



Modular Water-cooled Oil Free Centrifugal Chiller

TECS-W/L-M Series



Modular Water-cooled Oil Free Centrifugal Chiller

TECS-W/L-M Series Modular Water Cooled Oil Free Centrifugal Chiller adopts modular design which is specially designed by CLIMAVENETA targeting on energy efficiency reconstruction applications. It is mostly demanded to replace old and low efficient units, especially for applications with limited transportation and installation space such as small-medium data centers in high layer buildings, hotels, hospitals, subways and other republic buildings.



Hotel Reconstruction

- Yearly dynamic cooling capacity demand
- Daily dynamic cooling capacity demand
- With noise level requirements in plant room
- With limited plant room space and transportation space
- Limited reconstruction cycle to avoid affecting normal business



Subway Reconstruction

- Daily dynamic traffic flow and cooling capacity demand
- Dynamic temperature due to vehicle heat dissipation
- Accurately match the load to save energy in maximum extent
- Stable operation of air conditioner to guarantee normal operation of hospitals
- Limited reconstruction cycle to avoid affecting normal business



Hospital Reconstruction

- Daily dynamic traffic flow and cooling capacity demand
- Stable operation of air conditioner to guarantee normal operation of hospitals
- With noise level requirements in plant room
- Limited reconstruction cycle to avoid affecting normal business



Super High Layer Building

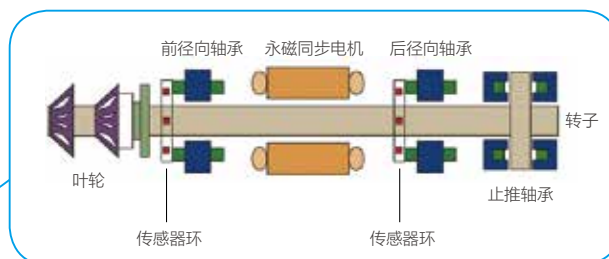
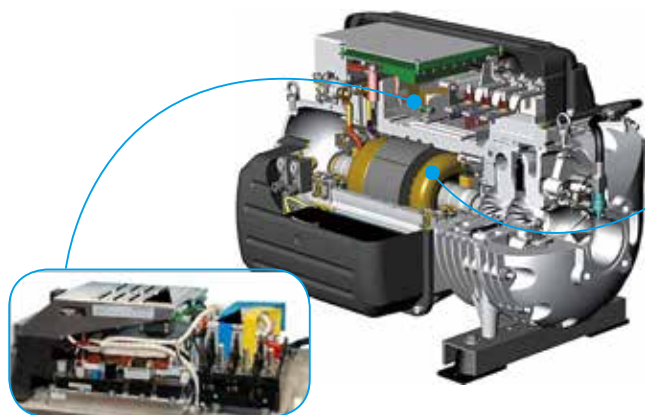
- Pipe pressure limit
- Vibration and floor load restriction for plants in the middle layer and top layer of the building
- With limited plant room space and transportation space
- Especially suitable for reconstruction of small-medium data centers of super high layer building



Key Components

Oil-free Centrifugal Compressor

Inverter driven high-efficiency magnetic levitation oil-free compressor: the compressor is designed with aerodynamic optimized two-stage centrifugal and magnetic levitation technology, high performance pulse width modulator (PWM), automatic regulation of rotation speed, which promise optimal operation and high-efficiency under both full load and part load operation.



The rotator and impeller of compressor are suspended in the magnetic field when operation. The sensor ring under the bearing keep sending real-time data to the bearing control system and adjust the position of shaft immediately to maintain its optimal running condition.

