Haier

SUPER CLIMA B Series
R32 Inverter Air-Cooled Modular Chiller

Service Manual

CA0100HANH CA0140HANH

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1. Safety Precautions

1.1 General Guidelines

Installation, operation and maintenance of this equipment can pose risks due to system pressures, electrical parts, and location of equipment. This task should only be performed by trained, certified installers and service technicians. It is not recommended for individuals (including children) with limited physical, sensory, or cognitive abilities, or those lacking relevant experience and knowledge, unless they are under proper supervision or instruction.

When working with this equipment, it is essential to follow the precautions mentioned in the literature and marked on tags, stickers, and labels attached to the equipment, as well as any other necessary safety measures.

Adhere to all safety codes. Use safety glasses and work gloves. Exercise caution while handling, rigging, setting this equipment, and dealing with all electrical components.

Ensure to use a quenching cloth for operations involving unbrazing. Keep a fire extinguisher accessible for all brazing operations.

It is crucial to acknowledge safety information. Understand the signal words WARNING, CAUTION, and NOTE. These words are used in conjunction with the safety symbols.

1.2 Meaning of Warnings and Symbols

WARNING denotes hazards that could potentially result in personal injury or death.

CAUTION is used to indicate unsafe practices that could cause minor personal injury or damage to the product and property.

NOTE is used to highlight suggestions that will enhance the installation, reliability, or operation of the equipment.

1.3 Safety Measures for A2L Refrigerant

Qualified Workers

Basic maintenance tasks like coil cleaning can be performed by untrained personnel. However, all other procedures necessitate the involvement of trained service professionals. When handling air-conditioning equipment with A2L refrigerant such as R32, qualified installation and service technicians should have training in the following areas:

1. Understanding of A2L refrigerants' explosive potential
2. Identification of potential ignition sources
3. Safety protocols for both ventilated and unventilated rooms or enclosures
4. Knowledge of refrigerant detectors
5. Familiarity with the concept of sealed components and enclosures
6. Appropriate work procedures for:
    a. Commissioning
    b. Maintenance
    c. Repair
    d. Decommissioning
    e. Disposal

When working on the equipment, adhere to precautions indicated in this manual, and on labels attached to the equipment.

1. Comply with all safety regulations.

2. Maintain a fire extinguishing medium and a quenching cloth at the ready during brazing.

3. Always wear safety glasses and protective gloves.

4. Exercise caution when handling, rigging, and positioning large equipment.

Safety Checks

Performing maintenance or repairs on air conditioning systems that use A2L refrigerants necessitates certain safety precautions to minimize the chance of ignition. The following steps should be observed before conducting any work on these systems:

1. Work should be conducted under a well-defined procedure to reduce the likelihood of a combustible gas being present during the procedure.

2. Maintenance personnel and others in the vicinity should be made aware of the nature of the work being performed. Avoid conducting work in confined spaces where possible.

3. Regular checks should be made with a suitable refrigerant detector to ensure that the technician is aware of potentially hazardous or combustible atmospheres. Make sure the leak detection equipment being used is compatible with all relevant refrigerants.

4. If any work involving heat is to be performed on the refrigeration equipment or any related parts, appropriate fire extinguishing equipment should be readily available.

5. No one should use any sources of ignition in a way that could lead to a fire or explosion while working on refrigeration equipment that involves exposing any pipes. All potential sources of ignition, including smoking, should be kept a safe distance from the installation, repair, removal, and disposal sites, where refrigerant could potentially be released into the surrounding area. The area around the equipment should be surveyed for flammable hazards or ignition risks before work commences. "No Smoking" signs should be displayed prominently.

6. When changing electrical components, they should be fit for purpose and to the correct specification. Manufacturer's maintenance and service guidelines should be adhered to at all times. If there is any uncertainty, the manufacturer's technical department should be consulted.

7. The following additional checks should be made when working with air conditioning systems that use A2L refrigerants:

   a. Check for the presence of A2L refrigerant in the chilled water circuit through the vent, drain, or pipe plug ports at the inlet and outlet water pipe connections.

   b. Ensure that all equipment markings remain visible and legible. Illegible markings and signs should be corrected.

   c. Refrigerating pipes or components should be installed in a location where they are unlikely to be exposed to any substance that could corrode the components containing refrigerant, unless the components are made of materials that resist corrosion or are properly protected against it.

After completing any work on the equipment, verify that the cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other negative environmental impacts. This check should also consider the effects of aging or continuous vibration from sources such as compressors or fans.

Electrical Components Checks

The process of repairing and maintaining electrical components should include initial safety checks and a thorough inspection of the components. In the event of a fault that could pose a safety risk, it is crucial to disconnect the electrical supply to the circuit until the issue is resolved. If the fault cannot be immediately rectified, but operation must continue, a safe temporary solution should be implemented. This situation should be promptly reported to the equipment owner to ensure all involved parties are informed.

Initial safety checks should include the following:

1. Ensure capacitors are safely discharged to avoid any potential sparking.

2. Ensure no live electrical components or wiring are exposed during the processes of charging, recovery, or purging the system.

3. Ensure continuous earth bonding.

Component Repair

Disconnect all electrical supplies from the equipment before removing any sealed covers. If it's necessary to have an electrical supply during servicing, a constantly operating leak detector should be placed at the most critical point to warn of any potential hazards.

Pay special attention to ensure that the casing is not altered in a way that affects its level of protection when working on electrical components. You can do this by:

1. Checking that the apparatus is mounted securely.

2. Confirming that seals or sealing materials have not degraded to the point where they fail to prevent flammable atmospheres from entering. Any replacement parts should match the manufacturer's specifications.

Keeping an eye out for damage to cables, an excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Do not add any permanent inductive or capacitance loads to the circuit without first verifying that this will not exceed the allowable voltage and current for the equipment in use.

Only intrinsically safe components can be worked on while live in the presence of a flammable atmosphere, and the test apparatus must be at the correct rating.

Replace components only with parts specified by the manufacturer. Using other parts could lead to the ignition of refrigerant in the atmosphere from a leak.

Note:

Silicon sealant can compromise the effectiveness of some types of leak detection equipment. Intrinsically safe (IS) components do not need to be isolated before working on them.

NOTE: DO NOT DISCONNECT any switch that de-energizes crankcase heaters unless the unit is undergoing maintenance or expected to be shut down for an extended period. After the unit has been shut down or serviced for a considerable duration, let the crankcase heaters run for 12 hours before restart.

NOTE: If the supply voltage phase imbalance exceeds 2%, promptly reach out to your local electricity provider. Do not run the unit until the imbalance issue has been addressed.

NOTE: Ensure that all air has been purged from the water system before powering up the unit.

NOTE: DO NOT RUN the unit on inappropriate supply voltage or with excessive phase imbalance.

NOTE: To guarantee power supply to the heaters, ensure the unit's power remains ON at all times (except during maintenance or an extended shutdown).

CAUTION

This system is specifically designed for use with A2L refrigerant (R32), which operates under higher pressures than R22 and other refrigerants. It is crucial to avoid using any other refrigerants as this could result in equipment damage or personal injury.

CAUTION

It is not advisable to re-use compressor oil or any oil exposed to the open air. Dispose of oil according to local regulations and codes. Minimize the exposure of the refrigerant system to air and seal the circuits being serviced as soon as possible. If repairs cannot be completed promptly, charge with dry nitrogen to prevent oil contamination. Ignoring these procedures could lead to equipment damage

CAUTION

When removing the refrigerant charge, do it slowly to avoid loss of compressor oil. Failing to do so could lead to compressor failure.

WARNING

Risk of electric shock which could result in personal injury or loss of life. Ensure all power sources connected to this equipment are turned off during the installation process. Multiple disconnect switches may be present. Mark all such locations to inform others not to restore power until the job is finished.

WARNING

When disassembling a component, make sure to wear protective gear such as gloves and goggles. Follow these steps:

a. Disconnect the power supply to the unit.

b. Utilize the refrigerant service ports to depressurize the system by recovering the refrigerant.

c. Displace any residual refrigerant gas with nitrogen and ensure good ventilation within the work area. Exposure to open flame can turn refrigerant into toxic gases.

d. Use a tubing cutter to sever the component connection tubing and remove the component from the unit. Keep a pan handy to collect any escaping oil, which can also serve as a measure for the quantity of oil to be replenished in the system.

e. When necessary, cautiously unsweat the remaining tubing stubs. Beware that oil can catch fire when exposed to a flame from a torch.

Non-compliance with these procedures could result in personal injury or loss of life.

WARNING

DO NOT employ any methods to speed up the defrosting process or for cleaning other than those suggested by the manufacturer.

WARNING

If the unit needs to be stored, ensure it is kept in an area without open flames in continuous operation (such as a functioning gas appliance) or other potential ignition sources like operating electric heaters or hot surfaces.

Note that refrigerants may not have a detectable odor.

WARNING

DO NOT VENT refrigerant safety valves indoors. The buildup of refrigerant in a confined space can displace oxygen leading to asphyxiation. Ensure sufficient ventilation in enclosed or low-ceiling areas.

Inhalation of high concentrations of refrigerant gas can be harmful, potentially leading to heart irregularities, loss of consciousness, or even death. Misuse can be fatal. Refrigerant gas is denser than air and can reduce the oxygen levels available for breathing. The product can cause irritation to eyes and skin. Breakdown products are hazardous.

1.4 Installation in Corrosive Environments

Potentially Corrosive Environments

Potentially corrosive outdoor environments include coastal areas, industrial zones, densely populated urban regions, certain rural areas, or any combination of these environments. Factors, including but not limited to, flue gas, sewage vents or open sewage systems, and diesel exhaust, can adversely impact HVACR equipment.

Type	Examples	Solution
Acid and alkaline atmosphere	Facilities such as waste disposal and waste refining power plants, which emit gases like Hydrogen Sulfide (H_2S) and Ammonia (NH_3); industrial zones characterized by high levels of Sulfur Dioxide (SO_2). Livestock farms and similar settings, where gases like H_2S, NH_3, and disinfectants such as formaldehyde, iodine, Sodium Hydroxide (NaOH), etc., are prevalent.	Customized product with anti-corrosion solution
Sodium chloride (salt) atmosphere	Coastal areas can be categorized by their distance from the shoreline and their corresponding corrosivity level, as defined by ISO 12944. Specifically: 1. Regions adjacent to inland seas: Areas within a 500m radius experience severe salt corrosion (C5 very high); areas between 500m and 1000m suffer from significant salt corrosion (C4 high); areas beyond 1,000m are considered normal environments. 2. Regions adjacent to open oceans: Within a distance of 1000m, the environment experiences heavy salt corrosion (C5 very high); areas further than 1,000m endure substantial salt corrosion (C4 high). 3. Islands are typically subject to severe salt damage (C5 very high). For a detailed understanding of the corrosive environment classifications (C1-C5), refer to the ISO 12944 standard.	Customized product with anti-corrosion solution. Constructing a wall/fence on the side of the chiller to block direct sea breeze will effectively reduce salt corrosion.

NOTE: This product does not come with an anti-corrosion design. Special customization is required for installation in environments with C4 and C5 corrosivity levels.

Installation Requirements

Coastal Areas

1. Even with anti-corrosion equipment, avoid installing in areas directly exposed to sea breeze and fog. If possible, choose a location where walls or other structures can provide protection.
2. As much as possible, install in a cool location that avoids direct ultraviolet exposure.
3. The outer panels of the unit will be cleaned by rainwater, eliminating the need for a canopy.
4. To prevent water accumulation on the panels, which could increase corrosion, ensure the unit is installed at a suitable angle to avoid drainage problems. Regularly inspect its condition and apply rust treatment or replace components as necessary.
5. For units installed in coastal areas, regular cleaning with fresh water is necessary to remove surface-attached salt.
6. Any scratches incurred during installation and maintenance should be repaired promptly.

Other Areas

If installed inland, the product should avoid the following environments as much as possible:

1. Areas with heavy oil fumes, frequent sandstorms, poor heat dissipation, or high-temperature heat sources.
2. Locations where flammable gas leakage is likely or where strong corrosive gases are present.
3. Hot spring areas and industrial zones with sulfur gases.
4. Places exposed to rainwater and direct sunlight.

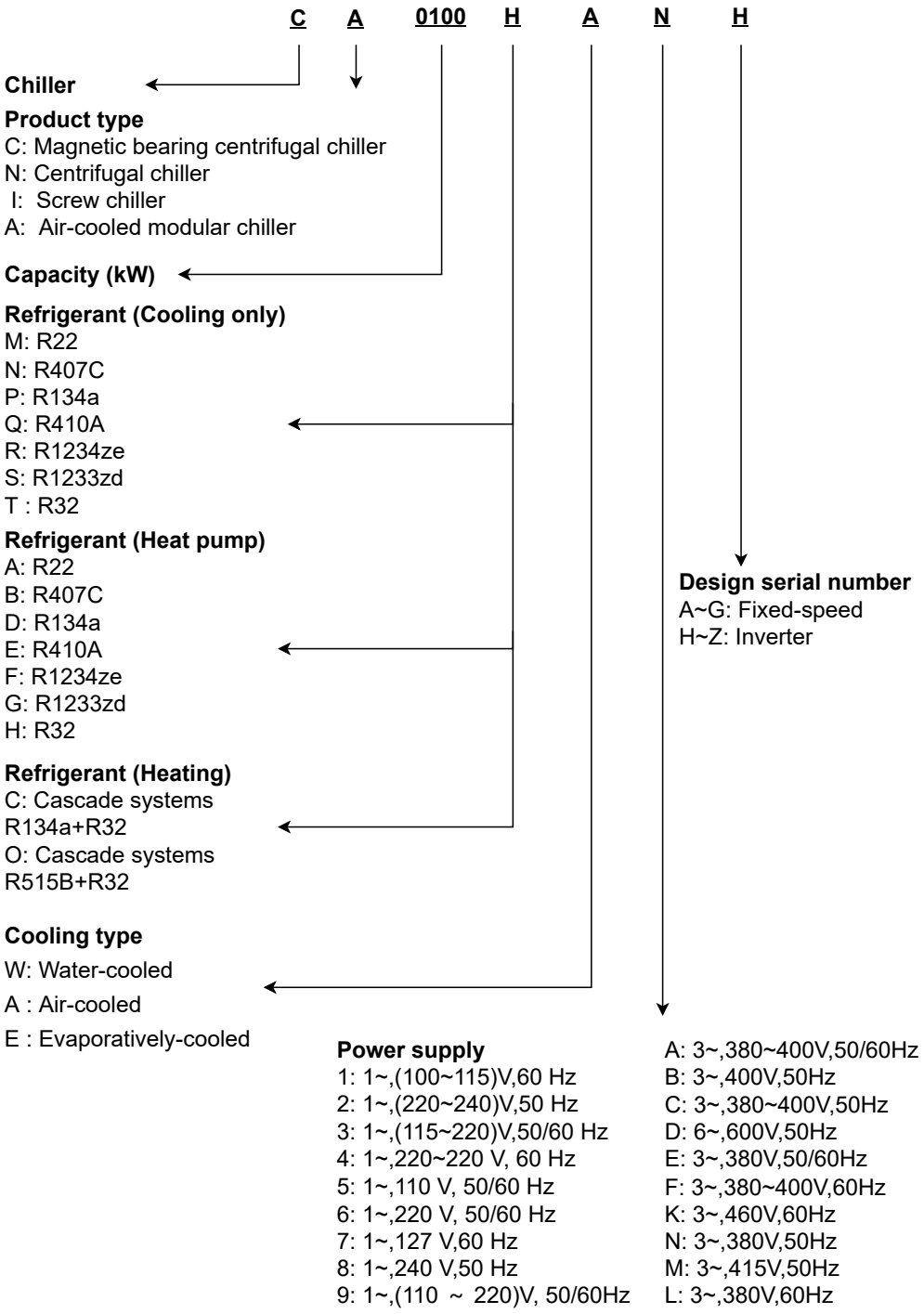
If installation in such location is essential, please contact us for anti-corrosion customization.

2. Introduction

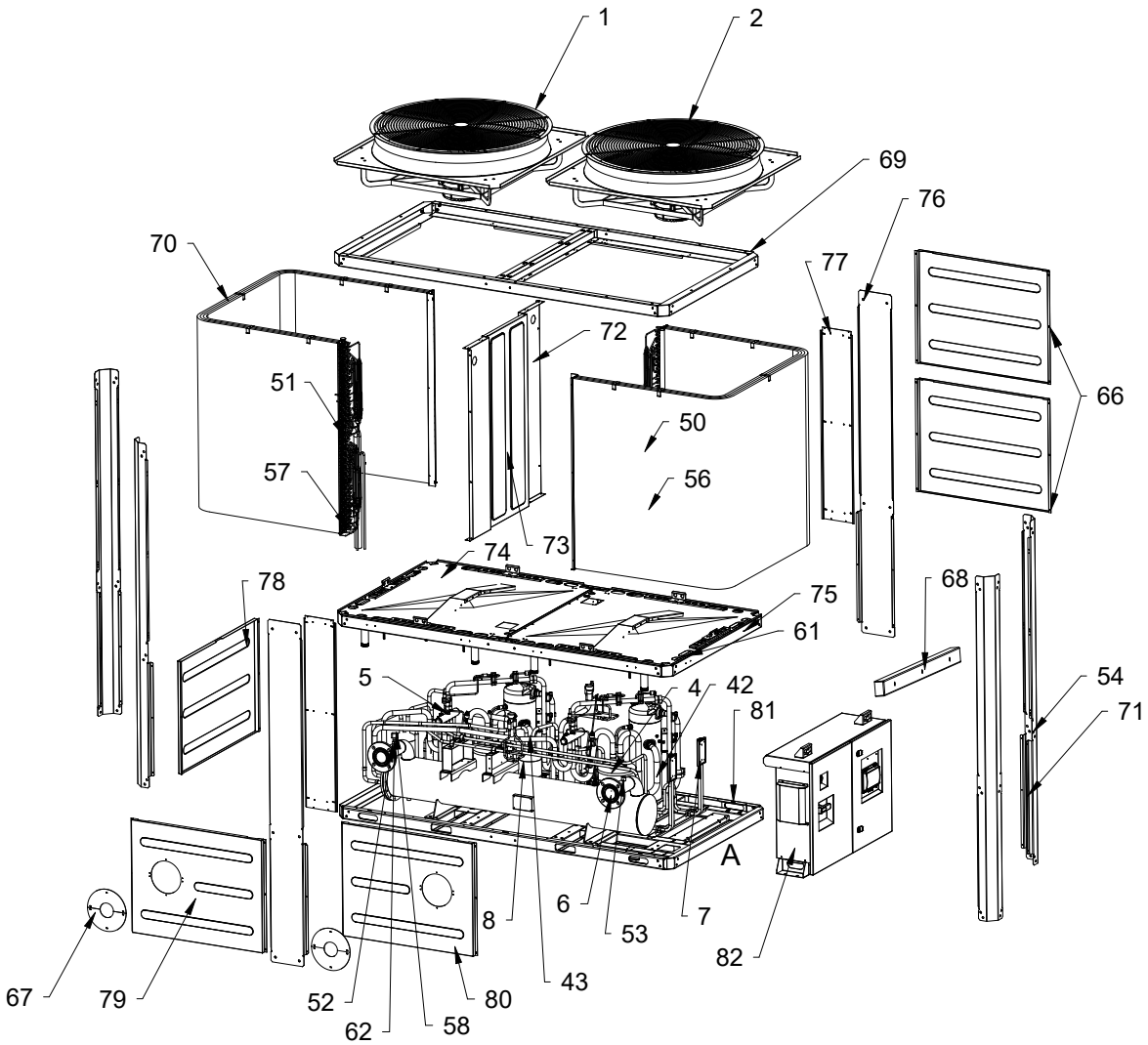
The R32 inverter air-cooled modular chiller is designed for efficient energy savings, convenient control, easy installation, safe operation, and easy maintenance. It utilizes the environmentally-friendly refrigerant R32. The unit boasts a range of features, including cooling, heating, domestic hot water (DHW), fast DHW, DHW priority, solar hot water, sterilization, dual-zone control, remote control, weekly schedule, holiday mode, and silent mode, among others.

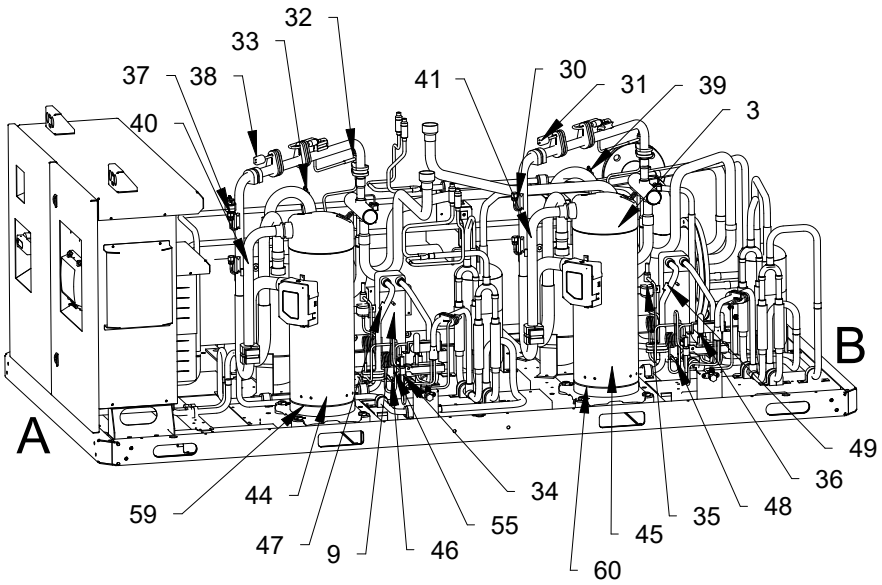
This service manual provides detailed instructions for starting up, operating, maintaining, and troubleshooting.

2.1 Nomenclature

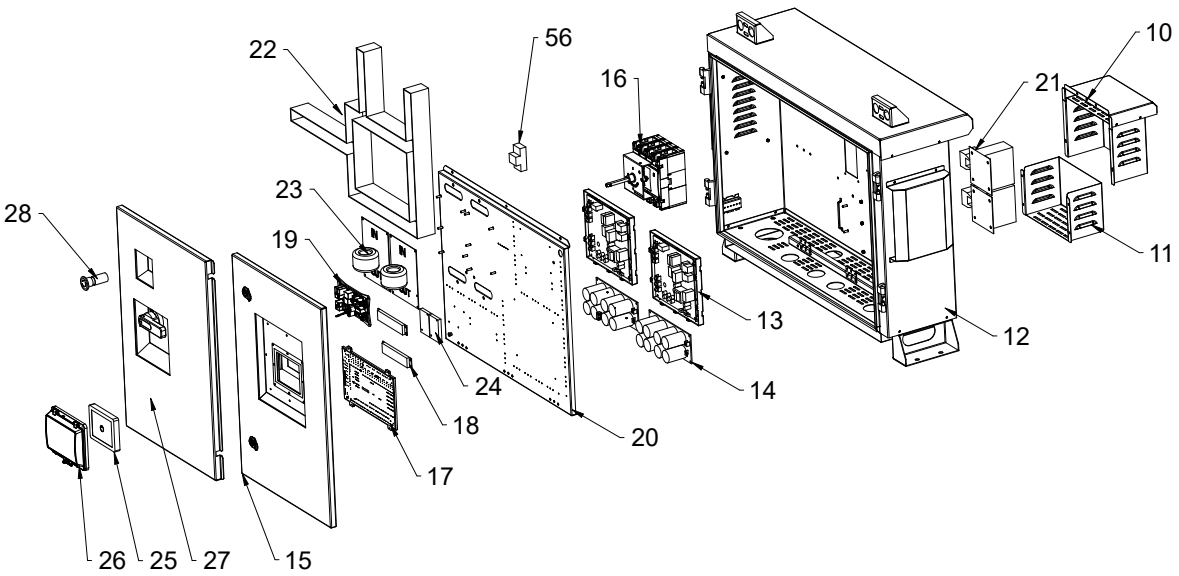


2.2 Components





NOTE:
1. None of the sensors are depicted in the drawing; only their positions are indicated.
2. Sensors 63 to 65, which are the total leaving water temperature sensor 2, tank temperature sensor, and solar temperature sensor, are not included with the chiller. These sensors must be purchased separately using their spare part codes.

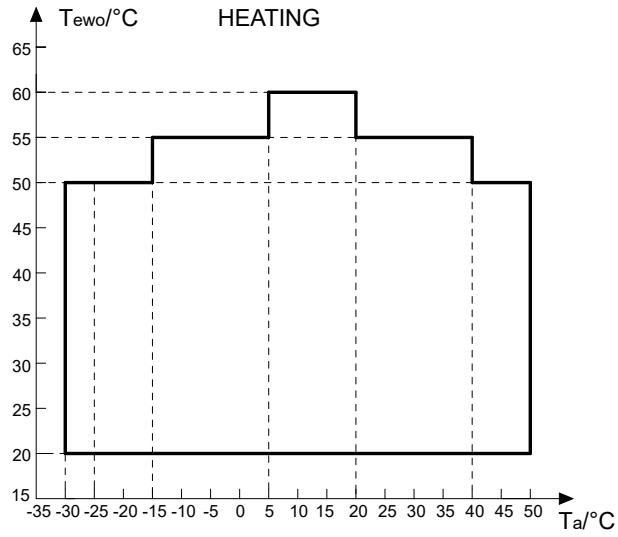


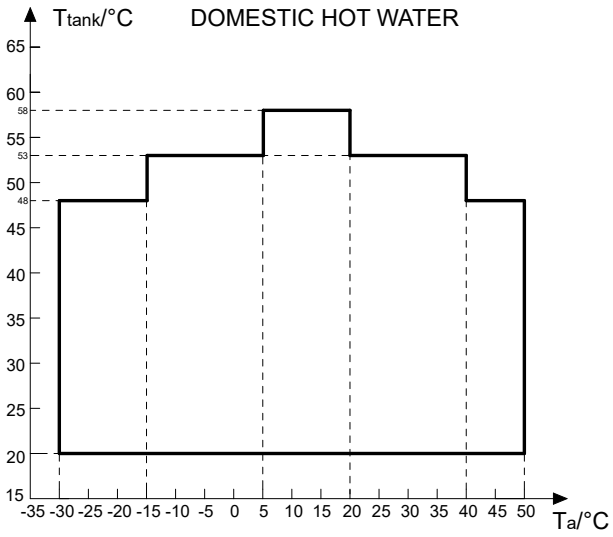
No.	Description	Qty.	No.	Description	Qty.
1	Fan motor assembly	1	42	System A suction temperature sensor	1
2	Fan motor assembly	1	43	System B suction temperature sensor	1
3	Compressor	2	44	System A oil temperature sensor	1
4	Gas-liquid separator	2	45	System B oil temperature sensor	1
5	Four way valve	2	46	System A economizer liquid inlet temperature sensor	1
6	Waterside heat exchanger	1	47	System A economizer gas outlet temperature sensor	1
7	Heat sink	2	48	System B economizer liquid inlet temperature sensor	1
8	Accumulator	2	49	System B economizer gas outlet temperature sensor	1
9	Plate heat exchanger	2	50	System A upper coil outlet temperature sensor	1
10	Reactor upper cover	1	51	System B upper coil outlet temperature sensor	1
11	Reactor lower cover	1	52	Leaving water temperature sensor	1
12	Electrical control box casing	1	53	Entering water temperature sensor	1
13	Inverter PCB	2	54	Ambient temperature sensor	1
14	Capacitor PCB	2	55	Economizer EEV	2
15	Right door	1	56	System A lower coil outlet temperature sensor	1
16	Circuit breaker	1	57	System B lower coil outlet temperature sensor	1
17	Main PCB	1	58	Total leaving water temperature sensor 1	1
18	Terminal block	2	59	System A crankcase heater	1
19	Power PCB	1	60	System B crankcase heater	1
20	Backplane	1	61	Drain pan heater	2
21	Reactor	2	62	Target flow switch	1
22	Wire channel	1	63	Total leaving water temperature sensor 2 (external)	1
23	Filter PCB	2	64	Tank temperature sensor (external)	1
24	Relay	2	65	Solar temperature sensor (external)	1
25	Remote wired controller	1	66	Side panel	2
26	Weatherproof cover	1	67	Panel bracket	4
27	Left door	1	68	Electrical control box bracket	1
28	Emergency stop	1	69	Fan motor assembly frame	1
29	Earth leakage circuit breaker	1	70	Airside heat exchanger	2
30	System B discharge pressure sensor	1	71	Pillar	4
31	System B high pressure switch	1	72	Wind baffle	2
32	Hot gas bypass solenoid valve	2	73	Middle wind baffle	1
33	System A suction pressure sensor	1	74	Drain pan	2
34	Throttle solenoid valve	2	75	Drain pan frame	1
35	Liquid injection solenoid valve	2	76	Middle pillar	2
36	Main circuit EEV	4	77	Fixing plate	2
37	System A discharge pressure sensor	1	78	Side panel	1
38	System A high pressure switch	1	79	Waterside panel	1
39	System B suction pressure sensor	1	80	Waterside panel	1
40	System A discharge temperature sensor	1	81	Chassis	1
41	System B discharge temperature sensor	1	82	Electrical control box assembly	1

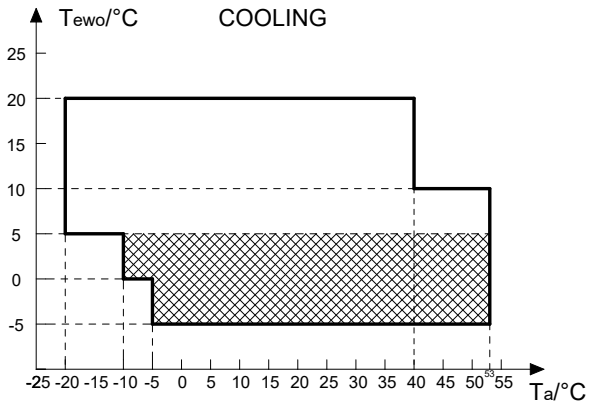
2.3 Operation Conditions

Item	Content
Power Supply	3N~/380~415V/50Hz
Power Supply Frequency	Within ±1% of the rated frequency
Phase Imbalance	The imbalance between any two phases of the power supply should be less than 2% of the rated voltage
Chilled Water Flow Rate	Within ±30% of the rated flow rate
Chilled Water Pressure	Below 1.0Mpa
Chilled Water Quality	No dissolved substances corrosive to copper, iron, and welding materials
Installation Site	Snow protection and ventilation measures should be taken as needed
Ambient Temperature	Refer to the graph below (Operation Range)
Relative Humidity	Below 90%

2.4 Operation Range







In the shaded area ▨, additional ethylene glycol antifreeze is required.

