0	Placeholder
15	Pump configuration	2	Two pumps
16	Placeholder	0	Place holder
17	Primary connection	S	1 1/2-in. sanitary flange
		F	FD83
18	Placeholder	0	Placeholder
19	Placeholder	0	Placeholder
20	Secondary connection	S	1 1/2-in. sanitary flange
		F	FD83
21	Secondary filtration	1	Fitted (50 micron)
		2	Fitted (25 micron)
22	Pressure relief valve	3	3 bar pressure relief valve
		4	4 bar pressure relief valve
23	Reservoir	N	Internal SS reservoir w/ fluid level detection
24	Packaging	0	Standard
25	Placeholder	0	Place holder

There are two versions of the CoolChip CDU 121: the AC unit and the DC unit.

- The type of power input is different. Specifically, the AC unit uses a 220 V to 48 V power module, whereas the DC unit uses a 48 V busbar clip.
- The overall dimensions are essentially the same, except that the DC unit includes an additional busbar clip at the rear exterior of the unit.
- Except for the power input components, all other electrical components and refrigeration components are the same, and the internal installation is basically the same.

4 Technical Data

4.1 General

Table 4.1 Dimensions

Dimensions	Height		Width		Depth	
Unit	in.	mm	in.	mm	in.	mm
Standard Cabinet	6.89	175	17.52	445	33.46	850
Shipping Cabinet	17.36	441	26.22	666	43.15	1096

NOTE: The dimensions of the DC unit do not include the rear busbar clip. Therefore, the overall dimensions of the AC and DC units are the same.

Table 4.2 Weights

Weights	Dry		Operating		Shipping	
	lb	kg	lb	kg	lb	kg
Standard AC unit	119.05	54	131.6	59.7	196.21	89
Standard DC unit	115.74	52.5	128.3	58.2	190.7	86.5

4.2 Pipe Connections

Pipe connections for both the primary and secondary circuits are located at the rear of the cabinet and may exit from either the top or bottom, depending on the unit configuration.

Table 4.3 Pipe Connections for Primary and Secondary Circuits

Circuit Type	Pipe Connection
Primary (facility) circuit	1.5 in. sanitary clamps
Secondary circuit	1.5 in. sanitary clamps

4.3 Circuit Fluid Volumes

Table 4.4 Fluid Circuit Volumes for Primary and Secondary Circuit

Circuit Type	Fluid Circuit Volume
Primary (facility) circuit	3.4 liters
Secondary circuit	7.3 liters

4.4 Electrical Data

Table 4.5 Electrical Data

Parameter	Electrical Data	
	AC	DC
Supported power supplies	110 V - 120 V, 208 V - 240 V, 1 PH, 50/60 Hz	46 V - 52 V DC
Unit full load amps	7.6 A / 3.8 A	18 A
Unit installed load	2.015 kVA (maximum)	-
Typical power consumption	875 W	860 W

4.5 Operating Conditions

Table 4.6 Operating Conditions

Condition	Requirements
Operating temperature and humidity range	18 °C to 45 °C, 20% to 60%
Storage temperature and humidity range	-40 °C to 70 °C, less than 95% (40 °C) RH
Pollution degree	PD 2
Maximum altitude	Below 1000 m (The output should be reduced when the altitude exceeds 1000 m)
Primary coolant type	Treated water or up to 40% glycol/water
Secondary coolant type	Treated water or 25% propylene glycol
Primary circuit allowable pressure drop	10 bar
Secondary circuit allowable pressure drop	3 bar or 4 bar (depending on the selected pressure relief valve)

4.6 Noise

Sound power level at 3 m is less than 55 dBA.

5 Installation

5.1 Unloading and Positioning

On arrival at site, the Vertiv™ CoolChip CDU 121 crate should be placed on a level solid surface to safely unload the unit from the crate.

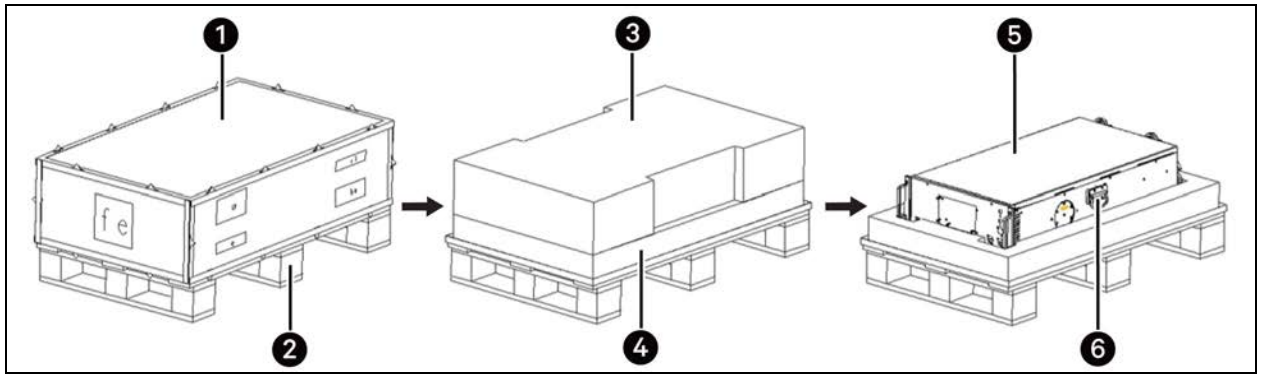
Check the crate for any signs of external transit damage. Any serious damage must be reported to manufacturer and shipper immediately prior to unpacking.

CAUTION: The CoolChip CDU 121 is a heavy piece of equipment and at least two technicians are required to carry out the unloading task safely.

CAUTION: Risk of improper handling of heavy and lengthy parts. Can cause injury. Building and equipment damage may also result. Only properly trained and qualified personnel wearing appropriate OSHA approved personal protective equipment (PPE) should attempt to remove or install cabinet panels.

Open the wooden box and remove the top EPE cover. Remove the two side handles from the attachment and place them into the slots on the unit side. The CoolChip CDU 121 is a heavy item of equipment and at least two technicians are required to carry out this task safely. The technicians hold the front handle of the unit with one hand and lift the side handles firmly upwards with the other hand to move the CoolChip CDU 121 to the ground or to a platform.

Figure 5.1 Unpacking the Unit



Item	Description	Item	Description
1	Wooden box	4	Bottom EPE cover
2	Wooden pallet	5	CoolChip CDU 121 unit
3	Top EPE cover	6	Side handle

Carefully inspect the unit for shipping damage. Any damage found must be reported to the Vertiv immediately and prior to installation.

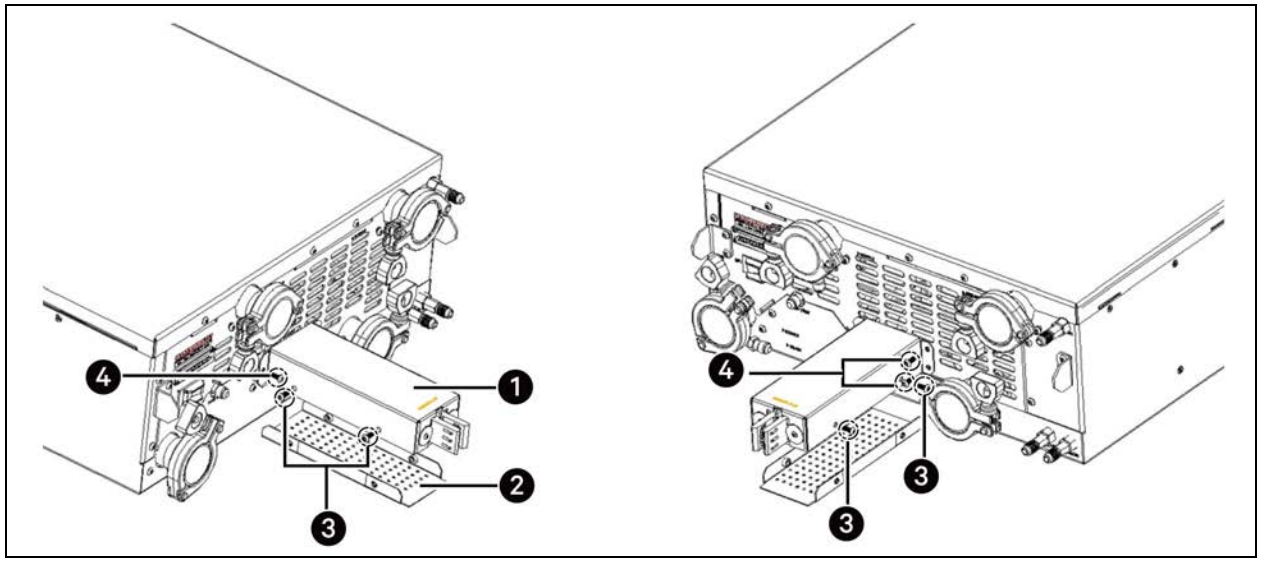
The CoolChip CDU 121 must be maneuvered into position ready for installation into a 19 in. rack. Care should be taken that adequate support is provided in the rack for this product. Ideally, this is a solid shelf.

5.2 Installing DC Busbar Clip

For the DC Unit, the busbar clip needs to be installed at the rear of the unit. Position the busbar clip vertically at the rear of the unit. Use four screws to attach the bracket to the busbar clip. Then, fix the busbar clip (with bracket) to the rear of the unit using three screws. The recommended tightening torque is 12 kgf·cm (1.18 N·m).

The busbar clip is pre-installed with a 176.6 mm shell. If adaptation to other IT racks is required, this shell can be removed and replaced with the alternative 96.6 mm shell supplied with the unit. The rest of the installation steps remain the same.

Figure 5.2 Installing the Busbar Clip

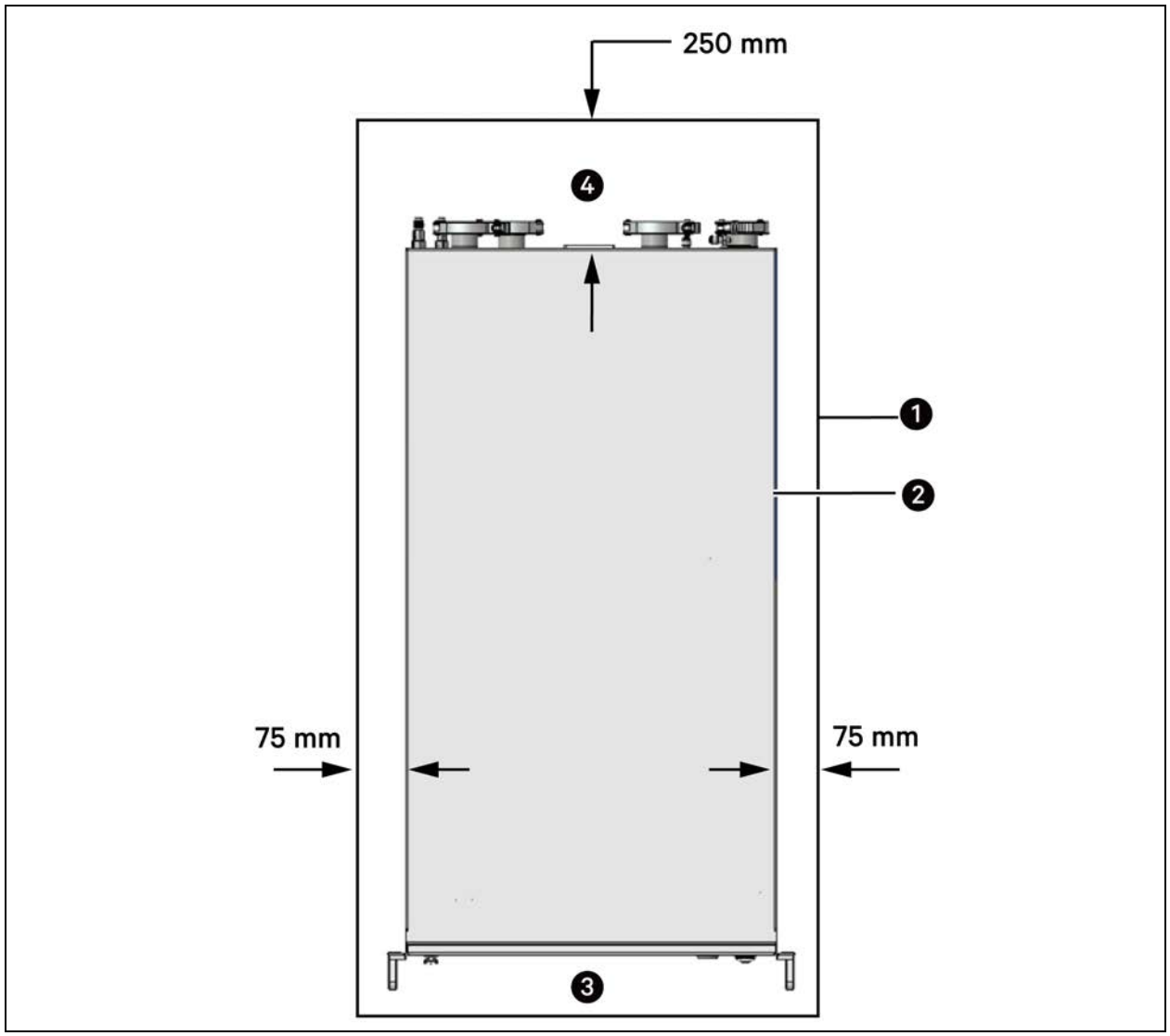


Item	Description	Item	Description
1	Busbar clip shell	3	Screws for attaching the busbar cilp to the bracket (four pieces)
2	Busbar clip bracket	4	Screws for fixing the busbar clip to the DC unit (three pieces)

5.3 Installing the Unit

The CoolChip CDU 121 is intended to be installed in a rack, preferably on a raised floor with at least 6 in. (150 mm), clear, underfloor space for hoses run to IT equipment and facility fluid. Space should be allowed at the front of the rack to enable the CoolChip CDU 121 to be fully withdrawn for maintenance or replacement is 35.43 in. (900 mm) minimum. In addition, a minimum clearance of 75 mm should be allowed at the sides and 250 mm minimum clearance at the back of the unit for ventilation airflow and pipework connections.

Figure 5.3 CoolChip CDU 121 Clearance Requirements (Top View)



Item	Description	Item	Description
1	19 in. rack (600 mm x 1200 mm)	3	Front side of the unit
2	CoolChip CDU 121 unit	4	Rear side of the unit

NOTICE

Check that the primary fluid supply system has an automatic fluid makeup facility and that filling the CoolChip CDU 121 unit does not result in the fluid system (chiller) shutting down due to loss of fluid.

5.4 Piping Connections

Please refer to the following submittals provided in Submittal Drawings on page 31.

Table 5.1 Piping Submittals

Document Number	Title
20000656	CoolChip CDU 121 Piping Schematic
20000658	CoolChip CDU 121 Leak Detection Rope AC & DC Unit

5.5 Primary Connections

The primary circuit cooled or chilled fluid is supplied by the end user.

The primary connections of the CoolChip CDU 121 are 1.5 in. (38.1 mm) sanitary clamps. It complies with BS 4825 Pt. 3 or an equivalent standard and has a diameter of 1.9 in. (50.5 mm). The clamps are fitted with stainless steel blanking caps to ensure pipework remains contaminant free during transit.

CAUTION: During installation, first release the pressure through the primary circuit drain, then remove the blanking caps, and finally connect the unit primary pipeline to the external pipeline with clamps.

The CoolChip CDU 121 primary connections are located at the rear of the unit.

External isolation valves should be fitted by the installer to both supply and return pipes, as close as possible to the CoolChip CDU 121 for maintenance purposes and care should be taken that all inter connecting pipework to/from the CoolChip CDU 121 is adequately supported, as the CoolChip CDU 121 is not designed for any external pipe loads.

All primary circuit hoses or pipework and components should be insulated to protect against condensation.

It is recommended to store the removed stainless steel blanking caps that may be used in case of replacement or maintenance in the unit.