- With build-in inverter, which enables motor speed of compressor adjusting automatically according to load
- High efficient operation under part load condition
- Inverter start, making the starting current of unit low to 2A, therefore to reduce impulse on power network
- Decreasing thermal stress of motor stator

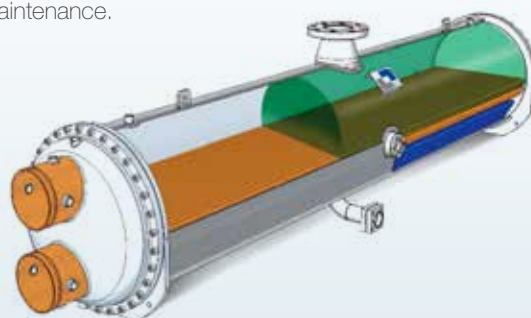
High-efficiency Flooded Type Evaporator

The copper tubes of flooded type evaporator are completely dipped inside the boiling liquid refrigerant. Thanks to this design, the unit performance and COP are enhanced obviously.

- Super high efficiency copper tubes are designed with patent technology. The external screw on the tube benefits the evaporation of the refrigerant and as a result to reduce the heat transfer temperature difference between tube internal surface and external surface effectively.
- In order to achieve perfect water perturbation and turbulent heat transfer, the internal surface of the copper tube is also special designed.
- Chilled water flowing inside the tube, it's beneficial for clean and maintenance.

Electronic Expansion Valve (EXV)

- Precisely control refrigerant flow, enhancing evaporator heat exchange performance
- Quick regulation according to load to ensure outlet water temperature stable, especially suitable for variable water flow system and applications with fluctuate load.



Modular Water-cooled Oil Free Centrifugal Chiller

Unit Features



Energy Saving and High Efficiency

Flexible multi module combination, mostly operating at part load, energy saving up to above 50%

Can quickly match cooling load demand by changing module quantity by configuring an optional main controller

Each module can operate in peak efficiency working condition by configuring an optional main controller, enhancing the unit's annual efficiency compared with convectional packaged oil free water cooled chiller.



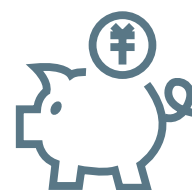
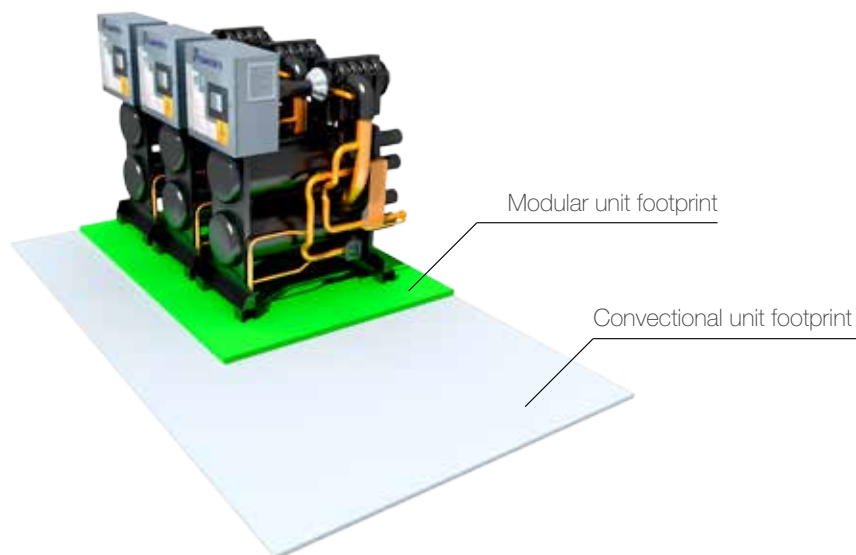
Easy for Transportation

Don't need large lifting device during transportation and installation. The modular unit can be transported through cargo elevator to the plant of the building easily.



Compact Structure, Small Footprint

Thanks to the compact structure with compressor, evaporator, condenser from top to bottom, the unit doesn't need to be dissembled to get into the elevator. Besides, the modular unit is with 50% smaller footprint compared with convectional packaged oil free water cooled chiller, which is especially suitable for reconstruction projects which are without specially transportation channel and limited space.



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Modular oil-cooled Free Centrifugal Chiller



Light

Weight of the modular unit is lighter than 1.6 ton. It can be transported through the cargo elevator easily. This is very helpful in super high layer buildings.