Add 25% or more for T_{ewo} set between -5 and 0°C.

Add 15% or more for T_{ewo} set between 0.5 and 5°C.

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

T_{tank}: DHW tank temperature

3. Specification

Product Data		Unit	CA0100HANH	CA0140HANH
Cooling (LWT 7°C/OAT 35°C)	Capacity	kW	100.0	130.0
	Power Input	kW	28.60	42.88
	EER	kW/kW	3.50	3.03
Cooling (LWT 18°C/OAT 35°C)	Capacity	kW	110.0	145.0
	Power Input	kW	23.40	40.28
	EER	kW/kW	4.70	3.60
Heating (LWT 35°C/OAT 7°C)	Capacity	kW	100.0	142.0
	Power Input	kW	20.00	30.87
	COP	kW/kW	5.00	4.60
Heating (LWT 45°C/OAT 7°C)	Capacity	kW	100.0	142.0
	Power Input	kW	24.20	36.90
	COP	kW/kW	4.13	3.85
Heating (LWT 55°C/OAT 7°C)	Capacity	kW	100.0	142.0
	Power Input	kW	29.10	43.50
	COP	kW/kW	3.44	3.26
Seasonal Energy Efficiency	SEER	kWh/kWh	4.88	4.82
	$\eta_{s,c}$	%	192	190
	SCOP (35°C)	kWh/kWh	4.85	4.60
	$\eta_{s,h}$	%	191	181
	SCOP (55°C)	kWh/kWh	3.85	3.80
	$\eta_{s,h}$	%	151	149
Operating Temperature Range	Cooling	°C	-20~53	
	Heating	°C	-30~50	
	DHW	°C	-30~50	
Leaving Water Temperature Range	Cooling	°C	-5~20	
	Heating	°C	20~60	
Storage Temperature Range (Tank)	DHW	°C	20~58	
Refrigerant	Type	-	R32	R32
	GWP	CO_2e/kg	675	675
	Charge			
	System A	kg	11	11
	System B	kg	11	11
	CO_2 Eq.	tCO_2e	14.85	14.85
	Throttle Method	-	Electronic expansion valve	
Electrical Control Box IP Class		-	IPX4	IPX4
Defrost Method		-	4WV reverse defrosting	
Casing	Color	-	Light grey	
	Material	-	Galvanized steel	
Compressor	Brand	-	Copeland	
	Type	-	Inverter scroll	
	Quantity	-	2	2
	Rated Load Amps. (RLA)	A	43.1	43.1
	Crankcase Heater	W	90	90
	Quantity		2	2
	Compressor Oil Brand	-	Copeland	Copeland
	Compressor Oil Type	-	NXG5020	NXG5020
	Compressor Oil Charge (Compressor + Gas-Liquid Separator)			
	System A	ml	3300	3300
	System B	ml	3300	3300

Product Data		Unit	CA0100HANH	CA0140HANH
Fan Motor	Brand	-	Match-Well	
	IP Class	-	IP55	IP55
	Type	-	DC	
	Quantity	-	2	2
	Insulation Class	-	F	F
	Maximum Rotary Speed	rpm	600	720
Fan	Brand	-	Match-Well	
	Type	-	Axial	
	Quantity	-	2	2
	Fan OD. Diameter	mm	Ø1000	Ø1000
	Maximum Airflow Rate	m^3/h	20500	25400
Water System	Water Pressure Drop	kPa	30	54
	Maximum Pressure	MPa	1	1
	Water Pipe Size (Inlet/Outlet)	-	DN65/DN65	DN65/DN65
	Standard Water Flow Rate (Cooling)	m^3/h	17.20	22.40
	Minimum Water Flow Rate (Cooling)	m^3/h	12.04	15.68
	Standard Water Flow Rate (Heating)	m^3/h	17.20	24.40
	Minimum Water Flow Rate (Heating)	m^3/h	12.04	17.08
Waterside Heat Exchanger	Type	-	Shell-and-tube	
	Number of Shellside Passes	-	11	11
	Number of Tubeside Passes	-	4	4
Airside Heat Exchanger	Type	-	Tube-fin	
	Number of Rows	-	3	3
	Number of Circuits	-	28	28
	Tube Pitch	mm	21	21
	Row Pitch	mm	18.186	18.186
	Fin Spacing	mm	1.6	1.6
	Fin Material	-	Aluminum	
	Fin Coating Type	-	Hydrophilic aluminum foil	
	Salt Spray Test Duration	hour	500	500
	Tube OD. Diameter	mm	7	7
	Tube Type	-	Inner grooved	
Plate Heat Exchanger	Brand	-	Weyee	
Electronic Expansion Valve	Brand	-	Sanhua	
Four Way Valve	Brand	-	Sanhua	
	Quantity	-	2	2
Sound Power Level		dB(A)	88	91
Sound Pressure Level at 1m		dB(A)	70	72
Power Supply		Ph/V/Hz	3N~/380~415/50	
Maximum Running Current		A	100	120
Rated Current (Cooling/Heating)		A	46.20/39.70	68.23/58.72
Dimension	External Dimension (W*D*H)	mm	2260*1255*2260	2260*1255*2260
	Packing Dimension (W*D*H)	mm	2280*1275*2400	2280*1275*2400
Weight	Net Weight	kg	910	910
	Gross Weight	kg	940	940
	Operating Weight	kg	973	973

Note:

1. Haier reserves the right to change these specifications without prior notice.
2. Ratings calculated according to EN14511 and EN14825.
3. η_s calculated according to Ecodesign regulation for chillers comfort cooling and heating (813/2013, 2016/2281)
4. Ecodesign figures are calculated at variable water flow rate.
5. Sound data is tested in Haier lab, which may vary according to different installation conditions.
6. The pressure drop parameters listed in the table do not account for the pressure drop of the included water filter.
7. Rated current in cooling mode is referred to the following conditions: water inlet/outlet 12°C/7°C; ambient 35°CDB
8. Rated current in heating mode is referred to the following conditions: water inlet/outlet 40°C/45°C; ambient 7°CDB/6°CWB
9. CA0100HANH/CA0140HANH have two independent refrigerant circuit.
10. For further information, please contact Haier staff.

4. Capacity Performance

4.1 Cooling Capacity

CA0100HANH

Standard Water Flow Rate (Cooling) = 17.2m^3/h

Condition	T_{ao}	T_{ewo} (°C)											
		-20			-15			-10			-5		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	-	-	-	-	-	-	-	-	-	69.7	19.59	3.56
	0	-	-	-	-	-	-	95.3	20.09	4.75	96.0	22.01	4.36
	5	122.7	18.76	6.54	121.3	18.85	6.43	120.0	21.86	5.49	120.9	24.00	5.04
	7	133.1	18.90	7.04	131.5	18.97	6.94	126.5	21.19	5.97	127.4	23.47	5.43
	10	144.5	19.64	7.36	142.8	19.83	7.20	141.1	21.76	6.49	142.1	23.01	6.18
	15	161.2	21.54	7.48	159.3	21.79	7.31	159.5	21.91	7.28	160.6	22.19	7.24
	18	171.2	22.69	7.54	169.8	23.01	7.38	171.5	23.36	7.34	172.7	23.66	7.30
	20	177.3	23.35	7.59	175.4	23.62	7.43	178.1	24.02	7.41	179.3	24.34	7.37
Nom	-5	-	-	-	-	-	-	-	-	-	51.4	12.23	4.20
	0	-	-	-	-	-	-	70.2	12.56	5.59	70.7	13.76	5.14
	5	90.3	11.53	7.83	89.2	11.50	7.76	88.3	13.57	6.50	88.9	14.90	5.97
	7	97.9	11.81	8.29	96.7	11.90	8.13	92.9	13.85	6.71	93.6	15.34	6.10
	10	106.2	12.28	8.65	104.9	12.43	8.44	103.8	13.59	7.63	104.5	14.37	7.27
	15	118.3	13.51	8.76	116.9	13.69	8.54	117.2	13.72	8.54	118.0	13.89	8.50
	18	121.1	13.63	8.89	120.6	13.92	8.66	121.7	13.63	8.93	122.6	13.80	8.88
	20	122.2	13.51	9.05	122.5	13.90	8.81	123.9	13.55	9.14	124.8	13.73	9.09

Condition	T_{ao}	T_{ewo} (°C)											
		-2			2			5			15		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	78.3	21.27	3.68	84.5	21.48	3.93	80.7	21.17	3.81	70.9	24.00	2.95
	0	102.8	22.16	4.64	110.0	22.34	4.92	104.5	21.92	4.77	96.5	25.83	3.74
	5	124.0	23.83	5.21	127.9	22.48	5.69	124.5	22.59	5.51	120.4	27.91	4.31
	7	128.7	23.03	5.59	131.8	22.51	5.85	128.7	23.51	5.47	125.6	27.94	4.50
	10	140.3	21.97	6.38	141.1	23.10	6.11	139.0	23.97	5.80	140.2	28.22	4.97
	15	161.4	21.83	7.40	162.9	23.45	6.95	160.1	23.79	6.73	156.4	29.15	5.36
	18	174.4	23.42	7.44	177.1	25.20	7.03	175.4	25.76	6.81	171.8	31.63	5.43
	20	180.2	24.02	7.50	182.1	25.74	7.07	183.8	26.84	6.85	180.1	32.92	5.47
Nom	-5	57.7	12.40	4.65	65.4	14.33	4.56	59.4	13.44	4.42	52.1	15.06	3.46
	0	75.7	13.05	5.80	81.8	14.14	5.79	76.9	13.72	5.61	70.9	15.95	4.45
	5	88.5	13.19	6.71	94.2	14.16	6.65	91.6	14.05	6.52	88.4	17.11	5.17
	7	89.7	13.14	6.83	96.0	14.32	6.70	94.7	14.57	6.50	92.4	17.15	5.39
	10	103.9	13.97	7.44	101.5	14.33	7.08	102.2	14.89	6.86	103.0	17.48	5.89
	15	119.4	13.55	8.81	119.6	14.55	8.22	117.5	14.86	7.91	114.9	18.10	6.35
	18	123.3	13.43	9.18	123.8	14.11	8.77	121.1	14.29	8.47	119.5	17.29	6.91
	20	125.4	13.31	9.42	126.1	13.46	9.37	125.3	13.85	9.05	121.3	16.46	7.37

Condition	T_{ao}	T_{ewo} (°C)											
		20			25			30			35		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	71.9	27.35	2.63	72.5	30.36	2.39	84.1	39.91	2.11	81.1	43.48	1.86
	0	96.8	29.37	3.30	96.8	31.96	3.03	109.5	41.34	2.65	106.0	44.59	2.38
	5	119.3	31.36	3.80	118.4	33.97	3.48	130.8	44.03	2.97	127.4	46.33	2.75
	7	126.0	32.05	3.93	126.2	34.32	3.68	140.9	45.05	3.13	137.3	47.10	2.92
	10	137.8	32.01	4.30	135.5	34.90	3.88	146.1	43.32	3.37	143.4	47.30	3.03
	15	150.9	33.25	4.54	147.1	35.95	4.09	152.6	43.00	3.55	149.8	46.09	3.25
	18	164.0	35.43	4.63	159.2	38.45	4.14	156.3	43.67	3.58	152.4	45.77	3.33
	20	173.1	36.77	4.71	168.2	40.14	4.19	161.3	43.85	3.68	156.8	45.98	3.41
Nom	-5	52.7	17.06	3.09	53.4	18.93	2.82	59.4	24.03	2.47	58.0	26.11	2.22
	0	71.1	17.72	4.01	71.2	19.56	3.64	78.1	24.34	3.21	76.9	26.76	2.88
	5	88.0	18.87	4.66	87.1	20.59	4.23	94.7	25.45	3.72	93.7	28.05	3.34
	7	92.7	18.95	4.89	92.8	20.97	4.42	102.2	26.28	3.89	100.8	28.79	3.50
	10	101.3	19.41	5.22	99.6	20.41	4.88	108.0	23.99	4.50	106.8	25.30	4.22
	15	108.5	19.13	5.67	102.1	19.95	5.12	109.1	22.96	4.75	108.6	24.36	4.46
	18	112.5	18.94	5.94	104.2	19.58	5.32	112.3	22.78	4.93	110.2	23.64	4.66
	20	113.7	17.82	6.38	105.9	18.87	5.61	115.2	22.50	5.12	112.4	23.32	4.82

Condition	T_{ao}	T_{ewo} (°C)											
		40			45			50			53		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	68.9	38.47	1.79	60.5	36.47	1.66	43.7	31.70	1.38	35.0	30.19	1.16
	0	88.8	38.80	2.29	76.5	36.24	2.11	58.4	33.79	1.73	46.1	33.61	1.37
	5	105.4	40.23	2.62	89.0	36.86	2.41	71.4	35.43	2.02	59.7	36.43	1.64
	7	112.9	40.77	2.77	94.3	37.33	2.53	76.6	35.68	2.15	64.8	36.22	1.79
	10	117.3	40.31	2.91	97.2	36.01	2.70	81.7	35.72	2.29	72.7	38.48	1.89
	15	127.8	41.22	3.10	-	-	-	-	-	-	-	-	-
	18	133.5	41.98	3.18	-	-	-	-	-	-	-	-	-
	20	136.6	42.28	3.23	-	-	-	-	-	-	-	-	-
Nom	-5	53.7	25.45	2.11	48.5	24.46	1.98	34.6	20.94	1.65	27.9	22.29	1.25
	0	69.7	25.61	2.72	60.8	24.10	2.52	46.2	21.86	2.11	38.3	23.80	1.61
	5	83.1	26.47	3.14	70.2	23.97	2.93	56.4	23.00	2.45	47.6	25.58	1.86
	7	88.9	27.03	3.29	74.4	24.53	3.03	60.5	22.98	2.63	51.6	24.09	2.14
	10	93.0	25.34	3.67	76.2	23.71	3.21	64.5	23.13	2.79	54.3	23.82	2.28
	15	95.7	25.51	3.75	-	-	-	-	-	-	-	-	-
	18	98.9	25.55	3.87	-	-	-	-	-	-	-	-	-
	20	100.6	25.52	3.94	-	-	-	-	-	-	-	-	-

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

TC: Total Capacity, kW

PI: Power Input, kW

EER: Energy Efficiency Ratio, kW/kW

Max: 100% frequency of compressor

Nom: Nominal data, normally 80% of maximum frequency

CA0140HANH

Standard Water Flow Rate (Cooling) = 22.4m^3/h

Condition	T_{ao}	T_{ewo} (°C)											
		-20			-15			-10			-5		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	-	-	-	-	-	-	-	-	-	78.1	23.85	3.28
	0	-	-	-	-	-	-	106.8	24.52	4.36	107.6	26.86	4.00
	5	137.5	22.85	6.02	135.9	22.95	5.92	134.5	26.52	5.07	135.4	29.11	4.65
	7	149.1	23.04	6.47	147.4	23.11	6.37	141.7	25.73	5.51	142.7	28.51	5.01
	10	161.8	23.95	6.76	159.9	24.17	6.62	158.1	26.48	5.97	159.2	28.00	5.69
	15	180.6	26.28	6.87	178.4	26.58	6.71	178.7	26.72	6.69	179.9	27.05	6.65
	18	191.7	27.69	6.93	190.2	28.06	6.78	192.1	28.48	6.74	193.5	28.86	6.70
	20	198.6	28.49	6.97	196.5	28.81	6.82	199.5	29.30	6.81	200.9	29.68	6.77
Nom	-5	-	-	-	-	-	-	-	-	-	66.4	18.05	3.68
	0	-	-	-	-	-	-	90.8	18.55	4.89	91.4	20.33	4.50
	5	116.9	17.29	6.76	115.5	17.37	6.65	114.3	20.07	5.70	115.1	22.03	5.23
	7	126.8	17.44	7.27	125.3	17.49	7.16	120.5	19.48	6.19	121.4	21.57	5.62
	10	137.6	18.13	7.59	136.0	18.30	7.43	134.4	20.04	6.71	135.4	21.19	6.39
	15	153.5	19.89	7.72	151.7	20.11	7.54	151.9	20.22	7.51	153.0	20.47	7.47
	18	163.0	20.95	7.78	161.7	21.24	7.61	163.3	21.56	7.58	164.5	21.84	7.53
	20	168.8	21.56	7.83	167.1	21.80	7.66	169.6	22.17	7.65	170.8	22.46	7.60

Condition	T_{ao}	T_{ewo} (°C)											
		-2			2			5			15		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	87.7	25.91	3.38	94.7	26.18	3.61	90.4	25.80	3.50	79.4	29.14	2.73
	0	115.2	27.07	4.25	123.3	27.31	4.51	117.1	26.77	4.37	108.2	31.46	3.44
	5	138.9	28.91	4.81	143.3	27.32	5.24	139.5	27.44	5.08	134.8	33.76	3.99
	7	144.2	27.98	5.15	147.6	27.36	5.39	144.2	28.55	5.05	140.7	33.82	4.16
	10	157.1	26.75	5.87	158.1	28.10	5.63	155.7	29.14	5.34	157.1	34.22	4.59
	15	180.8	26.63	6.79	182.5	28.58	6.39	179.3	28.98	6.19	175.2	35.39	4.95
	18	195.3	28.57	6.84	198.4	30.72	6.46	196.4	31.39	6.26	192.5	38.41	5.01
	20	201.9	29.30	6.89	204.0	31.38	6.50	205.9	32.71	6.29	201.8	39.98	5.05
Nom	-5	74.6	19.61	3.80	80.5	19.82	4.06	76.8	19.53	3.94	67.5	22.05	3.06
	0	97.9	20.48	4.78	104.8	20.67	5.07	99.6	20.26	4.91	92.0	23.81	3.86
	5	118.1	21.88	5.40	121.8	20.67	5.89	118.6	20.77	5.71	114.6	25.55	4.49
	7	122.6	21.17	5.79	125.5	20.71	6.06	122.6	21.61	5.67	119.7	25.59	4.68
	10	133.6	20.24	6.60	134.4	21.27	6.32	132.4	22.05	6.00	133.6	25.90	5.16
	15	153.8	20.15	7.63	155.2	21.63	7.17	152.5	21.93	6.95	148.9	26.78	5.56
	18	166.1	21.62	7.68	168.6	23.25	7.25	167.0	23.75	7.03	163.7	29.07	5.63
	20	171.7	22.18	7.74	173.5	23.75	7.30	175.0	24.75	7.07	171.5	30.25	5.67

Condition	T_{ao}	T_{ewo} (°C)											
		20			25			30			35		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	80.3	33.00	2.43	81.2	36.87	2.20	94.7	49.22	1.92	90.8	52.55	1.73
	0	108.3	35.20	3.08	108.4	38.94	2.78	122.0	49.99	2.44	118.8	54.14	2.19
	5	133.7	37.37	3.58	132.6	40.99	3.23	145.3	51.20	2.84	142.7	55.97	2.55
	7	141.0	37.64	3.75	141.3	41.46	3.41	157.2	52.41	3.00	153.8	56.98	2.70
	10	154.4	38.22	4.04	151.8	42.22	3.59	164.0	52.24	3.14	160.6	57.25	2.81
	15	170.0	39.46	4.31	164.8	43.53	3.79	171.5	50.58	3.39	167.8	54.56	3.08
	18	185.4	42.49	4.36	178.4	46.56	3.83	181.9	52.61	3.46	170.7	54.41	3.14
	20	195.1	44.30	4.40	188.4	48.62	3.87	193.6	55.12	3.51	175.6	55.03	3.19
Nom	-5	68.5	25.07	2.73	69.1	27.90	2.48	80.1	36.59	2.19	77.2	39.77	1.94
	0	92.2	27.03	3.41	92.2	29.47	3.13	104.3	38.05	2.74	101.0	40.97	2.46
	5	113.6	28.62	3.97	112.7	31.02	3.63	124.6	40.19	3.10	121.3	42.36	2.86
	7	120.0	29.28	4.10	120.1	31.38	3.83	134.2	41.17	3.26	130.8	43.12	3.03
	10	131.2	29.29	4.48	129.0	31.95	4.04	139.2	39.65	3.51	136.5	43.33	3.15
	15	143.8	30.46	4.72	140.1	32.94	4.25	145.4	39.39	3.69	142.7	41.29	3.46
	18	156.2	32.47	4.81	151.6	35.24	4.30	148.9	40.01	3.72	145.2	41.18	3.53
	20	164.9	33.71	4.89	160.2	36.80	4.35	153.6	40.21	3.82	149.3	41.65	3.59

Condition	T_{ao}	T_{ewo} (°C)											
		40			45			50			53		
		TC	PI	EER	TC	PI	EER	TC	PI	EER	TC	PI	EER
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	-5	70.3	38.39	1.83	61.8	36.52	1.69	44.6	31.40	1.42	35.7	30.03	1.19
	0	90.7	38.91	2.33	78.0	36.13	2.16	59.6	33.51	1.78	47.0	33.09	1.42
	5	107.6	40.13	2.68	90.8	36.85	2.46	72.9	35.28	2.07	61.0	36.07	1.69
	7	115.2	40.72	2.83	96.2	37.35	2.58	78.2	35.58	2.20	66.2	36.75	1.80
	10	119.7	40.31	2.97	99.1	36.07	2.75	83.4	35.67	2.34	74.2	38.25	1.94
	15	130.4	41.26	3.16	-	-	-	-	-	-	-	-	-
	18	136.2	42.04	3.24	-	-	-	-	-	-	-	-	-
	20	139.3	42.35	3.29	-	-	-	-	-	-	-	-	-
Nom	-5	70.3	38.39	1.83	61.8	36.52	1.69	44.6	31.40	1.42	35.7	30.03	1.19
	0	90.7	38.91	2.33	78.0	36.13	2.16	59.6	33.51	1.78	47.0	33.09	1.42
	5	107.6	40.13	2.68	90.8	36.85	2.46	72.9	35.28	2.07	61.0	36.07	1.69
	7	115.2	40.72	2.83	96.2	37.35	2.58	78.2	35.58	2.20	66.2	35.95	1.84
	10	119.7	40.31	2.97	99.1	36.07	2.75	83.4	35.67	2.34	74.2	38.25	1.94
	15	130.4	41.26	3.16	-	-	-	-	-	-	-	-	-
	18	136.2	42.04	3.24	-	-	-	-	-	-	-	-	-
	20	139.3	42.35	3.29	-	-	-	-	-	-	-	-	-

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

TC: Total Capacity, kW

PI: Power Input, kW

EER: Energy Efficiency Ratio, kW/kW

Max: 100% frequency of compressor

Nom: Nominal data, normally 80% of maximum frequency

4.2 Heating Capacity

CA0100HANH

Standard Water Flow Rate (Cooling) = 17.2m^3/h

Condition	T_{ao}	T_{ewo} (°C)											
		-30			-25			-20			-15		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	63.2	22.17	2.85	73.0	24.34	3.00	89.2	27.08	3.30	96.3	27.42	3.51
	25	65.0	24.76	2.63	75.7	27.20	2.78	91.2	29.55	3.09	98.6	29.84	3.30
	30	67.0	27.49	2.44	79.0	30.41	2.60	94.9	32.61	2.91	101.4	32.39	3.13
	35	70.0	31.50	2.22	82.9	34.66	2.39	99.3	36.62	2.71	104.9	35.76	2.93
	40	62.0	29.68	2.09	74.5	33.64	2.21	101.1	40.35	2.51	107.8	39.41	2.73
	45	53.0	27.36	1.94	64.9	32.25	2.01	101.4	44.62	2.27	109.0	43.48	2.51
	50	54.6	30.74	1.78	65.9	35.38	1.86	105.0	50.33	2.09	112.5	47.97	2.35
	55	-	-	-	-	-	-	-	-	-	112.7	51.39	2.19
	60	-	-	-	-	-	-	-	-	-	-	-	-
Nom	20	45.9	13.74	3.34	50.7	14.72	3.45	65.0	17.05	3.81	70.8	17.35	4.08
	25	47.2	15.22	3.10	52.3	16.15	3.24	66.1	18.42	3.59	72.0	18.64	3.86
	30	48.7	16.76	2.91	54.4	17.74	3.07	68.8	20.21	3.41	73.3	19.95	3.67
	35	50.8	18.97	2.68	56.7	19.76	2.87	71.9	22.51	3.20	75.0	21.68	3.46
	40	45.1	17.77	2.54	51.7	19.12	2.71	73.3	24.56	2.98	77.4	23.94	3.23
	45	38.6	16.22	2.38	45.9	18.20	2.52	73.5	26.78	2.74	78.7	26.39	2.98
	50	39.7	19.29	2.06	47.2	21.14	2.23	76.0	29.98	2.54	81.2	29.43	2.76
	55	-	-	-	-	-	-	-	-	-	80.5	31.70	2.54
	60	-	-	-	-	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)											
		-10			-7			-5			-2		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	107.5	28.17	3.82	114.7	28.42	4.04	121.1	28.96	4.18	126.2	28.87	4.37
	25	108.8	30.23	3.60	116.4	30.78	3.78	122.3	31.41	3.89	127.3	31.55	4.03
	30	110.6	32.37	3.42	118.1	33.15	3.56	123.5	33.81	3.65	128.2	34.21	3.75
	35	113.2	35.27	3.21	120.9	36.40	3.32	125.6	37.19	3.38	130.2	38.00	3.43
	40	116.5	38.71	3.01	122.0	39.37	3.10	126.9	40.03	3.17	131.5	40.88	3.22
	45	118.0	42.46	2.78	121.5	42.62	2.85	126.4	43.06	2.94	130.9	43.95	2.98
	50	121.0	47.07	2.57	130.1	48.36	2.69	136.4	49.17	2.77	143.7	50.50	2.85
	55	119.0	51.09	2.33	128.9	52.19	2.47	135.2	53.46	2.53	142.2	54.88	2.59
	60	-	-	-	-	-	-	-	-	-	-	-	-
Nom	20	75.4	17.06	4.42	81.2	17.49	4.64	83.6	17.44	4.80	86.4	17.48	4.94
	25	76.2	18.21	4.19	81.8	18.72	4.37	84.5	18.80	4.49	87.1	18.90	4.61
	30	77.5	19.43	3.99	82.3	19.89	4.14	85.3	20.12	4.24	87.8	20.29	4.33
	35	79.3	21.05	3.77	83.5	21.51	3.88	86.7	21.95	3.95	89.1	22.22	4.01
	40	81.6	22.95	3.55	84.4	23.03	3.66	87.6	23.49	3.73	90.1	23.77	3.79
	45	82.7	24.94	3.31	84.1	24.58	3.42	87.3	25.04	3.48	89.7	25.32	3.54
	50	84.7	27.31	3.10	89.7	27.59	3.25	94.1	28.39	3.31	95.2	28.09	3.39
	55	83.3	29.25	2.85	88.7	29.78	2.98	93.2	30.52	3.05	95.1	30.48	3.12
	60	-	-	-	-	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)											
		0			2			7			10		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	131.4	29.39	4.47	132.5	28.66	4.62	137.8	28.72	4.80	141.7	27.74	5.11
	25	132.2	32.02	4.13	133.5	31.27	4.27	141.1	30.57	4.62	144.7	29.65	4.88
	30	132.9	34.61	3.84	134.5	33.70	3.99	145.6	32.54	4.47	148.6	31.63	4.70
	35	134.6	38.32	3.51	136.5	37.16	3.67	151.2	35.06	4.31	153.6	34.21	4.49
	40	135.9	41.32	3.29	137.8	40.22	3.43	152.6	38.35	3.98	155.1	37.78	4.11
	45	135.4	44.56	3.04	137.3	43.58	3.15	151.9	42.18	3.60	154.5	42.07	3.67
	50	149.4	50.91	2.93	150.9	50.50	2.99	152.3	48.14	3.16	155.1	46.24	3.36
	55	147.3	54.86	2.69	150.0	55.08	2.72	152.9	50.75	3.01	155.6	49.39	3.15
	60	-	-	-	-	-	-	139.9	52.40	2.67	141.5	50.21	2.82
Nom	20	89.9	17.57	5.11	93.4	17.79	5.25	97.2	17.34	5.60	97.9	16.88	5.80
	25	90.4	19.04	4.75	94.3	19.27	4.89	97.9	18.20	5.38	98.9	17.76	5.57
	30	90.9	20.47	4.44	95.1	20.65	4.60	98.6	18.96	5.20	100.1	18.57	5.39
	35	92.1	22.50	4.09	96.5	22.56	4.28	100.0	20.01	5.00	102.0	20.26	5.18
	40	93.0	24.02	3.87	98.1	24.34	4.03	102.2	22.26	4.59	104.3	21.94	4.76
	45	92.6	25.55	3.62	98.2	26.19	3.75	102.9	24.91	4.13	105.1	24.60	4.27
	50	96.6	27.75	3.48	101.1	28.57	3.54	104.8	27.96	3.75	106.6	27.86	3.83
	55	97.3	30.32	3.21	101.8	30.94	3.29	105.4	30.01	3.51	107.2	29.80	3.60
	60	-	-	-	-	-	-	103.5	32.65	3.17	108.0	32.53	3.32