CAUTION: Risk of improper piping installation, leak checking and fluid maintenance can cause injury. Building and equipment damage may also result. Installation and service of this equipment should be done only by qualified personnel who have been specifically-trained in the installation of air-conditioning equipment and who are wearing appropriate, OSHA-approved personal protective equipment (PPE).

5.6 Secondary Connections

WARNING! The secondary side piping contains 0.5 bar of low pressure nitrogen. When removing the blanking caps, take necessary precautions to prevent injury from pressure shock.

If the unit is pressure free, please refer to the following operations:

1. Check if there is a leak in the unit. Repair if feasible.
2. Use nitrogen to pressurize the unit pipeline to 5 bar.
3. Maintain the pressure for 10 hours and check if the pressure difference exceeds 1%.
4. If the inspection is qualified, it can continue to be used. If it is not qualified, please contact Vertiv.

The secondary connections of the CoolChip CDU 121 are 1.5 in. (38.1 mm) DN32 sanitary clamps. It complies with BS 4825 Pt. 3 or an equivalent standard and has a diameter of 1.9 in. (50.5 mm). The clamps are fitted with stainless steel blanking caps to ensure pipework remains contaminant free during transit.

CAUTION: During installation, first release the pressure through the primary circuit drain, then remove the blanking caps, and finally connect the unit primary pipeline to the external pipeline with clamps.

The CoolChip CDU 121 secondary connections are located at the rear of the unit. See and

External isolation valves or quick connectors should be fitted by the installer to both supply and return pipes, as close as possible to the CoolChip CDU 121 for maintenance purposes and care should be taken that all interconnecting pipework to/from the CoolChip CDU 121 is adequately supported, as the CoolChip CDU 121 is not designed for any external pipe loads.

It is recommended to store the removed stainless steel blanking caps that may be used in case of replacement or maintenance in the unit.

5.7 Electrical, Control, and Communication Wiring

5.7.1 Power Wiring

WARNING! This unit is powered by high voltage. Serious injury or death can occur. All electrical work must be carried out by a qualified electrician.

WARNING! Arc flash and electric shock hazard. Disconnect all electric power supply, verify with a voltmeter that power is Off and wear approved personal protective equipment (PPE), before working within the electric control enclosure.

Power Wiring for AC Unit

The CoolChip CDU 121 AC unit has dual C14 IEC connectors located on the rear panel for A and B power supplies and is supplied with mating C13 IEC 2 m long power cords for hard wiring to a single-phase AC (or DC) power supply. See . The socket-outlet shall be easily accessible. Upstream 20A protection must be provided by the end user in the form of fuses or in accordance with local regulations.

Power Wiring for DC Unit

The CoolChip CDU 121 DC unit is equipped with a busbar clip on the rear for hard wiring to the rack 48V power supply. See .

NOTE: The power supply for the CoolChip CDU 121 DC unit can only be UL listed or recognized.

Please refer to the following submittals provided in Submittal Drawings on page 31.

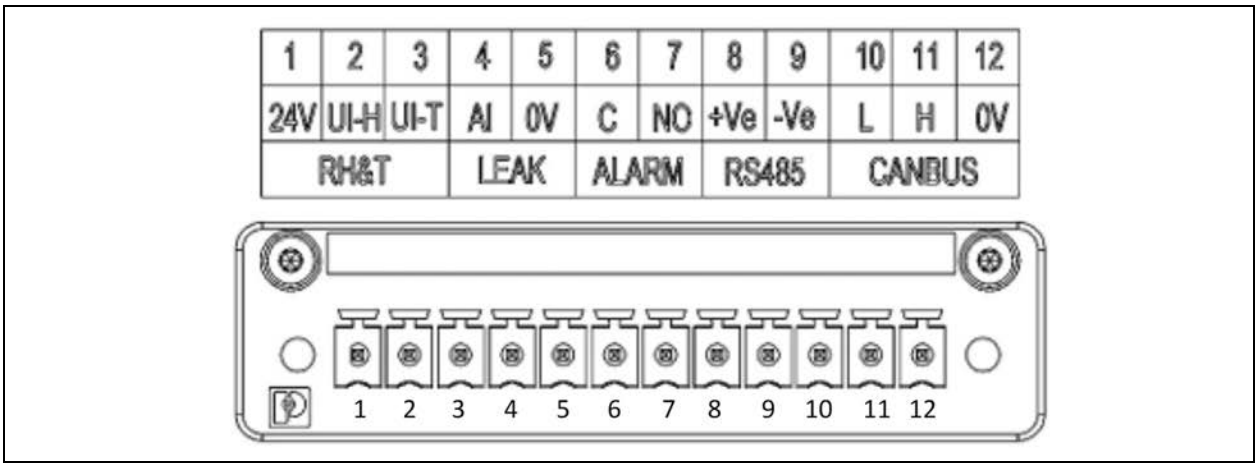
Table 5.2 Submittals

Document Number	Title
20000657	CoolChip CDU Electrical Connection DC Unit

5.7.2 Controls Wiring

A 12-pin terminal (SK1) is located on the rear panel for connection of an optional room temperature and RH sensor (for condensation control) and external leak detection tapes, plus communications as detailed below.

Figure 5.4 12-Pin Terminal (SK1)

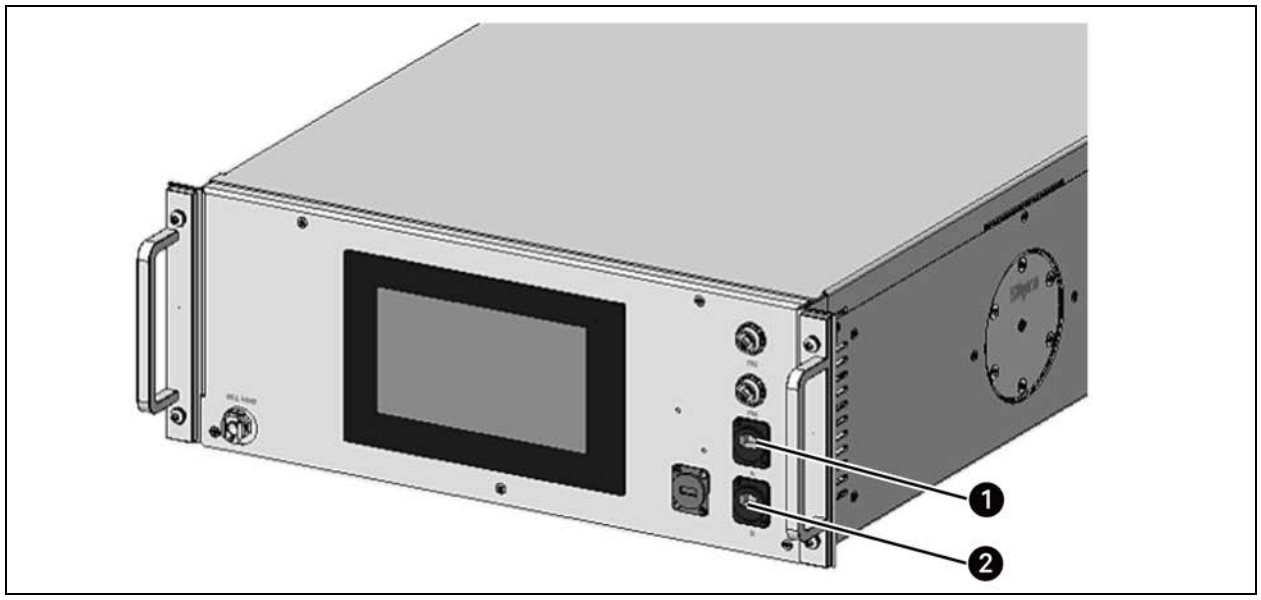


5.7.3 Communications Wiring

Several communications options are available on the CoolChip CDU 121.

1. RS485 Modbus (terminals 8 and 9 on connector SK1) – use Beldon 3106A, or equivalent (1 pair +1, shielded 22 AWG).
2. CAN bus (terminals 10, 11 and 12 on connector SK1) – use Beldon 3106A, or equivalent (1 pair +1, shielded 22 AWG). CAN bus is used for communication between CoolChip CDU 121s for Group Control.
3. 2 x Ethernet ports (RJ45) - Cat5e shielded cable.

Figure 5.5 CoolChip CDU 121 Ethernet Connections



Item	Description
1	Ethernet A
2	Ethernet B

5.7.4 Group Control

See the Vertiv CoolChip CDU 121 Operation and Maintenance Guide SL-71338 for more information.

5.8 Pre-commissioning Checks

5.8.1 Site Check

Check the following:

1. Check if the site requires protective equipment such as safety boots, gloves, hi viz vests, hard hats, safety glasses, etc.
2. Ensure that the site contact is aware of the location of the CoolChip CDU 121 power supply fuse board/circuit breakers.
3. Ensure that the site contact is aware of the location of the chiller/building services primary fluid connections and associated isolation valves. Ensure they are marked correctly.
4. Ensure the Secondary Loop is marked correctly at the rack manifold and remains consistent.
5. Check that the pre-treated secondary circuit fluid (Treated DI-H2O, PG25, etc.) has been delivered to site.
6. Check that any required biocides and/or corrosion inhibitors have been delivered to site.

5.8.2 Mechanical Installation Check

Confirm the following:

1. The CoolChip CDU 121 is successfully unloaded from its crate and thoroughly inspected for damage, paying particular attention to external panels and fluid circuit pipe work.
2. The CoolChip CDU 121 is positioned and secured in the correct rack location.
3. Floor tiles are cut away as required and ideally fitted with brush strip grommets if hoses or pipes are to run into the subfloor space.
4. The cable baskets, cable trays, and drip trays are installed to provide adequate support for the hoses.
5. Sufficient space is required to be at the front and rear of the rack to allow easy access to this unit.
6. The unit is adequately supported within the rack.

5.8.3 Electrical Supply Connection Check

WARNING! This unit is powered by high voltage. Serious injury or death can occur. All electrical work must be carried out by a qualified electrician.

1. Check and record that the voltage of the installation site available meets CoolChip CDU 121 model requirements and confirm that the CoolChip CDU 121 has the correct fuse fitted to suit power supply voltage. See CoolChip CDU 121 AC/DC Wiring Diagram shipped with the unit.
2. Check that the CoolChip CDU 121 is connected to the power supply using the AC power cords or DC busbar clip.
3. Check that the rating matches the CoolChip CDU 121 nameplate.
4. Check that all electrical connections are tight and have been safety tested/certified.
5. If the CoolChip CDU 121 is in a different location from the IT racks, confirm the room Temp/RH sensor (if fitted) is installed on a wall adjacent to the data racks at a height of approximately 72 in. (1828.8 mm) using the correct extension cable.
6. Confirm that any required external peripheral alarms/sensors are correctly fitted.

NOTE: Due to international restrictions regarding the transport of cell batteries by air, the printed circuit board (PCB) controller may not have a battery fitted. A suitable battery may need to be sourced and fitted locally (type CR2032). The sole purpose of this battery is to maintain the real time clock in the event of power down and its absence does not generally affect the overall operation and running of the unit. Although the touchscreen display also has a receptacle for a battery, there is no requirement to fit one to this PCB.

5.8.4 Primary Fluid Specification

The CoolChip CDU 121 is designed for use with a primary (facility) supply of treated water or up to 40% glycol/water from a site chilled water ring main or a dedicated chiller. If a higher concentration of glycol is used, then the cooling capacity of the unit may have to be de-rated. Contact Vertiv for advice.

It is the responsibility of installer to ensure that a 500-micron (35-mesh) filter is installed in the external primary circuit.

5.8.5 Secondary Fluid Specification

The secondary circuit must be filled with treated water or 25% propylene glycol fluid.

Failure to use proper fluid treatment can result in decreased system performance and reliability due to corrosion, scaling, fouling and microbiological growth.

Conventional water or glycol/water contain sediment, oxygen, microorganisms, chloride ions, calcium/magnesium ions, and other substances, which are prone to scaling or corroding pipelines and heat exchangers. Therefore, liquid quality treatment must be carried out to ensure that the quality of liquid meets the requirements for use. See Liquid Quality Requirements on page 39.

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6 Commissioning

6.1 Primary Circuit

6.1.1 Primary Pipework Installation

Confirm the following:

1. Newly installed primary pipework is correctly flushed (especially if any hot works have been carried out).
2. The installed primary circuit pipework is fitted with valves for unit isolation/maintenance.
3. Check supply/return connections are the correct.
4. Check that all pipe joints are tight.
5. Newly fitted primary pipe work and connections are tested for leaks using an appropriate pressure testing method and ensure certification can be provided.
6. All primary circuit pipework, hoses and valves are insulated as per installation requirements.
7. The external primary circuit is the means to vent air from the system, either automatically (preferable) or manually.

6.1.2 Primary Fluid Supply

1. If the primary fluid supply is from a dedicated chiller, confirm the chiller is fully commissioned at least 24 hours prior to commissioning the CoolChip CDU 121.
2. Check that the primary cold fluid supply is connected to the CoolChip CDU 121 primary fluid circuit.
3. Confirm that the primary cold fluid supply is available.
4. Confirm there are no potential issues with low flow switches in the primary fluid circuit.
5. Confirm that the correct specification external filter is fitted.
6. Verify that the chilled primary fluid supply is fully operational and providing sufficient flow rate or temperature at less than 10 bar pressure, as per the original installation specifications.

6.1.3 Primary Bypass Valve

Check that the primary circuit bypass link pipe has been installed on the primary external pipeline to protect the flow stability on the customer side.

6.1.4 Primary Circuit Filling

1. Open the supply and return valves fitted on the installation pipework to the CoolChip CDU 121 unit to allow the primary circuit within the cabinet to gently fill from the chilled fluid supply.
2. Check circuit for leaks

NOTICE

Check that the installed primary fluid supply system has an automatic fluid make up facility and that filling the CoolChip CDU 121 unit is not result in the fluid system (chiller) shutting down due to loss of fluid.

6.1.5 Primary Flow Setup

NOTICE

Before attempting to monitor and adjust the primary circuit flow, the operator should be fully conversant with the operation of the CoolChip CDU 121. See the **Vertiv™ CoolChip CDU 121 Operating and Maintenance Guide SL-80278** for more information.

1. For optimum performance, the primary fluid flow should be set to match the required heat load transfer and according to the primary inlet temperature and level of glycol. See **Vertiv™ CoolChip CDU 121 Application and Planning Guide SL-80276** for more information.
2. If the fluid flow is below the necessary requirement, there is insufficient cooling and the load temperatures start to rise. If there is too much flow, then the temperature control could become unstable.
3. An external means of restricting or bypassing excessive primary flow should be available in the external pipework.
4. To adjust the primary flow rate: Set the controller to Overrides and adjust Cooling Valve to 100%, this forces the cooling valve to open fully for maximum flow through the heat exchanger. Next go back to the Home screen or page 2 of the Status screen to view the Primary flow rate.
5. Adjust the external valve to regulate the flow through the CoolChip CDU 121 to the required approximate setting.

6.2 Secondary Circuit

6.2.1 Secondary Pipework

Check the following:

1. That all external hoses and any drip trays (if applicable) are installed in correct location.
2. That all hoses are correctly flushed.
3. Verify that all newly fitted secondary pipework, connections, and hoses are tested for leaks using an appropriate pressure testing method, and ensure that certification is provided.
4. That leak detection tape (if applicable) is installed into drip trays.
5. That hoses are cut to the correct size, allowing sufficient length to ensure supply/return hoses run smoothly from CoolChip CDU 121 to racks without kinking.
6. All hose ends are correctly labeled for supply/return flow direction.
7. All hoses are correctly and neatly routed from the CoolChip CDU 121 to racks.
8. Final connection of hoses to CoolChip CDU 121 and racks are tight.