Lower Noise

With oil free compressor, the unit is with less vibration and lower noise during operation. Compared with old convectional units, the noise can be 10~15dB(A).



Flexible Redundancy

Thanks to the modular design, the modular unit is flexible for redundancy. The customer can configure more modular units demand in the future to achieve larger cooling capacity. Only need to connect the preserved pipe which is very convenient.



Modular Water-cooled Oil Free Centrifugal Chiller

Control System

The microprocessor specially designed for modular water cooled oil free centrifugal chiller features friendly user interface, excellent control, strong expansion ability and compatibility.

Friendly Interface

Each modular unit is configured with an independent controller. It can control the unit independently or connected to an optional main controller. The main controller can adjust the cooling capacity for each module to ensure maximum efficiency, safety, stability and precise operation of the entire system. The main controller is configured with a LCD touch screen with graphical display interface, menu management, running status display, real-time data information for troubleshooting, parameter adjustment and setting, unique "black box" fault record and analysis system



Main Controller Display



Module Display

Unit Control and Operation Management

Both the main controller interface and modular unit controller interface can display the module unit operating status, operating curve, parameters setting, alarm recording etc.

Operating status

Chilled water inlet/outlet temperature, cooled water inlet/outlet temperature, modular unit operating status, compressor suction/discharge temperature and pressure, real time and history temperature/pressure curve,



Fault Recording

Record operating time of each module and load segment; intelligent control and balance work load of each module; with complete fault protection, alarm and recording functions, keeping fault recordings and on site data.



Compressor Status

Display compressor status, operating load and operating time etc.



Parameters Setting

Adjust and set operating and protection parameters to adapt to different applications.



Nomenclature

TECS-W100L-M

M: Modular unit
L: Water-cooled Chiller
Nominal Cooling Capacity(RT)
HFC-134a Oil Free Centrifugal Chiller

TECS-W100L-M

Means HFC-134a modular water cooled oil free centrifugal chiller; nominal cooling capacity is 100RT.

Technical Parameters

TECS-W/L-M		080	100	125	150
Cooling Capacity	kW	281.0	352.0	440.0	528.0
	RT	80	100	125	150
Power Input	kW	48.1	60.8	76.6	89.4
EER		5.84	5.79	5.74	5.91
IPLV		8.47	7.92	8.22	8.72
Chilled Water Flow	m³/h	48.3	60.5	75.7	90.8
Chilled Water Pressure Drop	kPa	53.5	60.1	53.5	54.5
Cooling Water Flow	m³/h	60.4	75.7	94.6	113.5
Cooling Water Pressure Drop	kPa	50.2	52.1	59.3	56.9
Microprocessor		W3000			
Compressor No.	n	1	1	1	1
Refrigerant Circuit No.	n	1	1	1	1
Refrigerant Charge	kg	64	80	107	124
Stepless Energy Regulation		20%-100%			
Dimension					
Length	mm	1755	1755	1775	1775
Width	mm	825	825	825	825
Height	mm	1830	1830	1845	1845
Operating Weight	kg	1210	1265	1495	1625

Remarks :

- Cooling condition: outlet temperature of chilled water 7°C , chilled water flow per cooling capacity 0.172 m³/(h·kW) ; outlet temperature of cooling water 30°C, cooling water flow per cooling capacity 0.215 m³/(h·kW) .;
- IPLV is measured according to GB/T 18430.1;
- Standard water side pressure of evaporator and condenser is 1.0MPa. 1.6MPa or 2.0MPa is optional.