Con-dition	T_{ao}	T_{ewo} (°C)														
		12			20			30			40			50		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	138.4	27.50	5.03	141.2	24.94	5.66	148.7	25.53	5.82	152.5	24.32	6.27	155.7	22.92	6.79
	25	140.5	29.31	4.79	145.0	27.20	5.33	153.1	26.91	5.69	158.0	25.63	6.16	162.4	24.17	6.72
	30	144.1	31.32	4.60	151.3	29.84	5.07	160.1	28.70	5.58	166.5	27.41	6.08	172.9	25.96	6.66
	35	148.9	33.97	4.38	158.8	33.27	4.77	168.5	30.89	5.46	176.5	29.53	5.98	184.9	28.03	6.60
	40	150.5	37.62	4.00	165.4	38.04	4.35	174.6	35.71	4.89	182.2	33.82	5.39	190.5	31.87	5.98
	45	150.0	42.05	3.57	169.7	43.89	3.87	178.4	41.98	4.25	185.5	39.27	4.72	193.6	36.68	5.28
	50	150.6	46.82	3.22	173.7	47.01	3.69	185.1	46.30	4.00	189.3	41.67	4.54	193.0	37.17	5.19
	55	151.0	49.58	3.04	179.4	51.43	3.49	192.5	49.22	3.91	194.0	44.95	4.32	-	-	-
	60	146.1	51.35	2.85	170.5	56.52	3.02	-	-	-	-	-	-	-	-	-
Nom	20	95.0	16.50	5.76	98.7	15.42	6.40	103.9	15.83	6.56	106.6	15.17	7.03	110.1	14.43	7.63
	25	95.2	17.27	5.51	101.1	16.68	6.06	106.7	16.61	6.42	110.0	15.90	6.92	113.8	15.12	7.53
	30	96.3	18.13	5.31	105.4	18.22	5.79	111.6	17.67	6.31	116.0	16.96	6.84	120.1	16.13	7.45
	35	98.1	19.28	5.09	110.6	20.18	5.48	117.3	18.96	6.19	122.9	18.21	6.75	127.4	17.31	7.36
	40	100.4	21.48	4.67	115.2	22.96	5.01	121.6	21.79	5.58	126.9	20.76	6.11	131.2	19.61	6.69
	45	101.1	24.08	4.20	118.1	26.31	4.49	124.1	25.37	4.89	129.1	23.94	5.39	133.1	22.44	5.93
	50	102.6	27.28	3.76	121.6	28.29	4.30	129.5	28.06	4.62	132.5	25.53	5.19	134.9	23.42	5.76
	55	103.2	29.31	3.52	126.9	31.10	4.08	136.0	30.00	4.53	137.1	27.70	4.95	-	-	-
	60	103.9	30.74	3.38	133.4	35.00	3.81	-	-	-	-	-	-	-	-	-

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

TC: Total Capacity, kW

PI: Power Input, kW

COP: Coefficient of Performance, kW/kW

Max: 100% frequency of compressor

Nom: Nominal data, normally 80% of maximum frequency

CA0140HANH

Standard Water Flow Rate (Cooling) = 24.4m^3/h

Condition	T_{ao}	T_{ewo} (°C)											
		-30			-25			-20			-15		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	63.5	21.43	2.96	74.7	24.38	3.06	91.3	26.66	3.42	98.5	27.98	3.52
	25	65.4	24.04	2.72	77.4	27.36	2.83	93.3	29.35	3.18	100.9	30.39	3.32
	30	67.4	26.80	2.51	80.9	30.71	2.63	97.1	32.66	2.97	103.7	32.92	3.15
	35	70.4	30.89	2.28	84.9	35.21	2.41	101.6	37.08	2.74	107.4	36.27	2.96
	40	62.4	29.11	2.14	76.2	34.16	2.23	103.4	41.05	2.52	110.2	40.24	2.74
	45	53.4	26.82	1.99	66.4	32.72	2.03	103.8	45.71	2.27	111.5	44.79	2.49
	50	54.9	30.18	1.82	67.4	35.84	1.88	107.4	51.38	2.09	115.1	49.83	2.31
	55	-	-	-	-	-	-	-	-	-	113.4	50.86	2.23
	60	-	-	-	-	-	-	-	-	-	-	-	-
Nom	20	62.8	20.93	3.00	72.6	22.98	3.16	88.7	25.56	3.47	95.7	25.89	3.70
	25	64.6	23.37	2.76	75.2	25.68	2.93	90.7	27.90	3.25	98.0	28.17	3.48
	30	66.6	25.95	2.57	78.6	28.70	2.74	94.4	30.78	3.07	100.8	30.57	3.30
	35	69.6	29.73	2.34	82.5	32.72	2.52	98.7	34.57	2.86	104.3	33.76	3.09
	40	61.7	28.02	2.20	74.1	31.76	2.33	100.5	38.09	2.64	107.1	37.21	2.88
	45	52.7	25.82	2.04	64.5	30.44	2.12	100.8	42.12	2.39	108.4	41.05	2.64
	50	54.3	29.02	1.87	65.5	33.40	1.96	104.3	47.51	2.20	111.9	45.28	2.47
	55	-	-	-	-	-	-	-	-	-	112.1	48.51	2.31
	60	-	-	-	-	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)											
		-10			-7			-5			-2		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	106.4	28.47	3.74	121.0	31.44	3.85	126.6	31.61	4.01	137.6	32.48	4.24
	25	107.7	30.59	3.52	122.8	33.97	3.61	127.9	34.25	3.73	138.8	35.46	3.91
	30	109.4	32.80	3.34	124.6	36.49	3.42	129.1	36.84	3.50	139.8	38.39	3.64
	35	112.0	35.80	3.13	127.5	39.95	3.19	131.3	40.47	3.24	141.9	42.59	3.33
	40	115.2	39.55	2.91	128.7	43.06	2.99	132.6	43.52	3.05	143.3	45.76	3.13
	45	116.8	43.75	2.67	128.1	46.42	2.76	132.2	46.75	2.83	142.8	49.13	2.91
	50	119.7	47.88	2.50	137.2	52.80	2.60	142.6	53.32	2.67	152.7	55.12	2.77
	55	117.8	49.91	2.36	132.5	54.64	2.43	137.7	55.20	2.49	149.9	58.15	2.58
	60	-	-	-	-	-	-	-	0.00	-	-	0.00	-
Nom	20	103.4	25.51	4.05	109.8	25.64	4.28	114.8	25.77	4.46	119.7	25.65	4.67
	25	104.6	27.35	3.83	111.4	27.70	4.02	116.0	27.93	4.15	120.7	28.00	4.31
	30	106.4	29.26	3.63	113.1	29.76	3.80	117.1	30.04	3.90	121.6	30.32	4.01
	35	108.9	31.85	3.42	115.6	32.57	3.55	119.1	33.00	3.61	123.4	33.63	3.67
	40	112.0	34.89	3.21	116.8	35.12	3.32	120.3	35.49	3.39	124.7	36.14	3.45
	45	113.5	38.16	2.97	116.2	37.85	3.07	119.9	38.12	3.14	124.2	38.80	3.20
	50	116.3	42.29	2.75	124.4	43.06	2.89	129.3	43.48	2.97	136.2	44.67	3.05
	55	114.5	44.65	2.51	123.3	46.70	2.64	128.1	47.19	2.71	134.7	48.47	2.78
	60	-	-	-	-	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)											
		0			2			7			10		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	140.9	32.45	4.34	142.9	32.43	4.41	149.6	32.89	4.55	152.5	32.49	4.70
	25	141.8	35.09	4.04	144.1	35.15	4.10	152.1	35.12	4.33	155.5	34.86	4.46
	30	142.6	37.66	3.79	145.2	37.65	3.86	155.2	37.34	4.16	159.2	37.27	4.27
	35	144.6	41.32	3.50	147.5	41.19	3.58	159.6	40.30	3.96	164.3	40.47	4.06
	40	146.0	44.39	3.29	148.9	44.28	3.36	161.8	43.66	3.71	166.6	43.89	3.80
	45	145.4	47.65	3.05	148.4	47.56	3.12	161.9	47.33	3.42	166.7	47.64	3.50
	50	158.4	55.01	2.88	162.0	54.74	2.96	166.9	51.98	3.21	169.9	51.63	3.29
	55	156.9	59.44	2.64	159.7	58.50	2.73	164.6	55.79	2.95	167.8	54.66	3.07
	60	-	0.00	-	-	-	-	147.6	52.52	2.81	149.0	59.34	2.51
Nom	20	123.5	25.94	4.76	124.5	25.25	4.93	129.5	25.35	5.11	133.2	24.52	5.43
	25	124.2	28.23	4.40	125.5	27.52	4.56	132.6	26.96	4.92	136.0	26.20	5.19
	30	124.9	30.49	4.10	126.4	29.64	4.26	136.8	28.68	4.77	139.6	27.93	5.00
	35	126.5	33.72	3.75	128.2	32.63	3.93	142.1	30.89	4.60	144.3	30.19	4.78
	40	127.7	36.22	3.53	129.5	35.28	3.67	143.2	33.71	4.25	145.6	33.27	4.38
	45	127.2	38.87	3.27	129.0	38.17	3.38	142.3	36.96	3.85	144.9	36.87	3.92
	50	140.3	44.65	3.14	141.7	44.15	3.21	143.1	42.22	3.39	145.7	40.64	3.59
	55	138.4	48.22	2.87	140.9	48.08	2.93	143.6	44.46	3.23	146.2	43.36	3.37
	60	-	-	-	-	-	-	139.9	48.74	2.87	141.4	46.83	3.02

Con-dition	T_{ao}	T_{ewo} (°C)														
		12			20			30			40			50		
		TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP	TC	PI	COP
	°C DB	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW	kW	kW	kW/kW
Max	20	147.0	31.75	4.63	157.4	32.57	4.83	160.8	31.05	5.18	163.2	29.37	5.56	166.6	26.66	6.25
	25	150.0	34.10	4.40	161.4	35.01	4.61	165.2	33.58	4.92	169.0	31.83	5.31	173.7	29.23	5.94
	30	155.1	36.78	4.22	167.9	37.88	4.43	172.2	36.54	4.71	178.2	34.84	5.11	184.9	32.42	5.70
	35	161.4	40.26	4.01	175.7	41.54	4.23	180.7	40.34	4.48	188.8	38.61	4.89	197.6	36.39	5.43
	40	163.2	43.49	3.75	177.5	45.29	3.92	187.0	44.69	4.18	194.9	42.46	4.59	203.6	39.80	5.12
	45	162.8	47.02	3.46	177.0	49.57	3.57	190.7	49.54	3.85	198.3	46.67	4.25	206.9	43.46	4.76
	50	163.9	51.30	3.19	181.1	54.55	3.32	192.4	54.05	3.56	202.4	49.50	4.09	206.2	45.63	4.52
	55	165.9	55.50	2.99	185.6	59.28	3.13	196.8	57.89	3.40	205.1	51.92	3.95	-	-	-
	60	143.7	55.93	2.57	166.9	60.47	2.76	-	-	-	-	-	-	-	-	-
Nom	20	129.0	24.01	5.37	135.3	22.46	6.02	142.5	23.04	6.19	146.2	21.96	6.66	149.2	20.64	7.23
	25	130.8	25.55	5.12	138.9	24.47	5.68	146.6	24.27	6.04	151.3	23.13	6.54	155.5	21.75	7.15
	30	134.2	27.29	4.92	144.9	26.83	5.40	153.4	25.87	5.93	159.5	24.73	6.45	165.5	23.35	7.09
	35	138.7	29.57	4.69	152.1	29.88	5.09	161.3	27.83	5.80	169.0	26.63	6.35	176.9	25.20	7.02
	40	139.8	32.63	4.29	158.3	34.11	4.64	167.2	32.11	5.21	174.5	30.46	5.73	182.3	28.63	6.37
	45	139.1	36.31	3.83	162.4	39.29	4.13	170.8	37.62	4.54	177.6	35.32	5.03	185.2	32.89	5.63
	50	140.2	40.51	3.46	166.2	42.15	3.94	177.1	41.45	4.27	181.2	37.46	4.84	184.6	33.32	5.54
	55	140.6	42.85	3.28	171.7	46.08	3.73	184.2	44.05	4.18	185.6	40.38	4.60	-	-	-
	60	136.1	44.32	3.07	163.2	50.54	3.23	-	-	-	-	-	-	-	-	-

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

TC: Total Capacity, kW

PI: Power Input, kW

COP: Coefficient of Performance, kW/kW

Max: 100% frequency of compressor

Nom: Nominal data, normally 80% of maximum frequency

4.3 Correction Factor

By Percent Glycol

% Glycol	Ethylene Glycol			Propylene Glycol		
	Freezing Point (°C)	Correction Factor		Freezing Point (°C)	Correction Factor	
		Capacity	Power Input		Capacity	Power Input
0	0.0	1.000	1.000	0.0	1.000	1.000
10	-4.0	0.984	0.998	-3.0	0.976	0.996
20	-9.0	0.973	0.995	-7.0	0.961	0.992
30	-16.0	0.965	0.992	-13.0	0.948	0.988
40	-23.0	0.960	0.989	-22.0	0.938	0.984
50	-37.0	0.950	0.983	-35.0	0.925	0.975

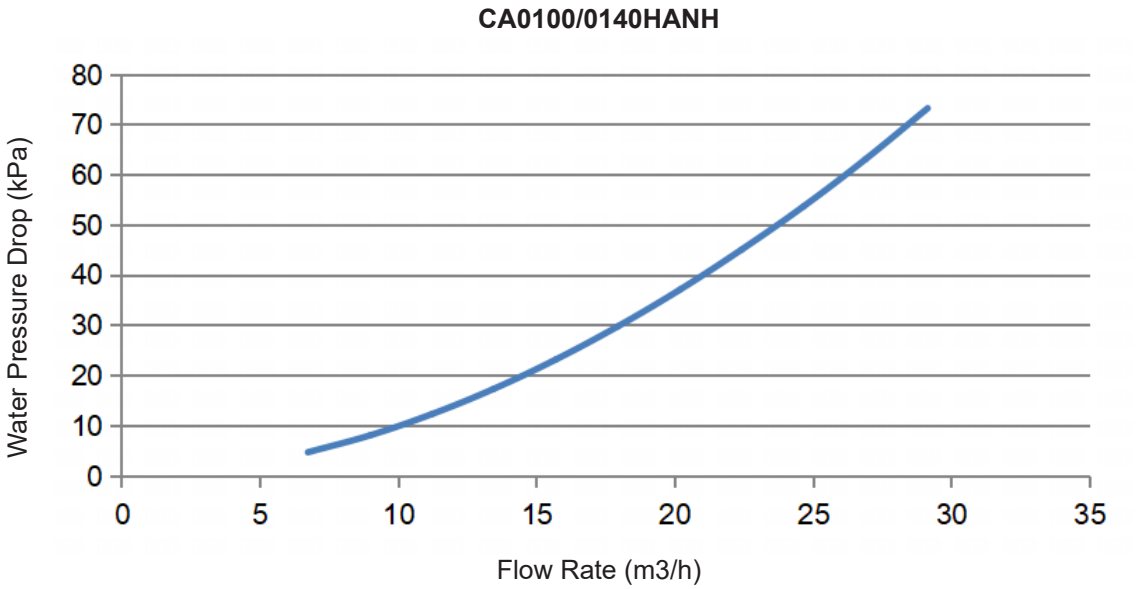
By Altitude

Altitude (m)	300	600	900	1200	1500	1800
Capacity	0.995	0.989	0.984	0.979	0.974	0.968
Power Input	1.004	1.009	1.012	1.015	1.019	1.024

By Fouling Factor

Fouling Factor (m^2•°C/kW)	Correction Factor	
	Capacity	Power Input
0.0176	1.042	1.108
0.0440	1.028	1.086
0.0880	1.000	1.000
0.1320	0.989	0.995
0.1760	0.977	0.989

5. Water Pressure Drop



% Nominal Flow	30	40	50	60	70	80	90	100	110	120	130
Flow Rate (m^3/h)	6.72	8.96	11.2	13.44	15.68	17.92	20.16	22.4	24.64	26.88	29.12
Water Pressure Drop (kPa)	4.78	8.14	12.38	17.42	23.26	29.86	37.16	45.18	53.8	63.2	73.33

Correction Factor

Fouling Factor (m^2•°C/kW)	Correction Factor
0.0176	0.940
0.0440	0.947
0.0880	1.000
0.1320	0.994
0.1760	0.988

6. Electrical Data

6.1 Cooling Operation

CA0100HANH

Standard Water Flow Rate (Cooling) = 17.2m^3/h

Condition	T_{ao}	T_{ewo} (°C)							
		-20	-15	-10	-5	-2	2	5	15
	°C DB	Running Current (A)							
Max	-5	-	-	-	31.68	34.41	34.20	33.72	38.82
	0	-	-	32.09	35.05	35.29	36.14	34.90	41.13
	5	30.35	30.02	34.93	38.22	38.53	36.35	36.54	44.85
	7	30.57	31.55	33.71	37.97	37.24	36.16	38.02	45.19
	10	31.55	36.14	34.62	36.97	35.30	37.36	38.17	45.34
	15	34.84	35.24	35.01	35.88	34.76	37.93	38.48	46.42
	18	36.14	37.21	37.32	38.02	37.88	40.76	41.02	51.15
	20	37.76	38.20	38.22	39.36	38.25	41.64	43.41	53.23
Nom	-5	-	-	-	19.60	19.82	22.80	21.38	23.95
	0	-	-	20.07	21.99	20.76	22.59	21.92	25.49
	5	18.42	18.37	21.69	23.81	21.15	22.70	22.53	27.42
	7	18.78	19.01	22.03	24.41	20.90	22.78	23.35	27.40
	10	19.68	19.93	21.62	22.86	22.32	22.90	23.78	28.02
	15	21.49	21.87	21.92	22.19	21.55	23.14	23.74	28.92
	18	21.77	22.32	21.67	22.06	21.46	22.45	22.73	27.72
	20	21.49	22.28	21.56	21.84	21.18	21.58	22.20	26.30

Condition	T_{ao}	T_{ewo} (°C)							
		20	25	30	35	40	45	50	53
	°C DB	Running Current (A)							
Max	-5	43.55	49.10	64.54	69.24	62.21	58.08	51.27	48.07
	0	46.77	51.68	65.83	72.12	62.75	58.62	54.64	54.36
	5	50.72	54.94	71.21	74.43	65.07	58.70	56.92	58.52
	7	51.84	54.65	71.74	76.18	65.50	59.44	57.70	57.67
	10	51.43	56.45	70.07	75.98	65.20	57.85	56.88	62.23
	15	52.94	58.14	68.47	74.55	65.64	-	-	-
	18	56.43	62.18	70.62	73.54	66.85	-	-	-
	20	59.47	63.92	70.93	74.36	68.37	-	-	-
Nom	-5	27.34	30.12	38.52	41.53	40.48	39.21	33.57	35.45
	0	28.31	31.36	38.72	42.76	40.91	38.34	34.78	38.14
	5	30.15	33.00	40.49	44.61	42.43	38.13	36.87	40.86
	7	30.38	33.50	42.12	46.36	43.18	39.33	36.72	38.62
	10	31.02	32.47	38.16	40.43	40.62	37.89	36.80	38.19
	15	30.43	31.73	36.81	39.05	40.58	-	-	-
	18	30.27	31.29	36.52	38.23	40.65	-	-	-
	20	28.57	30.02	35.79	37.38	40.91	-	-	-

CA0140HANH

Standard Water Flow Rate (Cooling) = 22.4m^3/h

Condition	T_{ao}	T_{ewo} (°C)							
		-20	-15	-10	-5	-2	2	5	15
	°C DB	Running Current (A)							
Max	-5	-	-	-	38.23	41.40	41.65	41.04	46.35
	0	-	-	39.17	42.92	43.05	43.63	42.78	50.27
	5	36.51	36.67	42.37	46.50	46.35	43.79	43.99	54.11
	7	36.66	36.93	40.94	45.35	44.50	43.53	45.77	54.03
	10	38.40	38.75	42.12	44.54	42.73	44.90	46.55	54.86
	15	41.80	42.46	42.69	43.22	42.36	45.47	46.31	56.55
	18	44.23	44.98	45.51	46.11	45.65	48.87	49.93	61.57
	20	45.32	46.19	46.61	47.22	46.62	50.31	52.43	63.87
Nom	-5	-	-	-	28.93	31.33	31.52	31.06	35.08
	0	-	-	29.65	32.48	32.58	33.02	32.37	38.04
	5	27.63	27.75	32.06	35.19	35.08	33.14	33.29	40.95
	7	27.74	27.95	30.98	34.32	33.68	32.94	34.64	40.89
	10	29.06	29.33	31.88	33.71	32.34	33.98	35.23	41.51
	15	31.63	32.13	32.31	32.71	32.05	34.41	35.05	42.79
	18	33.48	34.04	34.44	34.89	34.55	36.99	37.79	46.60
	20	34.30	34.95	35.27	35.74	35.28	38.07	39.68	48.34

Condition	T_{ao}	T_{ewo} (°C)							
		20	25	30	35	40	45	50	53
	°C DB	Running Current (A)							
Max	-5	52.91	58.64	78.91	83.60	61.07	58.54	50.33	47.76
	0	56.24	62.42	79.52	86.50	62.17	57.47	53.30	53.05
	5	59.71	65.71	81.44	89.04	64.34	58.62	56.55	57.63
	7	60.34	66.25	84.02	91.34	65.06	59.87	56.84	58.91
	10	61.07	67.16	83.10	91.48	64.61	57.63	56.74	61.32
	15	62.77	69.24	81.08	87.46	65.64	-	-	-
	18	67.88	74.40	84.34	86.94	66.88	-	-	-
	20	71.01	77.34	87.68	88.22	67.89	-	-	-
Nom	-5	40.19	44.38	58.65	63.26	61.07	58.54	50.33	47.76
	0	43.18	47.24	60.52	65.46	62.17	57.47	53.30	53.05
	5	45.73	49.73	63.93	67.39	64.34	58.62	56.55	57.63
	7	46.93	50.14	65.99	69.13	65.06	59.87	56.84	57.63
	10	46.81	50.83	63.08	69.23	64.61	57.63	56.74	61.32
	15	48.45	52.40	63.15	66.19	65.64	-	-	-
	18	51.89	56.30	64.14	65.31	66.88	-	-	-
	20	54.04	58.53	63.96	66.76	67.89	-	-	-

T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

Max: 100% frequency of compressor

Nom: Nominal data, normally 80% of maximum frequency

6.2 Heating Operation

CA0100HANH

Standard Water Flow Rate (Cooling) = 17.2m^3/h

Condition	T_{ao}	T_{ewo} (°C)							
		-30	-25	-20	-15	-10	-7	-5	-2
	°C DB	Running Current (A)							
Max	20	35.57	38.85	43.21	44.35	44.96	45.96	46.22	46.69
	25	39.74	43.41	47.42	47.63	48.89	49.13	50.80	50.63
	30	43.87	48.53	52.05	52.38	51.66	53.61	54.68	54.59
	35	50.27	55.62	59.23	57.39	56.29	58.42	59.68	61.46
	40	48.01	53.69	65.25	62.91	61.79	63.67	64.74	65.24
	45	44.24	52.16	71.60	70.32	68.14	68.02	69.10	71.08
	50	49.72	56.47	80.33	76.56	76.12	77.18	79.53	80.60
	55	-	-	-	83.11	81.54	83.75	86.46	87.59
	60	-	-	-	-	-	-	-	-
Nom	20	22.06	23.49	27.21	28.06	27.24	28.28	27.83	28.27
	25	24.42	25.78	29.55	29.75	29.45	29.87	30.40	30.33
	30	26.74	28.31	32.26	32.26	31.00	32.17	32.55	32.38
	35	30.27	31.72	36.41	34.80	33.59	34.52	35.23	35.94
	40	28.74	30.51	39.72	38.21	36.63	37.25	37.99	37.93
	45	26.23	29.43	42.97	42.69	40.02	39.23	40.19	40.96
	50	31.20	33.74	47.84	46.97	44.18	44.04	45.92	44.84
	55	-	-	-	51.26	46.68	47.78	49.36	48.64
	60	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)								
		0	2	7	10	12	20	30	40	50
	°C DB	Running Current (A)								
Max	20	45.74	46.46	44.27	44.48	39.81	41.30	38.82	36.79	46.69
	25	50.19	49.43	47.96	47.40	43.65	42.95	41.45	38.58	50.63
	30	54.51	51.93	51.15	49.99	48.27	45.81	43.74	41.98	54.59
	35	60.10	55.96	54.90	54.22	53.81	49.30	47.39	44.98	61.46
	40	65.05	61.21	61.10	60.04	60.71	57.76	54.69	50.87	65.24
	45	69.94	67.68	67.14	68.01	70.44	67.89	62.67	58.54	71.08
	50	81.67	77.87	74.78	75.13	75.02	74.30	66.87	60.12	80.60
	55	89.09	81.45	78.82	79.13	82.08	79.60	71.74	-	87.59
	60	-	84.74	81.20	81.96	91.41	-	-	-	-
Nom	20	28.40	28.05	26.94	26.68	24.61	25.61	24.21	23.15	28.27
	25	30.93	29.43	28.72	27.94	26.77	26.50	25.71	24.12	30.33
	30	33.39	30.25	30.04	28.93	29.46	28.21	27.06	26.08	32.38
	35	36.48	32.73	32.77	30.77	32.63	30.26	29.22	27.78	35.94
	40	39.36	35.52	35.48	34.29	36.65	35.24	33.57	31.30	37.93
	45	42.04	39.98	39.26	38.95	42.23	41.04	38.21	35.82	40.96
	50	46.21	45.22	45.06	43.78	45.16	45.03	40.97	37.87	44.84
	55	50.04	48.17	47.57	46.78	49.63	48.52	44.21	-	48.64
	60	-	52.81	52.62	49.06	56.61	-	-	-	-

CA0140HANH

Standard Water Flow Rate (Cooling) = 24.4m^3/h

Condition	T_{ao}	T_{ewo} (°C)							
		-30	-25	-20	-15	-10	-7	-5	-2
	°C DB	Running Current (A)							
Max	20	34.40	38.56	42.78	44.27	45.69	49.75	50.73	51.39
	25	38.04	43.90	46.44	48.77	48.40	53.74	54.66	56.91
	30	42.78	49.29	52.12	52.54	52.64	58.24	58.28	61.28
	35	48.86	56.19	59.50	57.38	57.13	63.76	64.94	68.35
	40	46.71	54.51	65.88	64.22	62.57	68.73	69.84	73.04
	45	42.43	51.77	72.96	71.87	69.22	74.09	74.61	77.73
	50	47.75	57.52	82.46	79.53	76.84	84.27	85.57	88.46
	55	-	-	-	80.47	79.66	87.68	87.34	92.00
	60	-	-	-	-	-	-	-	-
Nom	20	33.58	36.35	41.02	40.96	40.93	40.56	41.36	40.58
	25	37.51	41.20	44.13	45.21	43.26	43.82	44.57	44.93
	30	41.41	46.06	49.13	48.80	46.96	47.49	47.52	48.39
	35	47.45	52.22	55.48	53.41	50.84	51.99	52.95	53.97
	40	44.97	50.69	61.12	59.38	55.20	56.05	56.95	57.68
	45	40.86	48.16	67.22	65.87	60.37	60.41	61.18	61.38
	50	45.91	53.61	76.25	72.27	67.86	68.72	69.77	71.68
	55	-	-	-	76.75	71.27	74.95	74.66	76.68
	60	-	-	-	-	-	-	-	-

