Liquid Cooling Systems

DCX ECDU 1380/2600 V1AT3

Coolant Distribution Unit

Overview

DCX ECDU Coolant Distribution Unit defines new standard for the rack based high-capacity Coolant Distribution Units. ECDU has modular built and comes in 1.38 up to 2.6MW capacity. System is designed for use in mission-critical environments and includes all high availability features: redundant pumps, heat exchangers, power supplies, controls and sensors, to support continued operation during maintenance or unexpected events. This system supports both rack rows and complete rack groups and is optimised for for both standard in row / whitespace deployment or mechanical galleries. Standard dimensions enable easy integration into existing facilities. ECDU has built in cooling medium quality sensors and can be integrated with water treatment system. CDU offers comprehensive HMI and allows for remote monitoring and control.

Tech spec

Cooling Capacity (MW)	1.3 - 2.6
Approach Temperature (°C)	3
Power Specifications	2X380-480V AC 50/60 HZ
Power Consumption (kW)	27 - 31.5 (N+1 pumps)
Dimension (mm)	1200 | 1200 | 2400 (L*W*H)
Transport /Filled Weight (kg)	1280 / 1680

Features

- **New modular CDU** platform supporting scalable growth from 1.38 MW to 2.6 MW of real cooling capacity.
- **Industry-standard** compact footprint (L 1.2 m | W 1.2 m | H 2.4 m) enabling seamless integration.
- **Flexible connection** to primary and secondary loops from either top entry or technical floor interface.
- **N+1 redundant pumps** delivering over 220 m³/h flow rate and 50 m head pressure, supporting extended and complex secondary loop layouts.
- **N+1 redundant heat exchangers** and controllers ensuring high availability and system resilience.
- **Heat exchanger** with AT3 (3°C approach temperature), improved from the common 7.2°F (4°C) standard.
- **Integrated coolant monitoring system** ensuring long-term fluid quality and stable performance.
- **12" comprehensive HMI** with remote monitoring capability and group control functionality.

Benefits:

- **Enables flexible cooling for rack groups**, supporting in-row, whitespace, perimeter, or mechanical gallery deployments.
- **Supports ASHRAE W45** cooling guidelines with low 3°C approach temperatures.
- **Prevents condensation operational risk** by maintaining TCS water temperature above room dew point under varying environmental conditions.
- **Optimizes cooling efficiency** through adaptive flow management and dynamically adjusted coolant temperatures tailored to ITE demands.
- **Maximizes uptime and operational security** through full N+1 redundancy of pumps, heat exchangers, sensors, and controllers combined with remote monitoring and advanced condensation control.
- **Chiller energy savings** of up to 10% achieved through optimized control and improved heat exchange efficiency.

Technical Specification

DCX ECDU 2.6 MW

NCDU AT3: DI Water - DI Water	
Capacity (kW)	**2600**
Amount of supported GB200 / GB300 racks	23

Performance Specification: DI Water 2.6 MW AT3		
Coling capacity [kW]	2600	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	DI Water
Flow [m3/h]	320	150
Rated inlet temperature [°C]	40	58
Rated outlet temperature [°C]	47	43
Transport weight (kg)	1,280	
Operation weight (kg)	1,680 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	30,4 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0~50°C/ RH5~85%	
Noise Level (dB)	81	

Performance Specification: PG25 2.5 MW AT3		
Coling capacity [kW]	2500	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	PG25
Flow [m3/h]	309	150
Rated inlet temperature [°C]	40	58
Rated outlet temperature [°C]	47	43
Transport weight (kg)	1,280 kg	
Operation weight (kg)	1,680 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	31,0 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0~50°C/ RH5~85%	
Noise Level (dB)	81	

Technical Specification

DCX ECDU 1.5 MW

NCDU AT3: DI Water - PG25	
Capacity (kW)	**1500**
Amount of supported GB200 / GB300 racks	12

Performance Specification: DI Water 1.38 MW AT3		
Coling capacity [kW]	1500	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	DI Water
Flow [m3/h]	185	90
Rated inlet temperature [°C]	40	58
Rated outlet temperature [°C]	47	43
Transport weight (kg)	1,280 kg	
Operation weight (kg)	1,600 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	23,8 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0-50°C/ RH5-85%	
Noise Level (dB)	81	

Performance Specification: PG25 1.38 MW AT3		
Coling capacity [kW]	1500	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	PG25
Flow [m3/h]	185	90
Rated inlet temperature [°C]	22	58
Rated outlet temperature [°C]	29	43
Transport weight (kg)	1,280 kg	
Operation weight (kg)	1,600 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	24,3 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0-50°C/ RH5-85%	
Noise Level (dB)	81	

Technical Specification

DCX ECDU 1.38 MW

NCDU AT3: DI Water - PG25	
Capacity (kW)	**1380**
Amount of supported GB200 / GB300 racks	12

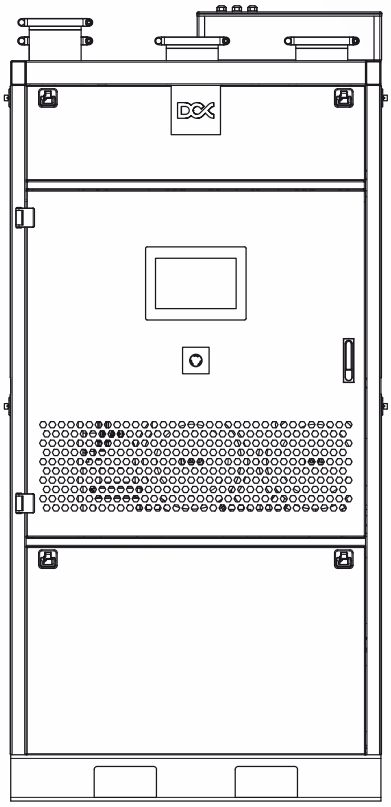
Performance Specification: DI Water 1.38 MW AT3		
Coling capacity [kW]	1380	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	DI Water
Flow [m3/h]	160	120
Rated inlet temperature [°C]	40	53
Rated outlet temperature [°C]	47	43
Transport weight (kg)	1,280 kg	
Operation weight (kg)	1,680 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	27,1 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0~50°C/ RH5~85%	
Noise Level (dB)	81	

Performance Specification: PG25 1.38 MW AT3		
Coling capacity [kW]	1380	
Approach temperature [°C]	3	
Operation condition	Primary side	Secondary side
Coolant	Facility water	PG25
Flow [m3/h]	160	125
Rated inlet temperature [°C]	40	53
Rated outlet temperature [°C]	47	43
Transport weight (kg)	1,280 kg	
Operation weight (kg)	1,680 kg	
Length (mm) | Width (mm) | Height (mm)	1200 | 1200 | 2400	
FWS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
TCS liquid connector style and dimension	6" TC Fitting / 6' ASME B16.5 C 150 / DN150 PN16 EN 1092-1	
Power consumption (kW)	27,7 kW (N+1)	
Power specifications	3x380-480V AC 50/60 Hz 65,3 A	
Working environment T&H	0~50°C/ RH5~85%	
Noise Level (dB)	81	