Modular Water-cooled Oil Free Centrifugal Chiller

Technical Parameters

TECS-W/L-M		080	100	125	150	
Cooling Capacity	kW	278.6	348.4	435.3	523.7	
	RT	79	99	124	149	
Power Input		kW	48.4	61.2	77.0	90.5
EER			5.76	5.69	5.65	5.79
IPLV			9.75	9.06	9.35	9.95
Chilled Water Flow	m³/h	43.2	54.0	67.5	81.2	
Chilled Water Pressure Drop	kPa	42.8	47.9	42.5	43.6	
Cooling Water Flow	m³/h	54.3	68.0	85.0	102.0	
Cooling Water Pressure Drop	kPa	43.3	44.8	50.9	46.1	
Microprocessor		W3000				
Compressor No.	n	1	1	1	1	
Refrigerant Circuit No.	n	1	1	1	1	
Refrigerant Charge	kg	64	80	107	124	
Stepless Energy Regulation		20%-100%				
Dimension						
Length	mm	1755	1755	1775	1775	
Width	mm	825	825	825	825	
Height	mm	1830	1830	1845	1845	
Operating Weight	kg	1210	1265	1495	1625	

Remarks:

1. Standard Cooling Condition: Chilled water (in/out)=12.2/6.7°C; Condenser water (in/out)=29.4/34.6°C;
2. IPLV is measured according to AHRI Standard 550/590;
3. Standard water side pressure of evaporator and condenser is 1.0MPa. 1.6MPa or 2.0MPa is optional;
4. Each project has different applications and demand: some require best full load efficiency, while others lowest initial investment, or an unrivaled part load performance. CLIMAVENETA provides optimized and tailored solution based on different cooling capacities and efficiency demand.

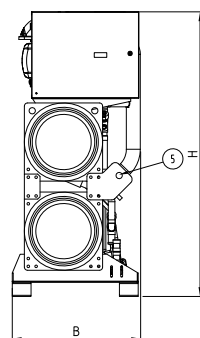
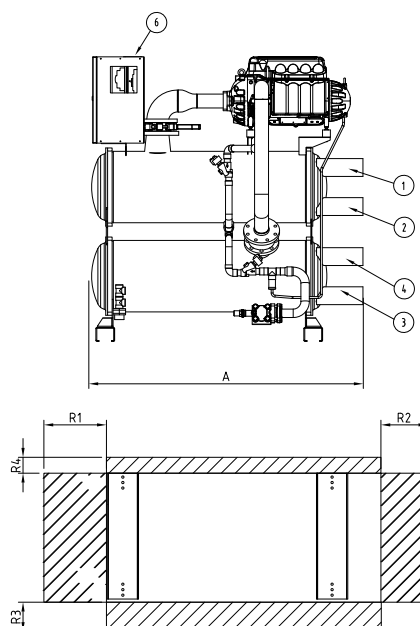
Electric Parameters

TECS-W/L-M	Compressor			Unit			Recommended cable
Module Unit	F.L.I.	F.L.A	L.R.A	F.L.I.	F.L.A	S.A.	mm ²
	kW	A	A	kW	A	A	
080	85	135	145	85	135	2	50
100	100	170	187	100	170	2	70
125	100	170	187	100	170	2	70
150	100	170	187	100	170	2	70

Note:

1. F.L.I Full load power input at max admissible condition; F.L.A Full load current ampere at max admissible condition; L.R.A. Locked rotor current for single compressor; S.A. Starting current; Supply power 380V/3Ph+N/50Hz; Range of voltage fluctuation: 10%; Range of voltage unbalance: 3%
- The rated power and current are based on the rated working condition. The maximum data is the theoretical limit value. When making wiring and power distribution, the data in the table are as reference. Please refer to Electric Standards for details.
2. The wiring cables shall be single-pole and exposed laying type.
3. The cables in the table are chosen under the working temperature of 90 C and environment temperature of 30 C.
4. The cables size in use shall not be less than the value in the table.

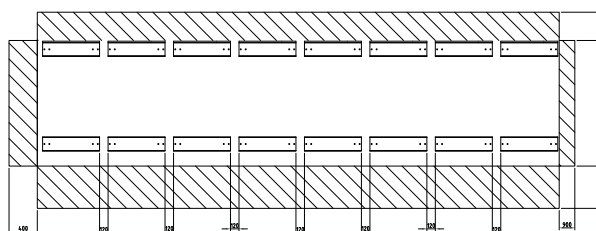
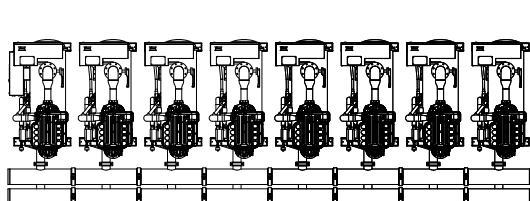
Dimension Drawing



Note:

- ①Evaporator inlet ②Evaporator outlet ③Condenser inlet ④Condenser outlet ⑤Lifting points ⑥Power inlet
- The above is schematic diagram for a single module unit and only for reference. Please consult with Climaveneta office for detail drawing.

