



# CoolChip CDU 100

## Installation and Commissioning Guide

Product Rev A

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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.

# TABLE OF CONTENTS

<b>1 Important Safety Instructions</b>	<b>1</b>
1.1 General	1
1.2 Installation and Handling	1
1.3 Application	1
1.4 Warranty	1
1.5 Electrical Connection	1
1.6 Replacement Parts	2
1.7 Waste Disposal	2
1.8 Documentation	2
<b>2 Agency</b>	<b>3</b>
2.1 Product Standards and Approvals	3
2.2 RoHS 3 Compliance	3
<b>3 Product Description</b>	<b>5</b>
3.1 General	5
3.2 Vertiv™ CoolChip CDU 100 Model Number Nomenclature	5
3.3 Product Views	7
3.3.1 Controls Wiring	9
<b>4 Technical Data</b>	<b>13</b>
4.1 General	13
4.2 Pipe Connections	13
4.3 Circuit Fluid Volumes	13
4.4 Operation and Storage Conditions	14
4.5 Electrical Data	14
4.6 Noise	14
<b>5 Installation</b>	<b>15</b>
5.1 Unloading and Positioning	15
5.2 Primary Connections	15
5.3 Secondary Connections	16
5.4 Electrical	16
5.4.1 Power Wiring	16
5.5 Controls Wiring	16
5.5.1 Communications Wiring	16
5.5.2 Group Control	17
5.6 Pre-commissioning Checks	17
5.6.1 Site Check	17
5.6.2 Mechanical Installation Check	18
5.6.3 Electrical Installation Check	18

5.6.4 Primary Fluid Specification .....	18
5.6.5 Secondary Fluid Specification .....	18
<b>6 Commissioning .....</b>	<b>19</b>
6.1 Primary Circuit .....	19
6.1.1 Primary Fluid Supply .....	19
6.1.2 Primary Bypass Valve .....	19
6.1.3 Primary Circuit Filling .....	19
6.1.4 Primary Flow Setup .....	19
6.2 Secondary Circuit .....	20
6.2.1 Secondary Pipework Connections .....	20
6.2.2 Secondary Circuit Filling .....	20
6.3 Unit Low Speed Circulation (Air Purging) .....	21
6.4 Unit Configuration .....	22
6.5 Overrides and Full Speed Operation .....	23
6.6 Operational Filling .....	23
<b>Appendices .....</b>	<b>25</b>
Appendix A: Technical Support and Contacts .....	25
Appendix B: Submittal Drawings .....	27
Appendix C: Warranty and Contact Details .....	29
Appendix D: Notes .....	31
Appendix E: Disposal Information .....	33

# 1 Important Safety Instructions

## 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.

If there is a doubt regarding safety, installation, operation or maintenance instructions, contact Vertiv for clarification and advice. See 25.

## 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. 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. The use of incorrect replacement parts may affect the operation or reliability of the unit and invalidate any warranty. See [Appendices](#) on page 25.

## 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

Operation and maintenance documentation together with installation and commissioning documentation, maintenance or service records must remain with the unit always.

## 2 Agency

### 2.1 Product Standards and Approvals

Vertiv products installed and operated in compliance with this document, the operation and maintenance guide and installation and commissioning guide, conform to the Low Voltage Directive 2014/35/EU, the EMC directive 2014/30/EU and the Pressure Equipment directive 2014/68/EU. As manufactured, Vertiv products are designed to comply with an IP21 rating. This product is cULus listed for the appropriate voltage models and certificates will be made available on request (cULus certificate 60335-2-40).



### 2.2 RoHS 3 Compliance

Vertiv certifies that all products manufactured and supplied by Vertiv are fully RoHS compliant in accordance with EU RoHS Directives EU 2015/863.



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## 3 Product Description

### 3.1 General

This document describes the physical and electrical characteristics of the Vertiv™CoolChip CDU 100 for installation and commissioning purposes.

The CoolChip CDU 100 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 refer to Vertiv™ CoolChip CDU 100 Application and Planning Guide SL-71339.

### 3.2 Vertiv™ CoolChip CDU 100 Model Number Nomenclature

**Table 3.1 CoolChip CDU 100 Model Number**

Digit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Model Number	X	D	U	1	0	0	W	A	K	P	1	4	2	0	0	0	0

**Table 3.2 CoolChip CDU 100 Model Number Definitions**

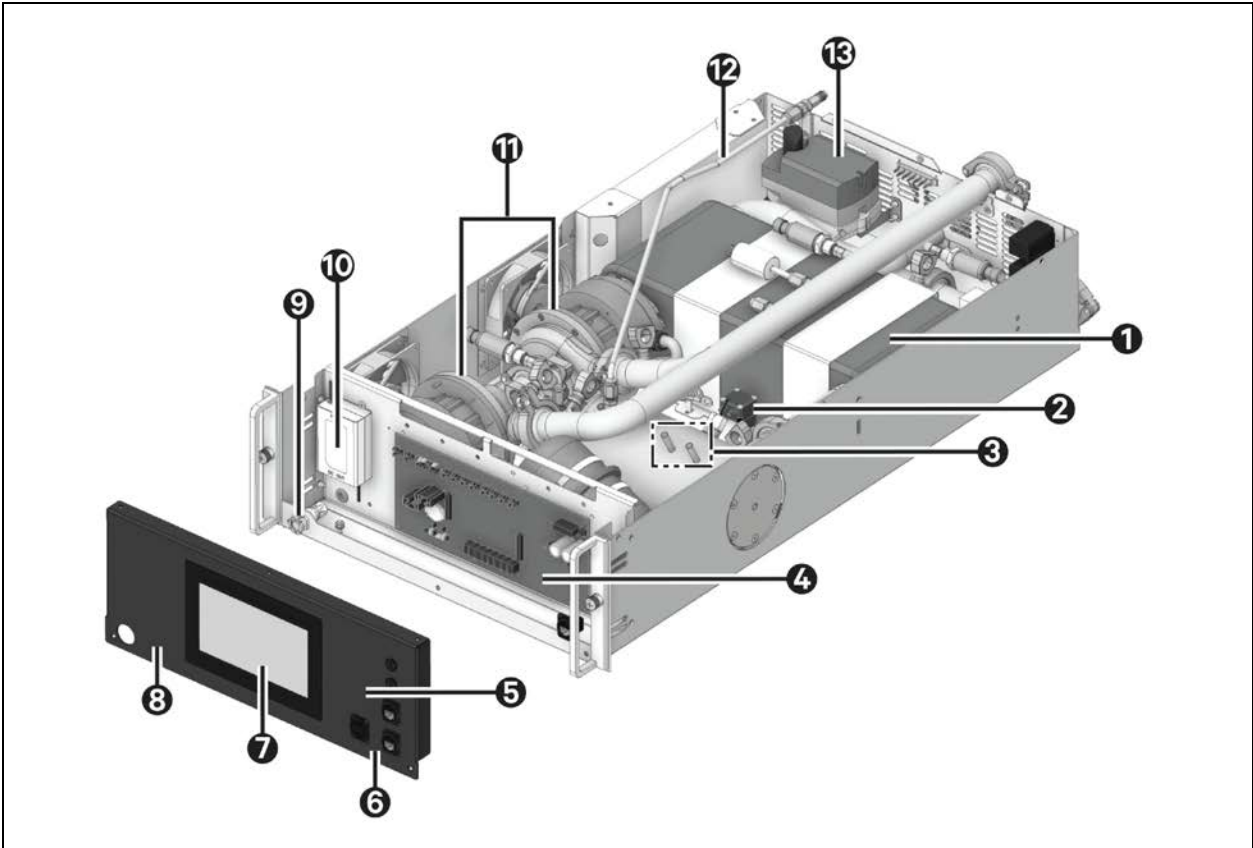
Digit	Feature	Value	Description
1,2,3	Family name	XDU	Product family
4,5,6	Unit model	100	Base model
7	Cooling Type	W	Liquid to liquid
8	Unit revision	A	Revision A
9	Voltage	K	110V-120V/60Hz
		S	200V-240V/50Hz
10	Power input	P	C14—IEC power inlet
11	Monitoring	1	Standard
12	Pressure relief valve	4	4 bar pressure relief valve
13	Secondary filtration	2	Fitted (50 micron/35 mesh)
14	Place holder	0	Place holder