6.2.2 Expansion Vessel

The CoolChip CDU 121 is fitted with an l liter expansion vessel and has these functions:

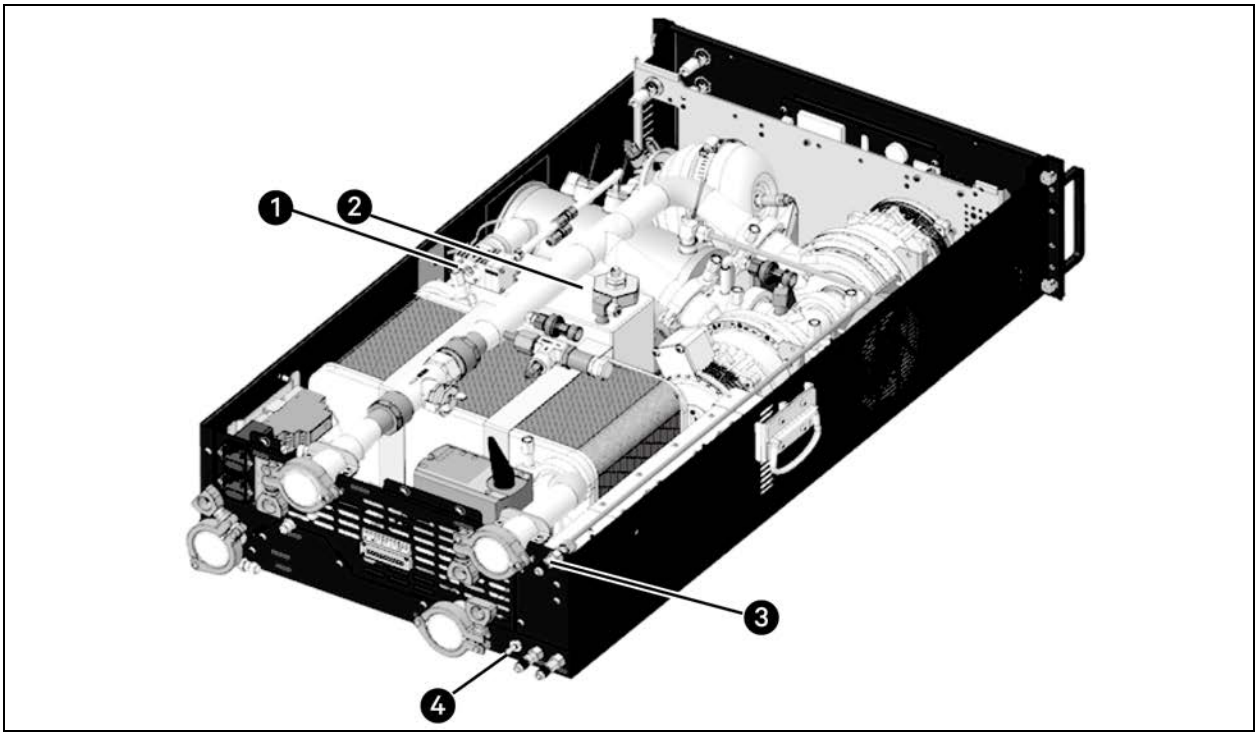
1. To provide a cushion when filling the system to a static fill pressure. During the filling operation, when the system pressure rises above the preset pressure of the expansion vessel, the cushion allows the pressure to rise gradually in a controlled manner to the required static pressure.
2. During normal operation, the expansion vessel stabilizes the system pressure. The expansion tank contains a small amount of system fluid. When the system pressure drops for any reason, e.g. trapped air in the system percolates out over time through the automatic air vents, the reserve capacity in the expansion vessel can accommodate the thermal expansion of the system due to the increase in fluid temperature. However, this has limitations, depending on the maximum fluid temperature and the volume of secondary fluid.

NOTE: The preset pressure of the expansion vessel is 0.8 bar and the maximum pressure drop is 10 bar.

6.2.3 Filling Hoses

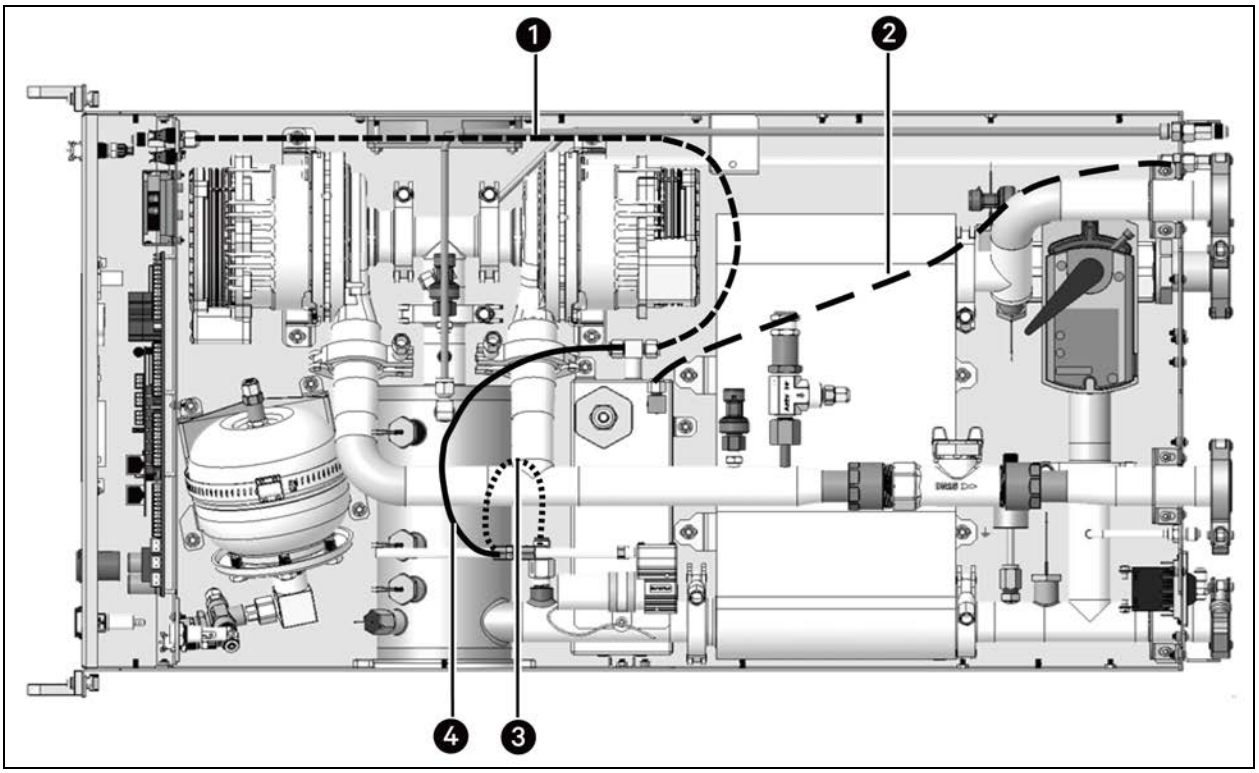
In the current design, a single fill pump is used to fill both the secondary circuit and the internal tank, as there is not enough space to install two separate pumps.

Figure 6.1 Filling Design



Item	Description	Item	Description
1	Fill pump	3	Reservoir / secondary circuit vent
2	Built-in tank	4	Pressure relief valve vent

Figure 6.2 Fill Hoses



Item	Description	Item	Description
1	Hose connecting fill port to built-in tank	3	Hose connecting fill pump to secondary circuit
2	Hose connecting built-in tank to built-in tank vent	4	Hose connecting built-in tank to fill pump

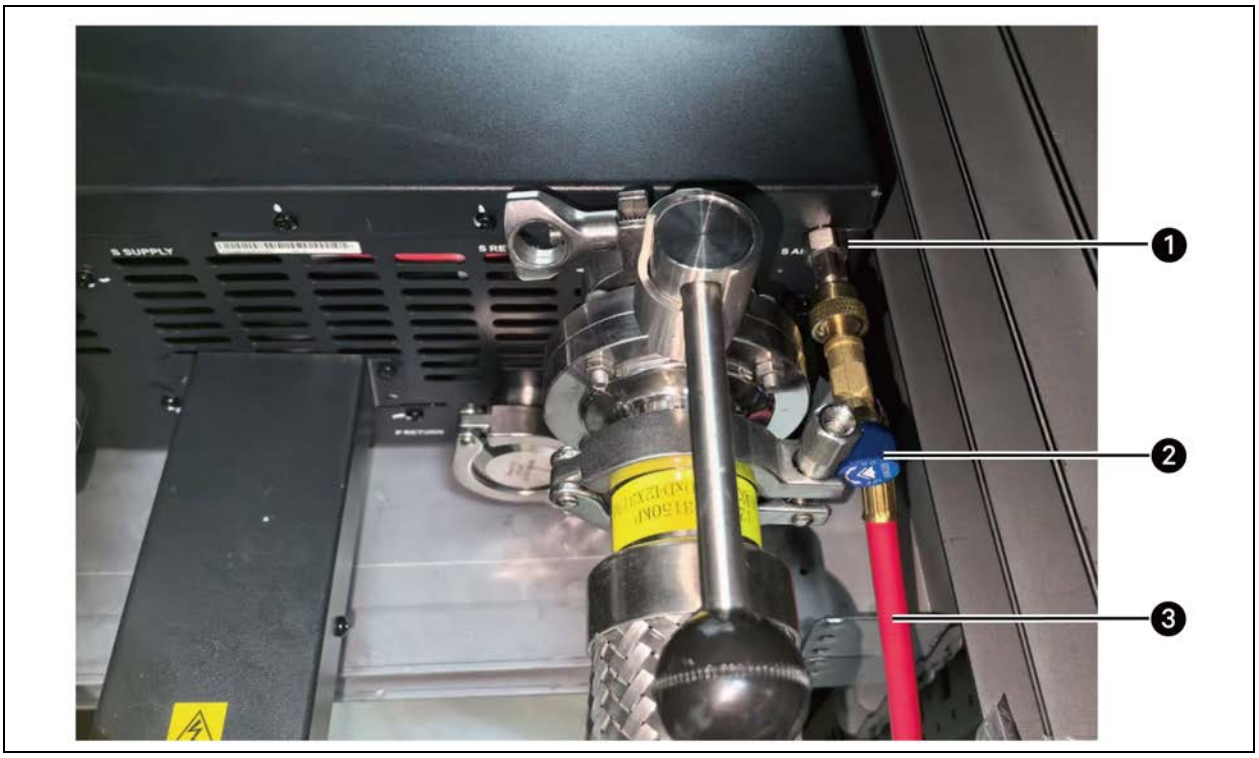
6.2.4 Secondary Circuit Filling

The volume of the built-in tank is 1.3L. After installing the CoolChip CDU 121 into the rack, you need fill the secondary circuit from an external tank.

1. Connect one end of the filling hose to the fill port on the front side of the unit and put the other end of the hose into an external tank containing treated water or 25% propylene glycol fluid.
2. On the rear side of the unit, check that the cap of the built-in tank vent is fastened. If the cap of the tank vent is not fastened, liquid cannot be fill into the system.
3. Connect one port of the exhaust and drain tool valve to the draining hose. Connect the other port of the exhaust and drain tool valve to the S air vent.

   Put the other end of the draining hose into an empty container. Rotate the blue part of the exhaust and drain tool valve clockwise until it stops, to open the valve.

Figure 6.3 Exhaust and Drain Tool Valve



Item	Description	Item	Description
1	Reservoir / secondary circuit vent	3	Draining hose
2	Exhaust and drain tool valve		

4. On the display panel, tap **Service** > **Full Manual Control**. On the Service - Full Manual Control page, first tap **S301 Full Manual Control** and tap **Enable**, and then tap **S305 Fill Pump P3** and tap **ON**, to start the fill pump P3. Then the liquid will go through the filling hose and will be filled into the secondary circuit. After about five minutes, liquid will drain through the S air vent into the empty container. Then rotate the blue part of the exhaust and drain tool valve counterclockwise to close the valve.
5. The fill Pump keeps running. After about 20 minutes, check pressure PS1 on the home page of the display. When Pressure PS1 is between 1.2 to 1.5 bar, start the circulation pump 1 (by tapping **S302 Pump 1 Speed** and set the value to **50%**). Open the exhaust and drain tool valve to vent air from the secondary circuit. When liquid is draining from the draining hose into the empty container, close the valve.
6. Wait for a while, open the exhaust and drain tool valve again. When the draining hose discharges the water column evenly for 5 seconds, close the valve.
7. Then set **S302 Pump 1 Speed** to **70%**. Open the exhaust and drain tool valve. When the draining hose discharges the water column evenly for 5 seconds, close the valve.
8. Then set **S302 Pump 1 Speed** to **100%** Open the exhaust and drain tool valve. When the draining hose discharges the water column evenly for 5 seconds, close the valve.

NOTE: When the pump 1 is running, make sure the pressure of PS1 is between 0.8-1.5 bar.

If it is lower than 0.8 bar, close the circuit Pump 1 (by setting S302 Pump 1 Speed to 0) and make sure that the fill pump is still running (if the fill pump has been closed, you need to start it)

If it is higher than 1.5 bar, close the fill pump (by setting S305 Fill Pump P3 to OFF)

9. If no air bursts into the empty container, check that secondary flow rate on the home page remains stable (with less fluctuation), this indicates that the filling of the secondary circuit is complete. Exit from the Full Manual Control mode (by setting **S301 Full Manual Control** to **Disable**).
10. At this time, the exhaust and drain tool valve has been closed. Now remove the valve from S air vent.