Multi Module Combination Maintenance Clearance



▨ Minimum Clearance

Note: To facilitate maintenance, clearance between modules should be above 120mm.

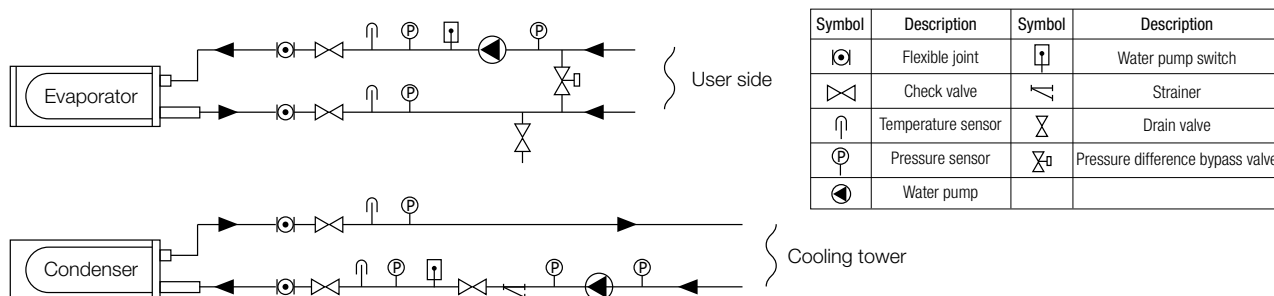
Dimension

TECS-W/L-M	Unit Size			Pipe Size		Clearance			
Module Unit	A	B	H	①/②	③/④	R1	R2	R3	R4
	mm	mm	mm	inch	inch	mm	mm	mm	mm
080	1755	825	1830	4"	4"	1200	1000	900	500
100	1755	825	1830	4"	4"	1200	1000	900	500
125	1775	825	1845	4"	4"	1200	1000	900	500
150	1775	825	1845	4"	4"	1200	1000	900	500

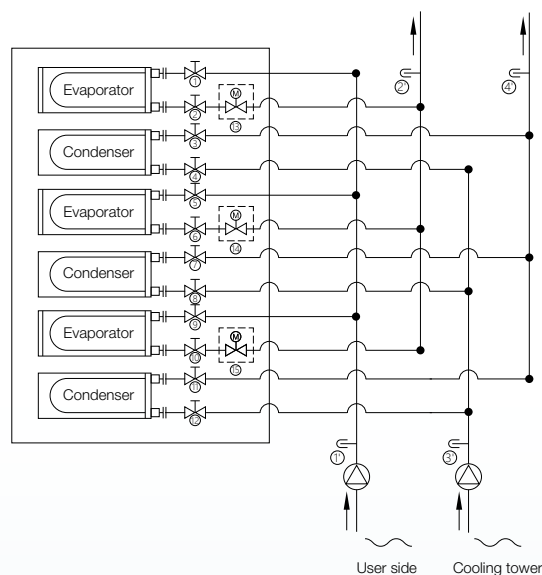
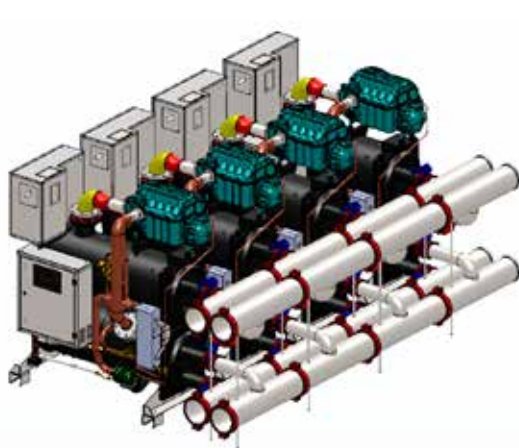
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Water System Piping Connection Schematic Diagram