Table 3.2 CoolChip CDU 100 Model Number Definitions (continued)

Digit	Feature	Value	Description
15	Place holder	0	Place holder
16	Place holder	0	Place holder
17	Configuration	0	Standard configuration
		S	Special feature authorization

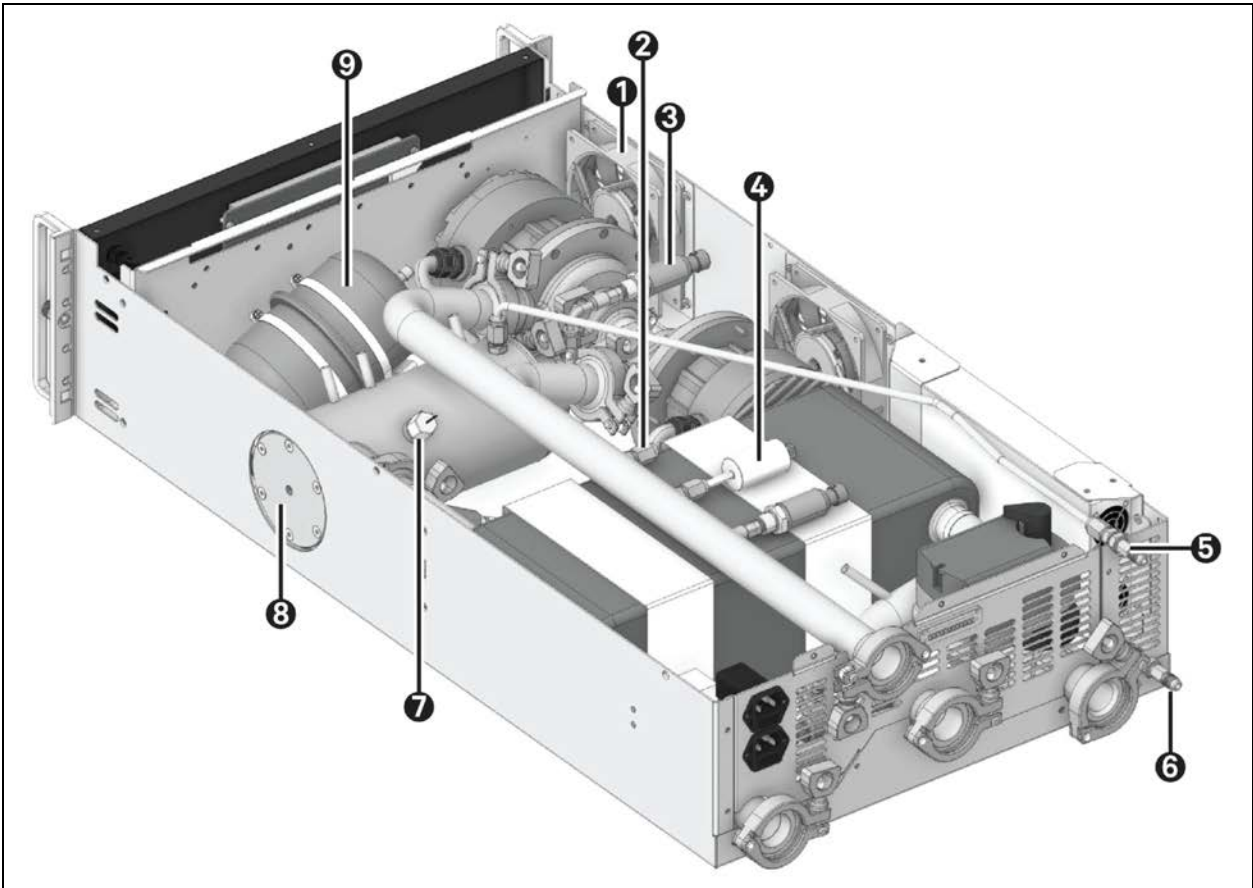
### 3.3 Product Views

Figure 3.1 Front View of Vertiv™ CoolChip CDU 100 (Top Cover Panel Removed)

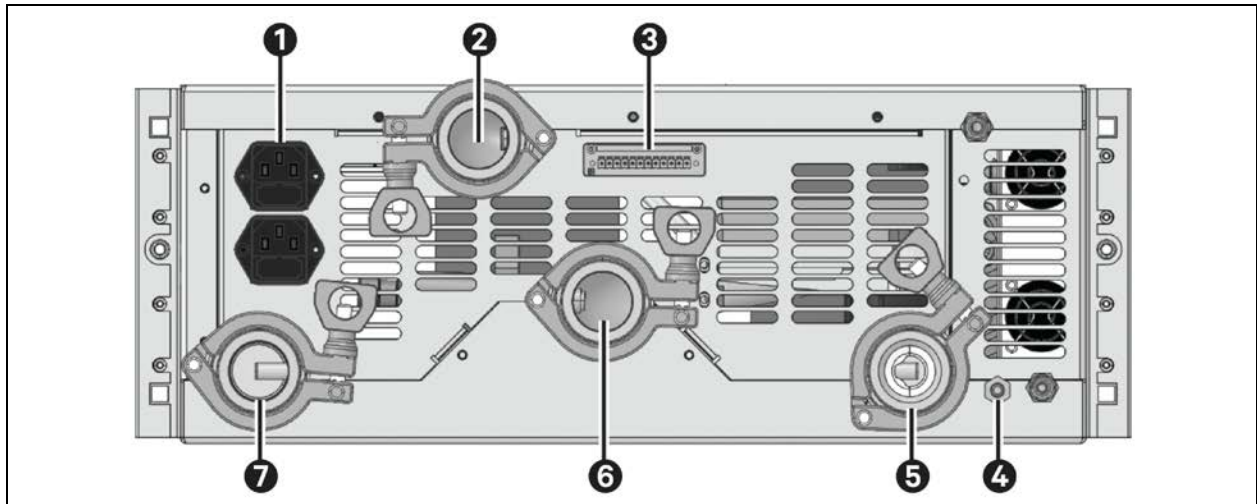


Item	Description
1	Plate heat exchanger
2	Fill pump
3	Temperature sensors
4	Control board
5	Alarm buzzer
6	Dual Ethernet (RJ45) and USB connection
7	Controller 7-inch touchscreen display
8	Removable fascia panel
9	Fill pump water connection
10	24 V DC power supply
11	Secondary circuit pumps
12	Pump 48 V DC power supply
13	Primary 3-way circuit control valve