Technical Drawings

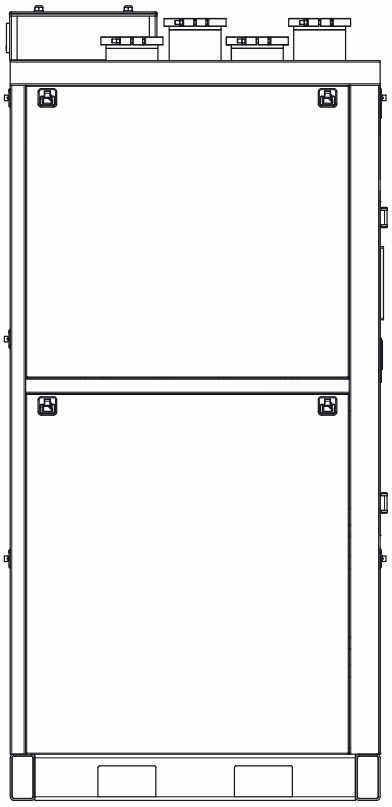
DCX ECDU 1380/2600 V1AT3

Front



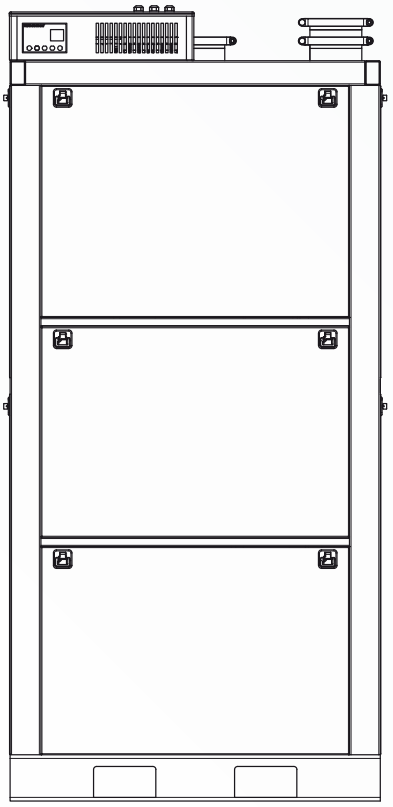
1200 mm | 47"

Side



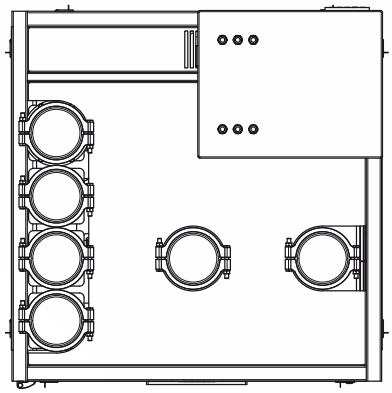
1200 mm | 47"

Rear

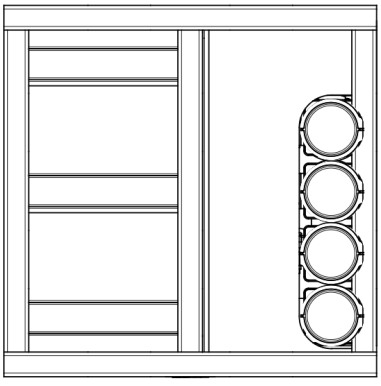


1200 mm | 47"

2400 mm | 94"



Top



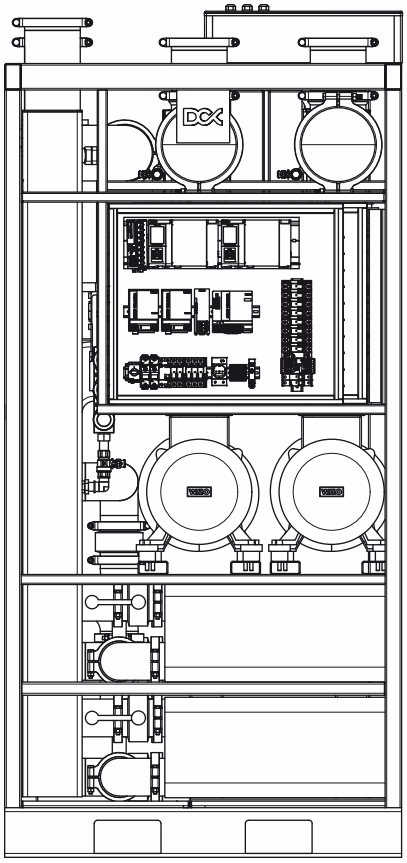
1200 mm | 47"

