



# Coolant Distribution Unit In-Row

Part-No. 3343.200



ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES



## Description:

The CDU In-Row is a liquid-to-liquid coolant distribution unit integrated into an OCP Rack (ORv3).

The Coolant Distribution Unit In-Row separates the primary coolant circuit (FWS = Facility Water System) from the secondary coolant circuit (TCS = Technology Cooling System) to cool the IT equipment.

This separation ensures that the required coolant flow, pressure and cleanliness is always maintained in the secondary circuit.

The CDU In-Row has a modular design and thus offers scalability, redundancy and easy serviceability.

The unit is suitable for an installation direct in the Data Center (white space) as well as in a separate technical room (grey space).

## Main components and features:

- **Enclosure:**
  - ✓ CDU In-Row is built in an ORv3
- **Power:**
  - ✓ All components are powered via the DC busbar which is installed at the rear side of the ORv3
  - ✓ Power shelf with 6 power supply units (PSUs) with a total output of 21.6 kW
  - ✓ Each PSU has a max. power output of 3.6 kW
  - ✓ Power supply units N+1 redundant (max. power consumption of CDU In-Row 18 kW)
  - ✓ Optional: Second power shelf for 2N redundant A/B power supply

## Coolant Circulation Units (CCUs):

- ✓ The CDU In-Row has 5 CCUs when fully expanded
- ✓ Depending on the required cooling capacity and therefore the required volume flow, the CDU In-Row can also be operated with less than 5 CCUs
- ✓ 3 pumps in each CCU, working in parallel
- ✓ N+1 redundancy of CCUs (4 CCUs reach the required volume flow of 1500 lpm)
- ✓ 3 status LEDs / CCU at the front for status checking power, communication, leakage
- ✓ RJ 45 socket at the front panel for communication between CCU and Control module
- ✓ Leakage sensor in each CCU



- **Plate HEX**
  - ✓ Designed for > 1 MW heat transfer duty @ 4 K ATD
  
- **Reservoir tank**
  - ✓ Store coolant for automatic pressure control TCS with an integrated fill pump and drain valve
  
- **Expansion vessel**
  
- **Control module**
  - ✓ Control module for monitoring and controlling the entire system
  - ✓ Hot swappable
  - ✓ Powered via DC busbar
  - ✓ Supported protocols:
    - Supported protocols: IPv4 / IPv6,
    - Integral web server, HTTP, HTTPS, SSL, SSH,
    - NTP, Telnet, TCP/IP v4 and v6, DHCP, DNS, NTP,
    - Syslog, SNMP v1, v2c and v3, Traps,
    - OPC-UA, Modbus/TCP,
    - FTP/SFTP (update / file transfer),
    - Email transmission (SMTP)
    - Redfish
  - ✓ Fail safe mode: CCUs (pumps) run in fail safe mode in case missing signal of control module or failure of a control relevant sensor
    - Default: Pumps continue to operate at the speed that was set at the time of the signal failure
    - Option: The speed at which the pumps should operate in the event of a signal failure can be selected in the software
  - ✓ 2-way valve opens if signal of controller is missing
  
- **FWS coolant supply and coolant return**
  - ✓ Pipes are connectable from top as well as from bottom
  - ✓ A Tri Clamp sanitary flange is used to connect the CDU to the FWS
  - ✓ The Tri-Clamp gasket and the Tri-Clamp are included in the scope of delivery
  - ✓ 2-way valve in water return FWS, motor hot swappable with fail safe mode
  
- **TCS coolant supply and coolant return**



- ✓ Pipes are connectable from top as well as from bottom
- ✓ A Tri Clamp sanitary flange is used to connect the CDU to the FWS
- ✓ The Tri-Clamp gasket and the Tri-Clamp are included in the scope of delivery
- **Sensors**
  - ✓ Temperature and pressure: hot swappable
- **Sensors primary loop (FWS)**
  - ✓ Water supply temperature
  - ✓ Water return temperature
  - ✓ Water supply pressure
  - ✓ Water return pressure (Located between the HEx outlet and the control valve)
- **Sensors secondary loop (TCS)**
  - ✓ Coolant supply temperature
  - ✓ Coolant return temperature
  - ✓ Coolant supply high pressure
  - ✓ Coolant return low pressure
  - ✓ Pressure drop in the filter
  - ✓ Coolant leakage sensors: 6 sensors in total, one in each CCU and one in the bottom area of the CDU
  - ✓ Level sensor of reservoir tank
  - ✓ Optional: Conductivity sensor
- **Ambient air side sensors**
  - ✓ Temperature- / humidity sensor including dew point control
- **Filter TCS**
  - ✓ 25 µm, optional 50 µm
  - ✓ filters redundant and hot swappable, accessible from the front
  - ✓ Filter monitoring via delta pressure
  - ✓ Filter located in coolant supply TCS (pump outlet)
- **Automatic bleeding valve:**
  - ✓ at FWS
  - ✓ at TCS