Figure 3.2 Rear View of Vertiv™ CoolChip CDU 100 (Top Cover Panel Removed)



Item	Description
1	Cooling fans
2	Pressure relief valve
3	Pressure sensors
4	Secondary flow meter
5	Air vent purge
6	Reservoir/Secondary circuit drain
7	Level sensor
8	Secondary filter
9	Expansion vessel

**Figure 3.3 Rear View of Vertiv™ CoolChip CDU 100 (Electrical and Hose Connections)**

Item	Description
1	A and B 1-phase IEC—C14 power inlet connections (factory fitted fuses)
2	Secondary circuit supply
3	Connectors for external temperature/humidity sensor, external leak detection tape RS485 and CANbus Communications
4	Pressure relief valve outlet
5	Primary circuit return
6	Secondary circuit return
7	Primary circuit supply

### 3.3.1 Controls Wiring

Several sensor and communications options are available on the RM100 CDU:

#### At the rear panel:

- External temperature and humidity sensor (optional)
- External leak detection cable (optional)
- RS485 modem. Use Belden 3106A or equivalent (1 pair + 1 shielded 22AWG).
- CANbus. Use Belden 3106A or equivalent (1 pair + 1 shielded 22AWG). CANbus is used for communication between CDUs for group control

**Table 3.3 Controls Wiring, Rear Panel**

Pin#	Description
Pins 1, 2, 3	RRH & T Sensor
Pins 4, 5	Leak Detection Cables
Pins 7, 8, 9	MODBUS RTU RS 485

Table 3.3 Controls Wiring, Rear Panel (continued)

Pin#	Description
Pins 10, 11, 12	CANBUS for Group Control

At the front panel:

- 2 Ethernet ports (RJ45)—Cat5e shielded cable

Figure 3.4 Controls Port Mapping (before July 2023)

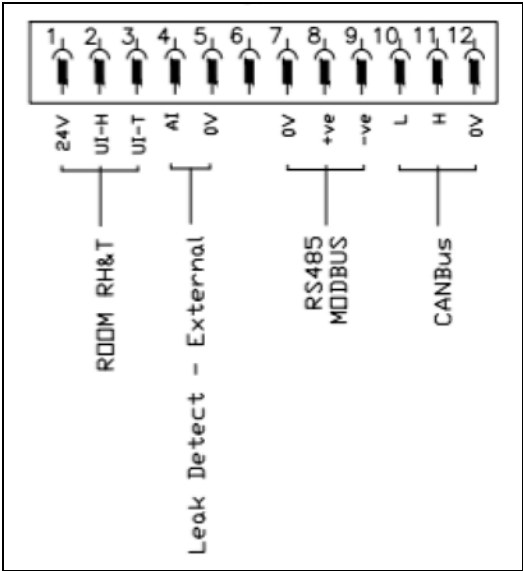
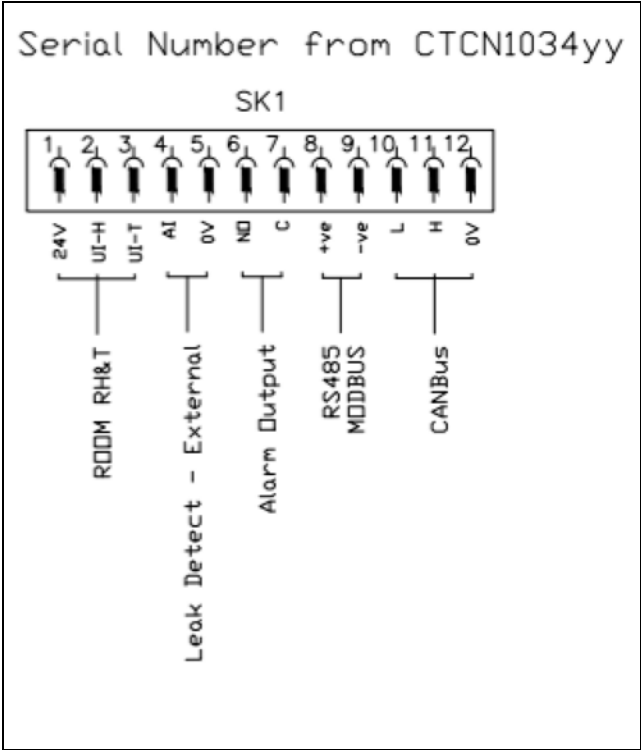


Figure 3.5 Controls Port Mapping (after July 2023)



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## 4 Technical Data

### 4.1 General

Also see Cabinet Dimensional Data 100 kW Unit in 27.

**Table 4.1 Dimensions and Weights**

Dimensions	Height		Width		Depth	
Unit	in.	mm	in.	mm	in.	mm
Standard Cabinet	6.89	175	17.52	445	32.66	830
<b>Shipping</b>						
Standard Cabinet	13	330	25.60	650	51.60	1310
Weight	Dry		Operating		Shipping	
	lbs.	kg	lbs.	kg	lbs.	kg
Standard Cabinet	116.84	53	130.07	59	191	87

### 4.2 Pipe Connections

Pipe connections for both primary and secondary circuits are made at the rear of the unit. Also refer to Piping Schematic 100kW Unit in 27.

**Table 4.2 Pipe Connections for Primary and Secondary Circuits**

Circuit Type	Pipe Connection
Primary (facility) circuit	1 in. or 1.5 in. Sanitary flanges
Secondary circuit	1 in. or 1.5 in. Sanitary flanges

### 4.3 Circuit Fluid Volumes

Pipe connections for both primary and secondary circuits are made at the rear of the cabinet and can be either top or bottom exit according to how the unit has been specified.

**Table 4.3 Fluid Circuit Volumes for Primary and Secondary Circuit of the CDU 100 Unit**

Circuit Type	Fluid Circuit Volume
Primary (facility) circuit	3.4 Liters
Secondary circuit	5.7 Liters

## 4.4 Operation and Storage Conditions

**Table 4.4 Operation and Storage Conditions**

Operating Conditions	0 to 40°C (0 - 104°F)	10 to 90% RH (non-condensing)
Storage Conditions	-40 to 70°C (-40 to 158°F)	5 to 93% RH (non-condensing)
Storage Environment	Keep unit upright, covered completely (preferably in original packaging), in an indoor environment, conditioned warehouse that is protected against freezing temperatures. Keep clean (no dust), well-ventilated, non-condensing	
Storage Time	Up to 6 months. If storing longer than 6 months, consult Vertiv.	

## 4.5 Electrical Data

**Table 4.5 Electrical Data**

Parameter	Details
Supported power supplies	110V-120V/60Hz 200V-240V/50Hz
Unit full load amps	9.7 A at 115 V 4.85 A at 230 V
Unit installed load	1.116 kVA (maximum)
Typical power consumption	0.7 kW

## 4.6 Noise

Power sound level at 3 m is less than 55 dBA.

## 5 Installation

### 5.1 Unloading and Positioning

On arrival at site, the Vertiv™CoolChip CDU 100 crate should be placed on a level solid surface to safely unload the unit from the crate.

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



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

After the lid of the crate has been removed, lift the CDU out and place on a solid surface. Lifting handles that can be temporarily installed for lifting have been provided enable easy lifting from the crate; however, the CDU is a heavy item of equipment and at least two technicians are required to carry out this task safely.

When at floor level, the protective bubble wrap should be removed and the unit inspected for any transit damage. Damage found must be reported to the Vertiv immediately and prior to installation.