Bottom

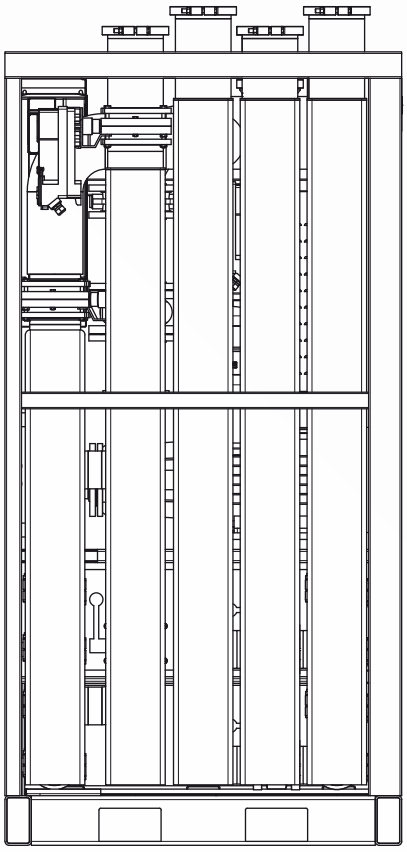
Technical Drawings

DCX ECDU 1380/2600 V1AT3

Front

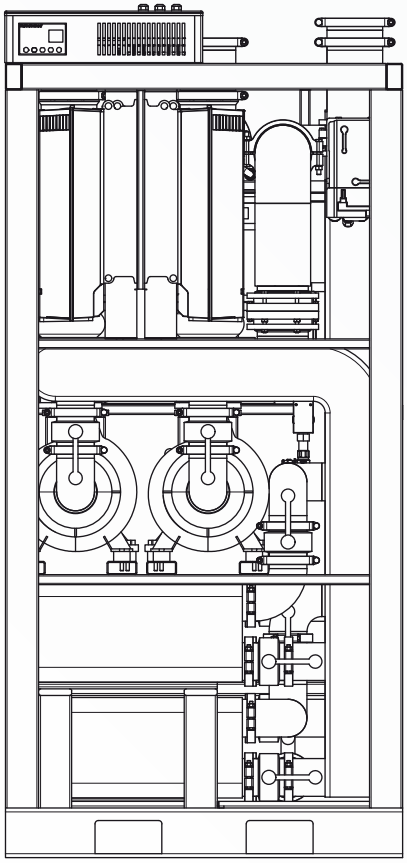


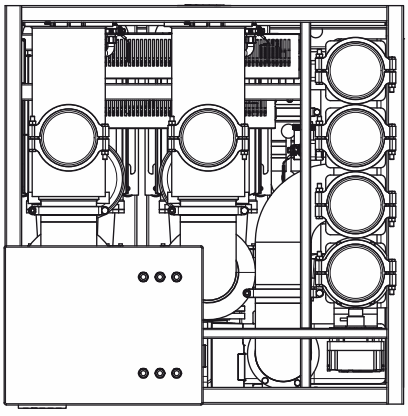
Side



FWS OUT **TCS IN** **TCS OUT** **FWS IN**

Rear

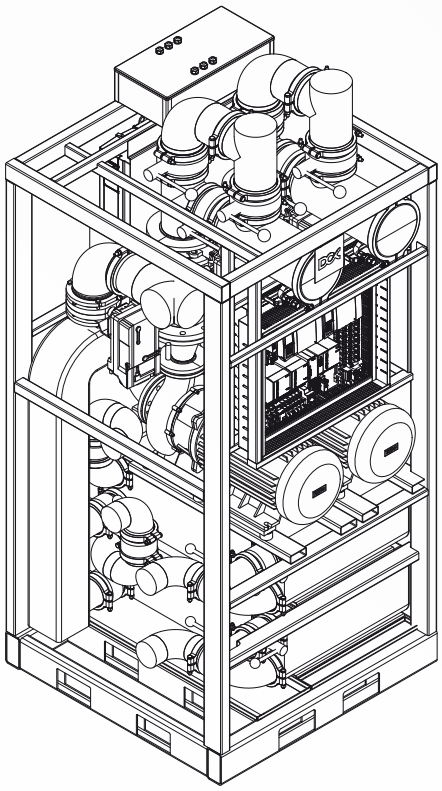




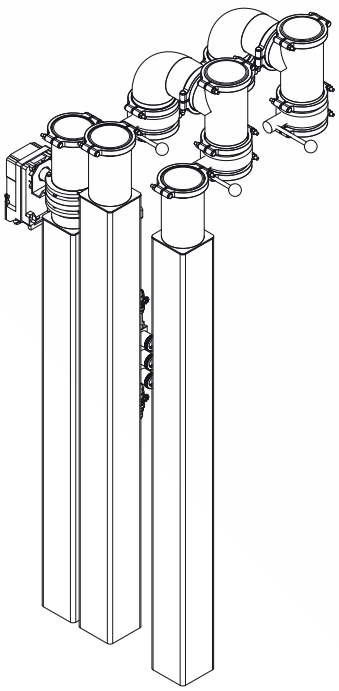
Top

Technical Drawings

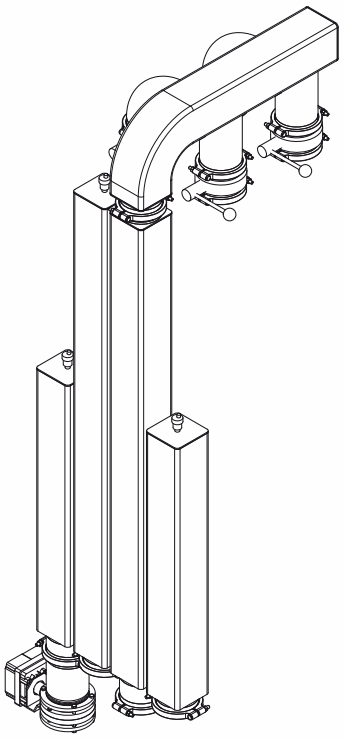
Modular Supply & Return Stack Assembly



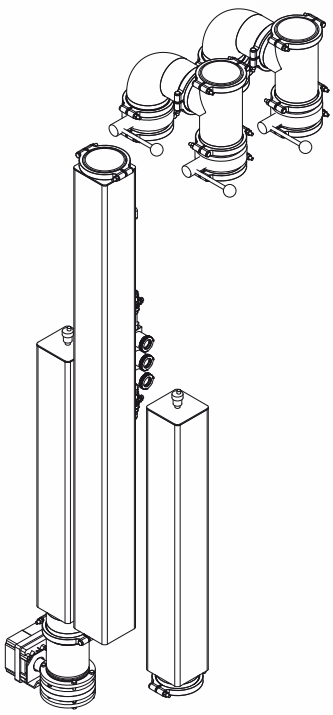
FWS Top Supply & Return
TCS Top Supply & Return