## Operation modes

- **The following modes can be selected:**
  - ✓ Automatic mode
    - The coolant supply temperature in TCS can be selected as a setpoint and is controlled via 2-way control valve in FWS
    - The delta pressure in TCS can be selected as a setpoint and is controlled by the pump speed
    - Option: The flow rate in TCS can be selected as a setpoint for the pump speed
    - Automatic system pressure control system (low pressure side) via automatic fill pump and drain valve
  - ✓ Manual mode
    - Selectable pump speed
    - Selectable opening degree of the 2-way valve
    - Control of the filling pump and the system's drain valve



## Technical data

Feature	Value
Cooling capacity	1 MW @ 4 K ATD 1.5 MW @ 6 K ATD
Dimensions w x h x d	600 x 2300 x 1400 mm / 23.62 x 90.55 x 55.12 in
Weight dry / wet	900 kg (2,425,1 lbs) / 1,250 kg (3306.9 lbs)
Shipping weight	1,060 kg (2777.8 lbs)
Nominal flow rate FWS	1,500 lpm / 396 gpm
Max. power consumption	18 kW
Dimension pipes FWS	DN 100 (4 inch)
Max. pressure FWS	10 bar / 145 psi
Water operating temp. FWS	10°C...50°C / 50°F...+122°F (non condensing)
Pressure drop FWS	0.45 bar @ 1500 lpm (6.53 psi @ 396 gpm)
Water volume FWS	127 Liter / 33,5 US gallons
Coolant TCS	PG 25
Coolant operating temp. TCS	+20...55°C / 68°F...131°F (non condensing)
Nominal flow rate TCS	1500 lpm @ 2 bar (396 gpm @ 29 psi) head
Dimension pipes TCS	DN 100 (4 inch)
Filtration TCS	25 microns, optional 50 microns
Coolant volume TCS	230 Liter / 60,7 US gallons
Volume expansion vessel TCS	Total: 16 Liter / 4.23 US gallons
Volume reservoir tank	34 Liter / 9 US gallons
Safety valve	Open at $\geq$ 6 bar (87 PSI)
Material PHEX	Stainless steel (soldered with copper)
Piping material	Stainless steel



Pumps material	Brass
Sealing material	EPDM

### Water composition limits for TCS and FWS circuits

Parameter	FWS (Table 5.3, ASHRAE 2014)	TCS (Table 6.2, ASHRAE 2014)
pH	7 to 9	8.0 to 9.5
Corrosion inhibitor(s)	Required	Required
Biocide	-	Required
Sulfide	<10 ppm	<1 ppm
Sulfate	<100 ppm	<10 ppm
Chloride	<50 ppm	<5 ppm
Bacteria	<1000 CFUs/mL	<100 CFUs/mL
Total hardness (as CaCO <sub>3</sub> )	<200 ppm	<20 ppm
Conductivity	-	0.2 to 20 mΩ/cm
Total suspended solids	-	<3 ppm
Residue after evaporation	<500 ppm	<50 ppm
Turbidity	<20 NTU (Nephelometric)	<20 NTU (Nephelometric)



## Power input characteristics PSU

Parameter	Conditions	Min.	Norm	Max.	Units
Input voltage operating range	Line to Line (Delta source)	180	200/208/277	305	VAC
	Line to Line Wye source with neutral connection	312	346/360/480	528	VAC
	HVDC	192	240/380	400	VDC
Frequency	AC Input	47	50/60	63	Hz



**List of wetted materials**

Classification		Designation
Metals	Ferrous metals	SS-AISI 301 SS-AISI 302 SS-AISI 303 SS-AISI 304 SS-AISI 304 L SS-AISI 316 SS-AISI 316L SS-AISI 420 SS-AISI 431 SS-AISI 630
	Non-ferrous metals	Nickel plated brass Brass CuZn10 CuZn37
Non-metals	Plastics	Thermoplastics PPS PPO PVDF PP HDPE
		Elastomers EPDM EPDM Peroxide cured FKM Butyl NBR
	Other non-metals	Ceramic Glas

**Performance characteristics**