The CoolChip CDU 100 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.

The CoolChip CDU 100 is intended to be installed in a rack preferably on a raised floor with at least 6 in. (150 mm), clear, under floor space for hose runs to IT equipment and facility fluid. Space should be allowed at the front of the rack to enable the CoolChip CDU 100 to be fully withdrawn for maintenance or replacement is 35.43 in. (900 mm) minimum. In addition, a minimum clearance of 2.95 in. (75 mm) should be allowed at the sides and 9.84 in. (250 mm) minimum clearance at the back of the unit for ventilation airflow and pipework connections.

**NOTE: The front and sides of the rack must be perforated to accommodate and allow for fan airflow.**

See Piping Schematic, 100kW Unit in 27.

The temperature and relative humidity sensor is standard and ships with the CDU 100 and needs to be field installed.

### 5.2 Primary Connections

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

The primary connections of the CoolChip CDU 100 are 1.5 in. (38.19 mm) DN40 sanitary flanges. It complies with BS 4825 Pt. 3 or an equivalent standard and has a diameter of 1.9 in. (50.5 mm). The flanges are fitted with stainless steel blanking caps to ensure pipework remains contaminant free during transit, which needs to be removed for installation.

The CoolChip CDU 100 primary connections are located at the rear of the unit shown in **Figure 3.3** on page 9.

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

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

## 5.3 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.**

The secondary connections of the CoolChip CDU 100 are 1.5 in. (38.19 mm) DN40 sanitary flanges. It complies with BS 4825 Pt. 3 or an equivalent standard and has a diameter of 1.9 in. (50.5 mm). The flanges are fitted with stainless steel blanking caps to ensure pipework remains contaminant free during transit, which needs to be removed for installation.

The CoolChip CDU 100 secondary connections are located at the rear of the unit as **Figure 3.3** on page 9.

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

## 5.4 Electrical

### 5.4.1 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.**

The CoolChip CDU 100 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.

Upstream 10A protection must be provided by the end user in the form of fuses or accordance with local regulations.

**RF earth connection:** For EMC compliance, an M6 earth stud is provided at the rear of the unit for connection of a braided EMC earth strap.

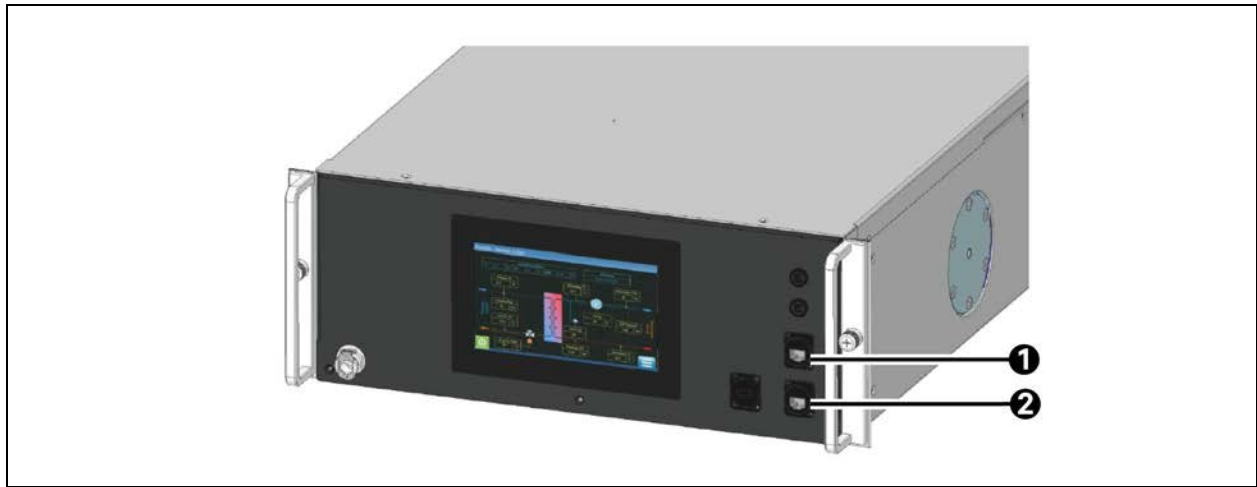
## 5.5 Controls Wiring

A 12-way connector strip (SK1) is located on the rear panel for connection of an optional room temperature and RH sensor (for condensation control) and up to 2 x external leak detection tapes, plus communications as detailed below.

### 5.5.1 Communications Wiring

Several communications options are available on the CoolChip CDU 100.

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

**Figure 5.1 CoolChip CDU 100 Ethernet Connections**

Item	Description
1	Ethernet A
2	Ethernet B

## 5.5.2 Group Control

Refer to the Vertiv CoolChip CDU 100 Operation and Maintenance Guide SL-71338 for more information.

## 5.6 Pre-commissioning Checks

### 5.6.1 Site Check

Check the following:

1. Check if the site requires protective equipment such as safety boots.
2. Check that the pre-treated secondary circuit fluid has been delivered to site.
3. Check that any required biocide and corrosion inhibitors have been supplied.
4. Ensure that the site contact is aware of the location of the CoolChip CDU 100 power supply fuse board/circuit breakers.
5. Ensure that the site contact is aware of the location of the chiller/building services cold fluid supply and associated isolation valves.

## 5.6.2 Mechanical Installation Check

Confirm the following:

1. The CoolChip CDU 100 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 100 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. 4' 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.

## 5.6.3 Electrical Installation 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 that the CoolChip CDU 100 is connected to the power supply using the supplied power cords or equivalent.
2. Verify that the rating of the circuit breaker/fuses supplying the CoolChip CDU 100 meets specification and rating as provided on the wiring diagram.
3. If rating differs from CoolChip CDU 100 specification, please note specification and confirm acceptability.

## 5.6.4 Primary Fluid Specification

The CoolChip CDU 100 is designed for use with a primary (facility) supply of plain water or up to 20% glycol/water from a site chilled water ring main or a dedicated chiller. A 20% glycol concentration gives frost protection to approximately -9°C (16°F). If a higher concentration of propylene 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 the installer to ensure the primary fluid is filtered to a level of at least 500 microns (35 mesh).

## 5.6.5 Secondary Fluid Specification

The fluid used in the secondary circuit should either be a minimum 25% water-glycol mixture or particulate free deionized fluid, treated with suitable corrosion inhibitors and biocides for the cooling application.

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

## 6 Commissioning

### 6.1 Primary Circuit

#### 6.1.1 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 CoolChip CDU 100.
2. Check that the primary cold fluid supply is connected to the CoolChip CDU 100 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.

#### 6.1.2 Primary Bypass Valve

1. Check that the primary circuit bypass link pipe has been installed.

#### NOTICE

With 3-way valve operation, the fluid flow to/from the primary fluid supply point is reasonably constant.

#### 6.1.3 Primary Circuit Filling

1. Open the supply and return valves fitted on the installation pipework to the CoolChip CDU 100 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 100 unit is not result in the fluid system (chiller) shutting down due to loss of fluid.

#### 6.1.4 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 100. Refer to the **Vertiv™ CoolChip CDU Operating and Maintenance Guide SL-71338** 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. Refer to **Vertiv™ CoolChip CDU 100 Application and Planning Guide SL-71339** 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 as described [Unit Low Speed Circulation \(Air Purging\)](#) on the facing page 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 external valve to regulate the flow through the CDU per site configuration.
6. Make certain all connections on the primary circuit are tightened at a torque of 5 nm/44 in/lb.