Condition	T_{ao}	T_{ewo} (°C)								
		0	2	7	10	12	20	30	40	50
	°C DB	Running Current (A)								
Max	20	52.08	52.04	52.03	52.13	50.24	52.26	49.83	46.47	42.78
	25	56.31	56.40	55.56	55.94	54.72	56.19	53.59	50.36	46.90
	30	60.44	60.09	59.07	59.81	58.70	60.79	58.32	55.13	51.74
	35	65.95	65.74	63.76	64.02	64.26	65.73	64.74	61.96	58.08
	40	70.23	71.05	69.69	70.05	69.80	71.65	71.32	68.14	63.87
	45	75.39	76.33	75.54	75.37	75.04	79.11	79.06	74.90	68.76
	50	87.03	86.60	83.42	82.39	82.33	87.54	86.74	78.31	72.18
	55	95.39	93.87	88.27	87.24	87.80	95.14	91.59	82.86	-
	60	-	-	84.28	93.89	89.26	96.51	-	-	-
Nom	20	41.63	40.52	40.11	39.35	37.98	36.05	36.97	34.75	33.13
	25	45.31	44.17	42.65	42.04	41.00	39.27	38.73	36.59	34.91
	30	48.93	47.30	45.38	44.82	43.55	43.05	41.29	39.12	37.27
	35	53.81	52.08	49.51	47.76	47.19	47.27	44.66	42.73	40.22
	40	57.30	56.61	53.80	53.10	52.36	53.97	51.25	48.88	45.94
	45	61.49	61.25	58.99	58.33	57.96	62.70	60.05	56.68	52.04
	50	70.63	69.85	67.75	64.86	65.01	67.65	66.53	59.27	52.72
	55	77.38	77.15	70.35	69.21	67.80	73.95	69.69	64.45	-
	60	-	-	78.22	74.10	70.74	80.65	-	-	-

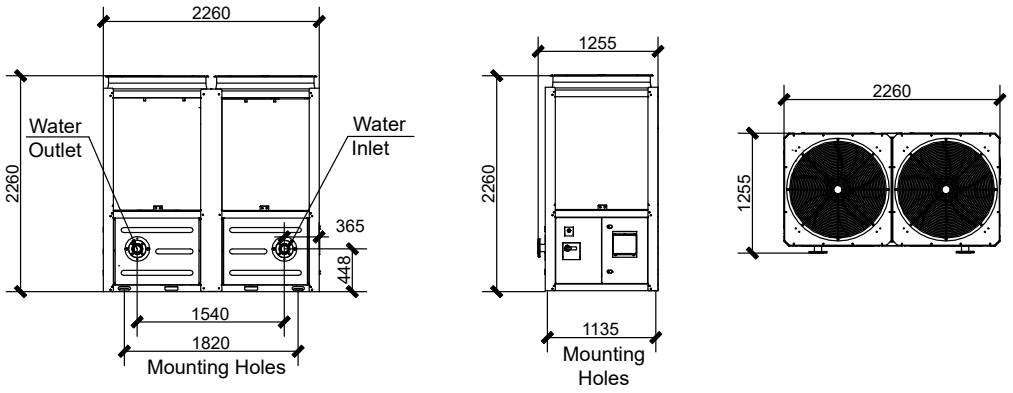
T_{ao}: Ambient temperature

T_{ewo}: Leaving water temperature

Max: 100% frequency of compressor

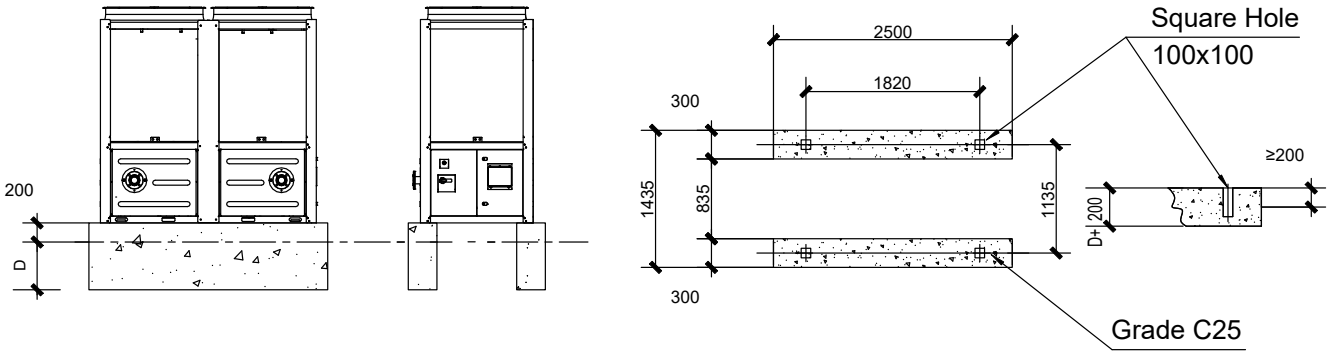
Nom: Nominal data, normally 80% of maximum frequency

7. Dimensions



Front View Side View Top View

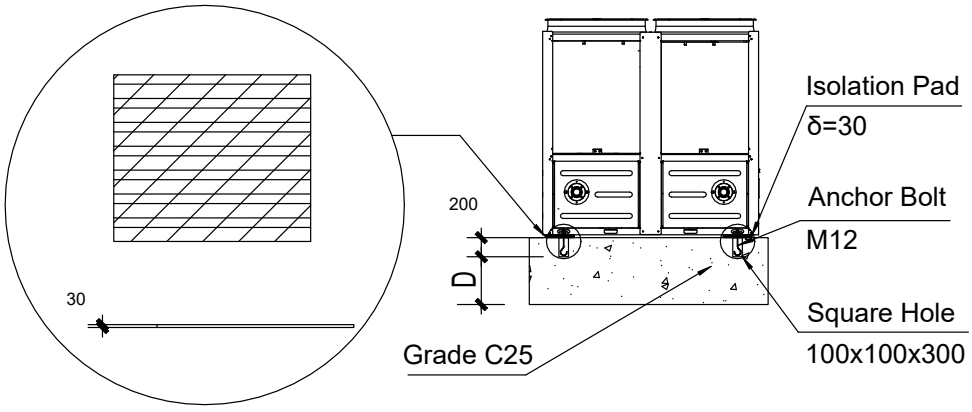
External Dimension



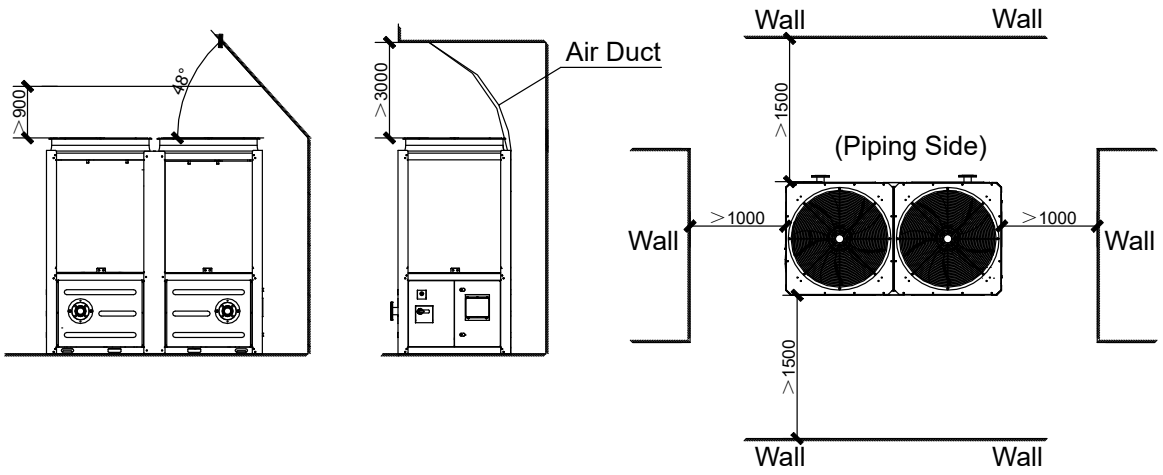
Ground Clearance Strip Foundation Dimension

Note: The minimum height of the foundation should be the local average snowfall D + 200mm.

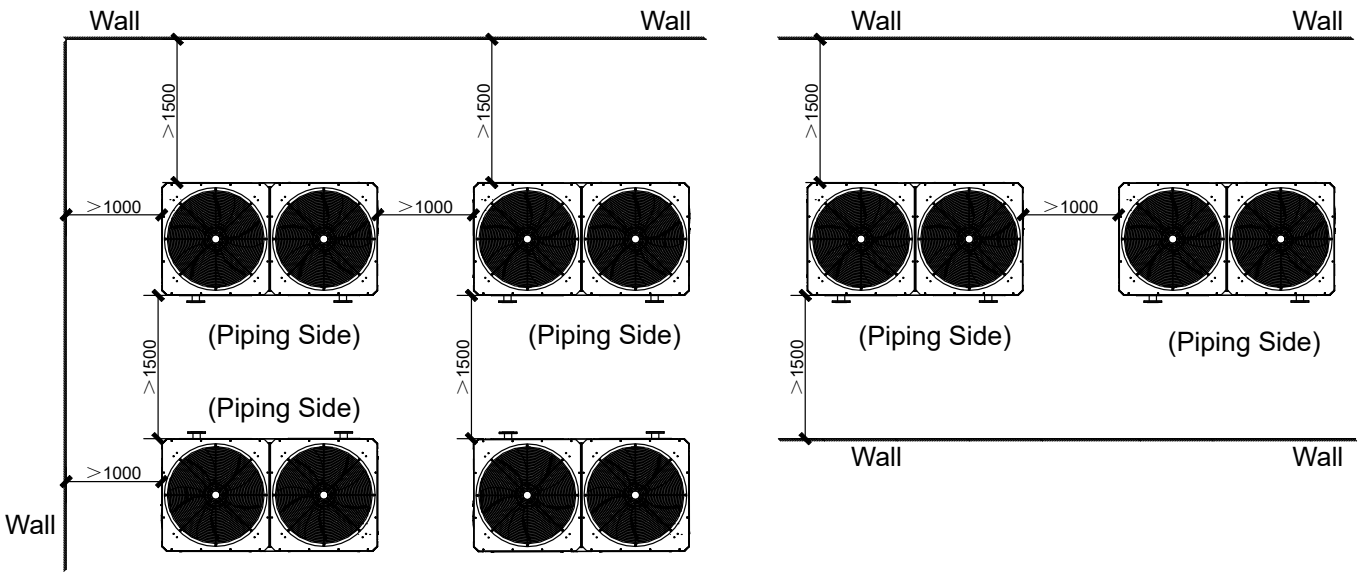
Note: The isolation pad's edge and the anchor bolt should maintain a minimum clearance of 100 mm on either side.



Standard Isolation (Isolation Pads)



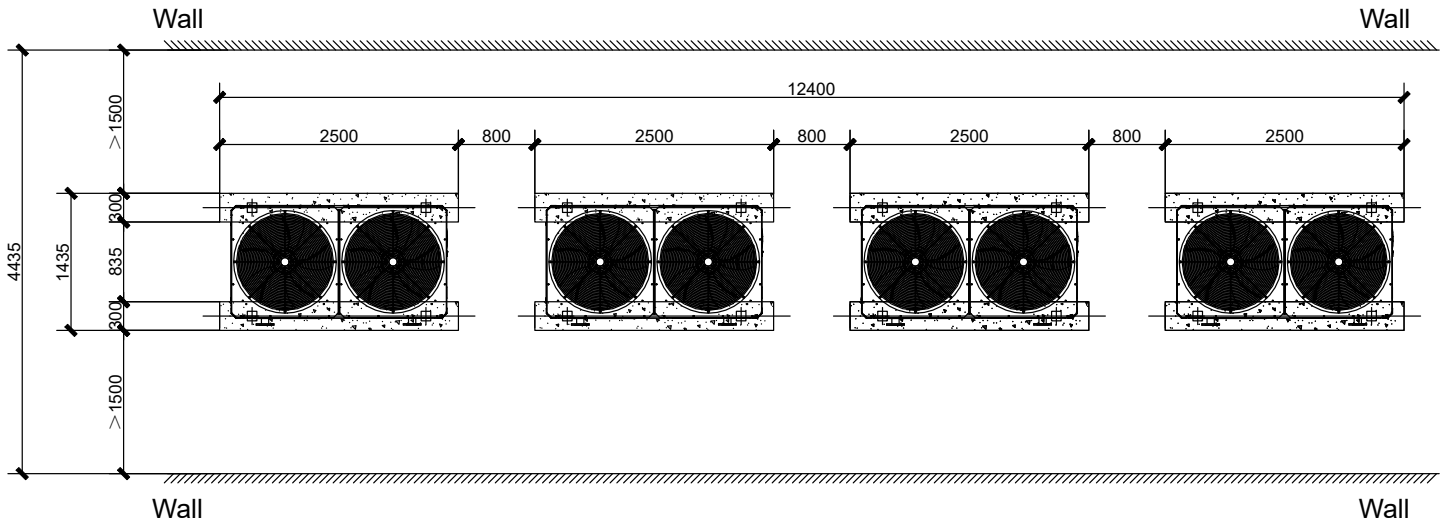
Installation Clearance (Single Chiller)



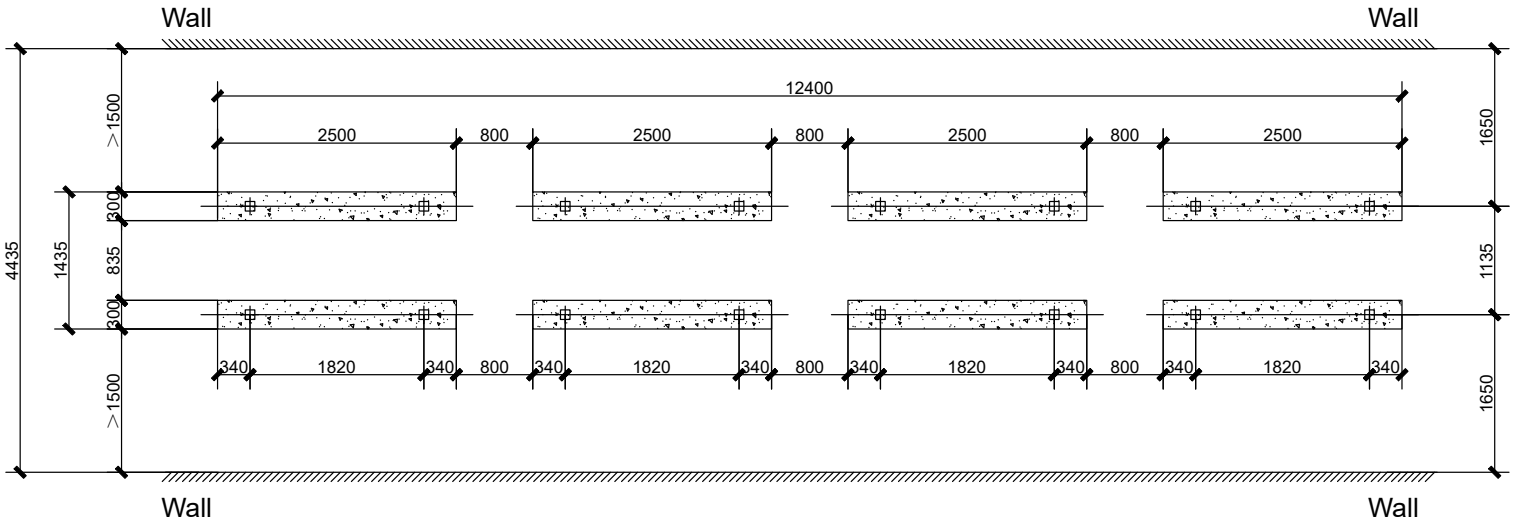
Installation Clearance (Multiple Chillers)

Note: All dimensions are in millimeters (mm).