Figure 6.4 Secondary Circuit Filling

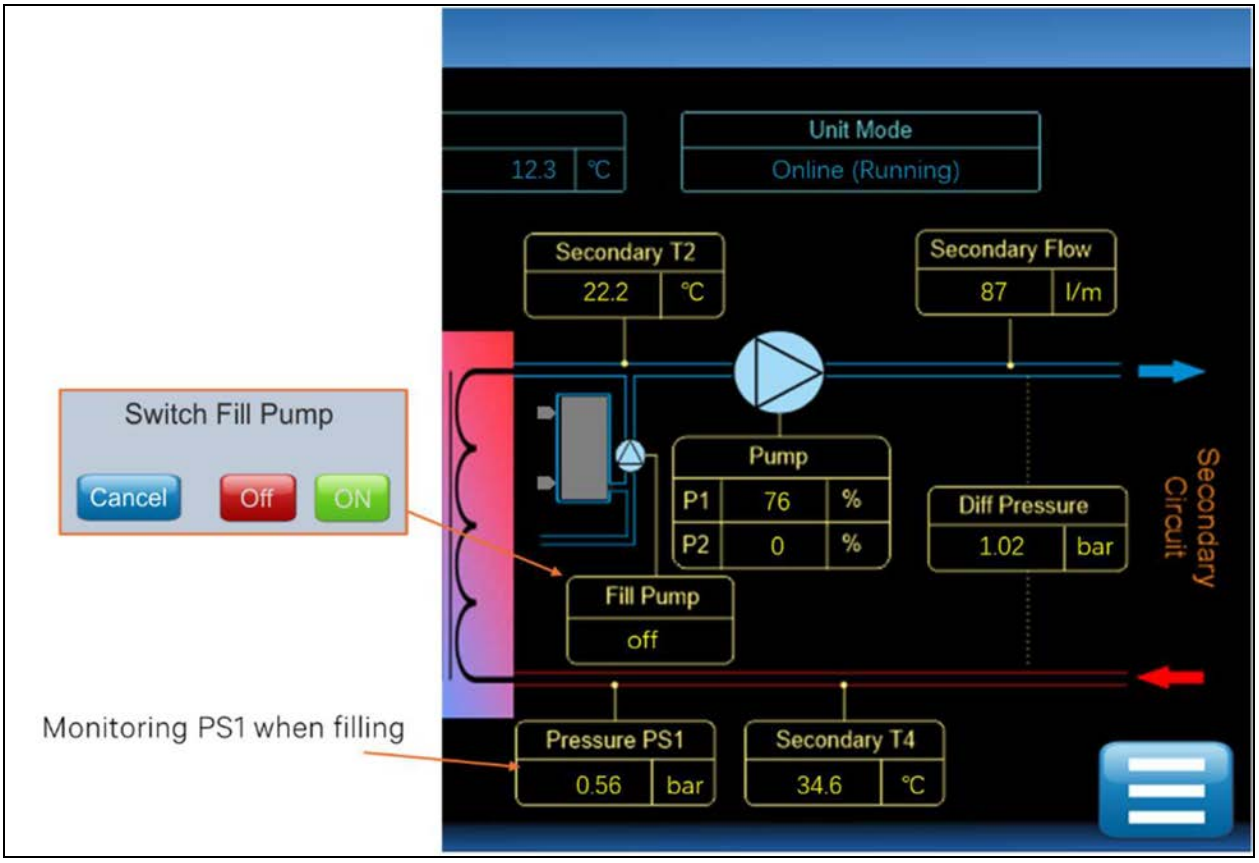
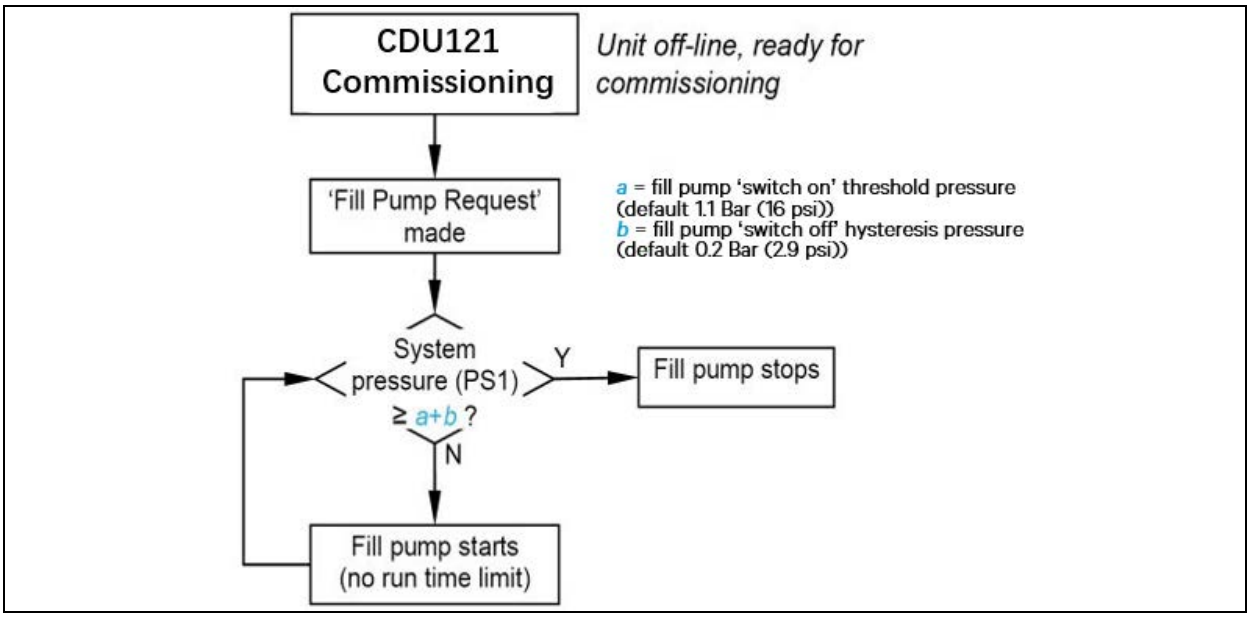


Figure 6.5 on the facing page shows the unit pressure monitoring and fill pump control during filling operation as part of commissioning (unit offline):

Figure 6.5 Vertiv™ CoolChip CDU 121 Pressure Monitoring and Filling Operation



6.2.5 Secondary Built-in Tank Filling

After filling the secondary circuit, fill the built-in tank with liquid to ensure that the unit does not need to connect the fluid container when operating normally.

NOTE: Keep the needle valve cap of the built-in tank vent for filling the tank or secondary circuit in the future.

1. Remove the cap from the built-in tank vent. Connect one port of the exhaust and drain tool valve to the draining hose. Connect the other port of the exhaust and drain tool valve to the tank vent. Place the free end of the draining hose into an empty container.
2. The filling hose is already filled with treated water or 25% propylene glycol fluid. Raise the external tank to ensure it is positioned higher than the unit.
3. Rotate the exhaust and drain tool valve clockwise to open it. Liquid will flow through the filling hose into the internal tank by siphon action.
4. On the home page of the display panel, the built-in tank icon (rectangle) turns solid blue when the internal tank is full. At this point, lower the external tank and immediately remove the filling hose from the fill port. If filling continues, liquid will drain through the exhaust and drain tool valve hose into the empty container.
5. Close and remove the exhaust and drain tool valve from the tank vent.

NOTE: When the secondary circuit runs short of liquid, the fill pump will operate automatically. However, when the internal tank is short of liquid (the Tank icon on the home page turns grey), it must be refilled manually.

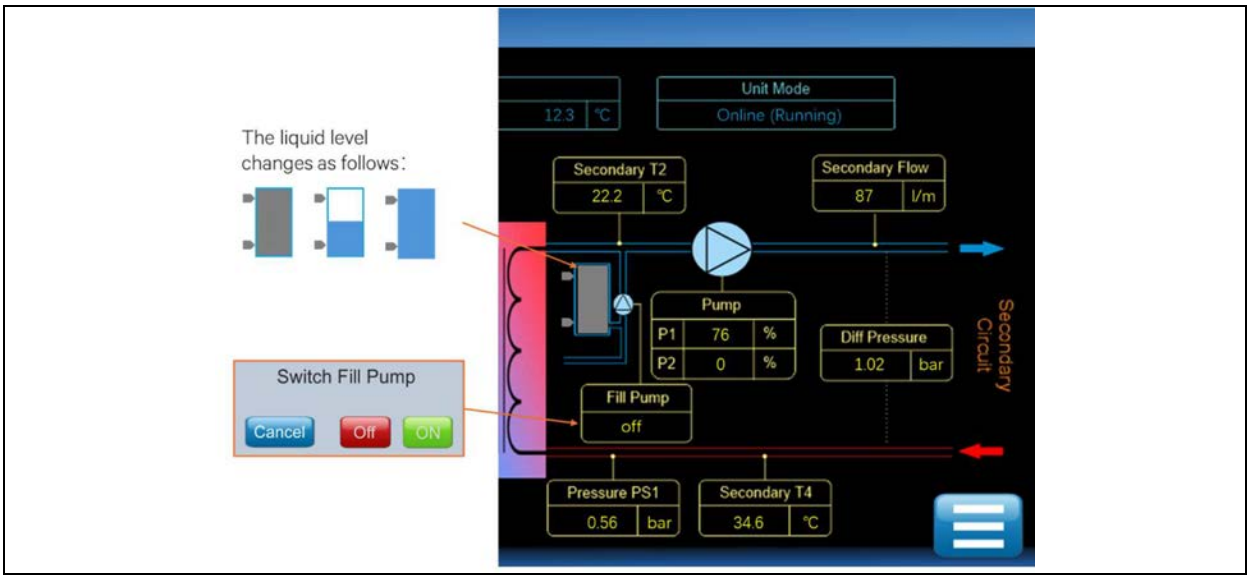
NOTE: When the secondary circuit runs normally, make sure the tank vent without the cap.

Next time you need to fill the built-in tank:

- If the unit can be stopped, follow the procedures listed above.
- If the unit cannot be stopped, follow the alternative procedures below:

- Open the built-in tank vent. Lower the end of the hose and allow the liquid in the tank to flow out and fill the hose. Seal the hose by hand, then quickly place it into a container. Hold the container higher than the unit and use gravity to fill the tank.
- If PS1 is lower than 1.3 bar (18.9 psi), tap **Overrides** on the service screen to force the fill pump to run. After the hose is partially filled with liquid, use gravity to complete filling the built-in tank.

Figure 6.6 Built-in Tank Filling



6.3 Unit Configuration

Prior to running the CoolChip CDU 121, the configuration must be checked to ensure the unit is set up according to the site requirements.

Flow or DP control: See Configuration menu/Pump Control/Flow or DP (P201). This controls the pump speed according to the required flow rate or differential pressure.

Flow /DP setpoint: See Configuration menu/Flow Setpoint (P202) or Differential Setpoint (P203). This sets the required flow or differential pressure to be achieved.

NOTE: It is best to leave these values at default, then set at the final stages of commissioning.

Over Pressure Action: See Configuration menu/Pump Control/Over Pressure Action (P212)/Alarm or Alarm + Shutdown. This determines if the unit should continue to run or shutdown in the event of a system over pressure situation.

Temperature control Mode: See Configuration menu/Temperature Control/Control Mode (P302)/Fixed Setpoint or Fixed Setpoint and Dewpoint Override. This keeps the secondary supply temperature at a fixed temperature or allow it to rise if there is a danger of condensation.

Leak detection: See Configuration menu/Leak Detection - Flood Tray (P601) and Leak Detection - External (P604 and P606)/Alarm or Shutdown and Alarm. This determines if the unit should continue to run or shutdown in the event of an internal or external leak.

Post Power failure option: See Configuration menu/Miscellaneous/Post Power Failure Options (P803)/Run or Standby. This determines if the unit automatically re-starts or remains in standby after a power outage.

Communications: See Setup menu.

6.4 Unit Low Speed Circulation

After the initial fill process, it is recommended to run the unit at a reduced pump speed. This gently circulates the fluid, enabling trapped air to separate out of the reservoir tank or be periodically vented out through the Schrader valve on the rear panel. If the Flow/DP setpoints have been left at the default values, then this happens naturally as these values have been deliberately set quite low.

To adjust the pump speed with the Overrides function:

1. Start the unit in normal automatic mode and allow the pump speeds to settle at the default flow or DP setpoint.

NOTE: The minimum allowable pump speed is 30% in order to enable adequate motor fan cooling and default flow/DP. The default flow/DP may not be achieved if the pump is required to operate below 30% depending on system impedance

2. Leave the unit running like this for approximately 30 minutes to allow any trapped air to vent.

NOTE: While the main pump is running, the fill pressure at PS1 may drop as air is purged from the system and the fill pump can automatically re-activate again.

6.5 Overrides and Full Speed Operation

After this period of reduced speed running, the pump speeds can be ramped up to full 100% speed to determine full flow/DP maximum performance available. Ideally the system should be a complete installation with all IT load circuits connected.

1. Go to the Logon screen and enter the Service access code.
2. Go to the Service menu and select Overrides. Select Pump Speed and enter the desired speed as a percentage of full speed operation, followed by the OK button.

The display shows the  icon on the Home screen all the time when this function is operational.

NOTE: If there is no interaction with the touchscreen, the controller reverts to full automatic mode. The default time for no interaction is 15 minutes.

Once satisfied that all air has been expelled from the system and CoolChip CDU 121 maximum performance is achieved, the pump operation can be set back to automatic control. Go back into Overrides and set the pump speed back to 0% to put the control back into automatic mode. The final required flow rate or DP can then be set in the Configuration menu/Pump Control/Flow Setpoint (P202) or Differential Pressure Setpoint (P203).

6.6 Subsequent Filling

Once the unit is commissioned - the filling wand may be disconnected and stowed away.

Subsequent filling can follow one of two scenarios as below:

1. Automatic Filling

   There is a built-in tank (approximately 1.5 liters capacity, filled with treated fluid) in place of the filling wand. Allows the unit to self-fill while unattended, in the event of minor fluid loss or during pressure loss when any remaining trapped air is purged out of the system.

2. Manual Filling

Alternatively, the optional flexible liquid container can be stored remotely and only connected to the CoolChip CDU 121 when filling is required. This requires the Configuration Parameter P107 (Fill Control Scheme) to be set to 1 (Manual), which ensures the unit does not go into an automatic filling cycle but will request manual confirmation that the liquid container is first connected. See Secondary Built-in Tank Filling on page 25

The liquid level of built-in tank should be regularly inspected during service visits and refilled if required, although any fill pump activity after commissioning greater than 5 seconds duration is raised as an A30 – Check fluid Make up Level alarm, as a reminder for investigation.

If there is already pressure in system and air is introduced into the fill pump suction line, then the fill pump may cease to pump. To rectify; leave the unit running while opening a drain valve to relieve pressure, until the fill pump starts to pump again.

Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road, Wanchai

Hong Kong

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Appendix B: Submittal Drawings

Submittal drawings referenced in this document are listed below and are presented in the order as mentioned within this document on the following pages.

Table B.1 Submittals

Document Number	Title
20000653	CoolChip CDU Standard Features
20000654	CoolChip CDU Cabinet Dimensional Data AC & DC Unit
20000655	CoolChip CDU Connection Location AC Version
20000656	CoolChip CDU Piping Schematic
20000657	CoolChip CDU Electrical Connection DC Unit
20000658	CoolChip CDU Leak Detection Rope AC & DC Unit
20000659	CoolChip CDU Component Location Diagram DC Version
20000660	Ship Loose Accessories AC and DC Version
20000703	CoolChip CDU Connection Location DC Version
20000704	CoolChip CDU Electrical Connection AC Unit
20000705	CoolChip CDU Component Location Diagram AC Version

COOLCHIP CDU

STANDARD FEATURES

Product description -
The Vertiv™ CoolChip CDU121 in-rack coolant distribution unit (CDU) provides effective separation of the facility fluid circuit and secondary fluid network via a liquid-to-liquid heat exchanger for single rack direct-to-chip cooling applications.

Twin pumps -
With single pump redundancy, provide maximum flow up to 120 liter/minute at external pressure drop of 1.15 Bar.

Controller -
Enables running in group control for multiple units via CANbus, to enable N+X redundancy design for larger installations. Provides data, alarm and system logging over the full product lifetime recorded to an on-board SD card.

Communications -
Modbus RS485, TCP/IP & BACnet communication with data center monitoring systems.

Alarms -
Provide full alarm monitoring for real-time status of the IT equipment and the local environment.

Redundancy -
Redundant pumps, inverters, critical temperature sensors, power supplies and ethernet communication ports.

Hygienic connections -
Sanitary flange and clamps enable easy installation, maintenance and retrofit of pipework parts.

Flow control -
Differential pressure control mode or flow rate control mode to suit various application requirements.

Display/HMI -
The Vertiv™ CoolChip CDU121 is provided with a 7” touch screen display with easily. navigable intuitive menu structure.

Temperature and RH sensor - Room temperature and humidity are constantly monitored and utilized to determine dew point in the room for CDU dew point control mode.

Reservoir - Reservoir tank is used for system make up and to maintain system threshold pressure.