## 6.2 Secondary Circuit

### 6.2.1 Secondary Pipework Connections

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 newly fitted secondary pipe work and connections, including hoses are tested for leaks using an appropriate pressure testing method and ensure certification can be 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 CDU to racks without kinking.
6. All hose ends are correctly labelled for supply/return flow direction.
7. All hoses are correctly and neatly routed from the CoolChip CDU 100 to racks.
8. Final connection of hoses to CoolChip CDU 100 and racks are tight.
9. Make certain everything on the secondary circuit is tightened between the manifold and the unit.
10. Make certain everything on the primary circuit is tightened between the manifold and the unit.

### 6.2.2 Secondary Circuit Filling

The highest point in the secondary circuit must have a vent.

#### NOTICE

When filling and running the secondary circuit, the operator should be fully conversant with the operation of the CoolChip CDU 100. Refer to **Vertiv™CoolChip CDU 100 Operating and Maintenance Guide SL-71338** for more information.

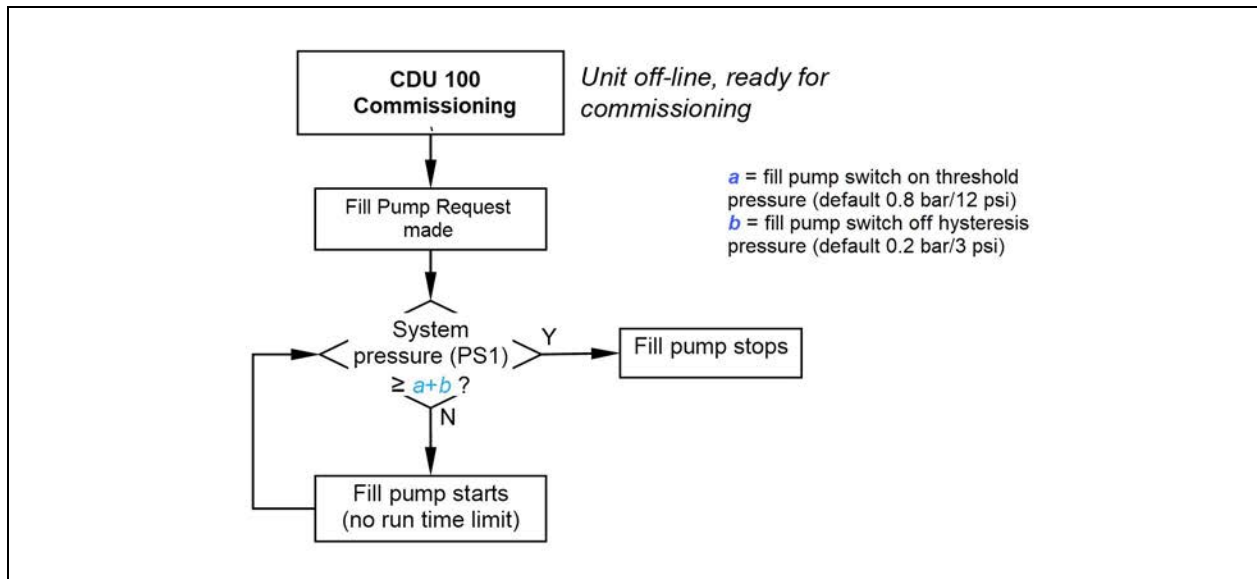
1. Position the container of pre-treated fluid in front of the CoolChip CDU 100.
2. Insert the filling wand into the container, then connect fill wand hose to the fill pump quick release coupling at the front of the unit.
3. Attach vent hose to the secondary circuit Schrader valve vent on the rear of the unit.
4. Log on to the controller with the Service access code.
5. Select Fill Pump Request, and the fill pump starts pumping the cooling liquid into the system at the rate of approximately 1.0 l/m.
6. While the fill pump is running, open the secondary supply vent at the top of the manifold (to chase out air).
7. The fill pressure (PS1) can be monitored under Status screen – Page 3, during filling.
8. Observe the fluid level of container and stop the fill pump by Fill Pump Request before changing the fluid container.

9. Repeat the process with more fluid containers until the fill pump automatically stops.
10. Pump stops when inlet pressure PS1 reaches the default 15 psi (1.0 bar).
11. Manually vent air from the reservoir tank by depressing the upper Schrader valve located on the rear panel. Fill pump may restart.
12. Manually vent air from the secondary circuit by depressing the upper Schrader valve located on the rear panel (fill pump may restart).
13. Leave the filling wand connected and in the container of fluid as more air is expelled during the initial operation.
14. Check for leaks.

**NOTE: It is important that all air is purged during filling and that this process is not rushed.**

The **Figure 6.1** below shows the unit pressure monitoring and fill pump control during filling operation as part of commissioning (unit offline):

**Figure 6.1 Vertiv™CoolChip CDU 100 Pressure Monitoring and Filling Operation**



**NOTE: If new servers are added to the system that are dry, the secondary circuit filling and unit low speed circulation steps must be followed again.**

### 6.3 Unit Low Speed Circulation (Air Purging)

After the initial fill process, it is essential to run the unit at a reduced pump speed. This gently circulates the fluid, enabling trapped air to separate out of the secondary loop and be periodically vented out through the Schrader valve on the rear panel and the rack manifold. If the DP setpoint was left at the default values, then this happens naturally as these values have been deliberately set quite low.

Also see Connection Locations in 27 and 13

**To adjust the pump speed with the Overrides function:**

1. Check that the vent at the highest point is fully opened.
2. Start the unit in normal automatic mode and allow the pump speeds to settle at the default DP setpoint.

**NOTE: The minimum allowable pump speed is 15% 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 15% depending on system impedance**

3. **Leave the Pump 1 running at 25% to 30% for a minimum of 30 minute to allow any trapped air to vent or there will be a risk of compromising the unit. There is a risk of low fluid issues in the future resulting in the fluid makeup bag remaining connected to the unit for longer.**
4. Repeat step 2 for Pump 2..
5. Increase the percentage of Pump 1 speed by 10% for 15 minutes to work any additional air out. Continue to increase the pump 1 speed by 10% for 15 minutes until 75% pump speed is reached.
6. Repeat Step 4 for Pump 2.
7. Fill with fluid as necessary, continuing as air is removed. Ensure that the filling wand inlet is completely emerged in the fluid during this step.
8. Remove filling wand and attach the flexible bag at a higher elevation than the unit fill port. Ensure that all air is bled out of the fill line.

Refer to Piping Schematic 100kW Unit in 27

**NOTE: This is highly recommended for proper functionality of the unit.**

**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.**

## 6.4 Unit Configuration

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

**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.

**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. Internal leak detection is field supplied and installed.


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

**Communications:** See Setup menu.

## 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 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 CDU 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 DP can then be set in the Configuration menu/Pump Control Differential Pressure Setpoint (P203).

## 6.6 Operational 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

An optional flexible make up container (approximately 2 liters capacity, filled with treated fluid) may be permanently connected 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 make up container can be stored remotely and only connected to the CoolChip CDU 100 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 make up container is first connected.

The make up container 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.

Before connecting the make up container, any air in the container hose should be purged. Fill the container with treated fluid, screw on the fill cap and then squeeze the bag while depressing the valve on the end of the quick release coupling until air is expelled and hose is full of fluid.