FWS Bottom Supply & Return
TCS Bottom Supply & Return

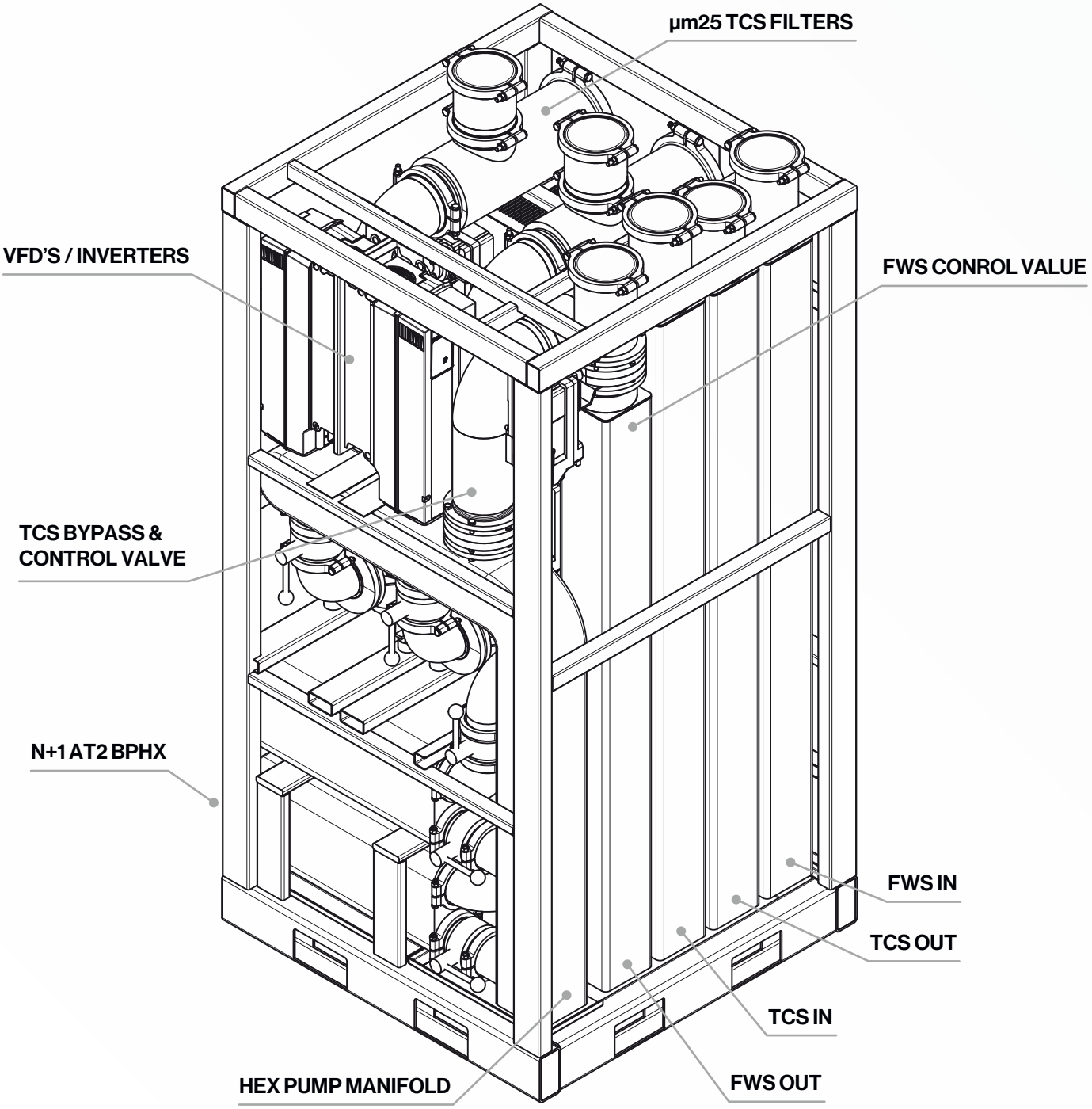


FWS Bottom Supply & Return
TCS Top Supply & Return



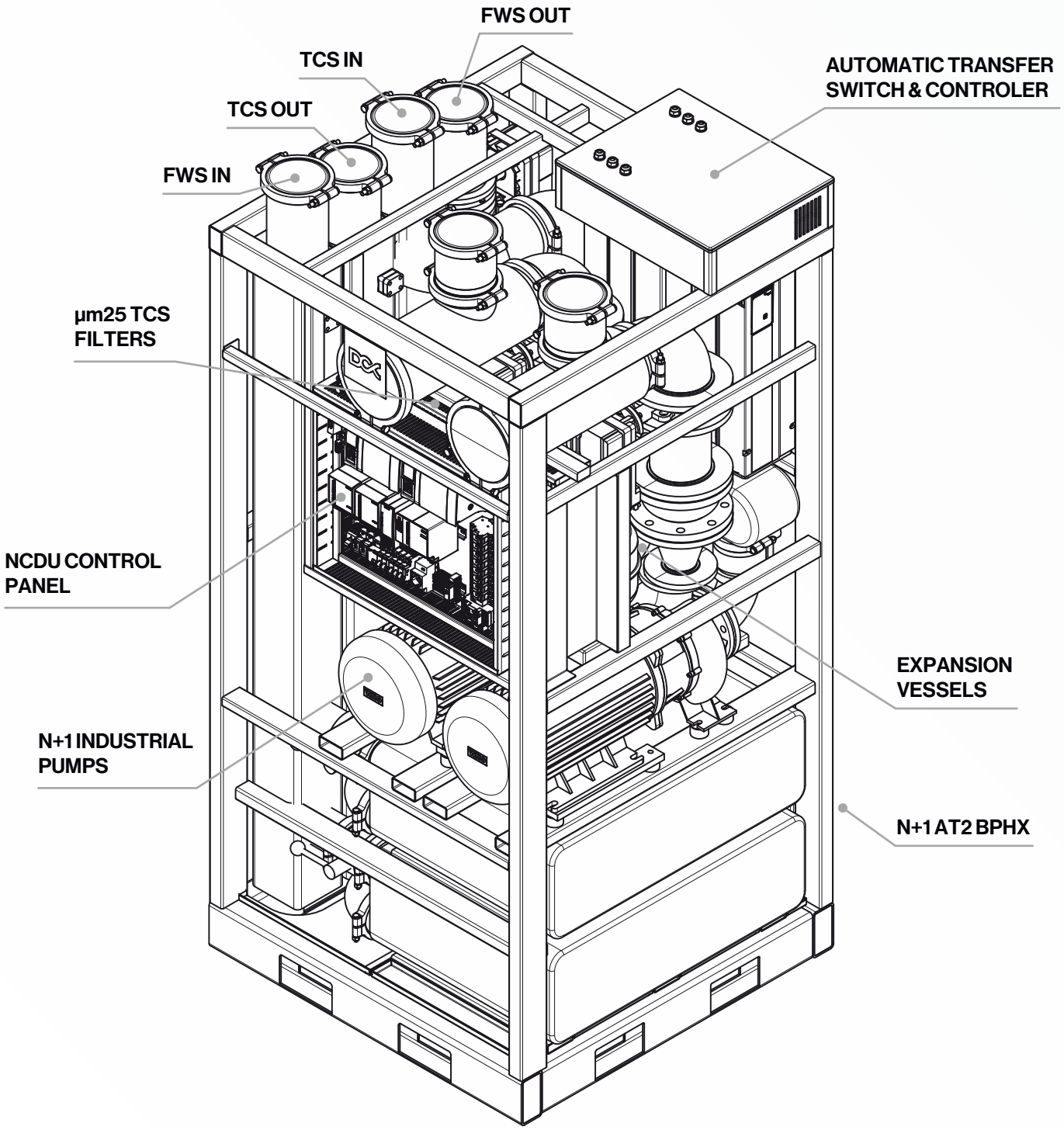
ECDU Build Details

DCX ECDU 1380/2600 V1AT3



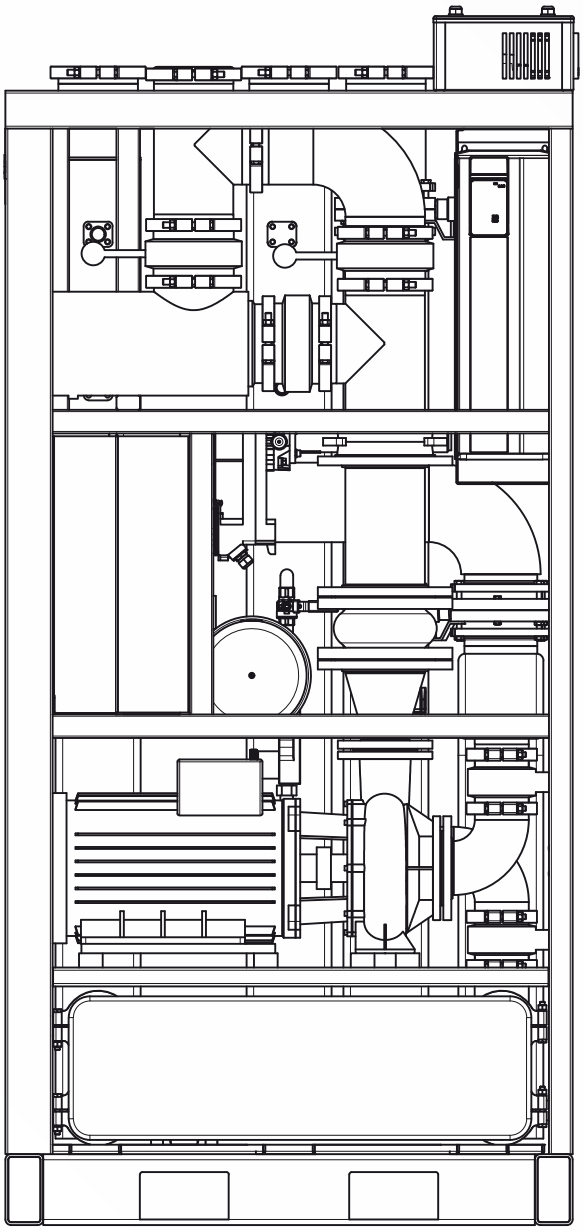
ECDU Build Details

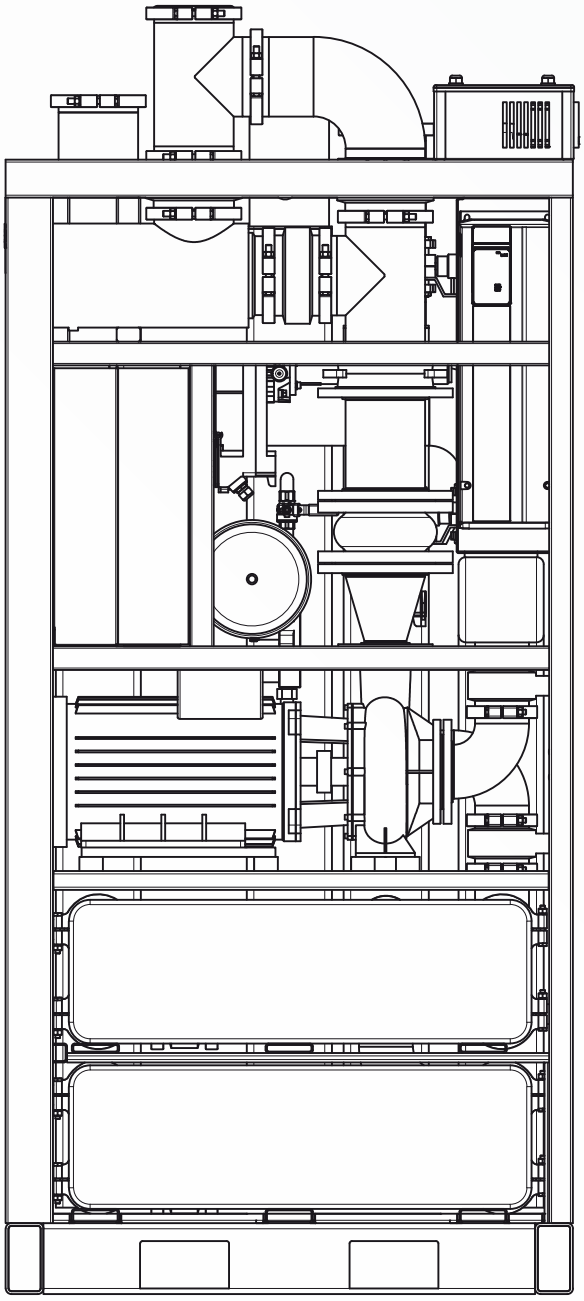
DCX ECDU 1380/2600 V1AT3