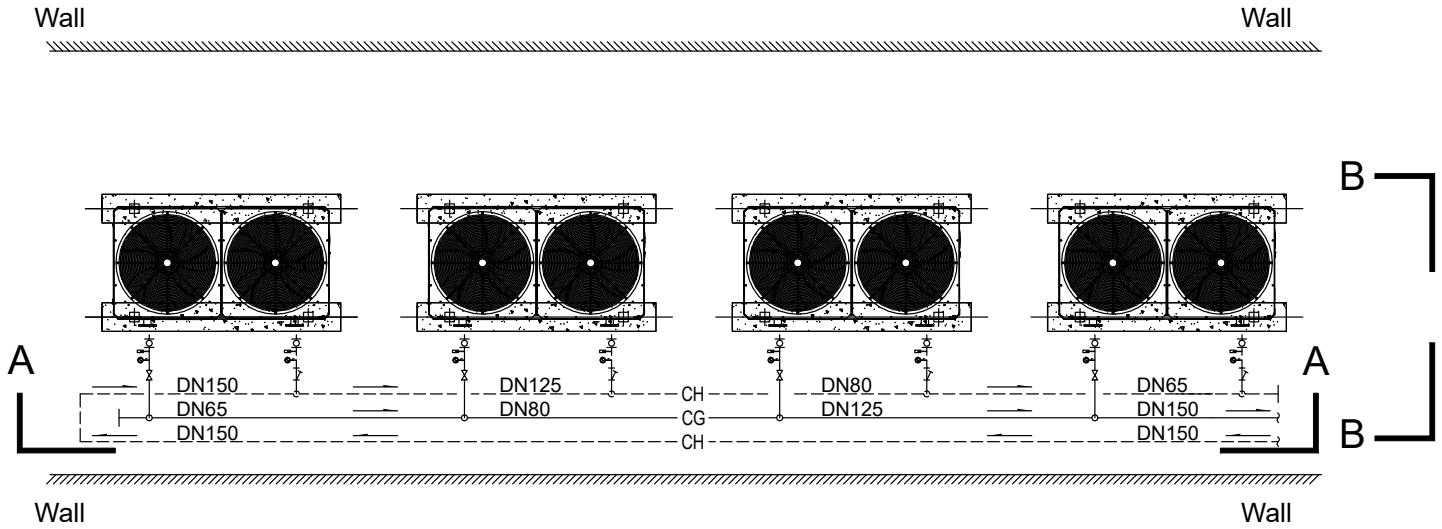
Multiple Chillers Arrangement, Type 1



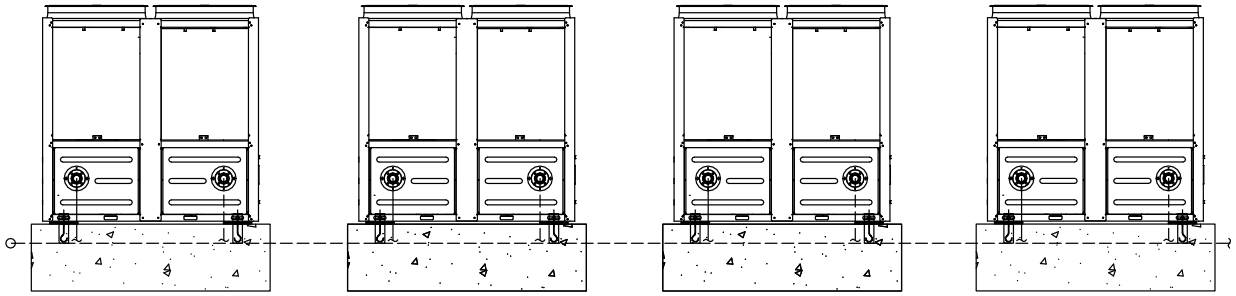
Equipment Layout Plan



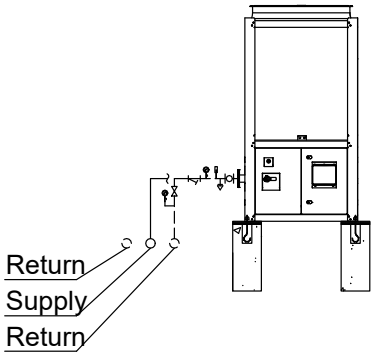
Foundation Layout Plan



Pipeline Layout Plan

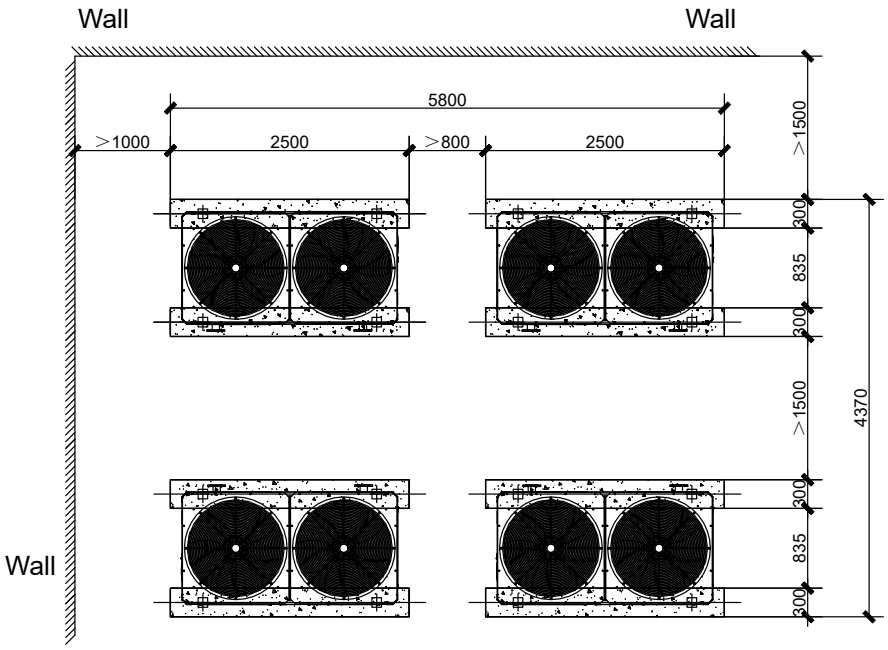


Section A-A

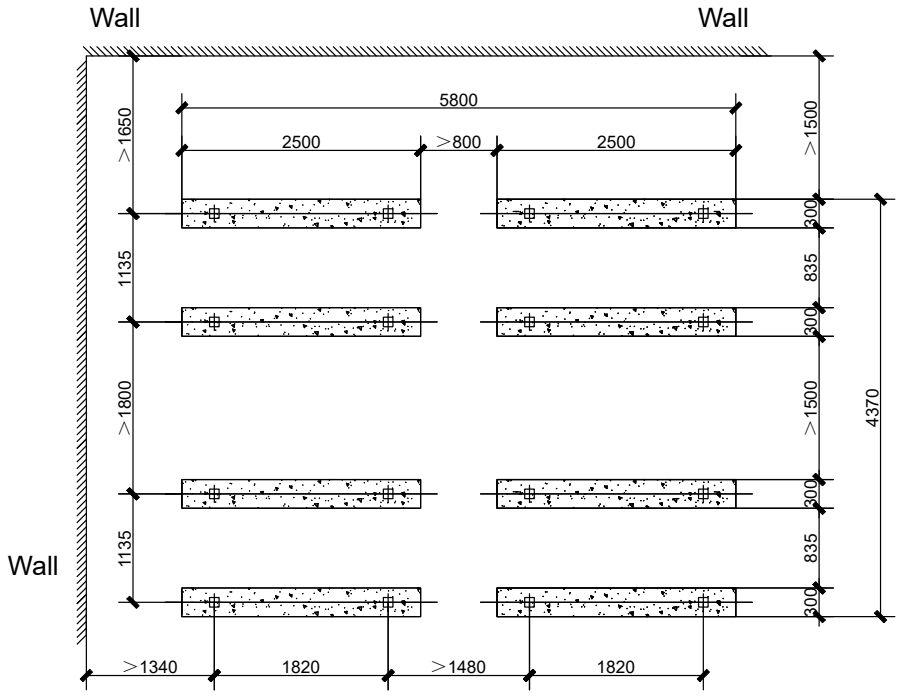


Section B-B

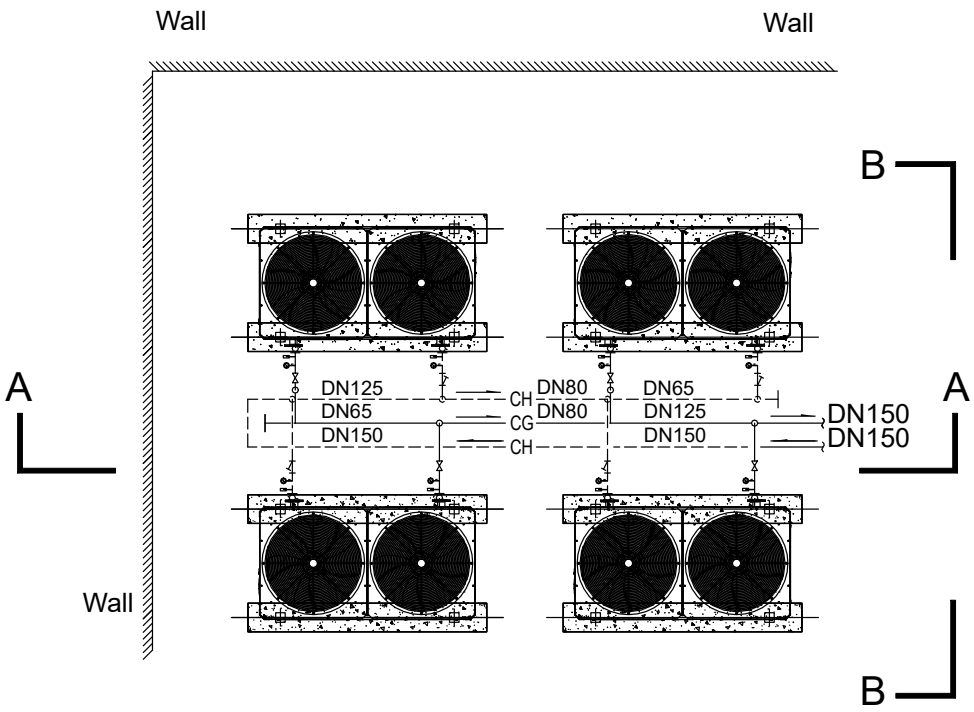
Multiple Chillers Arrangement, Type 2



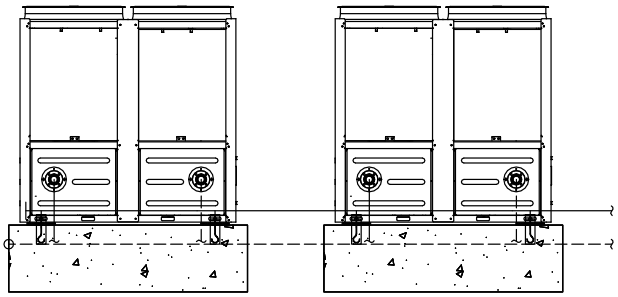
Equipment Layout Plan



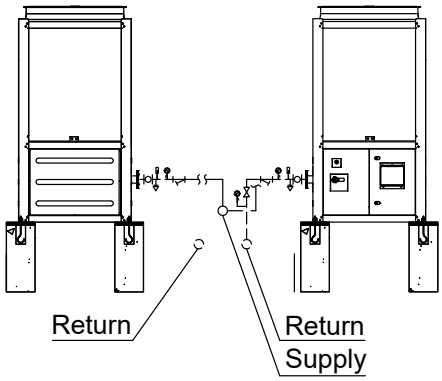
Foundation Layout Plan



Pipeline Layout Plan

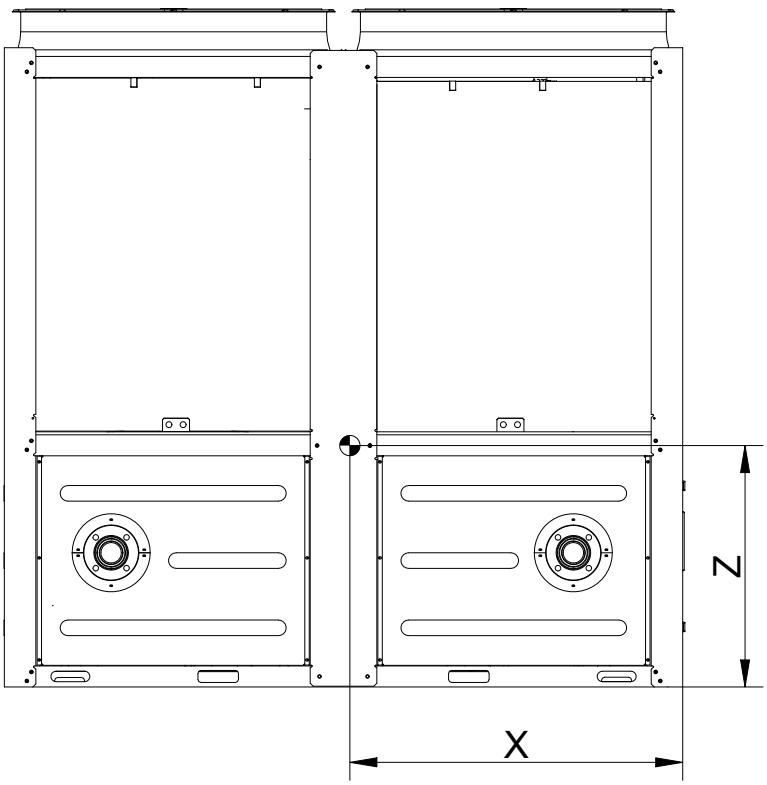


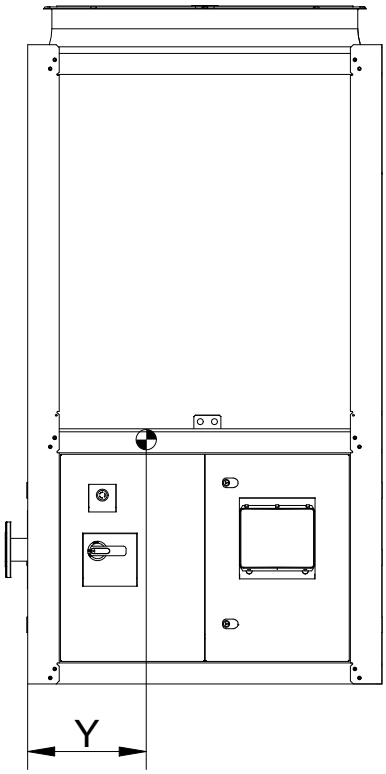
Section A-A

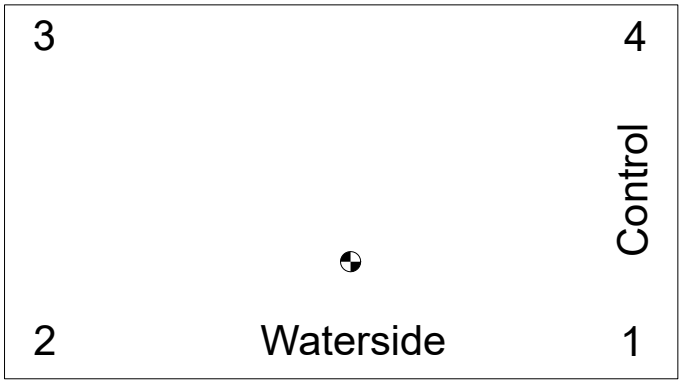


Section B-B

8. Center of Gravity / Weight Distribution





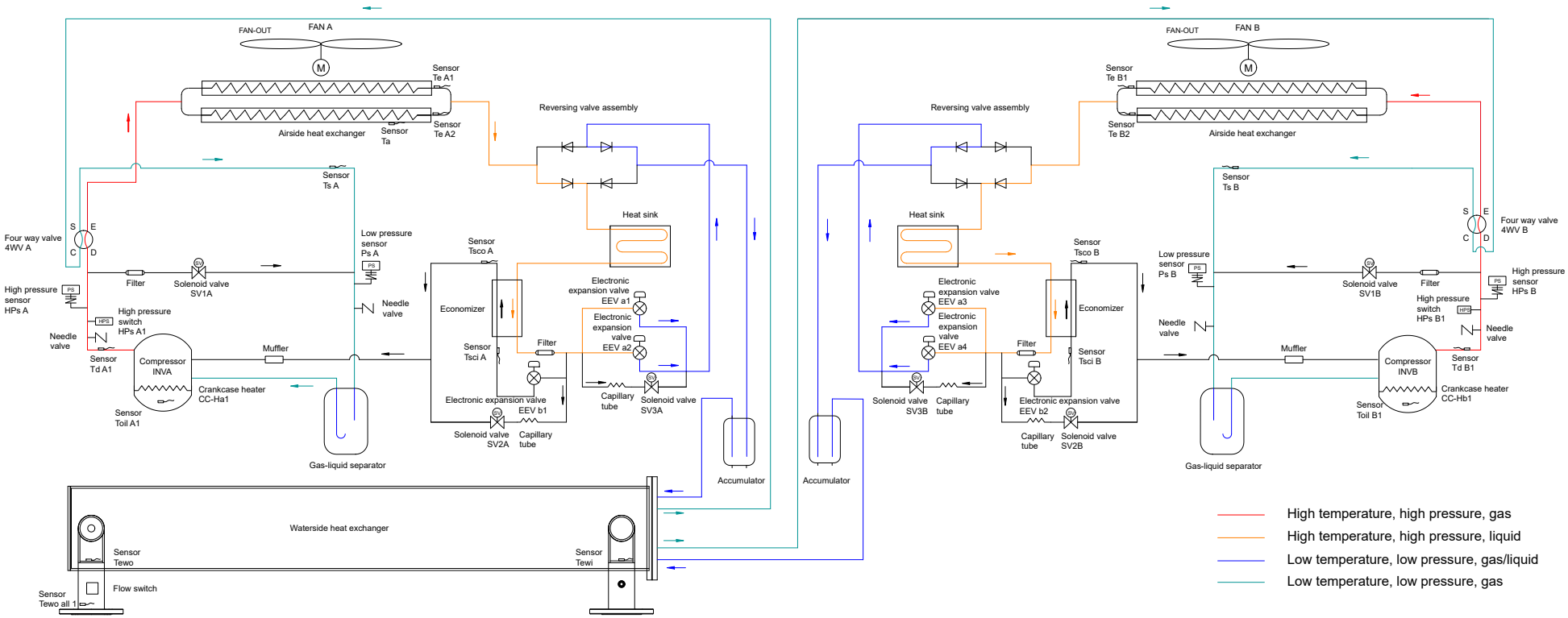


Model	Empty				Running				
	Net Weight	Center of Gravity			Operating Weight	Water	Center of Gravity		
		X	Y	Z			X	Y	Z
	kg	mm	mm	mm	kg	kg	mm	mm	mm
CA0100HANH	910	1110	395	804	973	63	1130	375	760
CA0140HANH	910	1110	395	804	973	63	1130	375	760

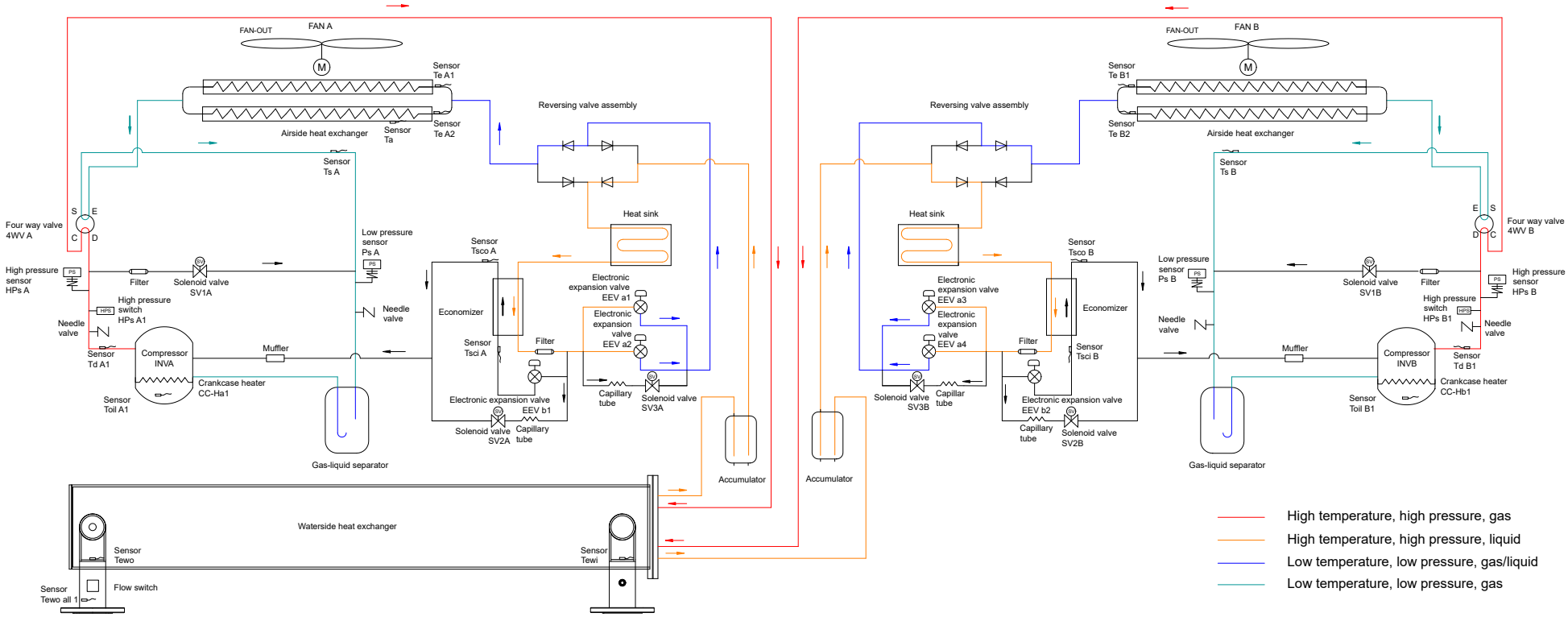
Model	Supporting Point Weight Distribution (kg)			
	Point 1	Point 2	Point 3	Point 4
CA0100HANH	267	254	223	229
CA0140HANH	267	254	223	229

9. Refrigerant System

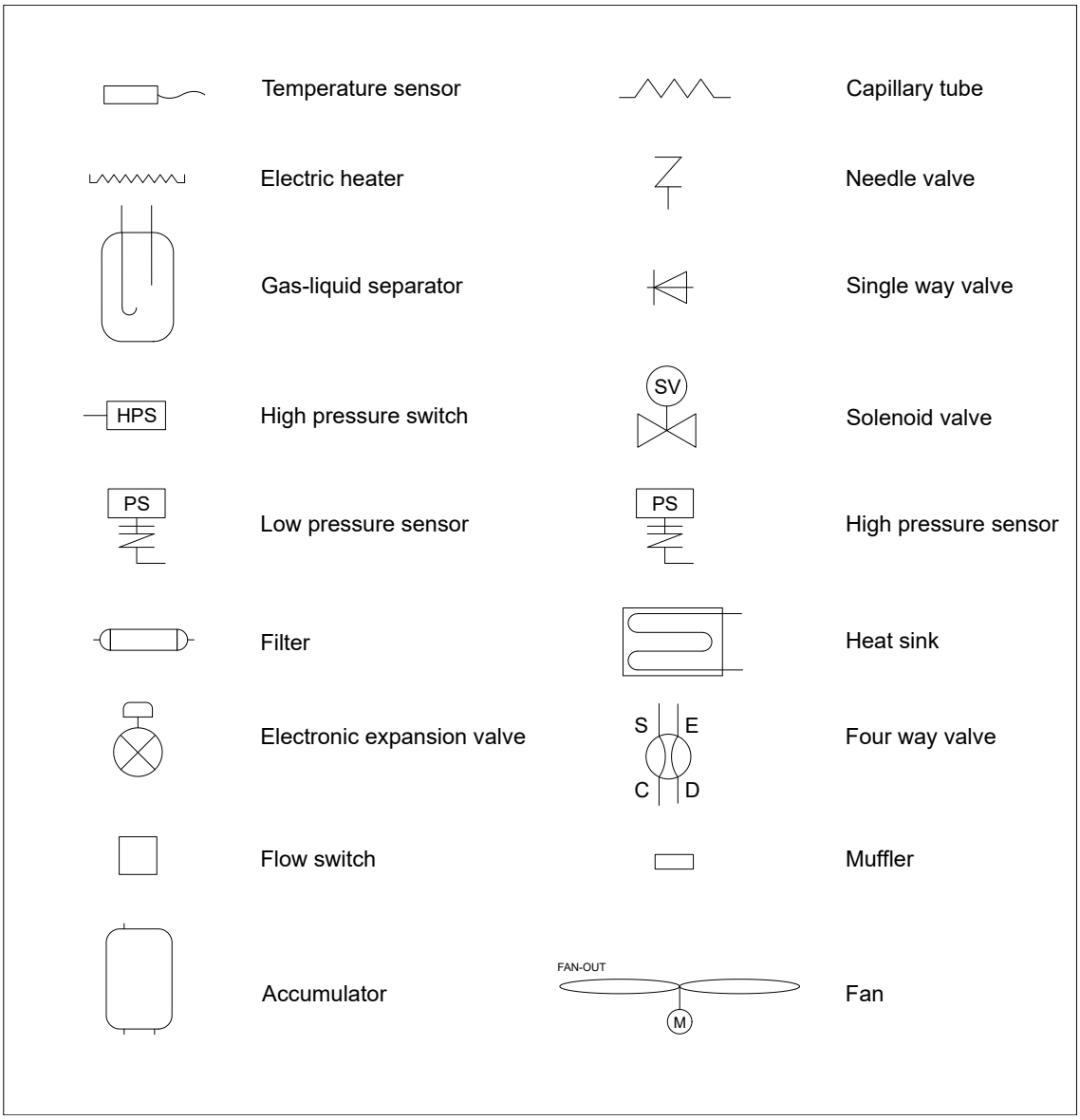
9.1 Piping Diagrams



Cooling



Heating & Domestic Hot Water

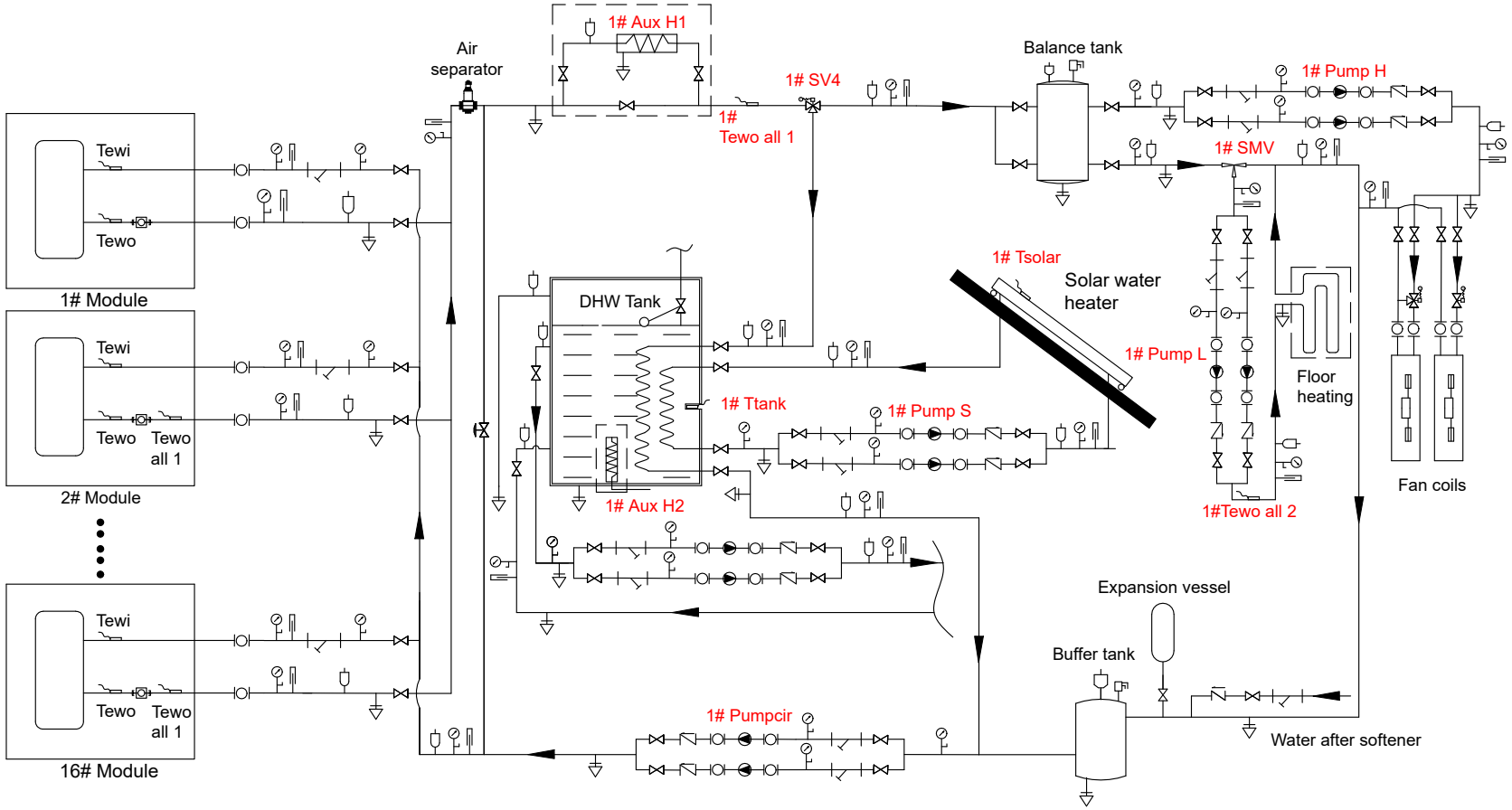

Temperature sensor
Capillary tube
Electric heater
Needle valve
Gas-liquid separator
Single way valve
HPS
High pressure switch
SV
Solenoid valve
PS
Low pressure sensor
PS
High pressure sensor
Filter
Heat sink
Electronic expansion valve
S
E
C
D
Four way valve
Flow switch
Muffler
Accumulator
FAN-OUT
M
Fan

No.	Legend	Description	Function
1	INVA/B	Compressor	Engine of the refrigeration cycle, drive the process forward, maintain high and low pressure differences.
2	Toil A1/B1	Oil temperature sensor	Measure the oil temperature at the bottom of the compressor to prevent startups with presence of liquid refrigerant.
3	CC-Ha1/b1	Crankcase heater	Heat the compressor oil temperature to prevent start-ups with presence of liquid refrigerant.
4	/	Gas-liquid separator	Separate liquid refrigerant in the returning gas to prevent liquid slugging.
5	/	Muffler	Silence and buffer.
6	Td A1/B1	Discharge temperature sensor	Measure the compressor discharge temperature.
7	HPs A1/B1	High pressure switch	Disconnect when high pressure is too high, and the chiller stops.
8	HPs A/B	Discharge pressure sensor	Measure high side discharge pressure.
9	4WV A/B	Four way valve	Reverse the direction of refrigerant flow to switch between cooling and heating. De-energized in heating mode. Energized in cooling mode.
10	/	Filter	Filter impurities in the refrigerant.
11	SV1 A/B	Hot gas bypass (HGBP) solenoid valve	Balance the system pressure when the low side pressure is too low.
12	Ps A/B	Suction pressure sensor	Measure low side suction pressure.
13	Ts A/B	Suction temperature sensor	Measure suction temperature.
14	/	Airside heat exchanger	During heating, the heat absorbed from the air is discharged into the waterside heat exchanger to exchange heat with the air. During cooling, the heat absorbed from the waterside heat exchanger is released into the air.
15	Ta	Ambient temperature sensor	Measure ambient temperature.
16	Te A1/A2/B1/B2	Coil outlet temperature sensor	Measure the outlet temperature of the coil.
17	Fan A/B	Fan motor assembly	Provide airflow for the airside heat exchanger to enhance heat exchange.
18	/	Reversing valve assembly (four single way valves welded together)	Switch the direction of the refrigerant flow so that the heat sink is always on the high pressure side.
19	/	Heat sink	Cool the inverter PCB.
20	EEV a1/a2/a3/ a4	Main circuit electronic expansion valve	Control the flow of the refrigeration system.
21	SV3 A/B	Throttle solenoid valve	Increase the refrigerant volume in the cooling mode and defrosting mode.
22	/	Capillary tube	Throttle and reduce pressure.
23	EEV b1/b2	Economizer electronic expansion valve	Control the refrigerant flow of vapour injection on the auxiliary circuit.
24	SV2 A/B	Liquid injection solenoid valve	Increase the auxiliary circuit refrigerant flow and reduce the discharge temperature.
25	Tsci A/B	Economizer liquid inlet temperature sensor	Measure the economizer liquid inlet temperature on the auxiliary circuit.

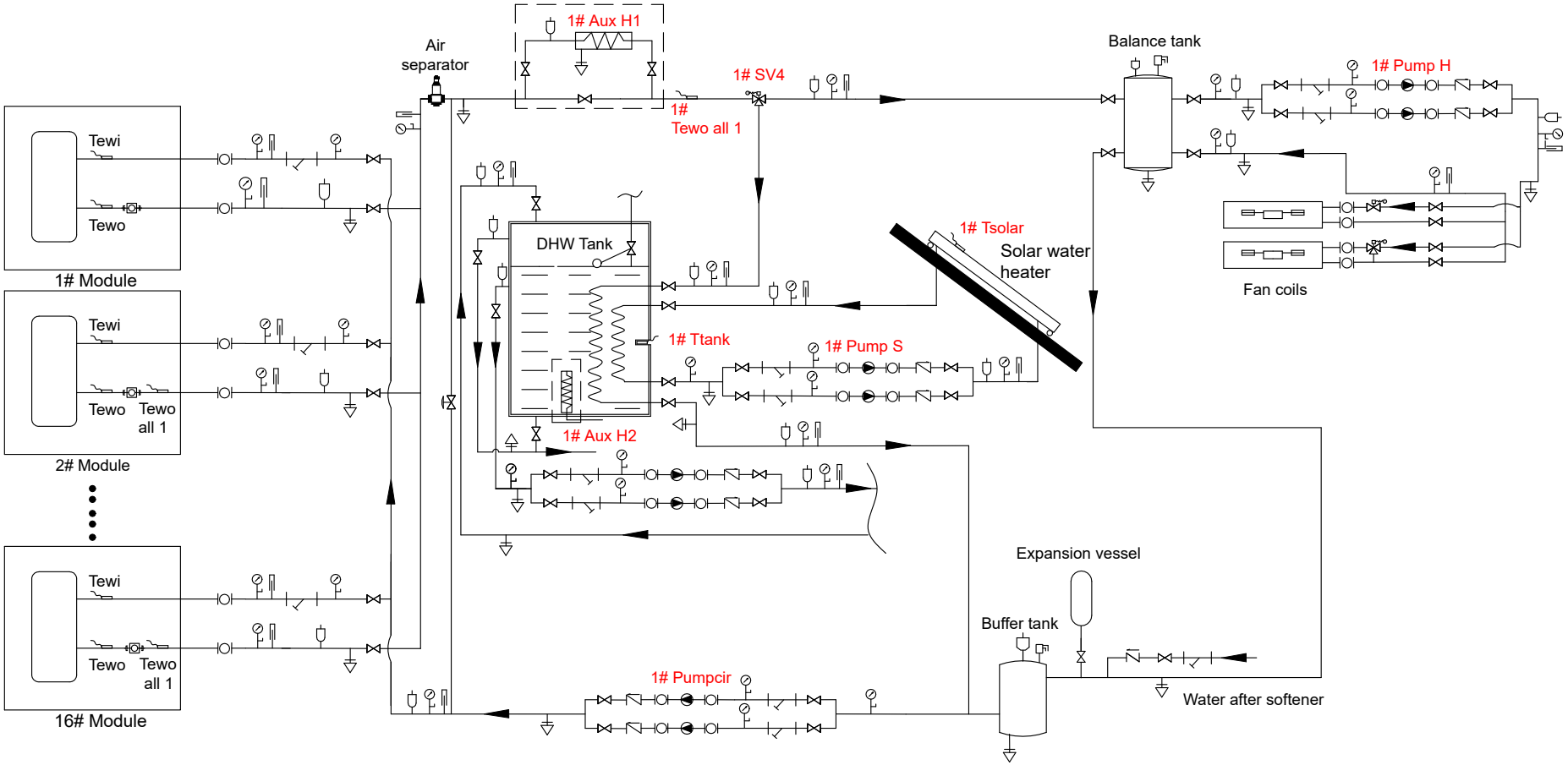
No.	Legend	Description	Function
26	Tsco A/B	Economizer gas outlet temperature sensor	Measure the economizer gas outlet temperature on the auxiliary circuit.
27	/	Accumulator	Store excess refrigerant during heating.
28	/	Waterside heat exchanger	Waterside heat exchange, providing cooling or heating source for the end users.
29	Tewi	Entering water temperature sensor	Measure the water inlet temperature.
30	Tewo	Leaving water temperature sensor	Measure the water outlet temperature.
31	Tewo all 1	Total leaving water temperature sensor 1	For single zone control, it is the total leaving water temperature sensor. For dual zone control, it is the total leaving water temperature for Zone1.
32	/	Flow switch	Low water flow protection.
33	/	Needle valve	Refrigerant service port.
34	/	Economizer	Economizer is a component where the refrigerant, after undergoing condensation, and the refrigerant from the auxiliary circuit, after throttling, exchange heat. As a result, the refrigerant entering the auxiliary circuit's compressor vapor injection port is heated and transformed into gas. Simultaneously, it increases subcooling of refrigerant in the main circuit.