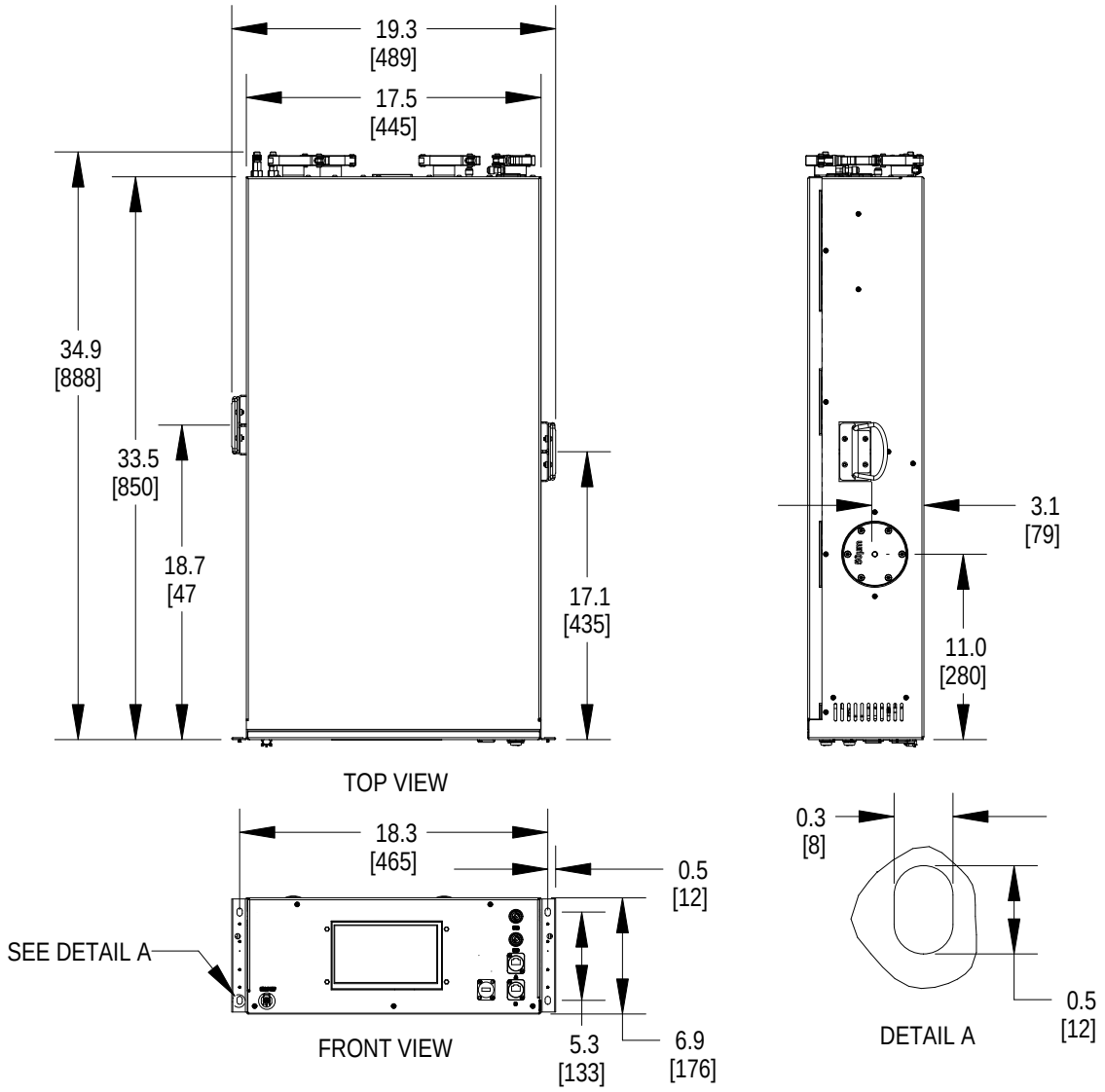
Water tanks and expansion tanks -
This unit is equipped with a built-in water tank with a capacity of 1.5 liters for convenient water replenishment. The expansion vessel can be maintained without stopping the unit.

Optional accessories -
This equipment is available with pressure relief valves of 3 bar or 4 bar for selection. Filters of 50μm or 25μm are available for selection.

COOLCHIP CDU

CABINET DIMENSIONAL DATA

AC & DC UNIT



DIMENSIONS :

DIMENSIONS	HEIGHT		WIDTH		DEPTH	
UNIT	IN.	MM	IN.	MM	IN.	MM
SHIPPING CABINET	17.36	441	26.22	666	43.15	1096

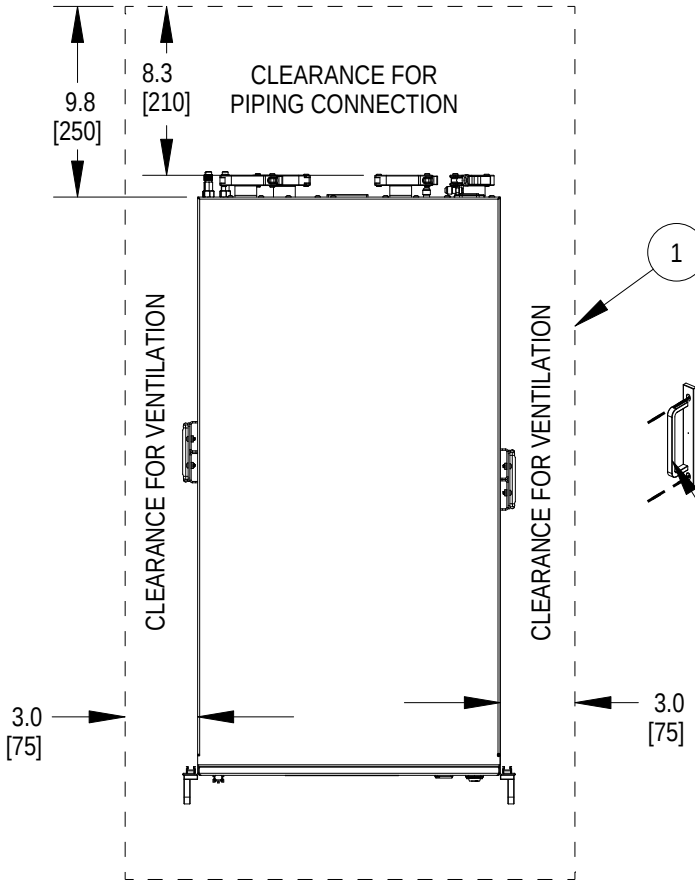
WEIGHTS:

WEIGHT	DRY		OPERATING		SHIPPING	
	LBS.	KG	LBS.	KG	LBS.	KG
STANDARD CABINET - AC VERSION	119.05	54	131.6	59.7	196.21	89
STANDARD CABINET - DC VERSION	115.74	52.5	128.3	58.2	190.7	86.5

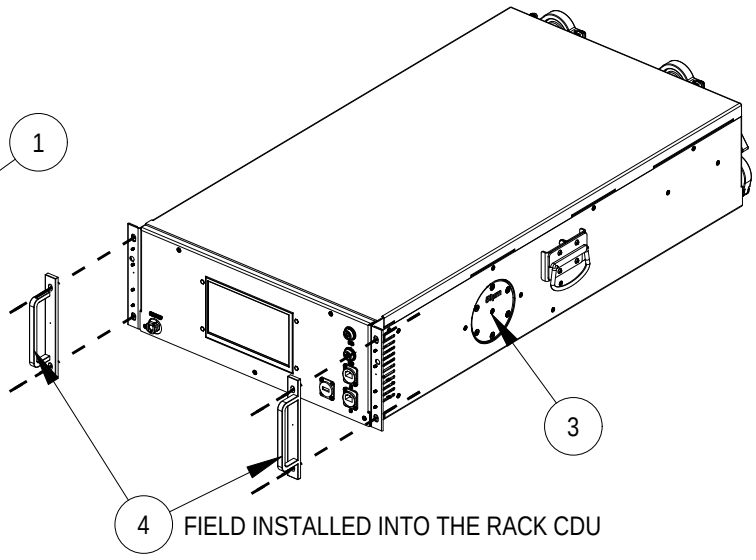
CABINET DIMENSIONAL DATA

RACK INSTALLED CLEARANCES

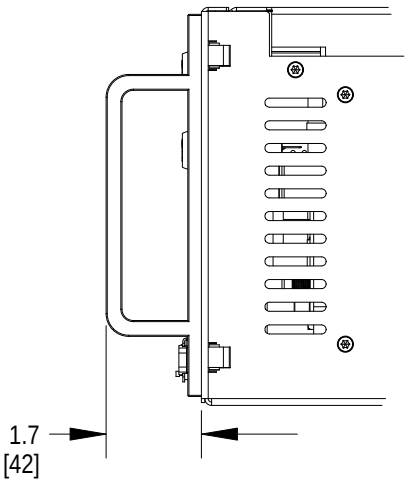
AC UNIT



TOP VIEW
INTERNAL CLEARANCE



FIELD INSTALLED INTO THE RACK CDU

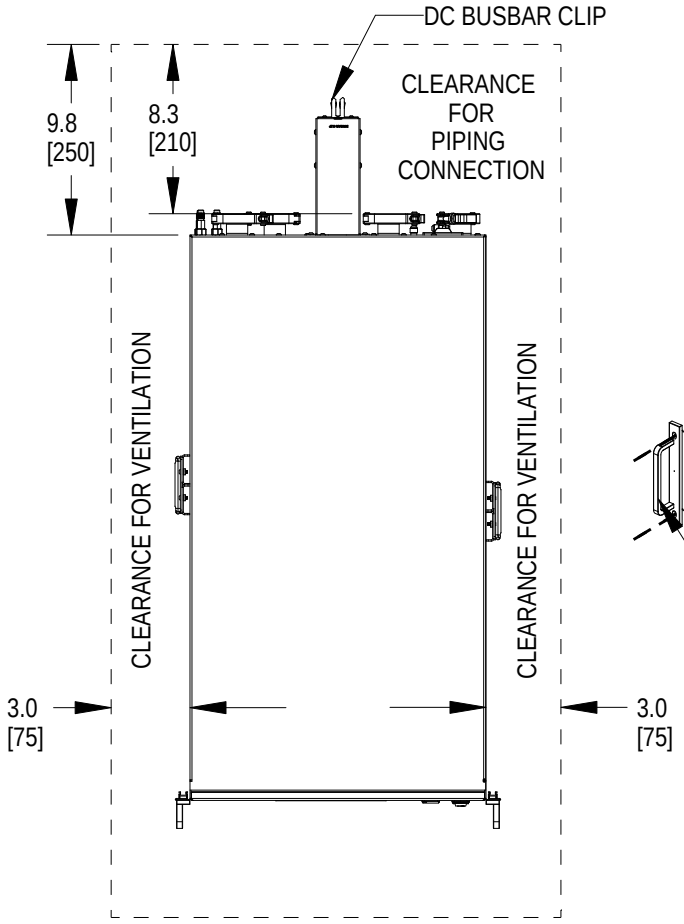


ITEM	DESCRIPTION
1	THE SERVER CABINET USED IN THIS SUBMITTAL DRAWING IS A REFERENCE
2	COOLCHIP CDU121 (AC)
3	50μm SECONDARY FILTER (25μm AS OPTION)
4	SIDE HANDLE FOR INSTALLATION, STAINLESS STEEL 304

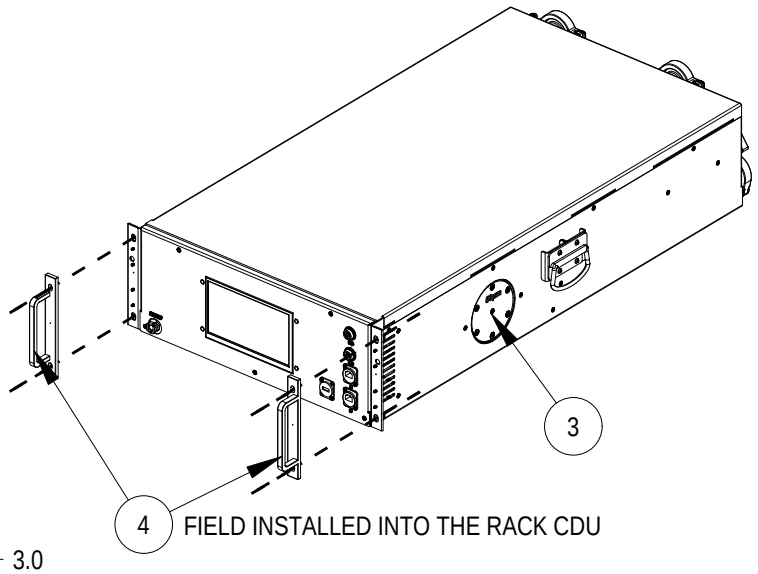
CABINET DIMENSIONAL DATA

RACK INSTALLED CLEARANCES

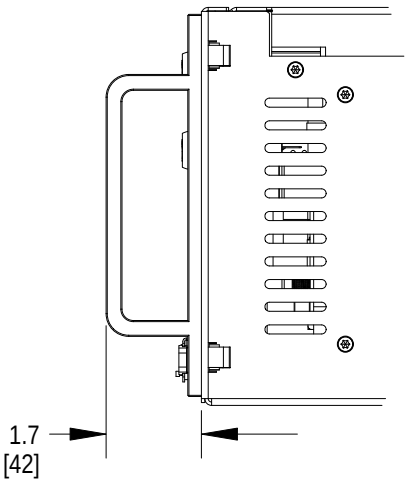
DC UNIT



TOP VIEW
INTERNAL CLEARANCE



FIELD INSTALLED INTO THE RACK CDU

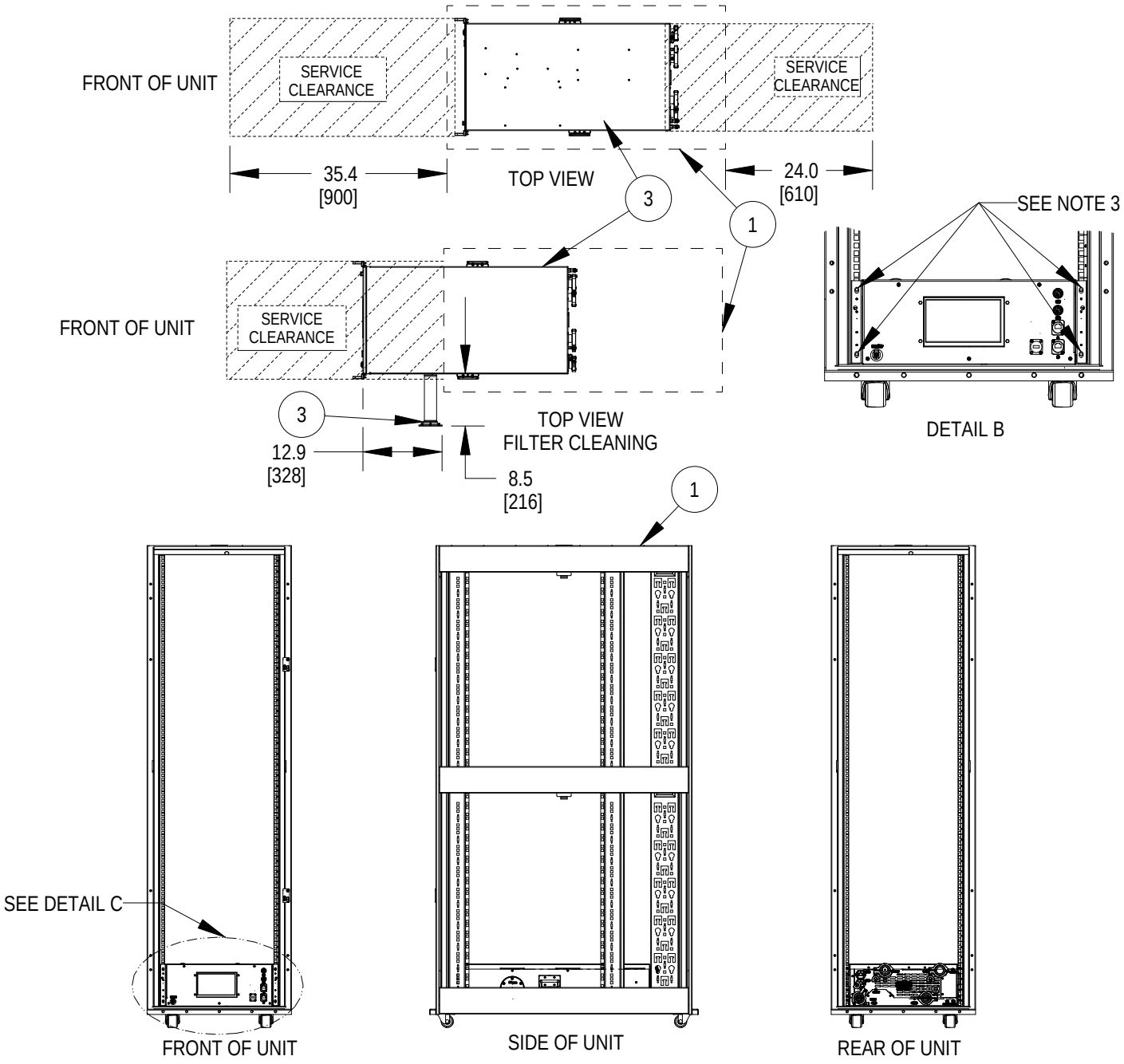


ITEM	DESCRIPTION
1	THE SERVER CABINET USED IN THIS SUBMITTAL DRAWING IS A REFERENCE
2	COOLCHIP CDU121 (DC)
3	50μm SECONDARY FILTER (25μm AS OPTION)
4	SIDE HANDLE FOR INSTALLATION, STAINLESS STEEL 304

CABINET DIMENSIONAL DATA

SERVICE CLEARANCES

BOTH AC & DC VERSION



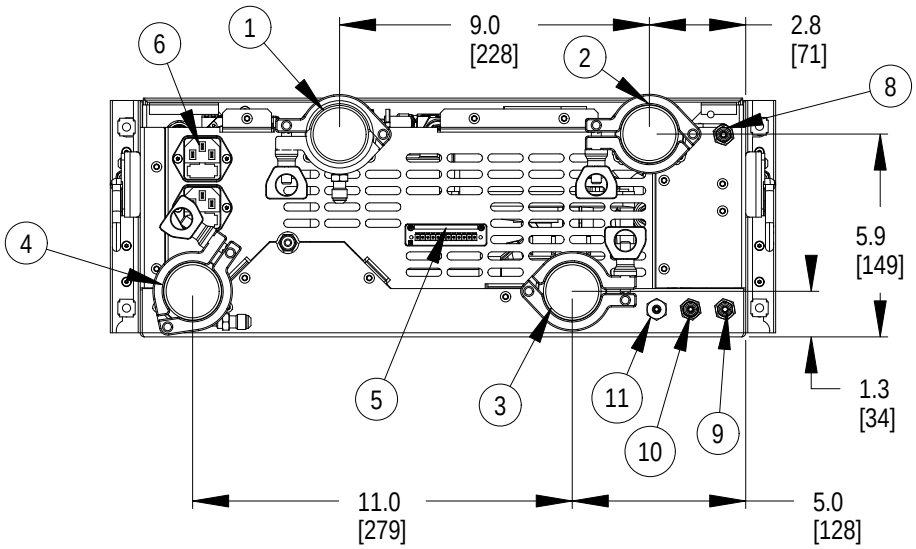
NOTES:

1. THE RACK (ITEM 1) IS SHOWN FOR REFERENCE ONLY.
2. THE COOLCHIP CDU121 (AC/DC) IS TO BE PLACED AT THE BOTTOM OF THE RACK. SUFFICIENT BRACKETS OR SHELVING IN THE RACK SHOULD BE PRESENT TO SUPPORT THE UNIT.
3. THE 4 HOLE LOCATIONS SHOWN ARE TO BE USED TO SECURE THE UNIT TO THE RACK.