ECDU Assembly Choice

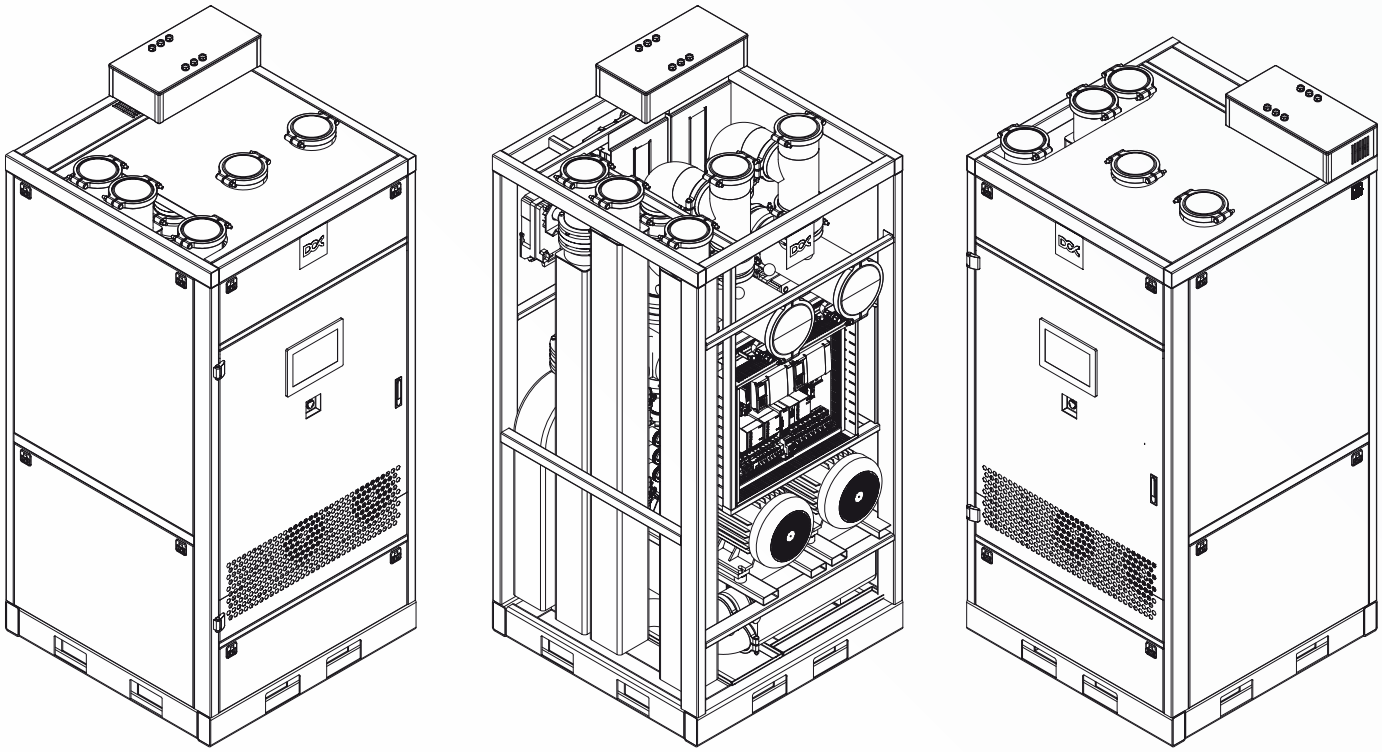
N / N+1 Heat Exchanger





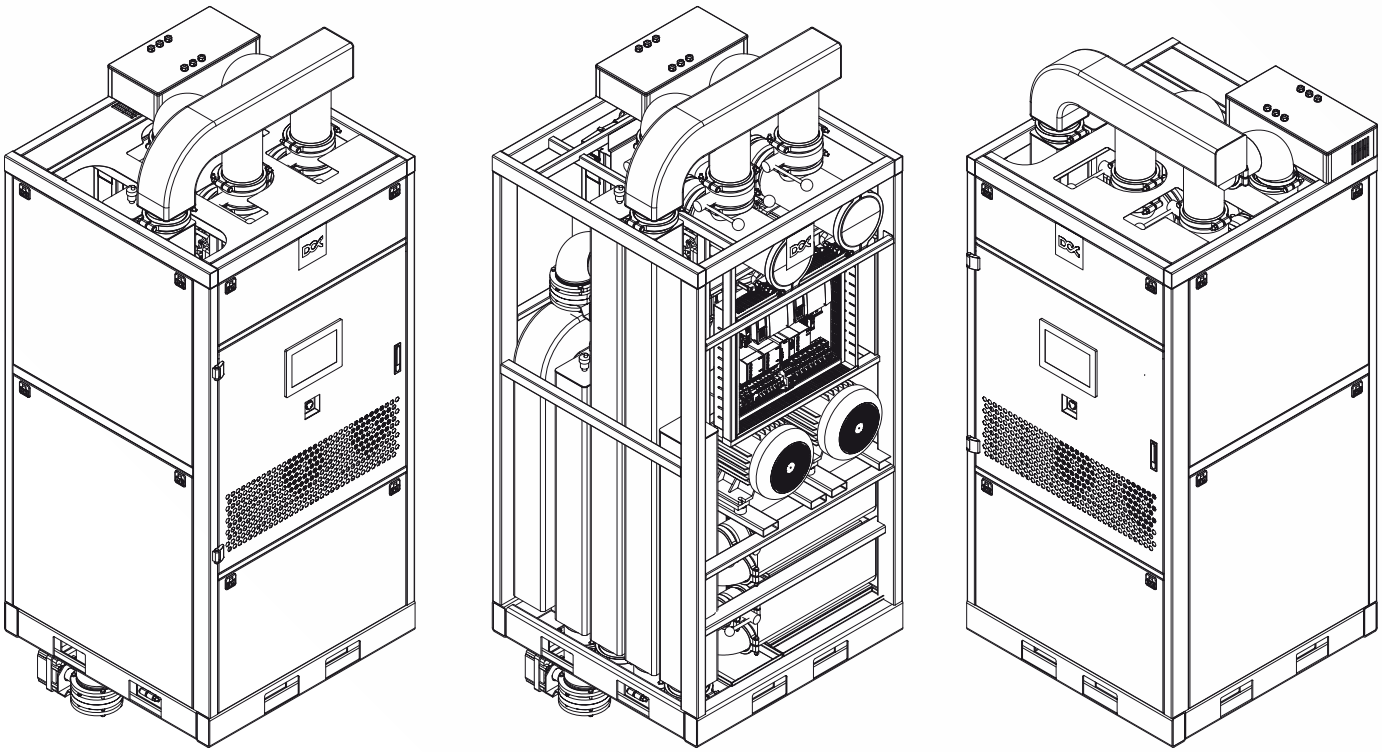
ECDU N Heat Echanger

DCX ECDU 1380/2600 V1AT3



ECDU N+1 Heat Echanger

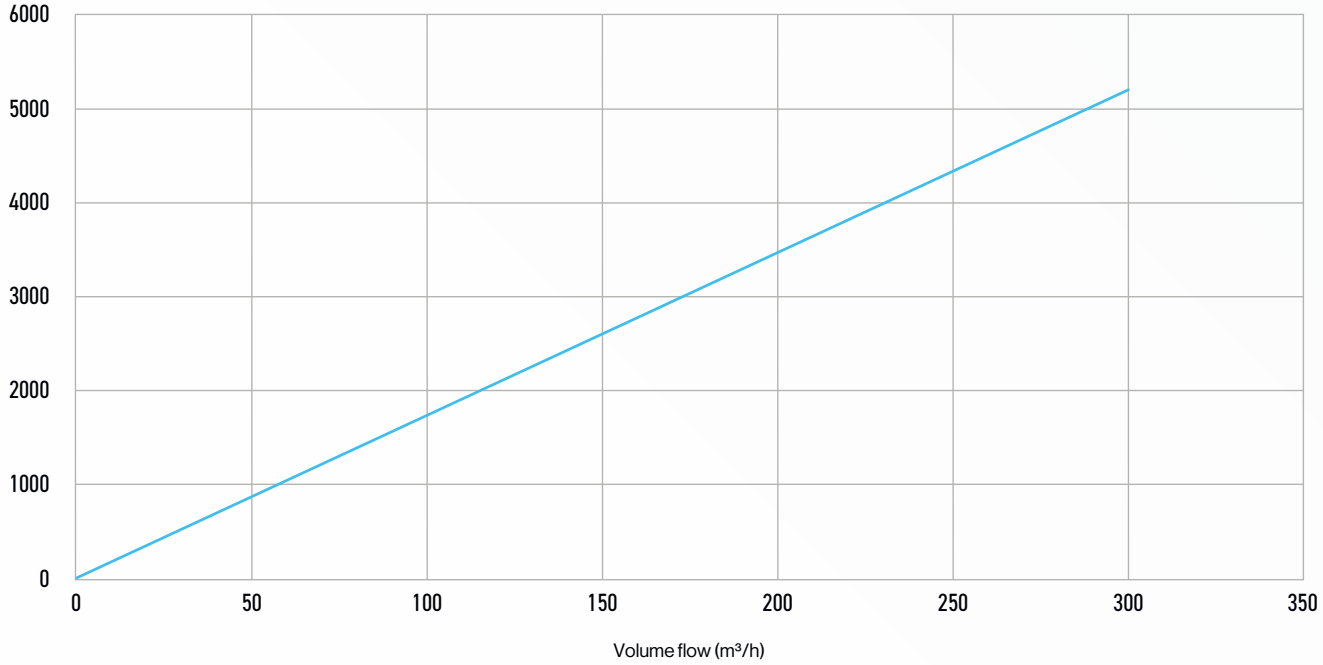
DCX ECDU 1380/2600 V1AT3



NCDU Heat Transfer Capacity

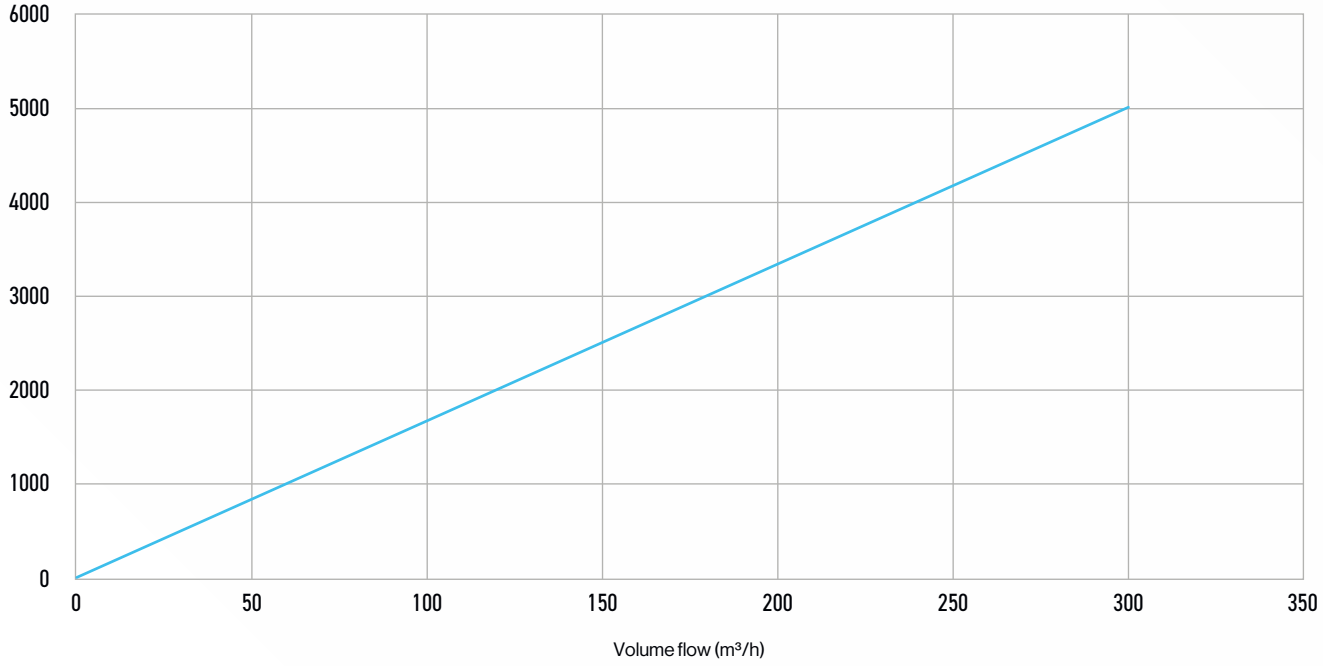