10. Water System

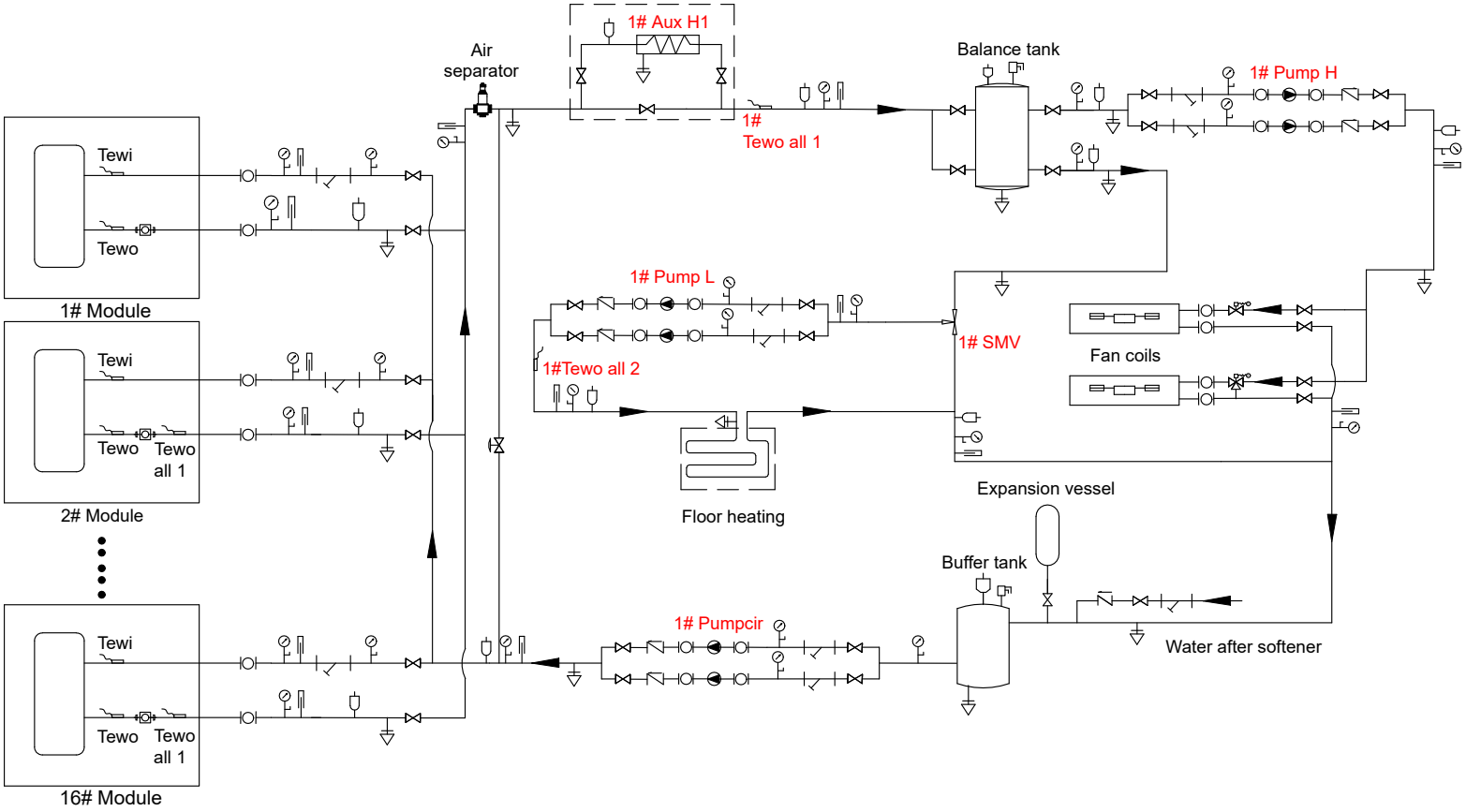
10.1 Piping Diagrams



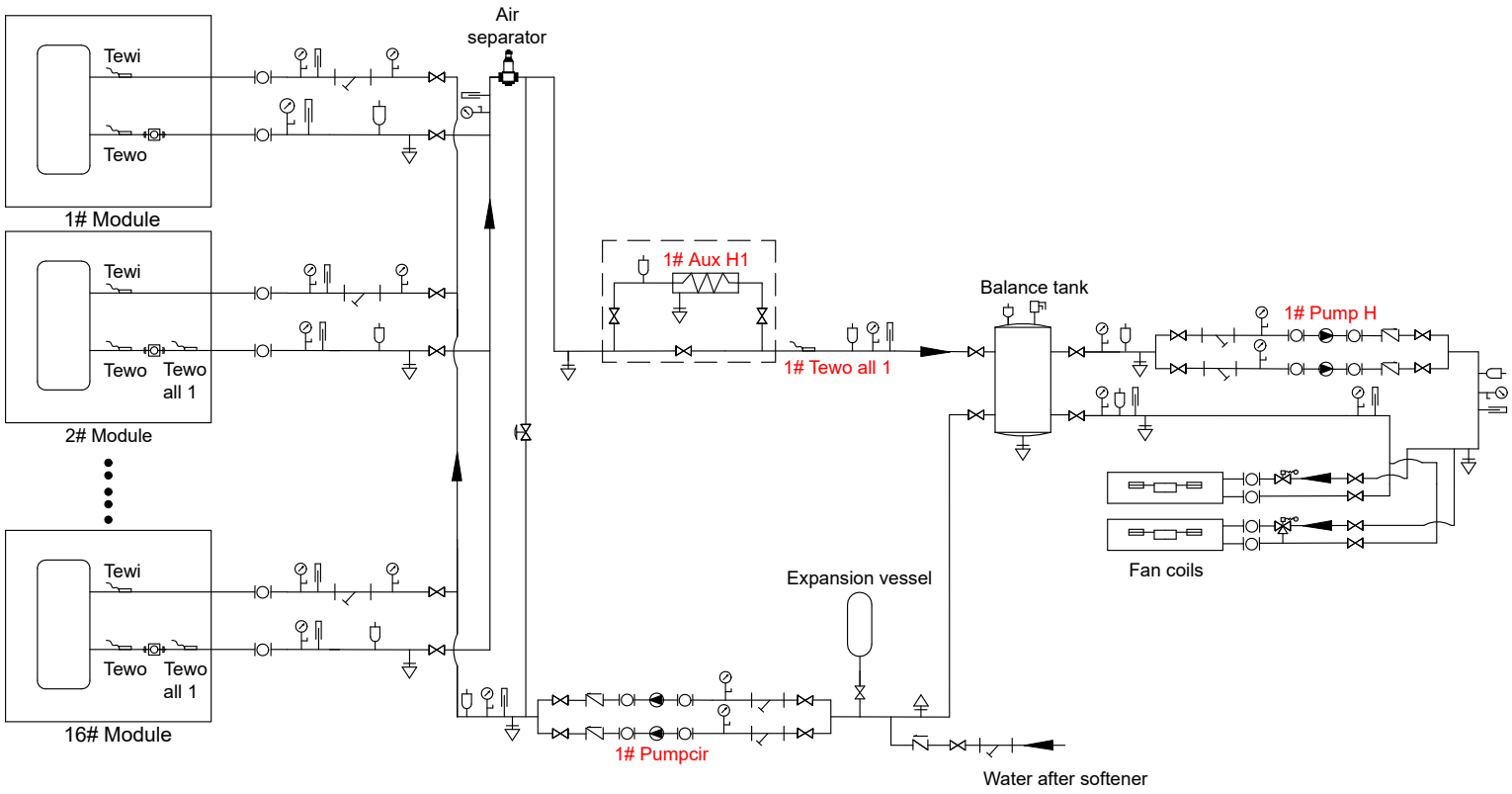
Dual Zone Domestic Hot Water &
Solar Hot Water



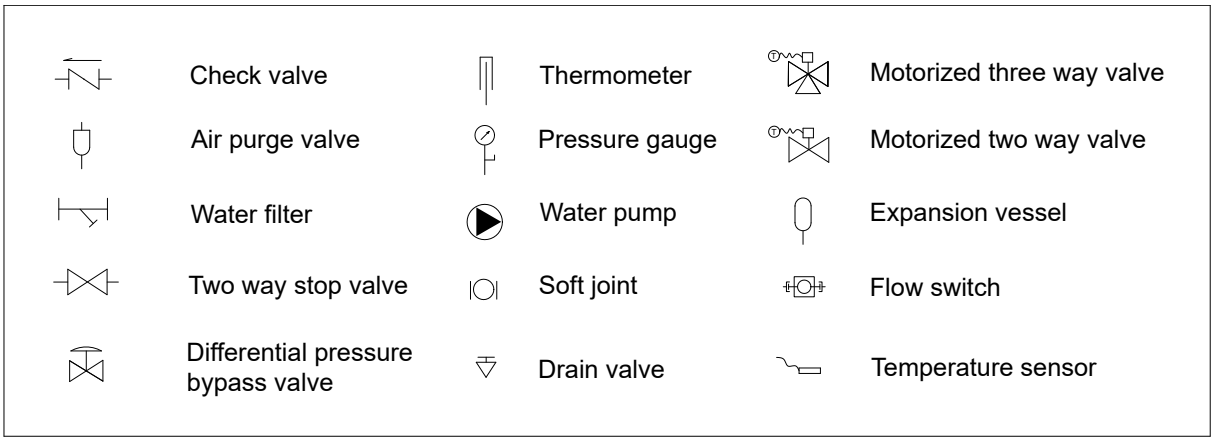
Zone1 Domestic Hot Water &
Solar Hot Water


1# Aux H1
Air separator
Balance tank
1# Pump H
1# Tewo all 1
Tewi
Tewo
1# Module
1# Pump L
1# SMV
1#Tewo all 2
Fan coils
Tewi
Tewo
Tewo all 1
2# Module
Floor heating
Expansion vessel
Buffer tank
1# Pumpcir
Water after softener
Tewi
Tewo
Tewo all 1
16# Module

Dual Zone



Single Zone (Zone1)



10.2 External Components

PUMPcir: Provides water flow for the unit.

PUMP H: For single zone control, it is an external circulating water pump. For dual zone control, it is the circulating water pump for Zone1.

PUMP L: Circulating water pump for Zone2

PUMP S: Solar water circulating pump

Aux H1: Waterside electric heater in HEAT mode

Aux H2: DHW tank electric heater in DHW mode

$T_{ewo\ all\ 1}$: For single zone control, it is the total leaving water temperature sensor. For dual zone control, it is the total leaving water temperature for Zone1. This sensor is an integral part of the chiller. When installing multiple modules in parallel, $T_{ewo\ all\ 1}$ from the Main module must be removed and reinstalled in order to function as the entire system's leaving water temperature sensor.

$T_{ewo\ all\ 2}$: For dual zone control, it is the total leaving water temperature for Zone2.

T_{tank}: Tank temperature sensor, monitors the temperature of the DHW tank.

T_{solar}: Solar water temperature sensor

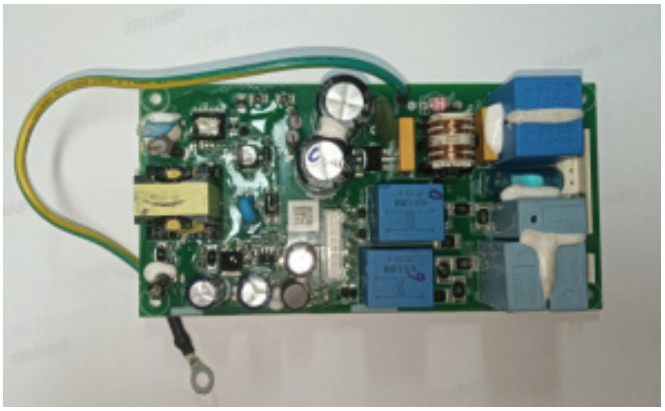
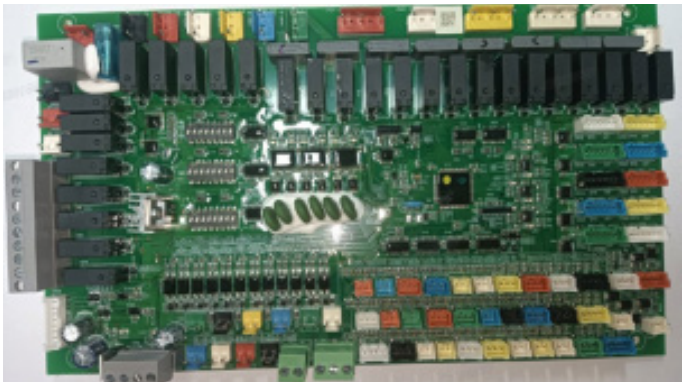
SV4: DHW three way valve; when energized, the water path switches to the hot water path.

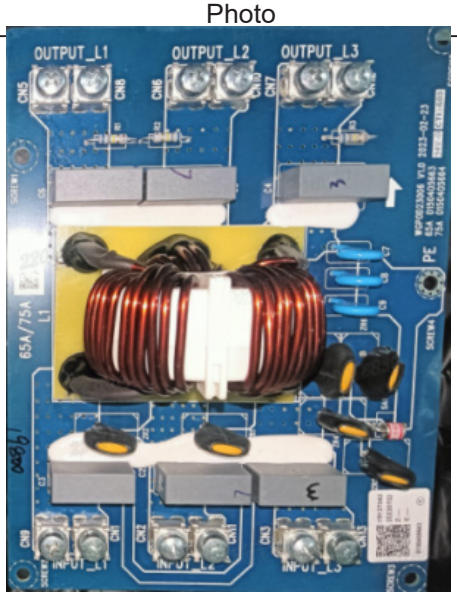
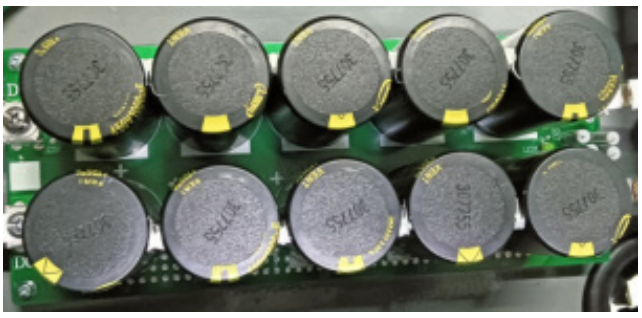
SMV: SMV: Three way mixing valve for Zone2. When N\L is energized, the valve opens and water supply to Zone2 comes more from chiller outlet; when N\K is energized, the valve closes, and water supply to Zone2 comes more from water outlet after floor heating (terminal unit). When L and K both de-energized, the valve will maintain its current state. L and K cannot be energized at the same time.

NOTE: $T_{ewo\ all\ 2}$, T_{tank}, and T_{solar} temperature sensors are not included with the chiller. These sensors must be purchased separately using their spare part codes.

11. Controls

11.1 Major Components

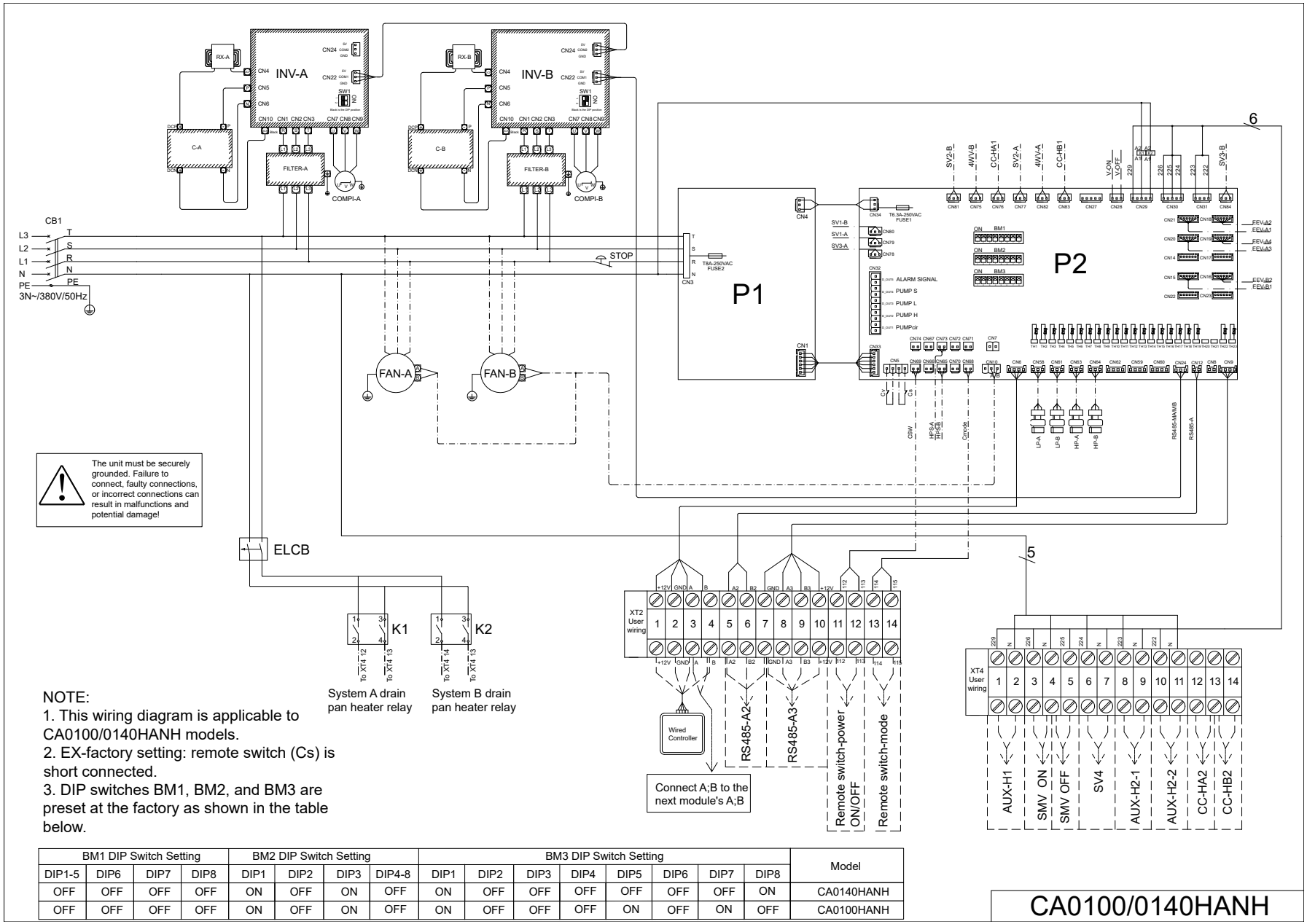
No.	Name	Qty.	Photo
1	Power PCB	1	
2	Main PCB	1	
3	Inverter PCB	2	

No.	Name	Qty.	Photo
4	Filter PCB	2	
5	Reactor	2	
6	Capacitor PCB	2	

No.	Name	Qty.	Photo
7	Circuit Breaker	1	
8	Touch Screen	1	
9	Emergency Stop Button	1	

11.2 Wiring Diagrams

See next page.

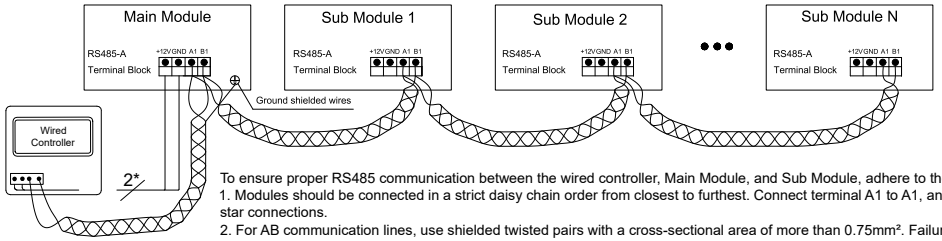


NOTE:
1. This wiring diagram is applicable to CA0100/0140HANH models.
2. EX-factory setting: remote switch (Cs) is short connected.
3. DIP switches BM1, BM2, and BM3 are preset at the factory as shown in the table below.

BM1 DIP Switch Setting				BM2 DIP Switch Setting				BM3 DIP Switch Setting								Model
DIP1-5	DIP6	DIP7	DIP8	DIP1	DIP2	DIP3	DIP4-8	DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8	
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	CA0140HANH
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	CA0100HANH

CA0100/0140HANH

LEGEND	DESCRIPTION	LEGEND	DESCRIPTION	LEGEND	DESCRIPTION	LEGEND	DESCRIPTION
P1	Power PCB	CC-HA1	System A crankcase heater	LP-B	System B low pressure sensor	TH1	System A discharge temperature sensor
P2	Main PCB	CC-HB1	System B crankcase heater	HP-B	System B high pressure sensor	TH2	System B discharge temperature sensor
INV-A	System A inverter PCB	CC-HA2	System A drain pan heater	EEV-A1	System A main circuit electronic expansion valve 1	TH3	System A upper coil temperature sensor
INV-B	System B inverter PCB	CC-HB2	System B drain pan heater	EEV-A2	System A main circuit electronic expansion valve 2	TH4	System B upper coil temperature sensor
FILTER-A	System A filter PCB	AUX-H1	Waterside heater	EEV-B1	System A economizer electronic expansion valve	TH5	System A oil temperature sensor
FILTER-B	System B filter PCB	AUX-H2	Tank heater	EEV-A3	System B main circuit electronic expansion valve 1	TH6	System B oil temperature sensor
C-A	System A capacitor PCB	SV1-A	System A HGBP solenoid valve	EEV-A4	System B main circuit electronic expansion valve 2	TH7	System B economizer liquid inlet temperature sensor
C-B	System B capacitor PCB	SV2-A	System A liquid injection solenoid valve	EEV-B2	System B economizer electronic expansion valve	TH8	System B economizer gas outlet temperature sensor
RX-A	System A reactor	SV3-A	System A throttle solenoid valve	STOP	Emergency stop button	TH9	Ambient temperature sensor
RX-B	System B reactor	4WV-A	System A four way valve	BM/SW	Dip switch	TH10	Entering water temperature sensor
COMPI-A	System A inverter compressor	SV1-B	System B HGBP solenoid valve	Cv	Flow switch	TH11	Single Zone: Total leaving water temperature sensor Dual Zone: Zone1 leaving water temperature sensor
COMPI-B	System B inverter compressor	SV2-B	System B liquid injection solenoid valve	Cs	Remote switch	TH12	Leaving water temperature sensor
FAN-A	System A fan	SV3-B	System B throttle solenoid valve	Cmode	Remote switch-mode	TH13	Dual Zone: Zone2 leaving water temperature sensor
FAN-B	System B fan	4WV-B	System B four way valve	CSW	Remote switch-power ON/OFF	TH14	System A lower coil temperature sensor
XT2	User wiring	SMV	Zone2 three way mixing valve	ALARM SIGNAL	Alarm output signal	TH15	System B lower coil temperature sensor
XT4	User wiring	SV4	DHW three way valve	PUMP S	Solar secondary pump	TH16	Tank temperature sensor
CB1	Circuit breaker	HPS-A	System A high pressure switch	PUMP H	Single Zone: External circulating pump Dual Zone: Zone1 secondary pump	TH17	Solar temperature sensor
ELCB	Earth leakage circuit breaker	HPS-B	System B high pressure switch	PUMP L	Zone2 secondary pump	TH18	System A suction temperature sensor
K1	System A drain pan heater relay	LP-A	System A low pressure sensor	PUMPcir	Waterside primary pump	TH19	System B suction temperature sensor
K2	System B drain pan heater relay	HP-A	System A high pressure sensor	V-ON	Motorized two way valve ON	TH22	System A economizer liquid inlet temperature sensor
				V-OFF	Motorized two way valve OFF	TH23	System A economizer gas outlet temperature sensor

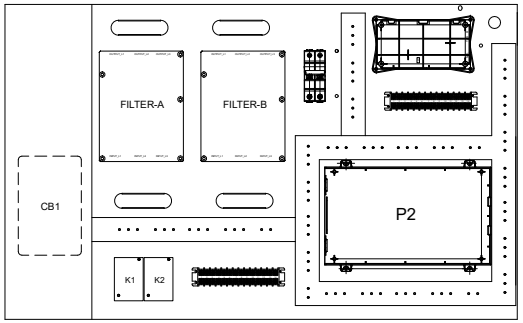


To ensure proper RS485 communication between the wired controller, Main Module, and Sub Module, adhere to these requirements:
1. Modules should be connected in a strict daisy chain order from closest to furthest. Connect terminal A1 to A1, and B1 to B1, avoiding star connections.
2. For AB communication lines, use shielded twisted pairs with a cross-sectional area of more than 0.75mm². Failure to do so may result in communication errors.
3. The AB line of the wired controller should also use shielded twisted pairs. If using four-core shielded wire, ground the shield layer near the Main Module's metal structure.
4. To prevent interference, all wiring should be routed away from high voltage sources such as power lines and lighting cables.

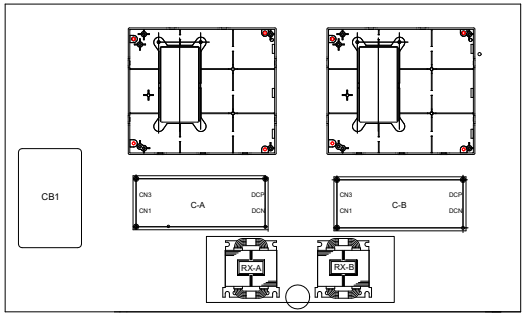
RS485 Communication Wiring

⚠ DO NOT alter internal wirings

Top Layer



Bottom Layer



BM1 Address Setting				
Address	DIP1	DIP2	DIP3	DIP4
Main Module 0	OFF	OFF	OFF	OFF
Sub Module 1	ON	OFF	OFF	OFF
Sub Module 2	OFF	ON	OFF	OFF
Sub Module 3	ON	ON	OFF	OFF
Sub Module 4	OFF	OFF	ON	OFF
Sub Module 5	ON	OFF	ON	OFF
Sub Module 6	OFF	ON	ON	OFF
Sub Module 7	ON	ON	ON	OFF
Sub Module 8	OFF	OFF	OFF	ON
Sub Module 9	ON	OFF	OFF	ON
Sub Module 10	OFF	ON	OFF	ON
Sub Module 11	ON	ON	OFF	ON
Sub Module 12	OFF	OFF	ON	ON
Sub Module 13	ON	OFF	ON	ON
Sub Module 14	OFF	ON	ON	ON
Sub Module 15	ON	ON	ON	ON

No.	Connector	Point Name	Point Description	Remarks
1	CN40	TH1	System A discharge temperature sensor	Analog Input (AI)
2	CN37	TH2	System B discharge temperature sensor	
3	CN44	TH3	System A upper coil temperature sensor	
4	CN45	TH4	System B upper coil temperature sensor	
5	CN57	TH5	System A oil temperature sensor	
6	CN55	TH6	System B oil temperature sensor	
7	CN54	TH7	System B economizer liquid inlet temperature sensor	
8	CN36	TH8	System B economizer gas outlet temperature sensor	
9	CN41	TH9	Ambient temperature sensor	
10	CN50	TH10	Entering water temperature sensor	
11	CN51	TH11	Single Zone: Total leaving water temperature sensor Dual Zone: Zone1 leaving water temperature sensor	
12	CN53	TH12	Leaving water temperature sensor	
13	CN43	TH13	Dual Zone: Zone2 leaving water temperature sensor	
14	CN56	TH14	System A lower coil temperature sensor	
15	CN46	TH15	System B lower coil temperature sensor	
16	CN35	TH16	Tank temperature sensor	
17	CN42	TH17	Solar temperature sensor	
18	CN38	TH18	System A suction temperature sensor	
19	CN39	TH19	System B suction temperature sensor	
20	CN47	TH22	System A economizer liquid inlet temperature sensor	
21	CN48	TH23	System A economizer gas outlet temperature sensor	
22	CN58	PSA	System A suction pressure sensor	
23	CN61	PSB	System B suction pressure sensor	
24	CN63	PSC	System A discharge pressure sensor	
25	CN64	PSD	System B discharge pressure sensor	
26	CN69	D_IN1	Remote switch-power ON/OFF	Digital Input (DI)
27	CN68	D_IN2	Remote switch-mode	
28	CN65	D_IN5	System B high pressure switch	
29	CN5	D_IN6	Remote switch	
30		D_IN7	Flow switch	
31	CN73	D_IN11	System A high pressure switch	
32	CN32	D_OUT1	Waterside primary pump	Passive; Electrical equipment provided by user
33		D_OUT2	Single Zone: External circulating pump Dual Zone: Zone1 secondary pump	
34		D_OUT3	Zone2 secondary pump	
35		D_OUT4	Solar secondary pump	
36		D_OUT5	Alarm output signal	Passive; Alarm Signal

No.	Connector	Point Name	Point Description	Remarks
37	CN78	D_OUT6	System A throttle solenoid valve	Digital Output (DO)
38	CN79	D_OUT7	System B liquid injection solenoid valve	
39	CN80	D_OUT8	System B HGBP solenoid valve	
40	CN81	D_OUT9	System A HGBP solenoid valve	
41	CN75	D_OUT10	System B four way valve	
42	CN76	D_OUT11	System A crankcase heater	
43	CN77	D_OUT12	System A liquid injection solenoid valve	
44	CN82	D_OUT13	System A four way valve	
45	CN83	D_OUT14	System B crankcase heater	
46	CN28	D_OUT18	Motorized two way valve ON	
47		D_OUT19	Motorized two way valve OFF	
48	CN29	D_OUT20	Waterside heater in HEAT mode	Active; Electrical equipment provided by user
49		D_OUT21	System A drain pan heater	
50		D_OUT22	System B drain pan heater	
51	CN30	D_OUT23	Zone2 three way mixing valve ON	
52		D_OUT24	Zone2 three way mixing valve OFF	
53		D_OUT25	DHW three way valve	
54	CN31	D_OUT26	Tank heater stage 1	
55		D_OUT27	Tank heater stage 2	
56	CN84	D_OUT28	System B throttle solenoid valve	Digital Output (DO)
57	CN21	EVA	System A main circuit electronic expansion valve 1	Analog Output (AO)
58	CN18	EVB	System A main circuit electronic expansion valve 2	
59	CN20	EVC	System A economizer electronic expansion valve	
60	CN19	EVD	System B main circuit electronic expansion valve 1	
61	CN14	EVE	System B main circuit electronic expansion valve 2	
62	CN17	EVF	System B economizer electronic expansion valve	
63	CN9	485	Cloud service	
64	CN12	485	PC monitoring/Central control	
65	CN7	485	Electricty meter/Energy meter	
66	CN10	485	System A fan/System B fan	
67	CN6	485	Remote wired controller	
68	CN24	UART	System A/B inverter compressor	
69	CN33	/	Low voltage power supply	
70	CN34	/	High voltage power supply	

11.3 Parallel Arrangement

The operating voltage should be kept within ±10% of the rated current (refer to unit nameplate). When the wiring length is extended longer, select the wiring size of a larger diameter. This should be done under the supervision of a professional, while referring to the technical specifications provided by the cable manufacturer.

DIP Switch Settings

BM1 DIP Switch Setting					BM2 DIP Switch Setting			
DIP1-4	DIP5	DIP6	DIP7	DIP8	DIP1	DIP2	DIP3	DIP4
Address Setting	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
BM3 DIP Switch Setting-CA0100HANH								
DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8	/
ON	OFF	OFF	OFF	ON	OFF	ON	OFF	/
BM3 DIP Switch Setting-CA0140HANH								
DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8	/
ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	/

Address	BM1-1	BM1-2	BM1-3	BM1-4
Main Module 0	OFF	OFF	OFF	OFF
Sub Module 1	ON	OFF	OFF	OFF
Sub Module 2	OFF	ON	OFF	OFF
Sub Module 3	ON	ON	OFF	OFF
Sub Module 4	OFF	OFF	ON	OFF
Sub Module 5	ON	OFF	ON	OFF
Sub Module 6	OFF	ON	ON	OFF
Sub Module 7	ON	ON	ON	OFF
Sub Module 8	OFF	OFF	OFF	ON
Sub Module 9	ON	OFF	OFF	ON
Sub Module 10	OFF	ON	OFF	ON
Sub Module 11	ON	ON	OFF	ON
Sub Module 12	OFF	OFF	ON	ON
Sub Module 13	ON	OFF	ON	ON
Sub Module 14	OFF	ON	ON	ON
Sub Module 15	ON	ON	ON	ON

See Centralized Control and Cloud Service Communication for Modbus address setting.