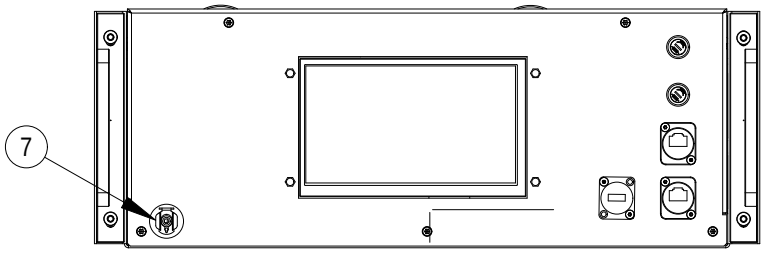
COOLCHIP CDU

CONNECTION LOCATION

AC VERSION



REAR VIEW OF UNIT

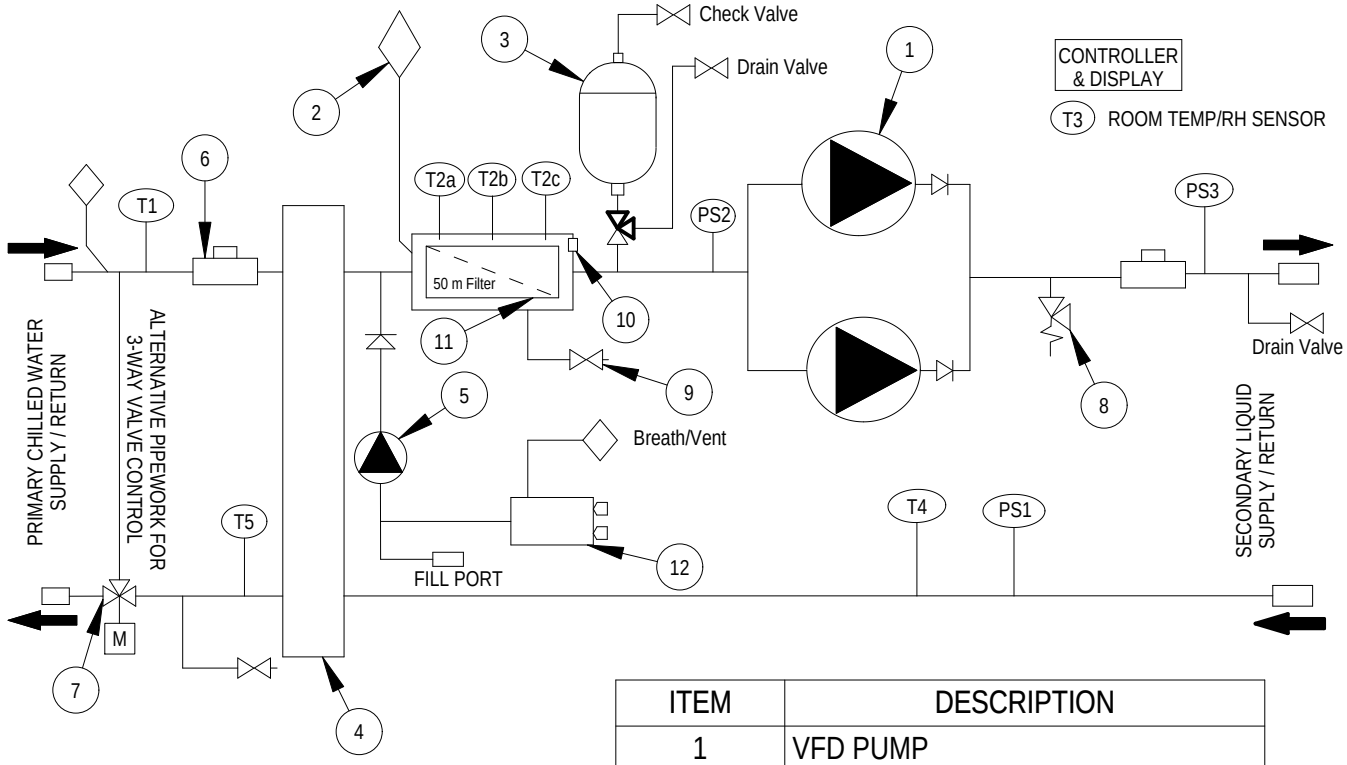


FRONT VIEW OF UNIT

ITEM	DESCRIPTION	CONNECTION SIZE
1	SECONDARY CIRCUIT SUPPLY	1.5IN SANITARY FLANGE
2	SECONDARY CIRCUIT RETURN	1.5IN SANITARY FLANGE
3	PRIMARY CIRCUIT RETURN	1.5IN SANITARY FLANGE
4	PRIMARY CIRCUIT SUPPLY	1.5IN SANITARY FLANGE
5	CONNECTORS FOR EXTERNAL TEMPERATURE/HUMIDITY SENSOR, EXTERNAL LEAK DETECTION TAPE RS485 AND CANbus COMMUNICATIONS	12 WAY CONNECTOR STRIP (SK1)
6	A AND B 1-PHASE IEC--C14 POWER INLET CONNECTIONS (FACTORY FITTED FUSES)	C14 - IEC CONNECTORS
7	WATER MAKE-UP CONNECTION	1/4IN X HOSE BARB 1/8IN ID, CUT-OFF TYPE RS-PMCD-BS32 WITH 3.24MM ID
8	SECONDARY CIRCUIT VENT	SCHRADER VALVE M8
9	SECONDARY CIRCUIT DRAIN	SCHRADER VALVE M8
10	BUILT-IN TANK CIRCUIT VENT	M8 NORMALLY OPEN
11	PRESSURE RELIEF VALVE VENT	BARBED CONNECTOR (NORMALLY OPEN)

COOLCHIP CDU

PIPING SCHEMATIC



FACTORY PIPING

T## TEMPERATURE SENSOR (FACTORY PROVIDED)

PS## PRESSURE SENSOR (FACTORY PROVIDED)

ITEM	DESCRIPTION
1	VFD PUMP
2	AIR VENT
3	EXPANSION VESSEL
4	HEAT EXCHANGER
5	FILL PUMP
6	FLOW METER
7	3-WAY COOLING CONTROL VALVE
8	RELIEF VALVE
9	DRAIN VALVE
10	WATER LEVEL SENSOR
11	FILTER
12	BUILT-IN TANK

Notes:

1. Arrangement Diagram representation shown. Do not use for specific connection locations.
2. For each CoolChip CDU unit, a separate 500 micron filter is required in the facility chilled water supply from the chilled water source. The filter is field supplied and installed.
3. Unit isolation valves are required in the field piping of facility and secondary fluid connections to facilitate service. The isolation valves are field supplied and installed.

COOLCHIP CDU

ELECTRICAL CONNECTION

DC UNIT

For DC Input

The cable assembly busbar clip is used to connect the ORv3 busbar to achieve standardized connection of the OCP power distribution architecture. It is installed at the tail of the unit and the cable assembly is connected to the unit load.

Communication Options:

Ethernet redundant communication ports RJ45 (2) are provided on the bottom of the unit control panel,labeled ETHA & ETHB. Cat5e shielded cable should be used when wiring to these ports
Modbus over IP, Webserver, SNMP, CanBus, BACnet, Redfish, TCP/IP, SSH, DMTF compliant
RS-485 Modbus (terminals 8 & 9 on connector SK1).

Group Control Networking Cabling:

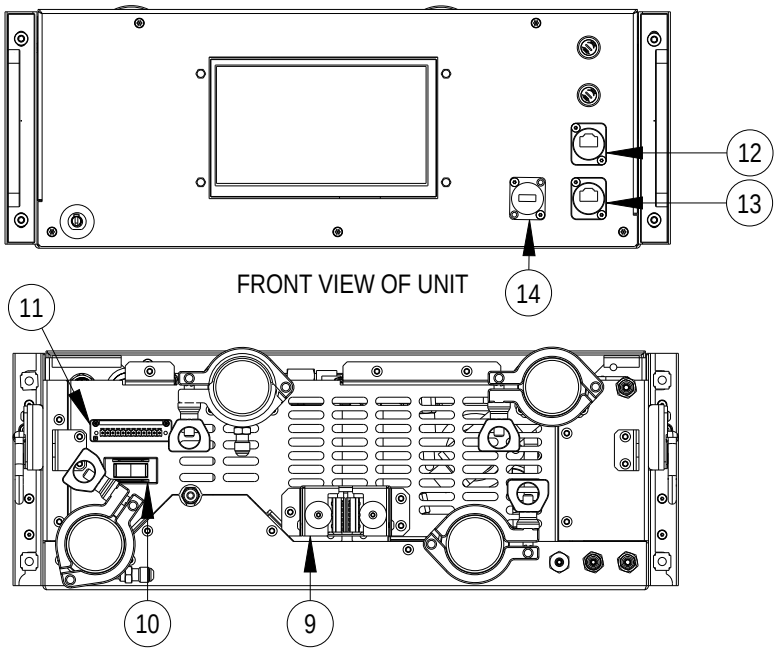
CANbus is used for communication between 4 CoolChip CDU121 units.
CANbus (terminals 10, 11 & 12 on connector SK1) cable requires 3 conductors terminals.
2 signal wires (CAN H and CAN L).
1 signal return path (GND).

Cable Type:

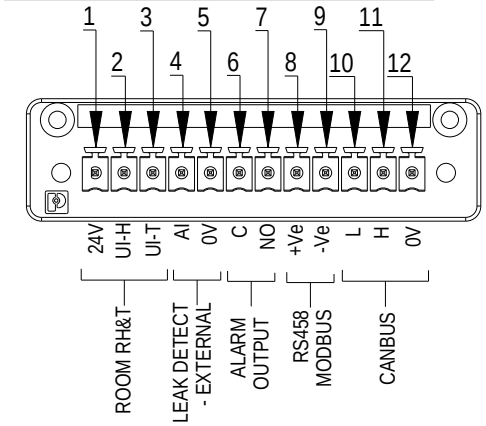
Beldon 3106A, or equivalent (1 pair +1, shielded 22AWG) is the recommended cable type to be used and pre-configured cable assemblies are provided with each CDU121 unit.

Leak Detection Tape:

A Leak detection tape (optional) can be connected to terminals 4 & 5 on SK1 for leak detection under the floor.



ITEM	DESCRIPTION
9	BUSBAR CLIP
10	BREAKER
11	TERMINAL POSITION FOR SK1
12	ETHERNET A
13	ETHERNET B
14	USB



TERMINAL POSITION FOR SK1

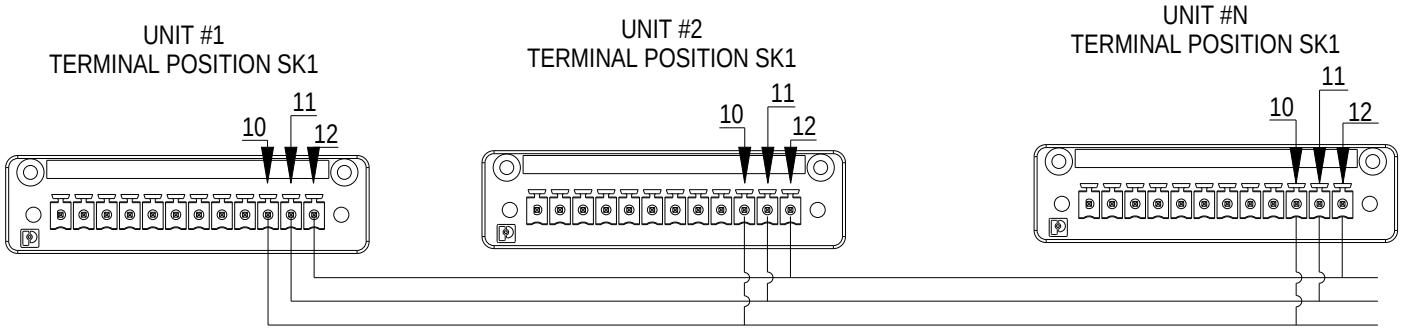
NOTES :

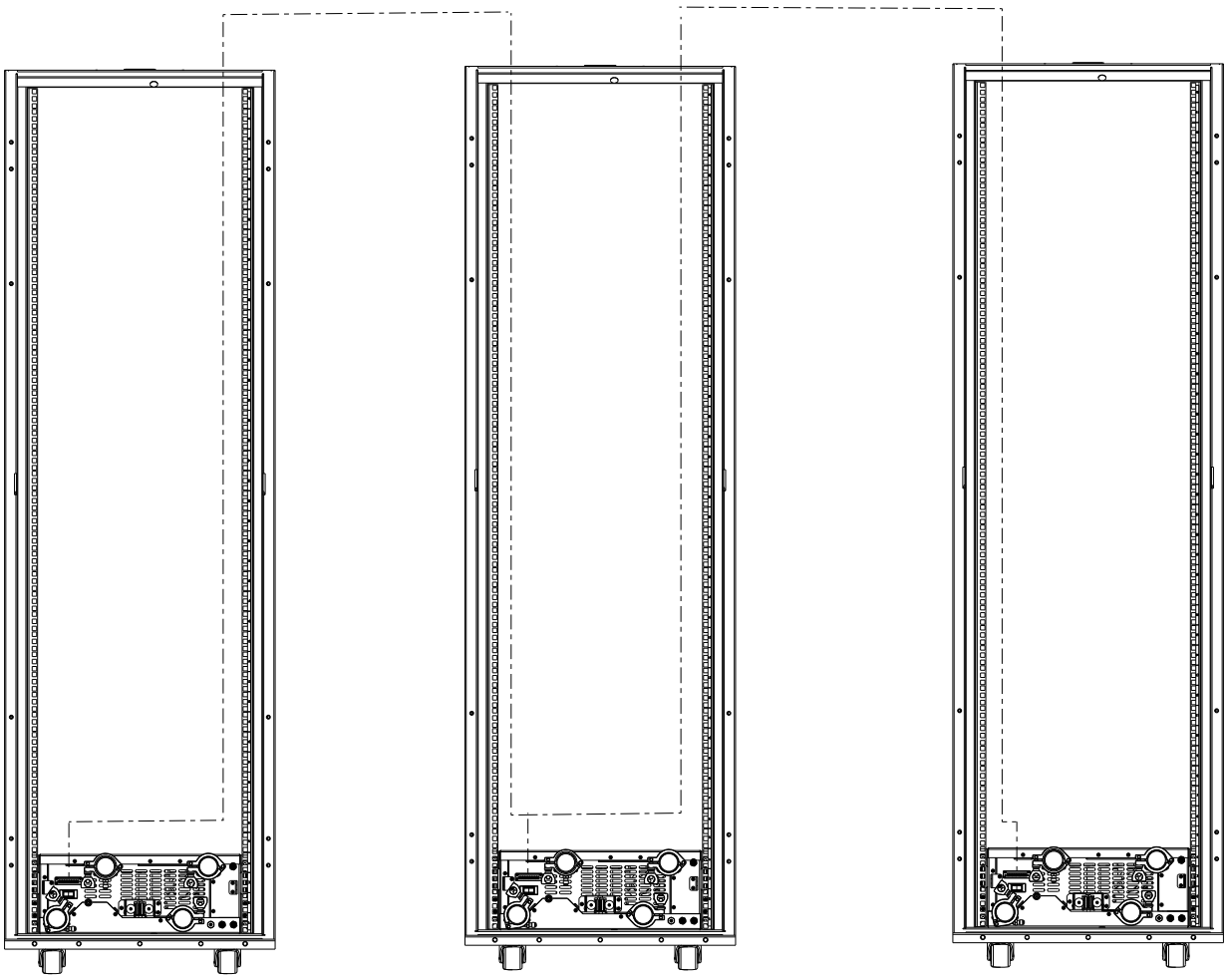
1. FACTORY PROVIDE 10A FUSE FOR 110-120V AC AND 200-240V AC INPUTS.