DCX ECDU 1380/2600 V1AT3

Heat Transfer Capacity AT=3K for DI water



Volume flow (m³/h)	0	50	100	150	200	250	300
Heat Transfer (kW)	0,0	866,05	1732,1	2598,15	3464,2	4330,25	5196,3

Heat Transfer Capacity AT=3K for PG25

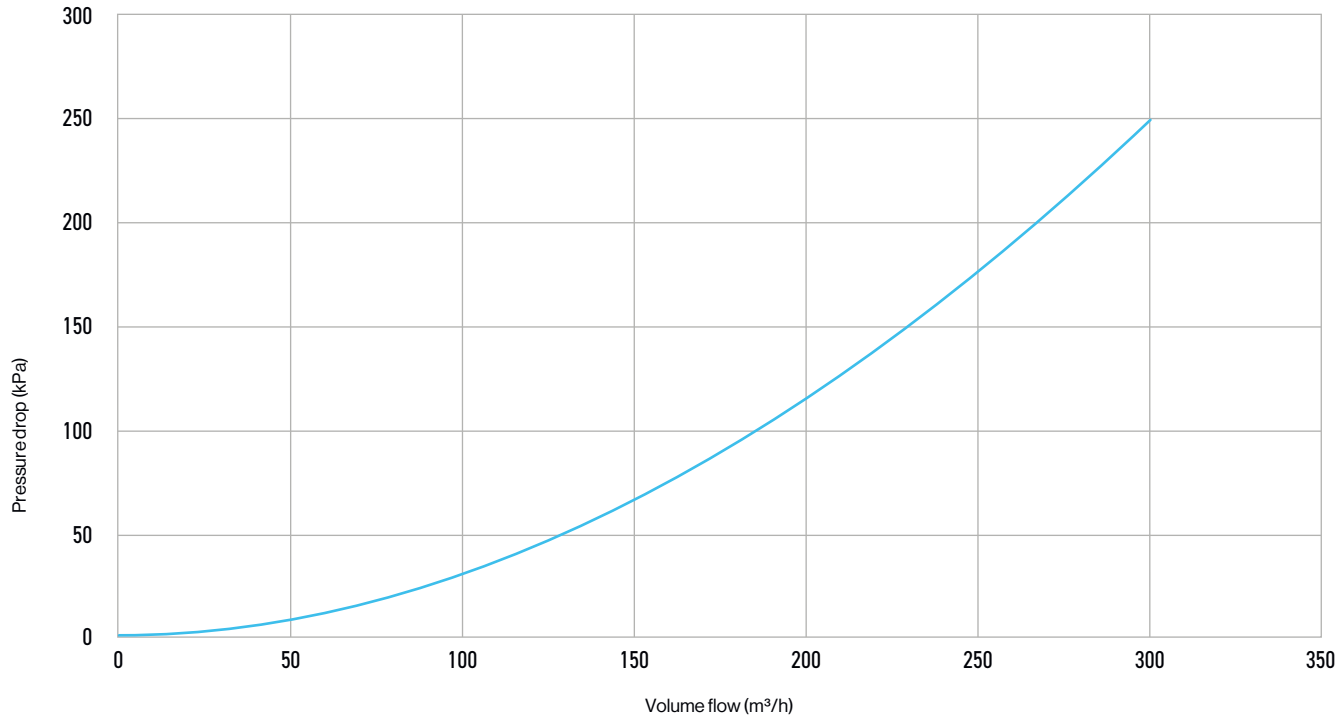


Volume flow (m³/h)	0	50	100	150	200	250	300
Heat Transfer (kW)	0,0	838,2	1676,4	2514,6	3352,8	4191	5029,2