Module Unit Water System Piping Connection Schematic Diagram



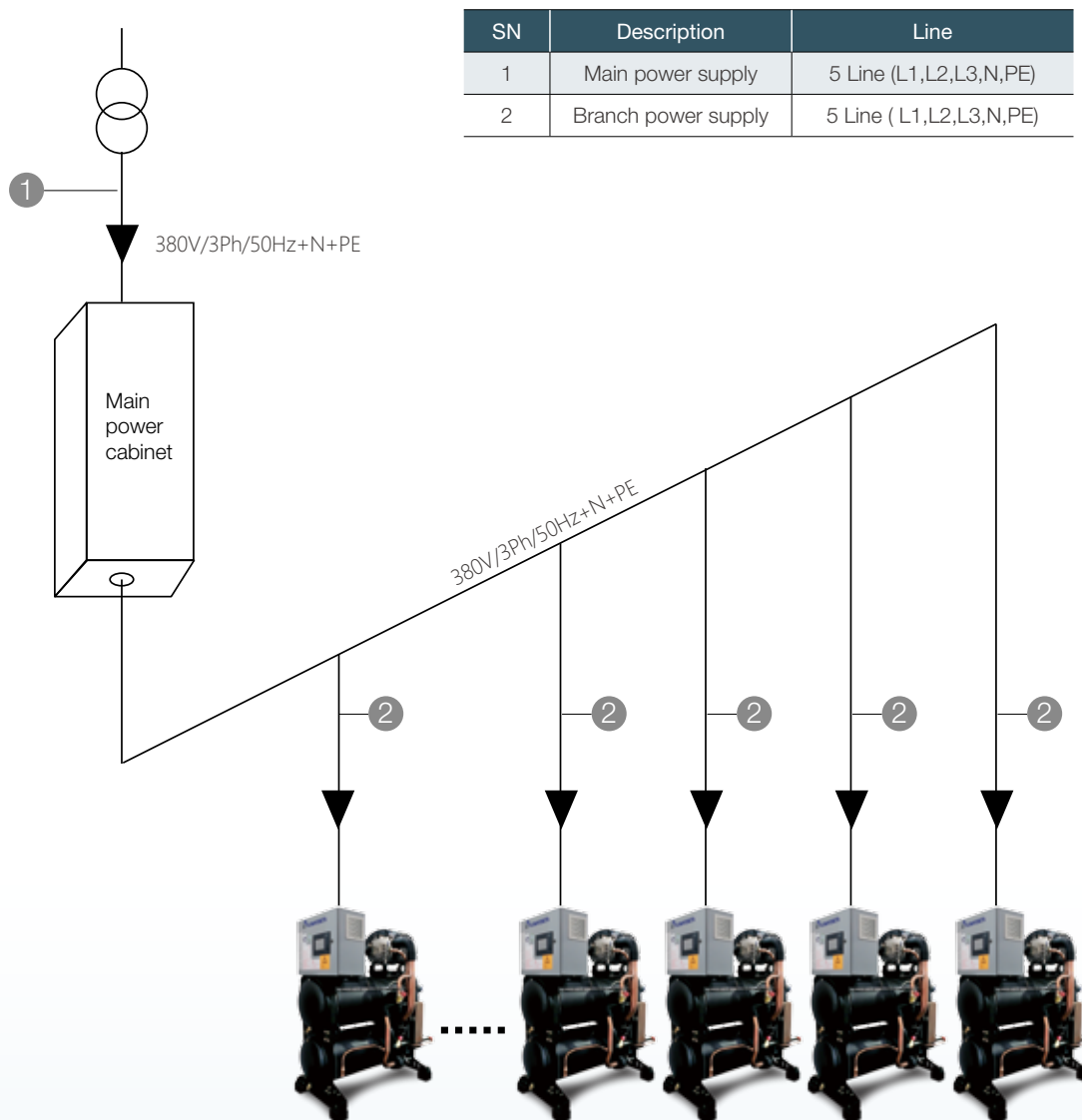
Multi Module Water System Valve, Temperature Sensor Installation Instruction