ELECTRICAL CONNECTION
DC UNIT COMMUNICATION WIRING

Connection Diagram for CANbus

Standard units can be connected/grouped/ teamworked up to 4 units in a single group. More units can be connected upon factory request.





REAR OF UNIT #1

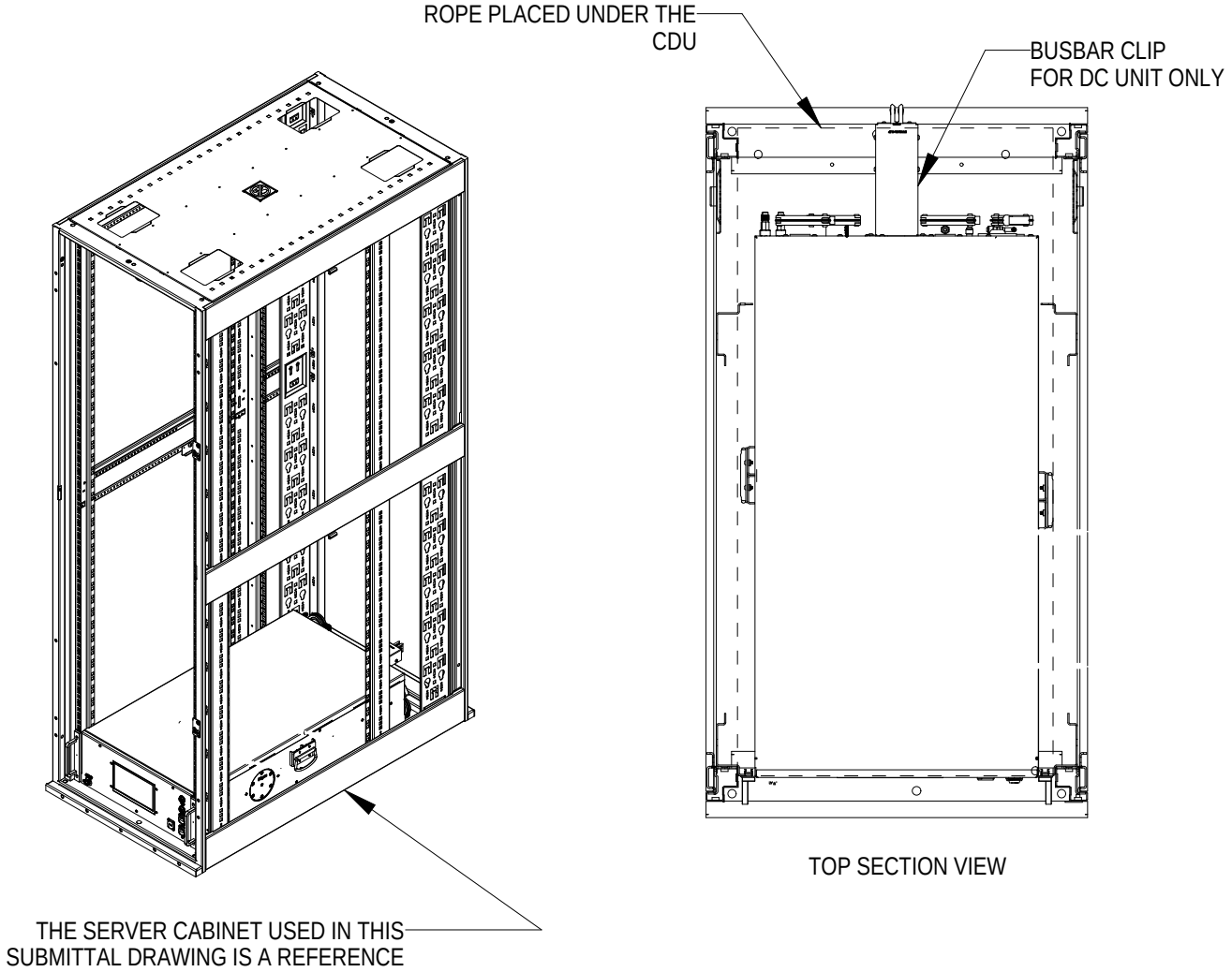
REAR OF UNIT #2

REAR OF UNIT #N

COOLCHIP CDU

LEAK DETECTION ROPE

AC & DC UNIT



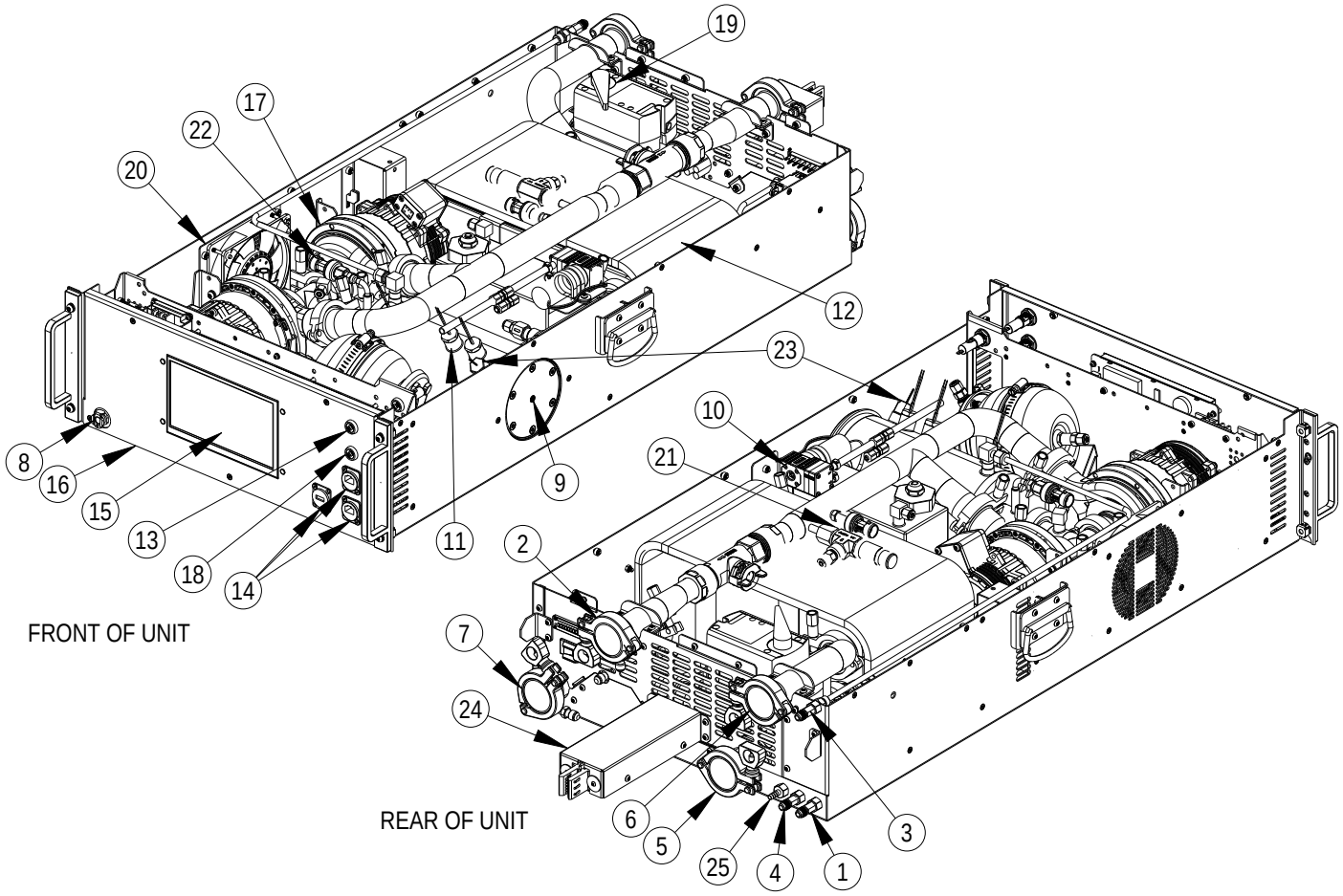
NOTES:-

1. SENSING LENGTH 10M (32.8 FT) OR 20M (65.6 FT).
2. PVC TWISTED PAIR WITH STAINLESS STEEL SENSING ELEMENTS.
3. 3.5MM (0.1 IN) OVERALL DIAMETER.
4. 3 M (9.8 FT) LEADER CABLE LENGTH.
5. CONNECTED TO TERMINALS 10 & 12 ON SK1.

COOLCHIP CDU

COMPONENT LOCATION DIAGRAM

DC VERSION



ITEM	DESCRIPTION
1	RESERVOIR/SECONDARY CIRCUIT DRAIN
2	SECONDARY CIRCUIT SUPPLY
3	RESERVOIR/SECONDARY CIRCUIT VENT
4	BUILT IN TANK VENT, NORMALLY OPEN
5	PRIMARY CIRCUIT RETURN
6	SECONDARY CIRCUIT RETURN
7	PRIMARY CIRCUIT SUPPLY
8	WATER MAKE UP CONNECTION
9	SECONDARY FILTER
10	FILL PUMP
11	SECONDARY SUPPLY TEMPERATURE SENSOR(REDUNDANCY)
12	HEAT EXCHANGER

ITEM	DESCRIPTION
13	FUSE FS2 FOR FILL PUMP
14	DUAL ETHERNET (RJ45) AND USB CONNECTIONS
15	CONTROLLER 7-INCH TOUCHSCREEN DISPLAY
16	REMOVABLE FRONT PANEL
17	SECONDARY CIRCUIT PUMPS
18	FUSE FS3 FOR DISPLAY
19	PRIMARY 3-WAY CIRCUIT CONTROL VALVE & ACTUATOR
20	COOLING FAN
21	PRESSURE RELIEF VALVE
22	PRESSURE SENSORS
23	LEVEL SENSOR
24	DC BUSBAR CLIP
25	PRESSURE RELIEF VALVE VENT

COOLCHIP CDU

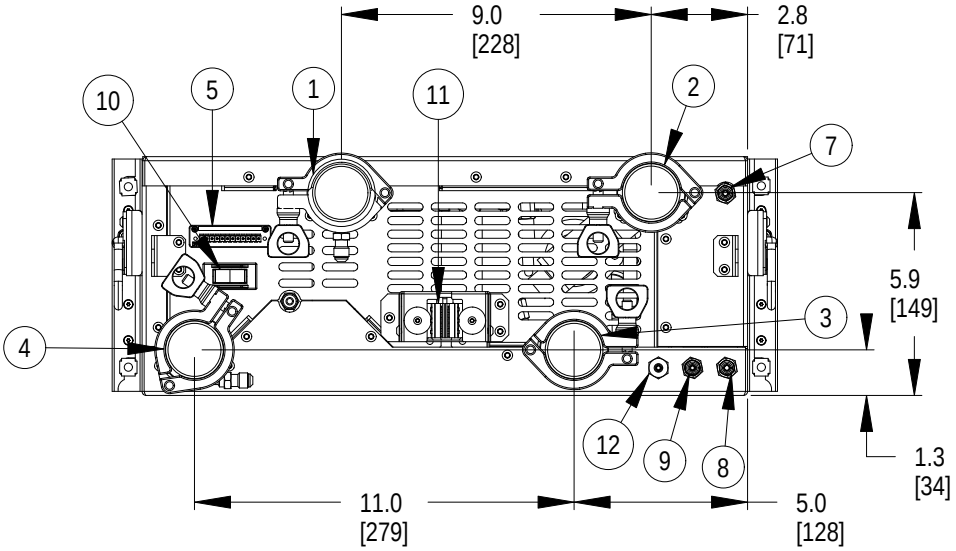
SHIP LOOSE ACCESSORIES

AC & DC VERSION

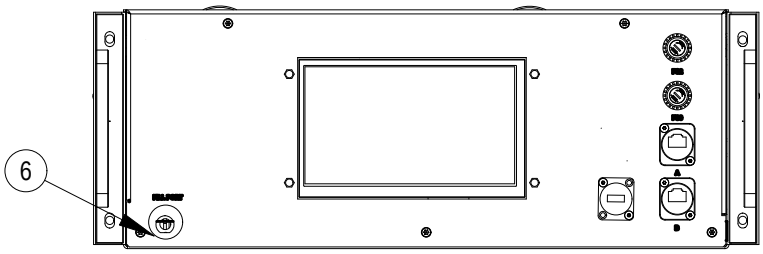
Sr. No	Description	Unit	Quantity for AC Unit	Quantity for DC Unit
1	Main Unit Coolchip CDU121	Each	1	1
2	Filling hoses, with quick-disconnect male connector	Each	1	1
3	Temperature and humidity sensor	Each	1	1
4	Side handle (stainless steel 304) for rac installation	Each	2	2
5	Exhaust and drain tool valve	Each	1	1
6	CoolChip CDU121 Installation and Commissioning Guide (printed)	Each	1	1
7	CoolChip CDU121 Installation and Planning Guide (printed)	Each	1	1
8	CoolChip CDU121 Installation and Maintenance Guide (printed)	Each	1	1
9	CoolChip CDU121 AC/DC Wiring Diagram (printed)	Each	1	1
10	Fixing Nut (for rack installation)	Each	4	4
11	Fixing Bolt (for rack installation)	Each	4	4
12	AC Power cord C13-C14, 15m (length), color black	Each	2	-
13	DC busbar clip fixing screw	Each	-	7
14	DC busbar clip bracket	Each	-	1
15	DC busbar clip shell (96.6 mm length)	Each	-	1