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 fill pump starts to pump again.

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# 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

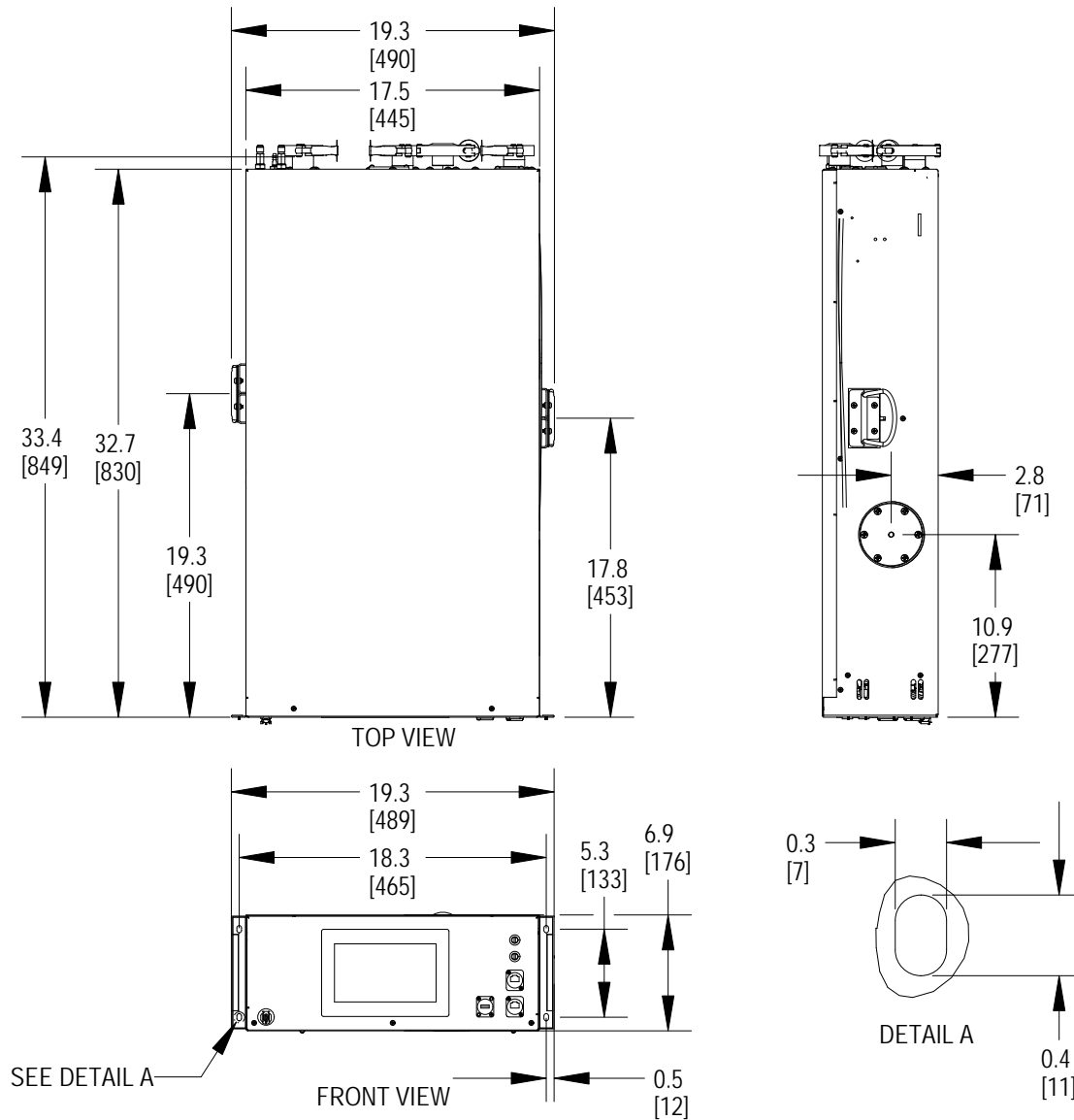
Submittal drawings referenced in this document are listed below and are presented in the order as mentioned within this document, on the following pages.

**Table B.1 Submittals**

Submittal Number	Title
20000219	CoolChip CDU 100 Cabinet Dimensional Data 100kW Unit Rack Installed Clearances
20000220	CoolChip CDU 100 Connection Locations 100kW Unit
20000221	CoolChip CDU 100 Piping Schematic 100kW Unit

## CABINET DIMENSIONAL DATA

### 100 kW UNIT



#### DIMENSIONS :

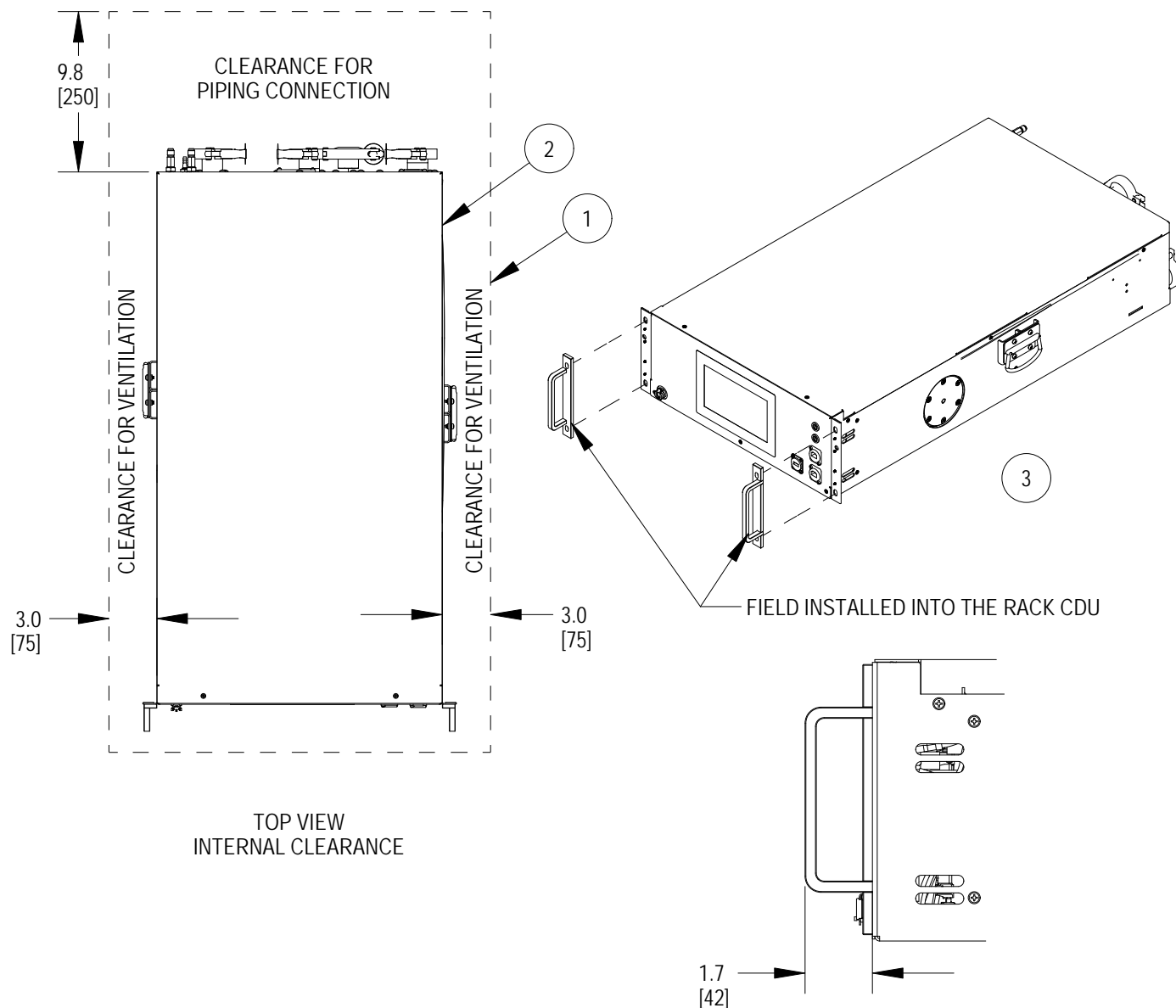
DIMENSIONS	HEIGHT		WIDTH		DEPTH	
UNIT	IN.	MM	IN.	MM	IN.	MM
SHIPPING CABINET	13	330	25.60	650	51.60	1310