NCDU Pressure Drop

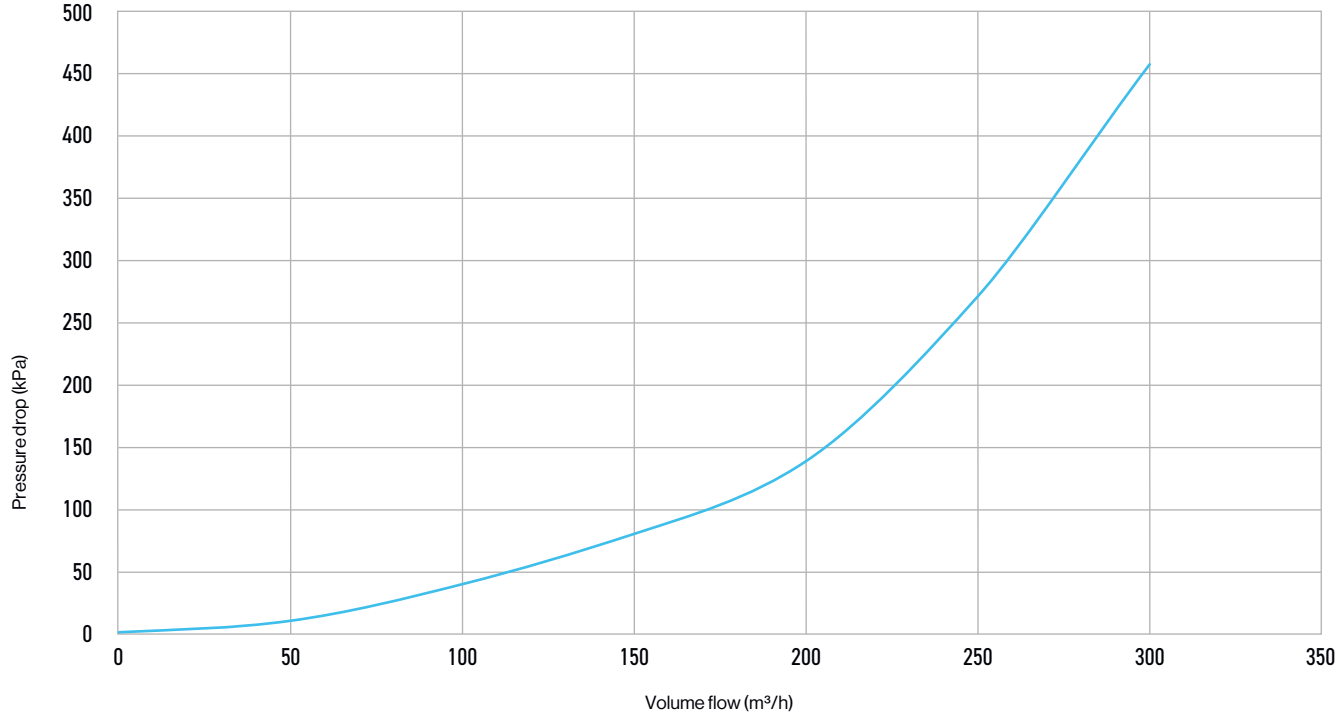
DCX ECDU 1380/2600 V1AT3

Pressure Drop on the Heat Exchanger for DI Water



Volume flow (m³/h)	0	50	100	150	200	250	300
Pressure Drop	0,0	7,185	30,62	66,555	114,99	175,925	249,36

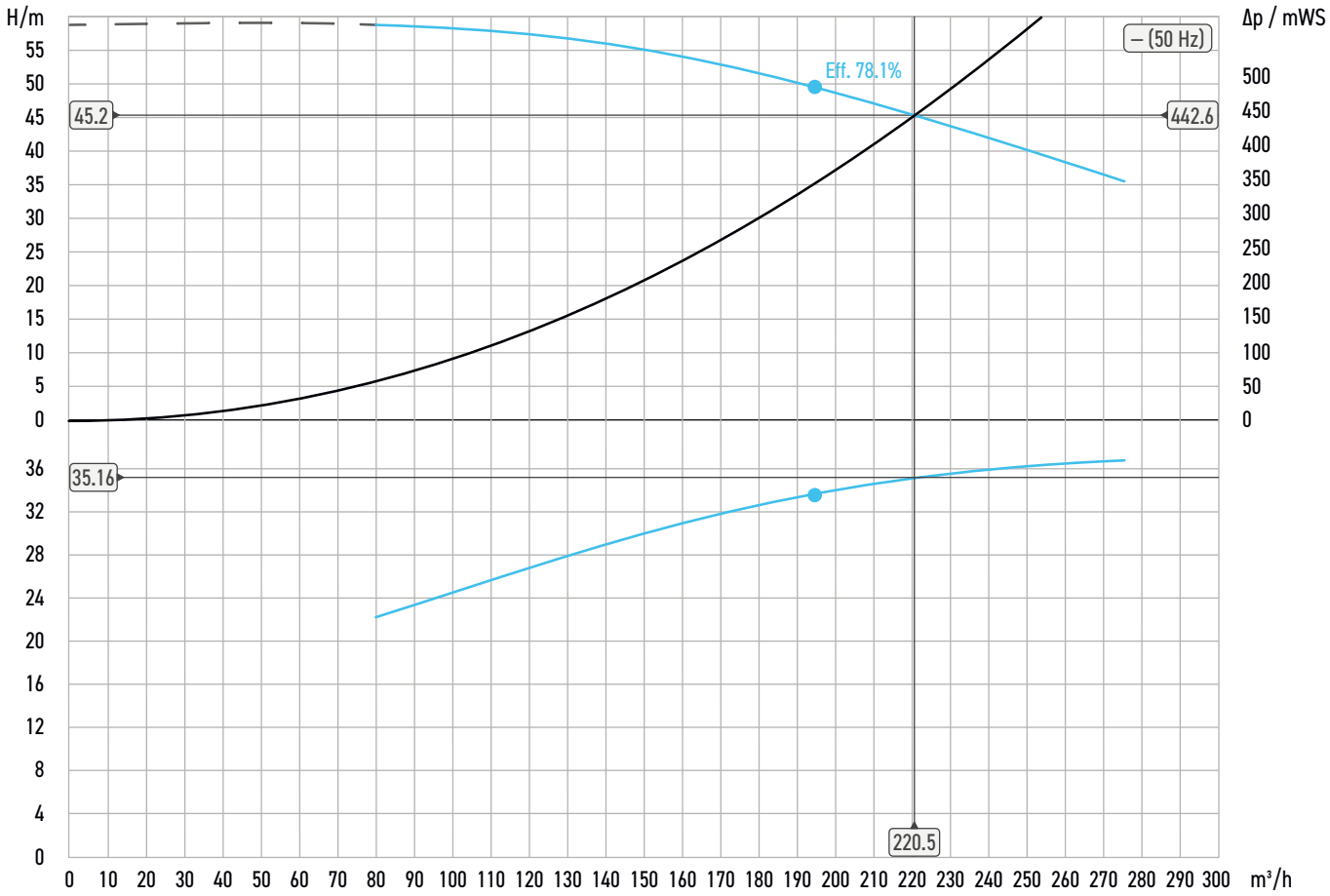
Pressure Drop on the Heat Exchanger for PG25