COOLCHIP CDU

CONNECTION LOCATION
DC VERSION

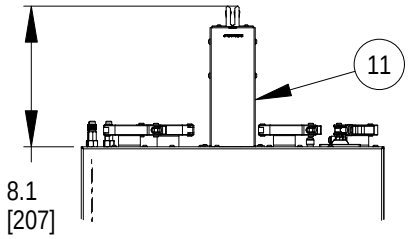


REAR VIEW OF UNIT



FRONT VIEW OF UNIT

REAR SIDE OF UNIT



PARTIAL TOP VIEW
OF UNIT

ITEM	DESCRIPTION	CONNECTION SIZE
1	SECONDARY CIRCUIT SUPPLY	1.5IN SANITARY FLANGE
2	SECONDARY CIRCUIT RETURN	1.5IN SANITARY FLANGE
3	PRIMARY CIRCUIT RETURN	1.5IN SANITARY FLANGE
4	PRIMARY CIRCUIT SUPPLY	1.5IN SANITARY FLANGE
5	CONNECTORS FOR EXTERNAL TEMPERATURE/HUMIDITY SENSOR, EXTERNAL LEAK DETECTION TAPE RS485 AND CANbus COMMUNICATIONS	12 WAY CONNECTOR STRIP (SK1)
6	WATER MAKE-UP CONNECTION	1/4IN X HOSE BARB 1/8IN ID, CUT-OFF TYPE RS-PMCD-BS32 WITH 3.24MM ID
7	RESERVOIR/SECONDARY CIRCUIT VENT	SCHRADER VALVE M8
8	RESERVOIR/SECONDARY CIRCUIT DRAIN	SCHRADER VALVE M8
9	BUILT-IN TANK CIRCUIT VENT	M8 NORMALLY OPEN
10	CIRCUIT BREAKER	-
11	48V DC POWER INPUT	BUSBAR CLIP
12	PRESSURE RELIEF VALVE VENT	BARBED CONNECTOR (NORMALLY OPEN)

COOLCHIP CDU

ELECTRICAL CONNECTION

AC UNIT

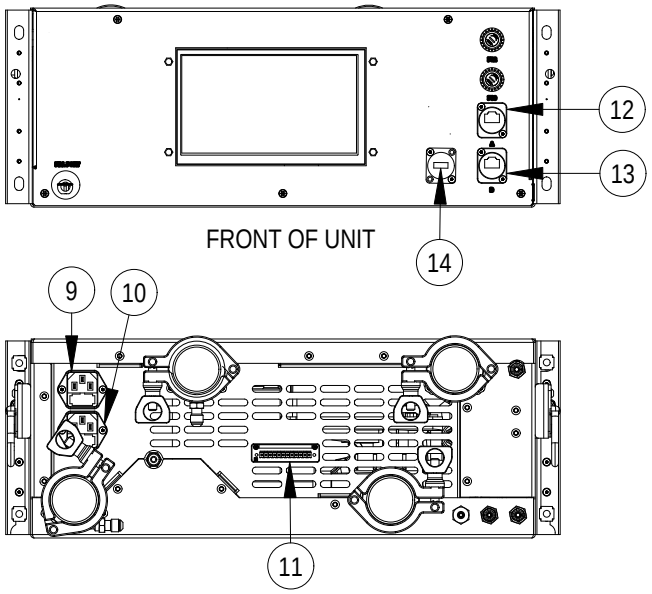
For AC Input:
The dual power cord feature allows the unit to be powered by two separate power sources.
The CDU will be supplied with two (2) detachable 6 ft (1.82 m) power cords that attach to two (2) IEC power inlets in the rear of the unit. Each power cord has a IEC 320-C14 plug at the opposite end.

Communication Options:
Ethernet redundant communication ports RJ45 (2) are provided on the bottom of the unit control panel,labeled ETHA & ETHB. Cat5e shielded cable should be used when wiring to these ports
Modbus over IP, Webserver, SNMP, CanBus, BACnet, Redfish
RS-485 Modbus (terminals 8 & 9 on connector SK1).

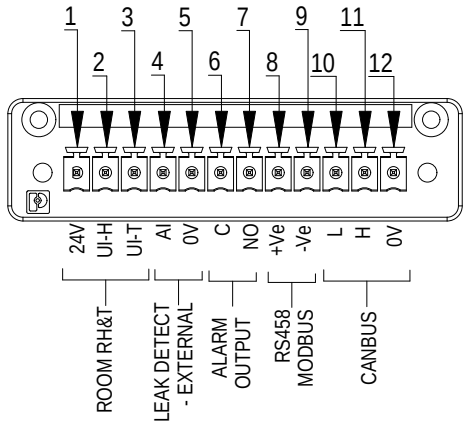
Group Control Networking Cabling:
CANbus is used for communication between 4 CoolChip CDU121 units.
CANbus (terminals 10, 11 & 12 on connector SK1) cable requires 3 conductors terminals.
2 signal wires (CAN H and CAN L).
1 signal return path (GND).

Cable Type:
Beldon 3106A, or equivalent (1 pair +1, shielded 22AWG) is the recommended cable type to be used and pre-configured cable assemblies are provided with each CDU121 unit.

Leak Detection Tape:
A Leak detection tape (optional) can be connected to terminals 4 & 5 on SK1 for leak detection under the floor.



ITEM	DESCRIPTION
9	IEC POWER INLETS A
10	IEC POWER INLETS B
11	TERMINAL POSITION FOR SK1
12	ETHERNET A
13	ETHERNET B
14	USB



TERMINAL POSITION FOR SK1

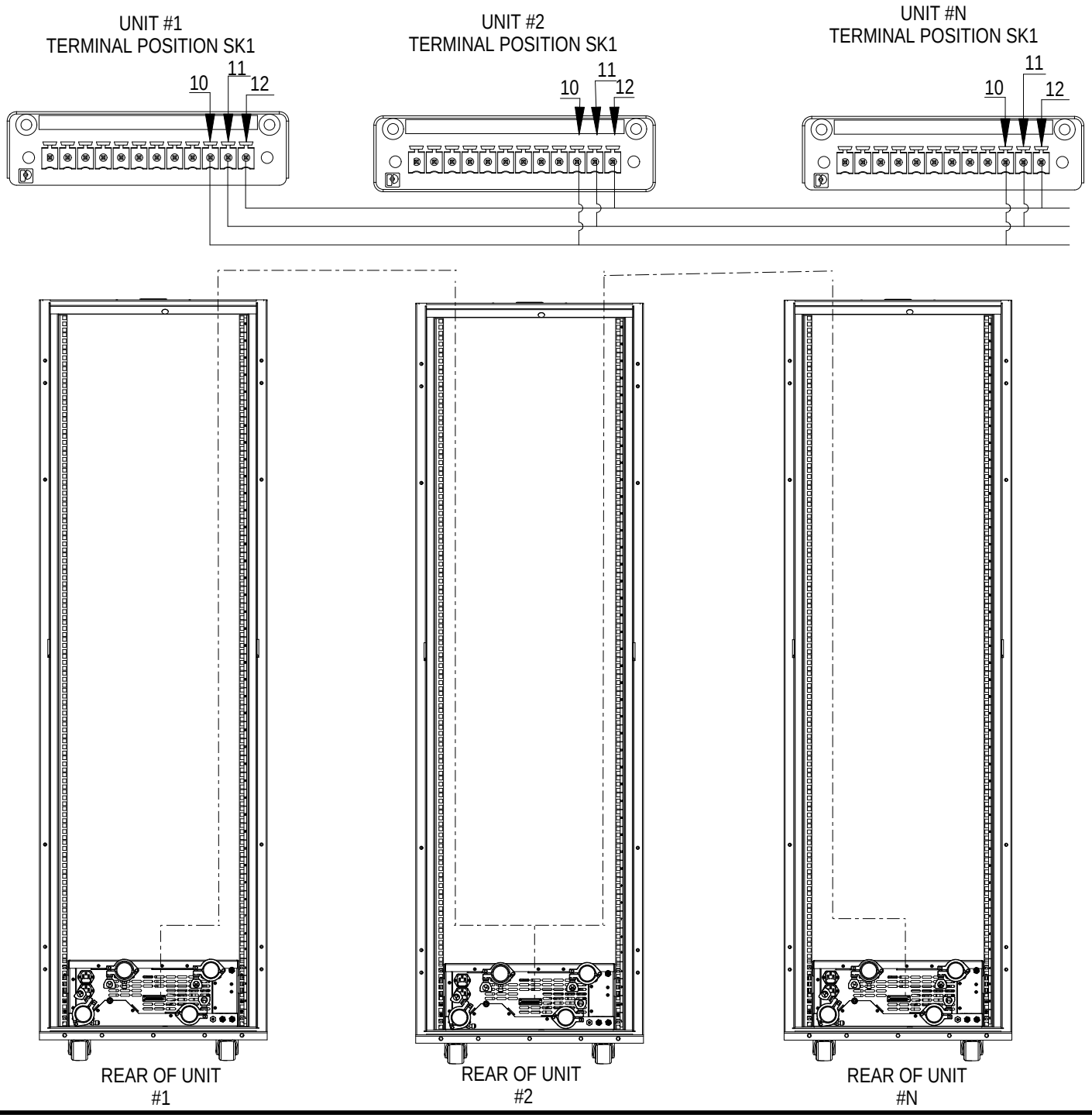
NOTES :

1. FACTORY PROVIDE 10A FUSE FOR 110-120V & 208-240V INPUT.

ELECTRICAL CONNECTION
AC UNIT COMMUNICATION WIRING

Connection Diagram for CANbus

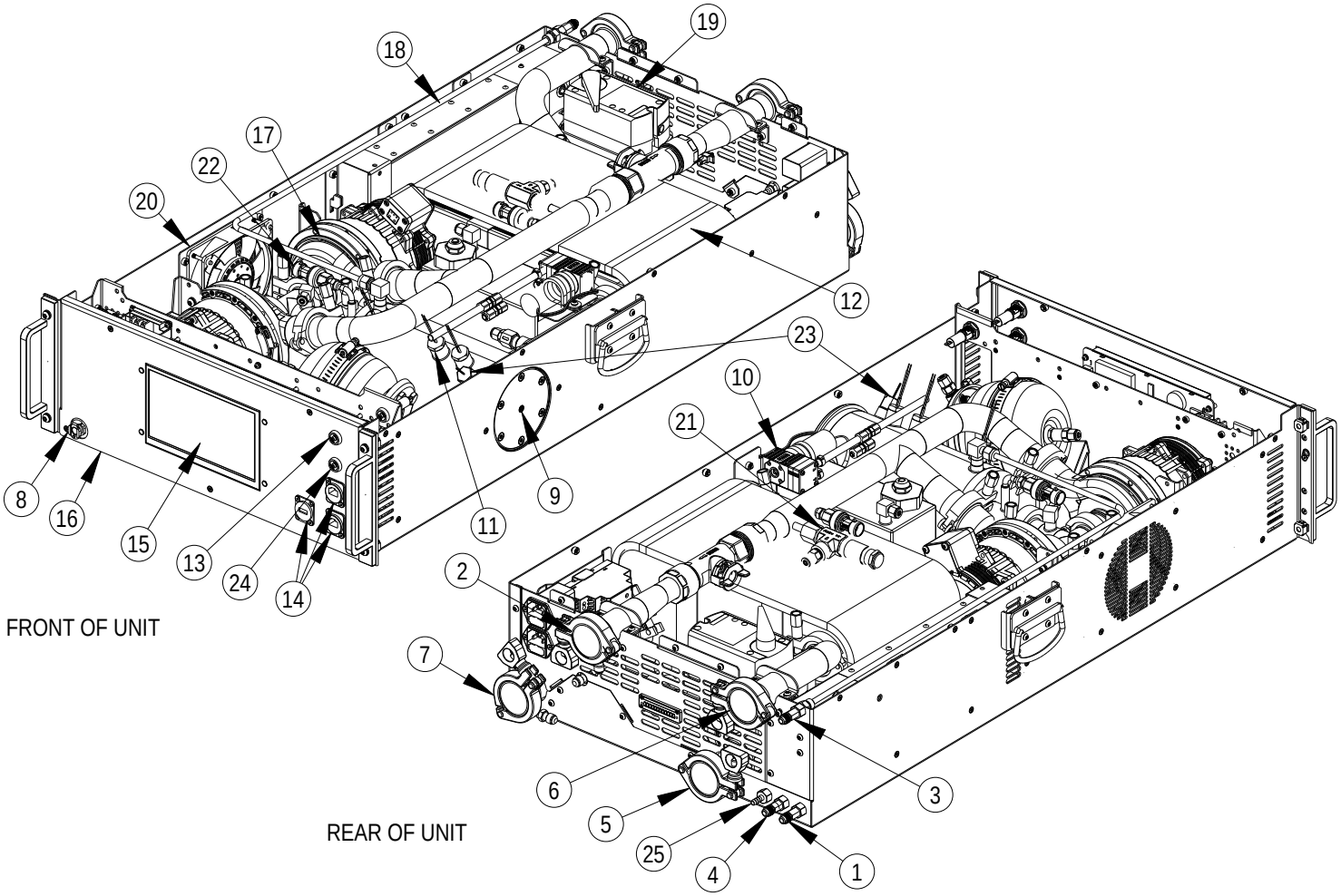
Standard units can be connected/grouped/ teamworked up to 4 units in a single group. More units can be connected upon factory request.



COOLCHIP CDU

COMPONENT LOCATION DIAGRAM

AC VERSION



ITEM	DESCRIPTION
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7	PRIMARY CIRCUIT SUPPLY
8	WATER MAKE UP CONNECTION
9	SECONDARY FILTER
10	FILL PUMP
11	SECONDARY SUPPLY TEMPERATURE SENSOR(REDUNDANCY)
12	HEAT EXCHANGER

ITEM	DESCRIPTION
13	FUSE FS2 FOR FILL PUMP
14	DUAL ETHERNET (RJ45) AND USB CONNECTIONS
15	CONTROLLER 7-INCH TOUCHSCREEN DISPLAY
16	REMOVABLE FRONT PANEL
17	SECONDARY CIRCUIT PUMPS
18	PUMP 48 VDC POWER SUPPLY
19	PRIMARY 3-WAY CIRCUIT CONTROL VALVE & ACTUATOR
20	COOLING FAN
21	PRESSURE RELIEF VALVE
22	PRESSURE SENSORS
23	LEVEL SENSOR
24	FUSE FS3 FOR DISPLAY
25	PRESSURE RELIEF VALVE VENT

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Appendix C: Warranty and Contact Details

C.1 Limited Product and Service Warranty

Extended warranties, service and maintenance programs are available in most locations, details available upon request. To obtain further details of limited warranty, also after sales service offerings, contact your local sales representative or technical support if you have any questions or problems during unit installation.

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Appendix D: Notes

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Appendix E: Disposal Information

NOTE: Waste materials must be disposed of in a responsible manner in line with environmental regulations.

De-commissioning and disposal of this product should be undertaken by qualified personnel in adherence to local and national safety regulations, particularly for protection of lungs, eyes and skin from chemicals, dust etc. Approved lifting gear and power tools should be used and access to the work area must be restricted to authorized personnel. The following steps are a guide only and should be adjusted to take into account local site conditions:

1. Disconnect the unit from its electrical supply.
2. Drain and dispose of heat transfer fluid to an approved recycling facility.
3. Transport the unit to an approved recycling facility.

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Appendix F: Liquid Quality Requirements

Table F.1 Liquid Quality Requirements

Item	Unit	Primary Circuit	Secondary Circuit
PH (25°C)	-	7.5 - 10	7.5-10
Turbidity	NTU	≤ 10	-
Conductivity (25°C)	μs/cm	≤ 2000	-
Cl ion	mg/L	≤ 250	≤ 100
Total iron ion	mg/L	≤ 1.0	≤ 20
Calcium ion (in CaCO3)	mg/L	≤ 300	-
Total alkalinity (in CaCO3)	mg/L	≤ 500	-
Dissolved oxygen	mg/L	≤ 0.1	-
Organic phosphorus (in P)	mg/L	≤ 0.5	-
SO4 ion	mg/L	-	≤ 100
Total copper ion	mg/L	-	≤ 20
Total aluminum ion	mg/L	-	≤ 5
Total calcium ion	mg/L	-	≤ 20
Total magnesium ion			≤ 20
Total number of bacterial colonies	CFU/mL	-	≤ 100

NOTE: If the liquid quality does not meet the requirements, it will affect the performance and service life of the unit and may cause equipment damage in severe cases.

NOTE: Vertiv is not responsible for the loss caused by the user's liquid quality.

NOTE: Please drain the liquid of the system if it is not used for a long time.

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