#### WEIGHTS :

WEIGHT	DRY		OPERATING		SHIPPING	
	LBS.	KG	LBS.	KG	LBS.	KG
STANDARD CABINET	116.84	53	130.07	59	143.30	65

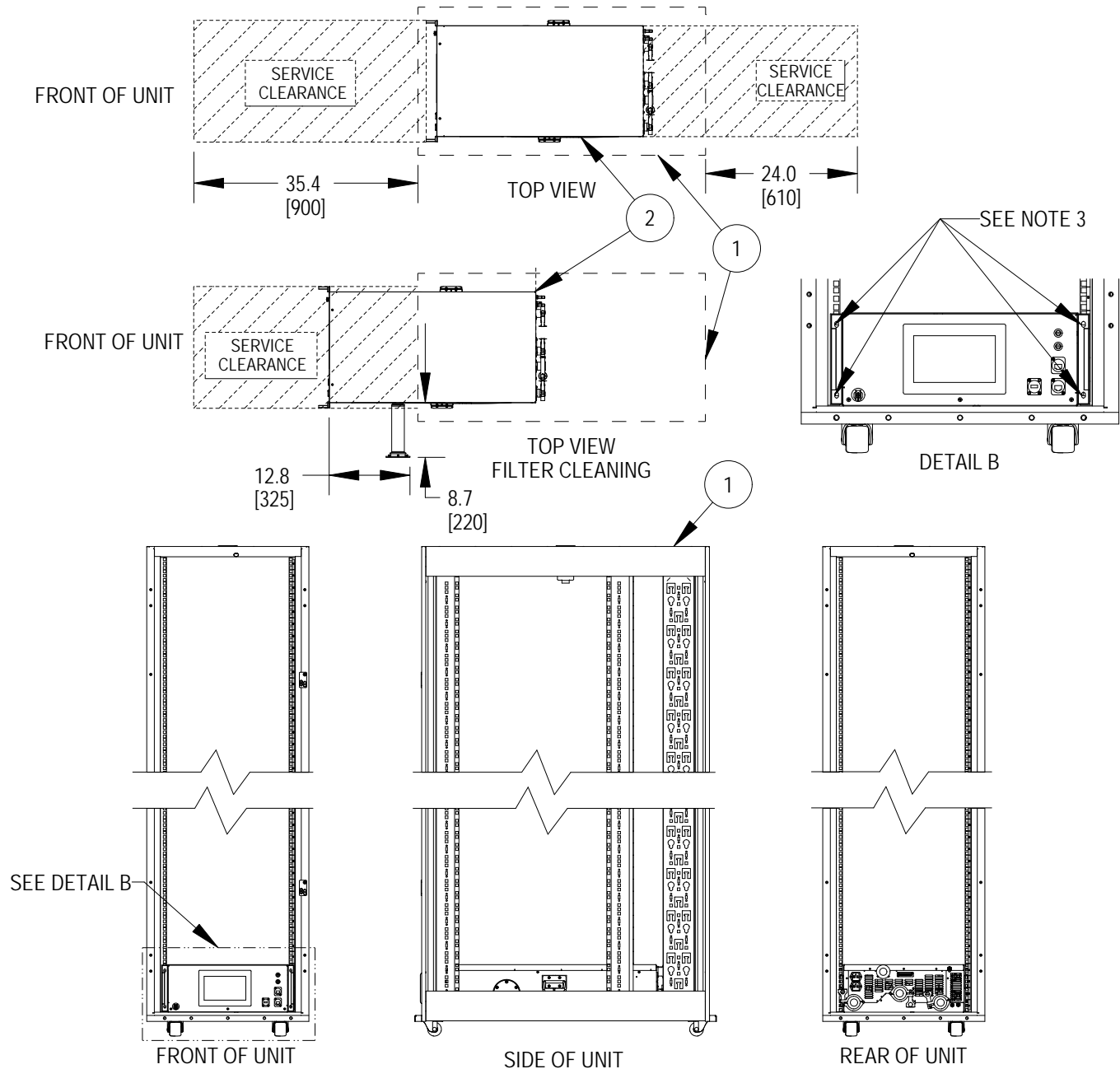
# COOLCHIP CDU

## CABINET DIMENSIONAL DATA 100 kW UNIT RACK INSTALLED CLEARANCES



ITEM	DESCRIPTION
1	THE SERVER CABINET USED IN THIS SUBMITTAL DRAWING IS A REFERENCE
2	COOLCHIP CDU100kW UNIT
3	RESERVOIR TANK WITH 50 MICRON SECONDARY FILTER