Volume flow (m³/h)	0	50	100	150	200	250	300
Pressure Drop	0,0	10	39,44	80	138,53	270,575	457,62

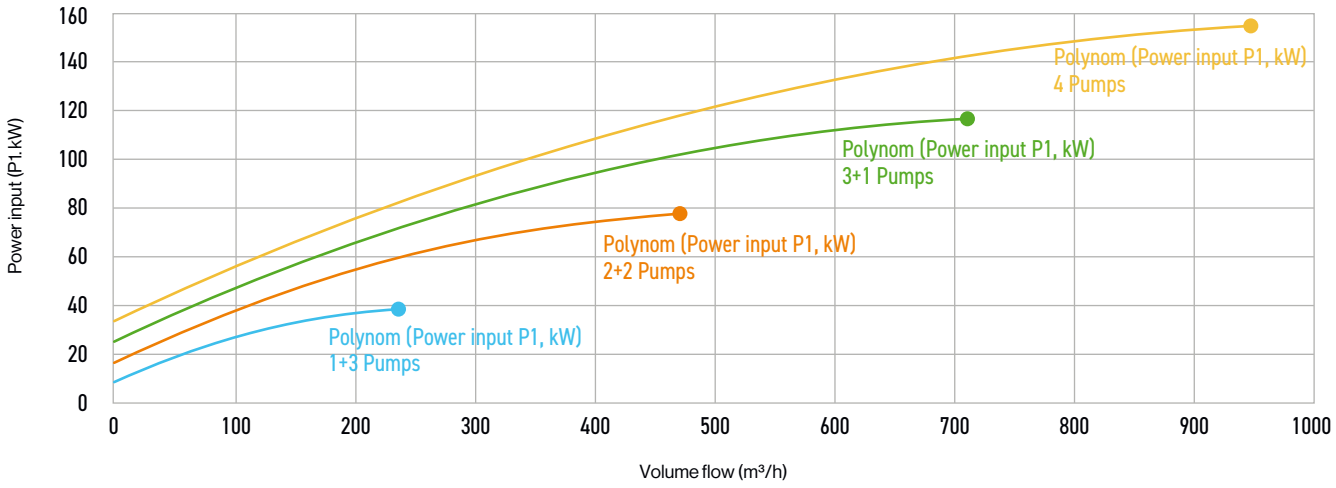
Pump Duty Point

DCX ECDU 1380/2600 V1AT3



Rotational speed	Frequency	Duty Point		Suction port	Discharge port
2,900 1/min	50 Hz	Q = 220.00 m³/h	H = 45.00 mm	DN 100	DN 80

Pump Power Consumption



Overview

The AI-driven datacenters require new types of Cooling Distribution Units - more capable, more powerful, and with different form factors. This is why DCX introduced a new architecture of DCX HYDRO CDU's dedicated to high-performance computing, enterprise, and colocation datacenters. We offer the most comprehensive portfolio, providing complete flexibility for data center operators.

CDU Role in Liquid Cooling System

The main job of the CDU is to supply and circulate the cooling medium in the secondary (TCS) loop with enough flow, energy (head), and pressure, so the heat is transferred effectively to the primary (FCS) loop and then to heat rejection devices (dry coolers, cooling towers, or chillers). The CDU controls the pressure, flow, and temperature to automatically adjust for fluid flow requirements and to maintain specific loop temperatures below the dew point without overheating the servers.

AT & Real World Performance

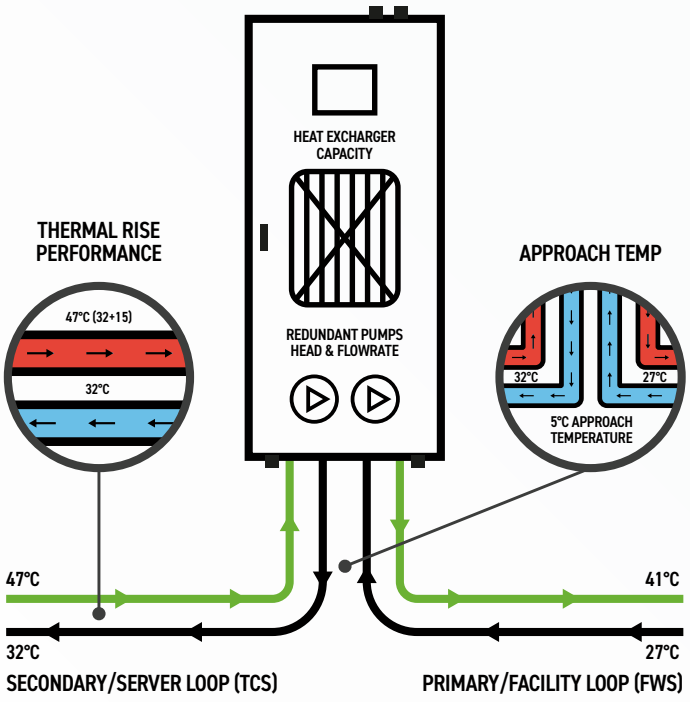
The Approach Temperature (AT) is an important parameter that defines the performance of the system. In liquid cooling systems, we define it as the difference between the supply temperatures on each side—specifically, between the water temperature of the facility cooling system inlet to the CDU and the temperature of the coolant leaving the CDU to the servers. The cooling capacity of a CDU is always assumed at a specific approach temperature. Sometimes, manufacturers may present a high inlet temperature but with unrealistic expectations of the approach temperature, which can result in incorrect loop sizing. For example, CDU A is defined as 100kW with a 25°C approach temperature, while CDU B is defined as 100kW with a 3°C approach temperature. At a 25°C approach, CDU A would be rated for more than 800kW!

Important Design Parameters

Coolant distribution units serve as the core of liquid-cooled data centers, functioning as the beating heart of each server cooling loop—a critical system that sustains optimal operating conditions. The most important CDU performance factors are: **head of the pumps** which defines the number of racks and servers that the CDU can support; **heat transfer performance** defined by heat exchange capacity; and **approach temperature**.. The choice of the right CDU should be based on:

- Topology and pressure drop of the TCS (Secondary) loop
- Required form factor, CDU location and available space
- Available head and flow of CDU pumps
- Approach temperature and heat transfer performance
- Cooling capacity and PQ curves
- Cooling medium in the Technical Cooling System (TCS) loop
- Available Facility Cooling System (FCS) temperature

CDU HEAT EXCHANGE PERFORMANCE



Heat Transfer Performance - Water		
Heat output - approach temperature 5°C	kW	42
Heat output - approach temperature 10°C	kW	87
Heat output - approach temperature 15°C	kW	132
Heat output - approach temperature 20°C	kW	177
Heat output - approach temperature 23°C	kW	203
Heat output - approach temperature 25°C	kW	278

Heat Transfer Performance - PG 25		
Heat output - approach temperature 5°C	kW	41
Heat output - approach temperature 10°C	kW	85
Heat output - approach temperature 15°C	kW	129
Heat output - approach temperature 20°C	kW	172
Heat output - approach temperature 23°C	kW	200
Heat output - approach temperature 25°C	kW	271

ASHRAE Liquid Cooling Class	Facility Water Supply Temp.
W1	2°C - 17°C
W2	2°C - 27°C
W3	2°C - 32°C
W4	2°C - 45°C
W5	>45°C