Note:

1. DO not duplicate addresses within the same system.
2. Only trained professionals should undertake the configuration of the settings mentioned above.
3. For BM1: DIP7 is used to select the status of the remote switch. The remote switch is turned off when set to OFF and turned on when set to ON.

Communication Wiring

1. Select network cables with robust shielding and minimal wire twisting distances.

2. Consider using cables approved under UL2547 or UL2791.

3. Ensure that the total length does not exceed 1000 meters.

4. Route communication lines away from high voltage lines, maintaining a minimum distance of 200mm.

11.4 Start-up Precautions

1. During storage, ensure that effective protective measures are implemented for its electronic control to prevent the entry of water or other foreign objects.

2. The power cable must be chosen strictly based on the maximum operating current (power) of the unit. If the power supply distance is extensive, the power cable's specifications should be increased accordingly. Once the wiring is complete, seal the inlet and outlet holes to maintain a dustproof seal.

3. The power input terminals of the electrical control box cannot be used as the force bearing point for the incoming power cables. It is strictly forbidden to process site installation materials such as wiring inside the electrical control box during the wiring of the unit. Other unrelated cables must not be hung in the electrical control box. Before energizing, ensure that the electrical control box and the cable tray are clean of foreign objects and confirm that the cable tray is reliably fixed.

4. Check whether the power supply specifications match the unit and whether the main switch of the unit meets the maximum operating capacity requirements of the unit.

 CAUTION
The power supply should have a voltage imbalance rate of less than 2%. To ensure the personal safety of operators, the unit must be reliably grounded.

5. Before powering on, confirm that the unit wiring has been correctly connected according to the wiring diagram, the fixing screws of each electrical component in the electric control box are tightened, the wiring terminals in the compressor junction box are tightened, and the insulation of each wiring terminal of the compressor is reliable.

 CAUTION
The insulation resistance must not be less than 30MΩ.

6. Prior to powering on, it's crucial to check for any potential short circuits. Ensure that the unit is reliably grounded and well-insulated. Inspect the cabinet for any existence of condensation or other miscellaneous items.

7. The installation, commissioning, and maintenance of the equipment must be completed by professionals. Anti-static measures should be taken during the operation, and unauthorized installation, commissioning, maintenance, or modification is strictly prohibited.

8. After power-on, check the touch screen for any alarm signals. The chiller cannot be started if any alarms have not been reset.

9. Avoid installing the equipment near sources of electromagnetic interference, such as electrical appliances, frequency converters, and power transmitters.

10. Our company is not liable for incidents resulting from non-adherence to these guidelines, improper use, or negligence.

Before wiring, the following safety rules and measures must be strictly followed:

1. Installation of power supply line: Before power-on, first check whether the power supply meets the usage requirements, and whether the unit's main circuit breaker meets the requirements.

2. It is strictly forbidden to process on-site installation materials such as wires in the electrical control box when wiring the unit. Before powering on, keep the control box and wire channel clean and free of foreign objects, and confirm that the wire channel is securely fixed. After the wiring is completed, the inlet and outlet holes need to be sealed with fireproof mud.

3. Before power-on, tighten the fixing screws of each electrical component in the electric control box and the wiring terminals in the compressor junction box.

4. Before power-on, check for short circuit problems, ensure that the unit is reliably grounded and well insulated, and check whether there is condensation or other debris in the control box.

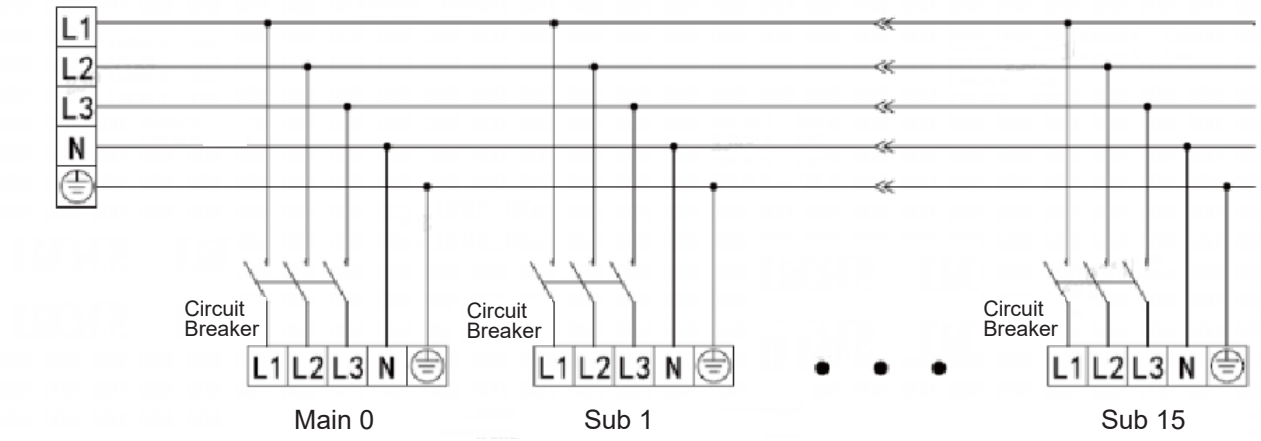
5. Do not randomly adjust the components in the electric control box, the electrical connections, or randomly connect other electrical equipment or wires on the electrical connection points.

6. The power cable is strictly selected according to the maximum current (power) of the unit. If the power supply distance is long, wire size of the power line should be appropriately increased.

7. Unless it is an emergency, do not turn off the unit by cutting off the main power supply.

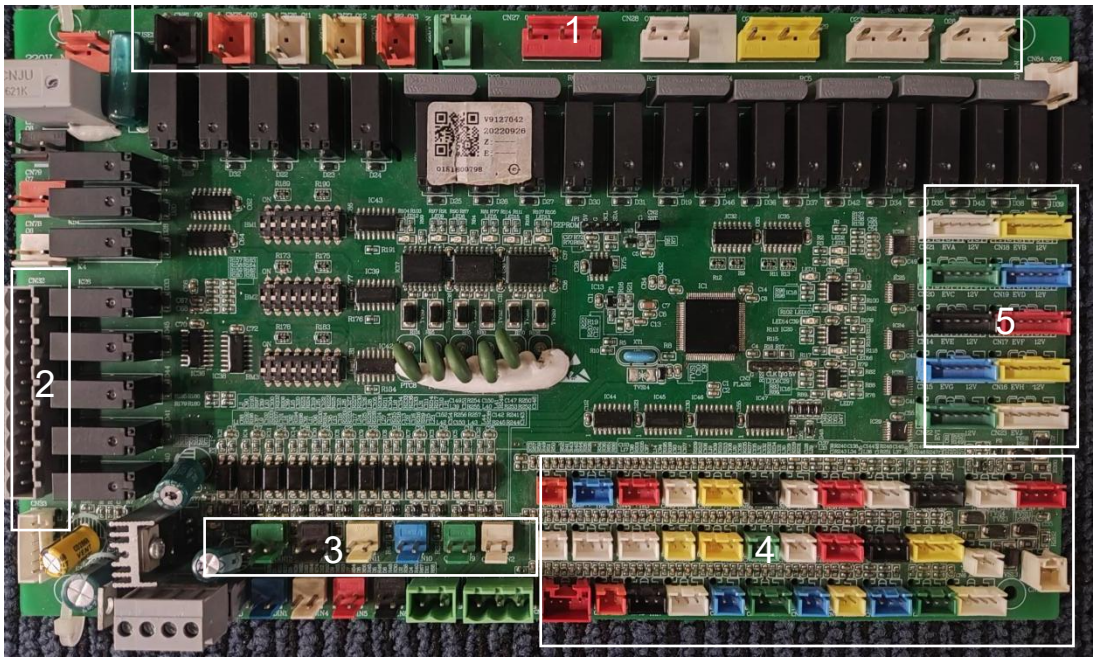
8. If the unit fails, it must be restarted only after all alarms have been reset. Do not forcibly start up while alarms remain unresolved.

11.5 Power Line Connection



CAUTION
There must be a circuit breaker (installed by users) with sufficient capacity at the power supply inlet. This circuit breaker device needs to have short circuit and ground fault protection, and this device has at least a 3mm contact distance.

11.6 External Connections on Main PCB



1: Digital Output (DO)

2: Passive dry contact

3: Digital Input (DI)

4: Analog Input (AI) and RS485

5: Analog Output (AO)

11.7 Cable Selection

No.	Cross-Sectional Area (mm^2)		Current Rating (A)
	Phase Wire	Ground Wire	
1	16	16	65
2	25	16	89
3	35	16	110
4	50	25	135
5	70	35	175
6	95	50	220
7	120	70	255
8	150	70	295
9	185	95	345
10	240	120	420
11	300	150	490
12	400	240	575
13	500	300	729

Notes:

1. The cable selection in the table applies to the use of BV or equivalent copper cable wires, with fewer than three wires in the distribution metal conduit.

2. The wiring specifications in this table are based on an ambient temperature of 40°C and a cable operating temperature of 90°C. When the long-term ambient temperature exceeds 40°C, it is necessary to use larger size of wireor or a cable with a higher insulation temperature rating.

3. When the three-phase power supply voltage deviation exceeds the nominal voltage by ±7% (in accordance with GB/T 12325-2008), causing the line voltage loss to not meet the requirements for the normal operation and starting terminal voltage of the electrical equipment, please adjust the applicable wire diameter according to the GB/T national standard.

4. Different cable types, environments, temperatures, and laying methods will affect the maximum current rating of the cable. This table is for reference only during wiring arrangement design, and the actual wiring is selected based on the specific site conditions. However, it should not be lower than the current rating requirements for wiring systems in GB/T 16895.6-2014.

11.8 Circuit Breaker Selection

It is recommended to select circuit breakers according to 1.2 times the maximum running current of the unit.

11.9 Controls Operation

1. Start-Stop Control

Start Control: When the wired controller initiates COOL/HEAT/DHW mode and reaches the startup temperature difference, the chiller starts. Once the EEV automatically adjusts, the chiller start control stops and enters normal operation.

Stop Control: When the chiller reaches the stop condition, the compressor begins to decrease frequency and stop, the fan stops, and the EEV opens to standby opening. The chiller then stops.

Note: In DHW mode, SV4 stays energized.

2. Loading/Unloading Control

Based on the combined frequency of all operating compressors, the target temperature T_{ewo}, changes in water temperature during loading/unloading, and the predicted T_{ewo} for the next operation cycle, calculate the heat demand required to reach the target temperature and the average heat demand of the subsystems to determine the number of systems to load/unload.

3. Water Pump Control

Waterside Primary Pump (Pumpcir): Remains operational when the chiller has a demand; switches on and off periodically during standby based on the schedule.

Zone1 Secondary Pump (Pump H): Operates when Zone1 is enabled and the chiller has a demand in COOL/HEAT mode.

Zone2 Secondary Pump (Pump L): Operates when Zone2 is enabled and the chiller has a demand in COOL/HEAT mode.

Solar Secondary Pump (Pump S): Operates when T_{solar}-T_{tank}≥5°C; ceases operation when T_{solar}-T_{tank}<1°C.

4. Capacity Control

The operation range of the compressor is limited by the evaporation temperature and the condensation temperature. After entering normal operation, the frequency increases at a rate of 1Hz/15s. During operation, the compressor frequency is auto-regulated based on the temperature difference of T_{ewo} between actual and target values. During shutdown, the compressor reduces its frequency, dropping to 60Hz, at which point the compressor stops.

5. Quiet Mode

Quiet mode can be set on the wired controller, with two time intervals available and will be executed daily. When activated, it limits the chiller's maximum operating frequency and fan speed.

6. Dual Zone Control

When COOL/HEAT mode is activated:

Only Zone1 enabled: The chiller controls Zone1 pump; target T_{ewo} = Temp. of Zone1

Only Zone2 enabled: The chiller controls Zone2 pump and mixing valve; target T_{ewo} = Temp. of Zone2

Dual Zone Control enabled: The chiller controls Zone1 pump, Zone2 pump and mixing valve; target T_{ewo} = min (Temp. of Zone1, Temp. of Zone2) in COOL mode; target T_{ewo} = max (Temp. of Zone1, Temp. of Zone2) in HEAT mode

Dual Zone Control disabled: Zone1 is forcibly enabled.

7. Solar Hot Water Control

When DHW mode is activated, enable Solar function on the wired controller and start the solar pump (Pump S). The pump operates when T_{solar}-T_{tank}≥5°C and ceases operation when T_{solar}-T_{tank}<1°C.

8. DHW Modes

DHW Mode: Activate DHW mode on the controller, start the chiller and begin DHW operation. When the chiller reaches the stop condition, it begins to shut down. SV4 needs to remain engergized during this process.

DHW Priority Mode: Activate COOL/HEAT mode and enable DHW Priority on the controller.

If T_{tank} < target T_{ewo}- 3°C, the chiller automatically switches to DHW mode. The chiller exits DHW mode and returns to the original COOL/HEAT mode once the target T_{ewo} is reached.

Fast DHW: If Fast DHW is enabled on the controller, the chiller automatically switches to DHW mode. Auxilliary electric heaters maybe be used based on the temperature difference. The chiller exits DHW mode, turns off electric heaters and returns to the original COOL/HEAT mode once the target T_{ewo} is reached.

9. Sterilization Mode

Once sterilization is enabled, it operates in a cyclical pattern. The tank heater will continue to operate until T_{tank} reaches 70°C, at which point it will stop.

10. Schedule Mode

Operates according to the preset Timing (when to turn ON/OFF), Cycle (which days of the week to repeat), Mode (DHW/COOL/HEAT), Zone Temps, and Except Dates (skip dates).

11. Holiday Mode

Operates according to the preset Dates (which time period is designated as holiday) and Zone Temps. Holidays take precedence over Schedules.

12. Before Start-up

12.1 Pre-startup Checks

1. Ensure that there are no damages or refrigerant leaks on the unit before powering it on. If any abnormalities are found, please contact after-sales service of the manufacturer.

2. Ensure that all external power sources and electrical components are connected correctly, and all connection points are secured without looseness.

3. Check if the electrical system matches the unit and whether the switch meets the maximum operating requirements of the unit. The unit uses a three-phase power supply, and the imbalance rate between phases should be less than 2%.

4. Inspect all wiring to ensure the presence of neutral wire and ground wire, and ensure that both are connected to the corresponding busbars in the control cabinet to ensure the safe operation of the unit.

5. Check the electrical control cabinet for foreign objects or condensation, inspect the seal of the power cable entry and exit points to prevent water or foreign objects from entering.

6. Check for any unauthorized installed devices; the circuit breaker must be in the off position before powering on.

7. Before connecting the power supply, tighten the fixing bolts of the electrical components inside the electrical control cabinet and the terminal blocks inside the compressor junction box, and ensure that the terminal blocks of the compressor are well insulated.

8. Before powering on, it is essential to check for any short-circuit issues and ensure that the unit is reliably grounded.

CAUTION
Do not use wires from the control cabinet to power other equipment.

WARNING
The above checks must be carried out with the power turned off. Removing the compressor end cap while the power is on will expose people to high voltage, and failing to cut off the power could lead to electric shock injuries or death!

12.2 Test Run

Before starting the unit, please check for any damage. If any damage or broken lines are found, please contact our after-sales service immediately. Once all the above checks are complete, start the commissioning in the following sequence:

Operation before power on:

1. Set the main PCB dip switches to the correct position as per the tables in the aforementioned instructions, in sequence.

2. Disconnect the wired controller connections of the Sub modules from the main PCB, leaving only the wired controller connection of the Main module.

Operation after power on:

1. Navigate to the menu interface > ERROR INQUIRY to check if the unit reports an error. If an error occurs, troubleshoot and clear it first. Once confirmed that the unit is error-free, press the POWER button to start the unit.

2. After the unit is powered on, it will preheat the oil temperature. The ERROR INQUIRY > CURRENT interface will display E85 (oil temperature preheating). When the oil temperature reaches the startup temperature, the error will automatically reset.

3. Test run for 30 minutes. After the entering and leaving water temperatures stabilize, adjust the water flow rate according to the temperature difference between the inlet and outlet of each unit to ensure that the unit operates normally within the allowable water flow range.

4. For extended use of the unit, maintain power even during shutdown. This helps the compressor maintain an appropriate temperature, reducing the risk of damage from liquid refrigerant during startups.

5. If the unit will not be in use and the ambient temperature could drop below 2°C, drain the system's water and disconnect the power to prevent freezing. Prior to restarting the unit, preheat it by powering on 12 hours beforehand. Refill it with water, inspect the unit, and conduct a test run to ensure functionality before fully powering on.

After the unit is running smoothly, check the following items:

CAUTION
After shutting down the unit during a test run, wait for ten minutes before restarting.

No.	Item to Be Checked	Approach	Reference
1	Power supply voltage	Voltmeter	Rated voltage ± 10%
2	Operating current per compressor	Ammeter	(30~57) A
3	Operating current per fan	Ammeter	(3~6) A
4	Entering water temperature (COOL)	Thermometer	(10~25) °C
5	Water outlet temperature (COOL)	Thermometer	(5~20) °C
6	Entering water temperature (HEAT)	Thermometer	(20~57) °C
7	Leaving water temperature (HEAT)	Thermometer	(25~62)°C
8	Temperature difference between inlet and outlet water	Thermometer	(2~10) °C
9	Compressor discharge temperature	Thermometer	(60~115) °C
10	Low side pressure (COOL)	Pressure gauge	(6.5~13.0) bar
11	High side pressure (COOL)	Pressure gauge	(20~41.5) bar
12	Low side pressure (HEAT)	Pressure gauge	(1~10.5) bar
13	High side pressure (HEAT)	Pressure gauge	(18~41.5) bar
14	Water flow rate at unit outlet	Flow rate	(18~30) m^3/h
15	Vibration and operating sound	Listen and touch	No abnormality

Note:

The reference value is only a benchmark for determining whether the unit is operating normally on-site. The highest and lowest values are for the unit under maximum and minimum operating conditions. If the unit operates outside the reference range after achieving stable operation, please consult your local dealer or after-sales service.

13. Shutdown

Seasonal Shutdown

During summer shutdown, the equipment needs to remain energized to avoid the risk of water pump rust. During winter shutdown, the unit needs to remain energized and should not be turned off to avoid the risks of water pump rust and pipeline freezing. You can also turn on Holiday mode or set a low target water outlet temperature to avoid freeze-up.

Limited Shutdown

During limited shutdown, the equipment needs to remain energized and should not be turned off to avoid the risks of water pump rust and freezing.

Extended Shutdown

During an extended shutdown, it is necessary to clean the units and the pipelines of any debris. Open all the drain valves to ensure all water in the unit and water system is drained, and cut off all power supply to prevent freezing damage. Simultaneously, dust protection measures should be implemented.

Restart after Extended Shutdown

Upon restarting the unit after an extended shutdown, the following preparatory work should be done:

1. Inspect and clean the unit to ensure there are no abnormalities.
2. Clean the water system to ensure that the pipeline is clean and free of foreign objects.
3. Inspect components of the water system, such as water pumps and control valves.
4. Ensure that all external power sources and electrical components are tightly connected.
5. Preheat the unit by energizing it 12 hours ahead.
6. Check the filter before startup and after water is running through. Ensure that there are no foreign objects in the filter.

14. Maintenance

Before delivery, the unit has undergone rigorous testing and inspection to ensure that the product has good performance after leaving the factory. To ensure that the unit continues to operate well over time, users should perform regular maintenance.

1. Inspection and Cleaning of the Airside Heat Exchanger

To ensure the effective operation of the airside heat exchanger and maximum heat exchange, its exterior must be kept clean, free from any contaminants such as fallen leaves, cotton fluff, insects, etc., that may clog the condenser fins.

2. Inspection and Cleaning of the Waterside Heat Exchanger

To determine if the waterside heat exchanger is clean, check the inlet and leaving water temperatures of the heat exchanger and compare them with the evaporation temperature. For instance, if the leaving water temperature differs from the evaporation temperature by more than (5~7)°C at the rated water flow, it indicates that the efficiency of the heat exchanger has decreased, and it needs to be cleaned. Since the cleaning process involves certain chemical treatments, it must be done by professionals.

3. Adding Refrigerant and Lubricant

Each unit is equipped with a sufficient amount of refrigerant R32 and lubricant at the factory. Under normal operation, there is no need to add refrigerant or lubricant, nor is it permitted to randomly charge or replace them. If additional charge is necessary due to leakage, please refer to the charge amount specified on the nameplate.

14.1 General Requirements

Before operating the refrigeration system, the system must be purged with nitrogen. Following this, the unit must be vacuumed for no less than 30 minutes. Finally, use 1.5~2.0MPa oxygen-free nitrogen (OFN) to flush the system for 30 seconds to 1 minute to identify areas that require attention. Maintenance of the refrigeration system can only begin after the residual flammable refrigerant gas has been removed.

When using refrigerant charging tools, it is important to avoid cross-contamination of different refrigerants. The total length of the system, including refrigerant piping, should be minimized to reduce the amount of residual refrigerant inside.

Refrigerant cylinders should be stored upright and secured in place.

Upon completion of maintenance to the refrigeration system, the system should be sealed safely.

Ongoing maintenance must not compromise the original safety level of the system.

14.2 Relocation

If you need to disassemble and reassemble the chiller during relocation, please contact your local dealer or after-sales service for technical support.

Among the materials used in the chiller, the content of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs) does not exceed 0.1% (by weight), and the content of cadmium does not exceed 0.01% (by weight).

Only qualified companies should undertake the decommissioning and disposal. Before that, please recycle use.

14.3 Scale Removal

After extended operation, substances like calcium oxide or other minerals in the water system will accumulate on the surface of the waterside heat exchanger. When an excessive amount of these substances build up, they can hinder heat transfer performance, resulting in increased power consumption, and high discharge pressure (or low suction pressure). Organic acids such as formic acid, citric acid, and acetic acid can be used to clean this buildup.

 CAUTION
The waterside heat exchanger is made of stainless steel and is prone to corrosion, leading to refrigerant leaks. Therefore, cleaning agents containing fluoroacetic acid or fluorides should not be used.

There are several things to pay attention to during the descaling:

1. This work should be done by professionals.

2. When using the cleaning agent, adjust the concentration, cleaning time, and temperature according to the state of scale deposition.

3. Protective equipment such as goggles, gloves, masks, and shoes must be used during the cleaning process. This is because the cleaning agent and neutralizer are corrosive to eyes, skin, and nasal mucosa, and contact with or inhalation of these agents should be avoided.

4. After using the cleaning agent, rinse the pipes and heat exchanger with clean water. Care should be taken to avoid the cleaning agent getting into the main pipeline to prevent corrosion of other pipeline equipment.

5. After acid cleaning, the waste liquid needs to be neutralized. Please contact the relevant company to handle the waste liquid.

14.4 Winter Freeze Protection

If ice builds up inside the heat exchanger, it may cause serious damage, i.e., the heat exchanger may rupture and leak. This type of freeze damage is not covered under warranty, so freeze protections are necessary.

1. If the unit is on standby and located in an outdoor environment where the temperature is below 0°C, the water in the water system should be drained.

2. If the target flow switch and freeze temperature sensor for chilled water fail during operation, the water pipes may freeze. Therefore, the water pump must be correctly connected.

3. During maintenance, when refrigerant is added or removed from the unit for repairs, the waterside heat exchanger may freeze and crack. When the refrigerant pressure is below 0.4Mpa, the pipeline may freeze at any time. Therefore, the water in the heat exchanger must be kept flowing or thoroughly drained.

14.5 Compressor Replacement

To replace the compressor, please follow these steps:

1. Cut off the power supply.

2. Remove the cable connections.

3. Evacuate all refrigerant and displace the refrigerant system with nitrogen.

4. Disassemble the suction pipe, discharge pipe, and vapour injection pipe of the compressor.

5. Remove all fastening screws.

6. Remove the compressor.

7. Replace with new compressor.

8. Weld the suction pipe, discharge pipe, and vapour injection pipe of the compressor.

9. Vacuum and add refrigerant.

10. Re-connect the power supply.

14.6 Leakage Test

The environment for checking refrigerant leaks should have no potential ignition sources. The use of halogen probes (or any other open flame detectors) for leak detection should be avoided.

For systems containing flammable refrigerants, electronic leak detection equipment can be used. During the leak detection process, the calibration environment of the leak detection equipment should not contain refrigerants. Ensure that the leak detection equipment will not become a potential ignition source and is suitable for the refrigerant to be detected. The leak detector should be set to a percentage of the refrigerant's Lower Flammable Limit (LFL), and it should be calibrated according to the refrigerant used to confirm the appropriate percentage of the gas (up to 25%).

The fluid used for leak detection should be suitable for most refrigerants. Avoid using chlorine-based solvents to prevent chemical reactions between chlorine and the refrigerant, which could corrode copper pipes.

If a leak is suspected, any open flames on site should be evacuated or extinguished.

If welding is required at the leak location, all refrigerants should be recovered, or isolated at a location away from the leak. Before and during welding, the entire system should be vacuumed for more than 30 minutes and purified with nitrogen.

14.7 Charge Refrigerant

The following are additional requirements for regular charging steps:

1. Cross-contamination of different refrigerants should be avoided when using refrigerant charging tools. The total length, including refrigerant piping, should be as short as possible to minimize residual refrigerant within the system.

2. Refrigerant cylinders should always be kept upright.

3. The refrigeration system should be securely grounded before charging begins.

4. Once charging is complete, a label should be affixed to the refrigeration system.

5. Overcharging is not permitted; the refrigerant should be charged slowly and carefully.

6. If a system leak is discovered, no refrigerant charging should take place until the leak is fully repaired.

7. Throughout the process, the charge amount should be accurately measured using an electronic scale or spring scale. The connection hose between the refrigerant cylinder and the charging equipment should be appropriately loosened to prevent measurement inaccuracies due to stress.

As for the refrigerant storage area:

1. Refrigerant cylinders should be stored in a well-ventilated environment with a temperature range of -10 to 50°C, and warning labels should be affixed.

2. Maintenance tools that come into contact with the refrigerant should be stored and used separately. To prevent cross-contamination, tools for different refrigerants should not be mixed.

14.8 Maintenance Schedule

Item to Be Checked	Monthly	Quarterly	Semi-annually	Annually	As Needed
1. Compressor					
Performance evaluation; Check for abnormal sounds	●				
Verification of firm wiring connections	●				
Check for current abnormalities (Within 10%)					
Discharge temperature		▲			
2. Controller					
Parameter settings			▲		
3. Protective Device					
Motor protector			▲		
High/Low pressure switches					▲
Flow switches					▲
Overload relay			▲		
4. Shell-and-Tube Heat Exchanger (Waterside)					
Water quality	●				
Clean heat exchanger					▲
Seasonal protective measure (winter freeze protection)					▲
5. Tube-Fin Heat Exchanger (Airside)					
Clean fins		▲			
6. Others					
Check if water filter needs to be cleaned or replaced	●				
Check if bolts and screws are loose		▲			

Above is the recommended maintenance schedule and is for reference only. Specific plans can be made in different situations.

● Performed by users

▲ Performed by professionals

It's also recommended to have your unit inspected and maintained each year before switching between COOL mode in summer and HEAT mode in winter.

During operation, closely monitor the suction and discharge pressure. If abnormalities are detected, promptly identify the root cause and troubleshoot.

Be careful not to randomly adjust the on-site settings of control and protection devices.

Regularly check whether electrical connections are loose, whether there is poor contact caused by oxidation or impurities at the contact points, and take measures if necessary.

Regularly inspect the operating voltage, current, and phase balance.

Timely check the reliability of electrical components. Invalid or unreliable components should be replaced promptly.