Installation Instructions:

- Isolation valves should be installed between the heat exchangers and main water pipe (refer to the valve position 1-12 for installation position) to facilitate module inspection, repair, also to balance the water flow between each module unit;
- When the air conditioning chilled water system is designed with variable water flow and two or more modular units are connected to the system, an electric valve need to be installed between each module unit and the main chilled water pipe (refer to the valve position 13-15 for installation position);
- The installation base needs to be level enough to avoid significant height differences between modules;
- The main water pipes, valves and connecting parts connected between the multi-module unit water system are optional;
- The space between module units should be above 120mm, and pipeline support needs to be added to each parallel pipe section similar to the picture on site, and 8 modular units can be freely combined at the most.
- Temperature probes should be installed on both the chilled water and cooling water inlet and outlet manifold (refer to the probe installation position 1'-4'). The position of the probe should be reserved on the manifold. Please consult with Climaveneta for detail probe installation size.

Electric Wiring

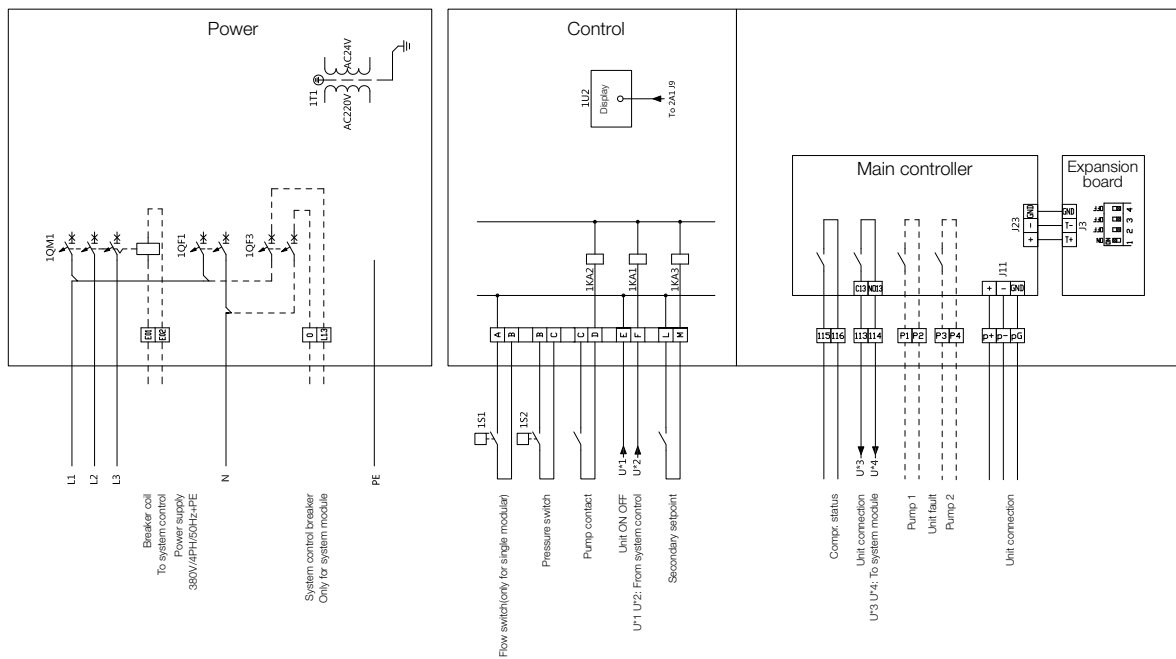


Wiring Instructions:

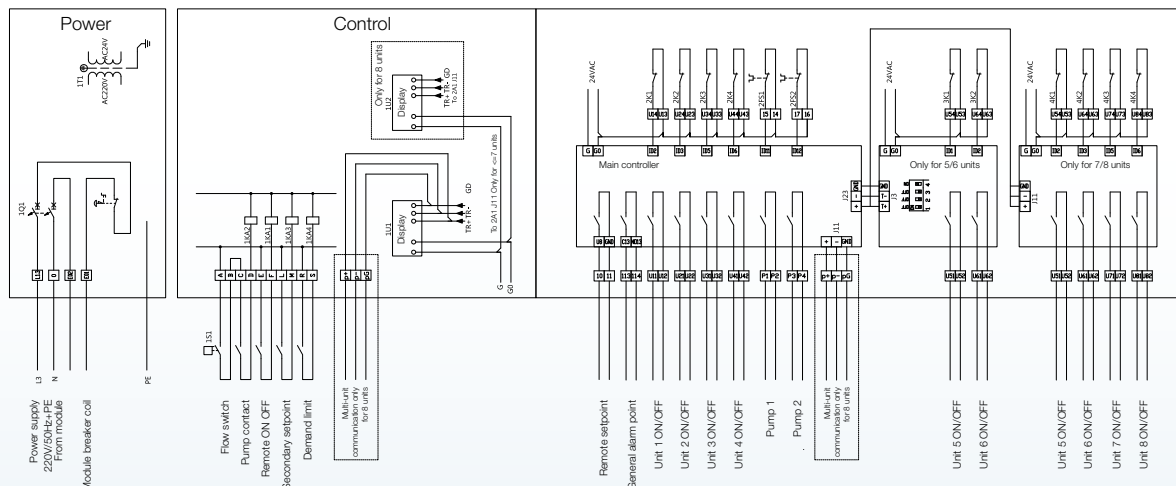
- The user needs to provide the main power cabinet and power branches according to the quantity of module units;
- Each module's power supply is independent and does not affect each other;
- Users need to provide power branch if need to expand cooling capacity in the future;
- This figure is for reference only. Please refer to the circuit diagram for specific wiring on site.

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Field Wiring Diagram



Single Module Field Wiring Diagram



System Controller Field Wiring Diagram

Note:

1. Each module needs to connect to independent power branch
2. Dotted line indicates that it needs the customer to do the wiring
3. Refer to electric wiring diagram for specific wiring



Global Headquarter

Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A.
36061 BASSANO DEL GRAPPA (VICENZA) ITALIA - VIA SARSON 57/C
TEL: +39 / 0424 509 500 (r.a.) FAX: +39 / 0424 509 509
E-mail: <https://www.melcohit.com>

Asia Pacific Headquarter

Climaveneta Chat Union Refrigeration Equipment (Shanghai) CO., LTD
NO. 88 BAIYUN ROAD XINGHUO DEVELOPING ZONE, SHANGHAI, CHINA
TEL: +86-21-57505566 FAX: +86-21-57505797
E-mail: <http://www.climaveneta.com.cn>

Hongkong Branch

ROOM 2003, CCT TELECOM BUILDING, 11 WO SHING STREET, FOTAN, SHATIN, N.T., HONGKONG
TEL: +852-26871755 FAX: +85-2-26873078
Website: <https://www.jinchat.com>

Vietnam Branch

6th floor, Room 6.6B, Etown 2, 364 Cong Hoa, Ward 13, Tan Binh Dist, Ho Chi Minh, Vietnam
TEL: 08-6262-9966 Fax: 08-6262-9977
Website: <https://www.climaveneta.com.cn>

Malaysia Branch

A-4-3, GARDEN SHOPPE ONE CITY, JALAN USJ 25/1, 47650 SUBANG JAYA, SELANGOR DARUL EHSAN
TEL: +603 8081 8558 FAX: +603 8081 9558
Website: <https://www.jinchat.com>

Myanmar Branch

ROOM 501, 5TH FLOOR, SALOMON BUSINESS CENTER, NO 244/A, U WISARA ROAD, BAHAN TOWNSHIP, YANGON
Tel: +951535098 Ext: 501
Website: <https://www.climaveneta.com.cn>