## CABINET DIMENSIONAL DATA 100 kW UNIT SERVICE CLEARANCES



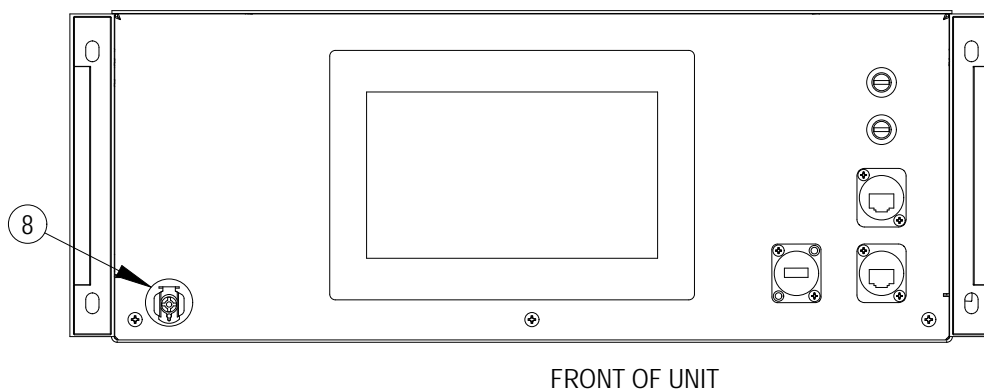
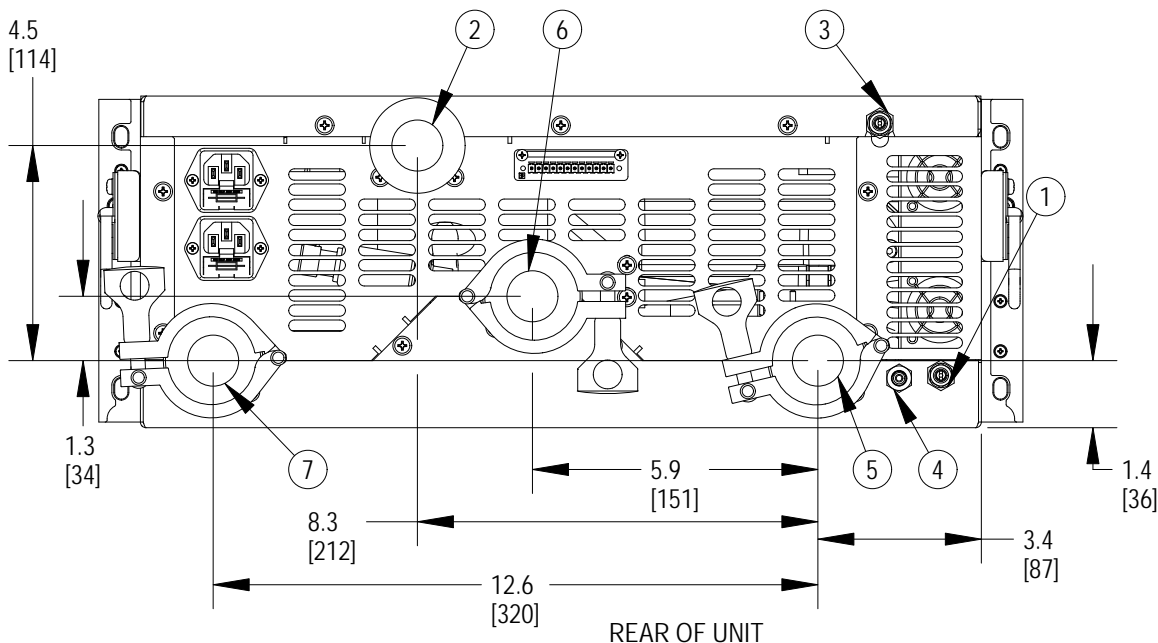
### NOTES:

1. THE RACK (ITEM 1) IS SHOWN FOR REFERENCE ONLY.
2. THE COOLCHIP CDU 100 IS TO BE PLACED AT THE BOTTOM OF THE RACK. SUFFICIENT BRACKETS OR SHELVEING 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 LOCATIONS

### 100 kW UNIT



ITEM	DESCRIPTION	CONNECTION SIZE
1	RESERVOIR/SECONDARY CIRCUIT DRAIN	SCHRADER VALVE M8
2	SECONDARY CIRCUIT SUPPLY	1.5IN (DN40) SANITARY FLANGE
3	RESERVOIR/SECONDARY CIRCUIT VENT	SCHRADER VALVE M8
4	PRESSURE RELIEF VALVE OUTLET	STRAIGHT ADAPTER 6MM HOSE ID
5	PRIMARY CIRCUIT RETURN	1.5IN (DN40) SANITARY FLANGE
6	SECONDARY CIRCUIT RETURN	1.5IN (DN40) SANITARY FLANGE
7	PRIMARY CIRCUIT SUPPLY	1.5IN (DN40) SANITARY FLANGE
8	WATER MAKE UP CONNECTION	1/4IN X HOSE BARB 1/8IN ID, CUT-OFF TYPE RS-PMCD-BS32 WITH 3.24MM ID

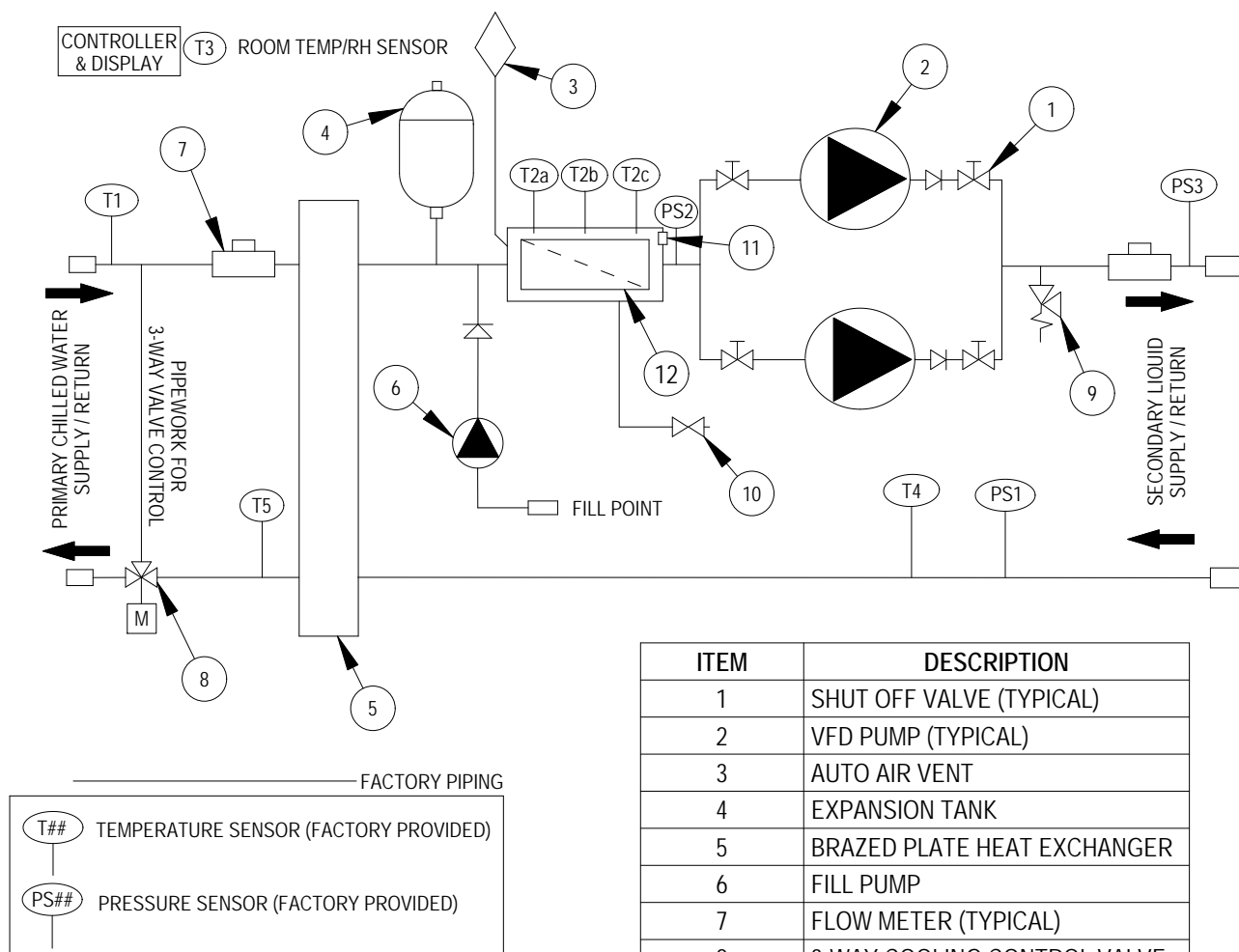
#### NOTES :

1. DRAWING NOT TO SCALE. TOLERANCE ON ALL PIPING DIMENSIONS IS  $\pm 1/2$ IN [13MM]

# COOLCHIP CDU

## PIPING SCHEMATIC

### 100 kW UNIT



#### 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.

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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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