15. Service Diagnosis

15.1 Troubleshooting

Symptom	Possible Causes	Possible Solutions	Remarks
Discharge pressure too high	Presence of air or non-condensable gas in the system	Purge non-condensable gas, vacuum if necessary	COOL/HEAT
	High suction pressure	Refer to "Suction pressure too high"	COOL/HEAT
	Defective high pressure switch	Replace high pressure switch	COOL/HEAT
	Condenser fins are dirty or blocked	Clean airside heat exchanger	COOL
	Insufficient condenser airflow or fan abnormality	Check fan	COOL
	High refrigerant charge	Trim refrigerant charge	COOL
	High ambient temperature	Shut down	COOL
	Insufficient water flow	Check water flow	HEAT
	Waterside heat exchanger scaling or has internal debris	Clean scale	HEAT
	High leaving water temperature	Lower leaving water temperature	HEAT
	Coil outlet temperature sensor is defective or misplaced	Check coil outlet temperature sensor	COOL
Suction pressure too high	Insufficient refrigerant	Trim refrigerant charge	COOL/HEAT
	Insufficient water flow	Check water flow	COOL
	Low entering water temperature	Increase entering water temperature	COOL
	Waterside heat exchanger scaling or has internal debris	Clean scale	COOL
	Insufficient airflow	Check fan	HEAT
	Air short circuiting (return vent intakes air from supply airflow)	Find cause and troubleshoot	HEAT
	Insufficient defrosting	Replace four way valve or defective defrosting temperature sensor	HEAT
Suction pressure too low	Insufficient refrigerant	Trim refrigerant charge	COOL/HEAT
	Low suction pressure	Refer to "Suction pressure too low"	COOL/HEAT
	Low ambient temperature of airside heat exchanger	Shut down	COOL
	Low entering/leaving water temperature	Increase water temperature	HEAT
Suction pressure too high	Excessive refrigerant charge	Trim refrigerant charge	COOL/HEAT
	High entering water temperature	Lower entering water temperature	COOL
	High ambient temperature of airside heat exchanger	Shut down	HEAT
Discharge temperature too high	Poor ventilation around chiller	Clear obstacles around chiller or add air ducts	HEAT
	Low ambient temperature	Shut down	HEAT
	Filter on refrigerant circuit is dirty and blocked	Replace filter	COOL/HEAT
	Insufficient defrosting or not defrosting	Change defrosting parameters	HEAT
	Insufficient refrigerant charge	Recharge refrigerant	COOL/HEAT
Pressure sensor open or short circuit	Sensor is damaged	Replace sensor	COOL/HEAT
	Sensor contact is defective	Replug sensor	

Symptom	Possible Causes	Possible Solutions	Remarks
Abnormal noise	Loose screws	Retighten screws	COOL/HEAT
	Liquid refrigerant enters compressor causing liquid slugging	Trim refrigerant charge or replace defective throttle device	
	Defective compressor	Replace compressor	
Flow switch abnormality	Presence of air in water system	Purge through air vent	COOL/HEAT
	Waterside heat exchanger scaling or has internal debris	Clean scale	
	Defective flow switch	Replace flow switch	
	Uneven water flow	Trim water flow with shutoff valves at water inlet/outlet	
	Water pump is not running	Install water pump in tandem with chiller	
	Insufficient capacity of selected water pump	Check pump	
Wired controller communication abnormality	Improper module address setting	Check module address setting, set address correctly	COOL/HEAT
	Improper communication cable wiring	Check communication cable wiring order	
	Damaged PCB	Replace PCB	
	Defective wired controller	Replace wired controller	
Compressor overcurent	High discharge pressure and high suction pressure	Refer to "Discharge pressure too high" and "Suction pressure too high"	COOL/HEAT
	Power supply voltage too high/too low, or single-phase power supply is used or there's phase imbalance	Check power supply	
	Motor or terminal wiring short circuit	Check terminal wiring	
Pressure sensor open circuit	Damaged sensor	Replace sensor	COOL/HEAT

15.2 Error Codes

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E1	Waterside flow switch abnormality	After the pre-run time of the water pump is over, the flow switch starts to detect. If the flow switch remains "OFF" for 5 secs, it is judged that the flow rate is too small, and a fault is reported.	All modules shut down if alarm is triggered from Main module; current module shuts down if alarm is triggered from Sub module	Auto reset after 3 mins. Then, restart the water pump. The flow switch will be detected again after 20 secs. Manual reset if latched: power off, clear faults and restart	After water pump pre-run ends; continuous	(2)
E5	Three-phase power phase loss	Three-phase power supply abnormality	All modules shut down if alarm is triggered from Main module; current module shuts down if alarm is triggered from Sub module	Restore AC power supply	After power-on; continuous	(4)
E6	Three-phase AC input phase reversal	Abnormality continues for 1 sec	All modules shut down if alarm is triggered from Main module; current module shuts down if alarm is triggered from Sub module	Power off, correct phase sequence and restart	After initial power-on; continuous	(4)
E7	Entering water temperature sensor Tewi abnormality	1) Entering water temperature sensor Tewi open or short circuit; or 2) Tewi≥85°C; continue for 30 secs; or 3) Tewi≤-10°C; continue for 30 secs	All modules shut down if alarm is triggered from Main module; current module shuts down if alarm is triggered from Sub module	Entering water temperature sensor Tewi is normal; 2°C≤Tewi<65°C; continue for 30 secs	After power-on; continuous	(1)
E8	Leaving water temperature sensor Tewo abnormality	1) Leaving water temperature sensor Tewo open or short circuit; or 2) Tewo≥85°C; continue for 30 secs; or 3) Tewo≤-10°C; continue for 30 secs	Current module shuts down	Leaving water temperature sensor Tewo is normal; 2°C≤Tewo<65°C; continue for 30 secs	After power-on; continuous	(1)
E9	Ambient temperature sensor Ta abnormality	Ambient temperature sensor Ta open or short circuit; continue for 30 secs	All modules shut down if alarm is triggered from Main module; current module shuts down if alarm is triggered from Sub module	Faulty sensor is replaced; continue for 30 secs	After power-on; continuous	(1)
E15	Remote wired controller communication abnormality	Wired controller cannot receive signals from main PCB; continue for 4 mins	All modules shut down; indicators on Main and Sub modules' PCBs flash Possible situations: 1) Loss of communication between Main module and controller. Both controller and Main module (if connected to a central controller with display) will report an E15 error; 2) Multiple chiilers' address are set as Main 0; 3) Loss of communication between Main module and Sub modules. Main module (if connected to a central controller with display) will not report an error.	Communication is re-established	After power-on; continuous	(1)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E16-address	Main PCB communication abnormality	1) Loss of communication between Main module and Sub modules; or 2) In multiple chillers application, Sub modules' addresses are not in sequence without skipping numbers; or 3) In multiple chillers application, communication with the last module is lost	Possible situations: 1) Loss of communication between Main module and Sub modules; wired controller reports E16-address (minimum address number if there're multiple Sub modules reporting error); indicator on Sub module flashes 2) Loss of communication between Main module and controller; wired controller reports E16; 3) If the addresses of the sub-modules are not in sequence without skipping numbers (i.e., 1,2,3...15), the controller will report an E16-address (minimum number skipped) error. However, the normal operation of other modules will not be affected	Communication is re-established	After power-on; continuous	(1)
E17-(1/2)	Inverter PCB and main PCB communication abnormality	No communication signal is received; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Communication is re-established	After power-on; continuous	(1)
E18-(1/2)	Fan driver module communication abnormality	Normal communication cannot be performed; continue for 30 secs	Fan motor from the current circuit (system A/B) and current circuit shut down	Communication is re-established	After power-on; continuous	(1)
E20-(1/2)	Inverter PCB inverter side hardware instantaneous overcurrent	Current module shuts down	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E21-(1/2)	Inverter PCB inverter side software instantaneous overcurrent	Current module shuts down	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E22-(1/2)	Inverter PCB heat sink temperature too high	Heat sink temperature ≥94°C	Current circuit (system A/B) shuts down	Heat sink temperature<94°C	After power-on; continuous	(3)
E23-(1/2)	Inverter PCB overload	Inverter PCB overload	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E24-(1/2)	Inverter PCB undervoltage	Inverter PCB voltage <DC420V	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E25-(1/2)	Inverter PCB overvoltage	Inverter PCB voltage <DC642V	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E26-(1/2)	Inverter PCB inverter side current detection circuit abnormality	Current module shuts down	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E27-(1/2)	Inverter PCB instantaneous power loss	Current module shuts down	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E28-(1/2)	Inverter PCB power supply abnormality	Instantaneous interruption of power supply to the system frequency control controller control board	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E29-(1/2)	Inverter PCB loss of synchronism	Unable to detect rotor position during startup or operation; for 6 consecutive times	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E30-(1/2)	Inverter PCB temperature sensor abnormality	Temperature sensor resistance abnormality or disconnected	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E31-(1/2)	Inverter PCB rectifier side software instantaneous overcurrent	Inverter PCB rectifier side software instantaneous overcurrent	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E32-(1/2)	Inverter PCB rectifier side current detection circuit abnormality	Inverter PCB rectifier side current detection circuit abnormality	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E33-(1/2)	Inverter PCB rectifier side hardware instantaneous overcurrent	Inverter PCB rectifier side hardware instantaneous overcurrent	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E34-(1/2)	Inverter PCB startup abnormality	Inverter PCB startup failed; for 5 consecutive times	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(3)
E47-(1/2)	Compressor phase reversal	Pd-Ps≤0.1Mpa; continue for 3 mins (Protection by compressor itself stops after the 3 mins)	Current circuit (system A/B) shuts down	Power off, clear faults and restart	After compressor startup; continuous	(4)
E48-(1/2)	Fan overload	Fan thermal switch is open circuit; continue for 3 secs	Current circuit (system A/B) shuts down	Auto reset after 5 mins	After power-on; continuous	(2)
E49-(1/2)	High pressure switch protection	High pressure switch is open circuit; continue for 3 secs	Compressor from the current circuit (system A/B) shuts down	60 secs after the signal is closed	After power-on; continuous	(2)
E51-(1/2)	Compressor overcurrent	Compressor current≥5.0A; continue for 2 secs	Compressor from the current circuit (system A/B) shuts down	Compressor current<5.0A; continue for 60 secs	After power-on; continuous	(2)
E52-(1/2)	Discharge temperature sensor Td open or short circuit	1) Ta>-5°C; discharge temperature sensor Td is open or short circuit; continue for 30 secs; or 2) Ta≤-5°C; discharge temperature sensor Td is open or short circuit and compressor has been running for 10 mins	Compressor from the current circuit (system A/B) shuts down	1) Discharge temperature sensor Td is normal; continue for 30 secs; or 2) When Ta≤-5°C, alarm resets after shutdown	After power-on; continuous	(1)
E53-(1/2)	Upper coil outlet temperature sensor Te open or short circuit	Upper coil outlet temperature sensor Te open or short circuit; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Faulty sensor is replaced; continue for 30 secs	After power-on; continuous	(1)
E54-(1/2)	Suction pressure sensor Ps open circuit	1) Tao<40; suction pressure sensor Ps open circuit (input voltage<0.45V); continue for 30 secs; or 2) Tao≥40°C; suction pressure sensor Ps open circuit (input voltage<0.45V); continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Input voltage≥0.48V; continue for 60 secs	1) After power-on if Tao<40; continuous 2) Test for 30 secs after power-on if Tao≥40; continuous	(2)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E55-(1/2)	Suction pressure Ps too low	1) COOL mode 1.1) Ta≤5°C; Ps<0.05MPa within the first 1 min; continue for 3 secs; or 1.2) Ta≤5°C; Ps<0.10MPa within the first 1~5 mins; continue for 3 secs; or 1.3) Ta≤5°C; Ps<0.30MPa after the first 5 mins; continue for 3 secs; or 1.4) Ta>5°C; Ps<0.10MPa within the first 5 mins; continue for 3 secs; or 1.5) Ta>5°C; Ps<0.38MPa after the first 5 mins; continue for 3 secs; 2) HEAT mode 2.1) Tewi≥20°C; non-defrosting period; Ps≤0.06MPa; continue for 5 secs; or 2.2) Tewi≤20°C; non-defrosting period; Ps≤0.05MPa; continue for 5 secs	Compressor from the current circuit (system A/B) shuts down	1) COOL mode 1.1) Within 5 mins after compressor startup; Ps>0.25MPa; continue for 30 secs; or 1.2) Ta≥5°C, Ps> (Ps trip value + 0.1MPa); continue for 30 secs; or 1.3) Ta<5°C, Ps>0.25MPa; continue for 30 secs 2) HEAT mode 2.1) Ta≥-12°C, Ps>(Ps trip value + 0.1MPa); continue for 30 secs; or 2.2) Ta<-12°C, Ps>Ps trip value; continue for 30 secs	After compressor's rotary speed is above 0 rpm (excluding defrosting operation); continuous	(2)
E56-(1/2)	Suction temperature sensor Ts open or short circuit	Suction temperature sensor Ts open or short circuit; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Faulty sensor is replaced; continue for 30 secs	After power-on; continuous	(1)
E58-(1/2)	Discharge temperature Td too high	1) Compressor frequency ≥50Hz; Td≥123°C; continue for 5 secs; or 2) Compressor frequency ≥50Hz; Td≥125°C; continue for 1 secs; or 3) Compressor frequency<50Hz; Td≥113°C; continue for 5 secs; or 4) Compressor frequency<50Hz; Td≥115°C; continue for 1 secs; or 5) Target frequency =0 but actual frequency≠0; Td≥125°C; continue for 1 secs (detected when frequency is not 0Hz)	Compressor from the current circuit (system A/B) shuts down	Td<90°C; continue for 30 mins	After power-on; continuous	(2)
E59-(1/2)	Upper/Lower coil outlet temperature Te too high	When compressor is running, Te≥66°C; continue for 6 secs	Compressor from the current circuit (system A/B) shuts down	Te<58°C; continue for 30 secs	After fan startup; continuous	(1)
E74-(1/2)	Lower coil outlet temperature sensor Te open or short circuit	Lower coil outlet temperature sensor Te A2/B2 open or short circuit; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Faulty sensor is replaced; continue for 30 secs	After power-on; continuous	(1)
E69-(1/2)	Low refrigerant charge	Before compressor startup or 90 secs after compressor shutdown; suction pressure Ps<0.05MPa (EE) ; continue for 3 secs	Current circuit (system A/B) shuts down	Power off, clear faults and restart	Before compressor startup and 90 secs after compressor stop; continuous	(4)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E72	Schedule timeout (set on wired controller)	The number of days in operation has surpassed the timeline initially set in the schedule.	All modules shut down	Change or cancel the wired controller schedule	After power-on; continuous	(4)
E77-(1/2)	Oil temperature sensor Toil open or short circuit	1) Ta>-5°C; oil temperature sensor Toil is open or short circuit; continue for 30 secs; or 2) Ta≤-5°C; oil temperature sensor Toil is open or short circuit and compressor has been running for 10 mins	Compressor from the current circuit (system A/B) shuts down	Oil temperature sensor Toil is normal; continue for 30 sec	After power-on; continuous	(1)
E79-(1/2)	Oil temperature Toil too high	Toil>100°C(EE); continue for 2 secs	Compressor from the current circuit (system A/B) shuts down (protective shutdowns during defrosting will not be displayed)	Toil<80°C	After compressor has been running for 3 mins; continuous	(2)
E80-(1/2)	Discharge pressure sensor Pd open circuit	Discharge pressure sensor Pd open or short circuit; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Faulty sensor is replaced; continue for 30 secs	After power-on; continuous	(1)
E81-(1/2)	Discharge pressure Pd too high	Pd≥4.3MPa(EE); continue for 5 mins	Compressor from the current circuit (system A/B) shuts down (protective shutdowns during defrosting will not be displayed)	Pd<(Pd trip value-0.1MPa)	After power-on; continuous	(2)
E82-(1/2)	Four way valve reversing abnormality	1) HEAT mode Tewo-Tewi<-1°C; continue for 10 secs 2) COOL mode Tewo-Tewi>1°C; continue for 10 secs	Compressor from the current circuit (system A/B) shuts down	Auto reset after 3 mins	1) HEAT mode: After compressor has been running for 10 mins (EE) (excluding defrosting operation; the start of the excluded period is when defrost start condition is met & manual defrost command is given; the end of the excluded period is when defrosting end condition is met & 5 mins after four-way valve is de-energized)); continuous 2) COOL mode: After compressor has been running for 10 mins; continuous	(2)
E83-(1/2)	Compression ratio ε too high	ε>17.8; continue for 1 min	Compressor from the current circuit (system A/B) shuts down (protective shutdowns during defrosting will not be displayed)	Auto reset after 3 mins	After compressor startup; continuous	(2)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E84-(1/2)	Compression ratio ε too low	ε<0.7; continue for 5 mins	Compressor from the current circuit (system A/B) shuts down	Auto reset after 3 mins	After compressor has been running for 5 mins (excluding defrosting operation); continuous	(2)
E85-(1/2)	Oil temperature Toil preheating	Oil temperature Toil does not meet the start condition (except for freeze protection in HEAT mode)	Compressor from the current circuit (system A/B) cannot be started. It starts only if the freeze protection conditions are met in HEAT mode.	Oil temperature mets the start condition	Once after remote wired controller is ON	(1)
E130-(1/2)	Economizer inlet pipe temperature sensor Tsci abnormality	Economizer liquid inlet temperature sensor Tsci open or short circuit	Compressor from the current circuit (system A/B) shuts down	Economizer liquid inlet temperature sensor Tsci is normal	After power-on; continuous	(1)
E131-(1/2)	Economizer outlet pipe temperature sensor Tsco abnormality	Economizer gas outlet temperature sensor Tsco open or short circuit	Compressor from the current circuit (system A/B) shuts down	Economizer gas outlet temperature sensor Tsco is normal	After power-on; continuous	(1)
E132	Total leaving water temperature sensor Tewo all 1 abnormality	Total leaving water temperature sensor Tewo all 1 open or short circuit; continue for 30 secs	All modules shut down	Total leaving water temperature sensor Tewo all 1 is normal; 2°C ≤Tewo all 1<65°C; continue for 30 secs	After power-on; continuous	(1)
E133	Total leaving water temperature sensor Tewo all 2 abnormality (can be only detected when Zone2 is enabled)	Total leaving water temperature sensor Tewo all 2 open or short circuit; continue for 30 secs	All modules shut down	Total leaving water temperature sensor Tewo all 2 is normal; 5°C ≤Tewo all 2<65°C; continue for 30 secs	After Zone2 is enabled; continuous	(1)
E134	Tank temperature sensor Ttank abnormality	Tank temperature sensor Ttank open or short circuit; continue for 30 secs	All modules shut down	Tank temperature sensor Ttank is normal; 2°C ≤Ttank<65°C; continue for 30 secs	After DHW mode is enabled; continuous	(1)
E135	Solar temperature sensor Tsolar abnormality	Solar temperature sensor Tsolar open or short circuit; continue for 30 secs	Solar water pump cannot be started	Solar temperature sensor Tsolar is normal; 2°C≤Tewo all 2<65°C; continue for 30 secs	After Solar Hot Water mode is enabled; continuous	(1)
E188-(1/2)	Suction pressure Ps too high	Ps≥1.6MPa; continue for 30 secs	Compressor from the current circuit (system A/B) shuts down	Auto reset after 3 mins	After compressor has been running for 5 mins (excluding during defrosting and when the chiller is stopping or has stopped); continuous	(2)
E193-(1/2)	Fan DC bus brake overvoltage	Fan reports 0x0002 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E194-(1/2)	Fan DC bus overvoltage	Fan reports 0x0004 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E195-(1/2)	Fan DC bus undervoltage	Fan reports 0x0008 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)

Error Code	Description	Trip Criteria	Action Taken	Reset Method/Criteria	Detection Period	Reset Type
E196-(1/2)	Loss of fan flux locked loop	Fan reports 0x0010 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E197-(1/2)	Fan heat sink temperature too high	Fan reports 0x0020 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E198-(1/2)	Fan driver module temperature too high	Fan reports 0x0040 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E199-(1/2)	Fan motor stator locked	Fan reports 0x0080 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E200-(1/2)	Fan phase loss	Fan reports 0x0100 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E201-(1/2)	Fan CPU overload	Fan reports 0x0400 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E202-(1/2)	Fan motor parameter loading abnormality	Fan reports 0x0800 error code	Current circuit (system A/B) shuts down	5 mins after fault is cleared	After power-on; continuous	(2)
E218	Main PCB EEPROM abnormality	Main PCB EEPROM open circuit, short circuit or damaged	Current module cannot be started	Power off, clear faults and restart	Instantly after power-on	(4)

Reset Type

(1) Automatic reset

(2) Automatic reset (less than three alarms within 60 mins); otherwise, Manual reset

(3) Automatic reset (less than four alarms within 60 mins); otherwise, Manual reset

(4) Manual reset

16. Centralized Control and Cloud Service Communication

The chiller features two designated ports, CN12 for central control and CN9 for cloud service. These ports provide readable operation status and can control modular chiller's ON/OFF, modes, water temperature, and freeze protection temperature. This allows for PC monitoring and remote control.

When the chiller is concurrently connected to a remote wired controller, a central controller, and cloud service, all three can read and write its status. When multiple control methods are online, the principle of "Last In, First Out (LIFO)" is followed.

Basic Settings

Modbus Protocol Parameters

Baud rate:9600 bps Data bits:8

Parity: None Stop bit:1

DIP Switch Settings

On the main PCB, DIP5 to DIP8 of BM2 are designated for the address setting of the entire system. The Least Significant Bit (LSBit) is allocated to DIP5, while the Most Significant Bit (MSBit) is allocated to DIP8. If all the switches are in the OFF position, the value is 1. Conversely, if all switches are in the ON position, the value is 16. For more specific details, please refer to the provided table. By default, both the chiller address setting and the Modbus address setting are in the OFF position, but can be changed as required.

1) In a scenario where multiple chillers are configured into a single large system (maximum 16 chillers), the addresses of each chiller can be set as required by the user. Typically, a chiller's modbus address is in the OFF position and does not require any setting. The host computer can establish a connection to the system for monitoring purposes via the Main module's central control and cloud service communication port (where CN12 is the central control port, and CN9 is the cloud service port).

2) In a scenario where multiple chillers are configured into several large systems, the addresses of each chiller within each system can be set as required by the user. The Modbus addresses between systems are configured according to the DIP switch table. The host computer's communication port is connected to the first large system's Main module's central control and cloud service communication port (where CN12 is the central control port, and CN9 is the cloud service port) for monitoring purposes.

BM2-5	BM2-6	BM2-7	BM2-8	Modbus Address
OFF	OFF	OFF	OFF	1
ON	OFF	OFF	OFF	2
OFF	ON	OFF	OFF	3
ON	ON	OFF	OFF	4
OFF	OFF	ON	OFF	5
ON	OFF	ON	OFF	6
OFF	ON	ON	OFF	7
ON	ON	ON	OFF	8
OFF	OFF	OFF	ON	9
ON	OFF	OFF	ON	10
OFF	ON	OFF	ON	11
ON	ON	OFF	ON	12
OFF	OFF	ON	ON	13
ON	OFF	ON	ON	14
OFF	ON	ON	ON	15
ON	ON	ON	ON	16

Modular Chiller Address Table

Address Range	Description
01001 ~ 01600	Data Addresses of Modular Chiller 0 (Main)
02001 ~ 02600	Data Addresses of Modular Chiller 1
.....	.....
16001—16400	Data Addresses of Modular Chiller 15

Main Modular Chiller 0 (Example)

Address	Description	Data Type	Access Type	Function Code
01000	DIP switch BM1	LSByte	R	4
01001	DIP switch BM2	LSByte	R	4
01002	DIP switch BM3	LSByte	R	4
01003	Error code 1	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01004	Error code 2	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01005	Error code 3	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01006	Error code 4	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01007	Error code 5	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01008	Error code 6	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01009	Error code 7	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01010	Error code 8	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01011	Error code 9	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01012	Error code 10	MSByte: Type of error; LSByte: All/A/B/C/D System	R	4
01013	Entering water temperature	0.1 °C	R	4
01014	Leaving water temperature sensor	0.1 °C	R	4
01015	Ambient temperature	0.1 °C	R	4
01016	Zone1 total leaving water temperature	0.1 °C	R	4
01017	Zone2 total leaving water temperature	0.1 °C	R	4
01018	Solar temperature	0.1 °C	R	4
01019	Water tank temperature	0.1 °C	R	4
01020	System A discharge temperature	0.1 °C	R	4
01021	System A upper coil temperature	0.1 °C	R	4
01022	System A lower coil temperature	0.1 °C	R	4
01023	System A suction temperature	0.1 °C	R	4
01024	System A compressor current	0.2 A	R	4
01025	System A fan current	0.2 A	R	4
01026	System A suction pressure	0.01 Bar	R	4
01027	System A saturated suction temperature	0.1 °C	R	4

Address	Description	Data Type	Access Type	Function Code
01028	System A EEV1 opening	1 PLS	R	4
01029	System A EEV2 opening	1 PLS	R	4
01030	System B discharge temperature	0.1 °C	R	4
01031	System B upper coil temperature	0.1 °C	R	4
01032	System B lower coil temperature	0.1 °C	R	4
01033	System B suction temperature	0.1 °C	R	4
01034	System B compressor current	0.2 A	R	4
01035	System B fan current	0.2 A	R	4
01036	System B suction pressure	0.01 Bar	R	4
01037	System B saturated suction temperature	0.1 °C	R	4
01038	Reserved	/	R	4
01039	System B EEV1 opening	1 PLS	R	4
01040	System B EEV2 opening	1 PLS	R	4
01041	System A oil temperature	0.1 °C	R	4
01042	System B oil temperature	0.1 °C	R	4
01043	System A high side pressure	0.01 Bar	R	4
01044	System B high side pressure	0.01 Bar	R	4
01045	Number of systems	1 Set	R	4
01046	Program version	Version number multiplied by 0.1	R	4
01047	EEPROM version	Unsigned integer	R	4
01048	System A total compressor running time, MSByte (of 16-Bit)	Unsigned integer	R	4
01049	System A total compressor running time, LSByte (of 16-Bit)	Unsigned integer	R	4
01050	Reserved	Unsigned integer	R	4
01051	Reserved	Unsigned integer	R	4
01052	System B total compressor running time, MSByte (of 16-Bit)	Unsigned integer	R	4
01053	System B total compressor running time, LSByte (of 16-Bit)	Unsigned integer	R	4
01054	Reserved	Unsigned integer	R	4
01055	Reserved	Unsigned integer	R	4
01056	System A compressor frequency	1 Hz	R	4
01057	System B compressor frequency	1 Hz	R	4
01058	System A economizer EEV opening	1 PLS	R	4
01059	System B economizer EEV opening	1 PLS	R	4
01060	System A economizer liquid inlet temperature	0.1 °C	R	4
01061	System A economizer gas outlet temperature	0.1 °C	R	4
01062	System B economizer liquid inlet temperature	0.1 °C	R	4
01063	System B economizer gas outlet temperature	0.1 °C	R	4
01064	System A fan speed	1 rpm	R	4
01065	System B fan speed	1 rpm	R	4
01066	Three way mixing valve travel time	00H-0s 01H-1s 02H-2s	R	4
01100	Flow switch status	DI	R	2
01101	Remote switch status	DI	R	2
01102	System A high pressure switch	DI	R	2
01103	System B high pressure switch	DI	R	2
01104	Remote switch-power ON/OFF input	0: OFF 1: ON	R	2
01105	Remote switch-mode input	0: COOL; 1: HEAT	R	2
01200	Waterside primary pump output	DO	R	1

Address	Description	Data Type	Access Type	Function Code
01201	Reserved	DO	R	1
01202	Reserved	DO	R	1
01203	System A four way valve output	DO	R	1
01204	System B four way valve output	DO	R	1
01205	Reserved	DO	R	1
01206	Reserved	DO	R	1
01207	Waterside heater output	DO	R	1
01208	System A HGBP solenoid valve output	DO	R	1
01209	System B HGBP solenoid valve output	DO	R	1
01210	System A crankcase heater	DO	R	1
01211	System B crankcase heater	DO	R	1
01212	Zone1 pump output	DO	R	1
01213	Zone2 pump output	DO	R	1
01214	Solar pump output	DO	R	1
01215	Tank heater stage 1	DO	R	1
01216	Tank heater stage 2	DO	R	1
01217	System A throttle solenoid valve	DO	R	1
01218	System B throttle solenoid valve	DO	R	1
01219	System A liquid injection solenoid valve	DO	R	1
01220	System B liquid injection solenoid valve	DO	R	1
01221	Two way valve ON	DO	R	1
01222	Two way valve OFF	DO	R	1
01223	System A drain pan heater	DO	R	1
01224	System B drain pan heater	DO	R	1
01227	DHW three way valve output	DO	R	1
01300	Remote wired controller-power ON/OFF	0: OFF 1: ON	R/W	3/6/16
01301	Remote wired controller-mode (DHW needs to be enabled on controller before use)	0: HEAT; 1: COOL; 2: DHW	R/W	3/6/16
01302	Freeze Protection temperature	0.5 °C	R/W	3/6/16
01303	Reserved	/	R/W	3/6/16
01304	Zone2 total leaving water temperature set (COOL)	0.1 °C	R/W	3/6/16
01305	Zone1 total leaving water temperature set (COOL)	0.1 °C	R/W	3/6/16
01306	Zone2 total leaving water temperature set (HEAT)	0.1 °C	R/W	3/6/16
01307	Zone1 total leaving water temperature set (HEAT)	0.1 °C	R/W	3/6/16
01308	DHW temperature set	0.1 °C	R/W	3/6/16
01309	Sterilization	0: OFF 1: ON	R/W	3/6/16
01310	Quiet mode	0: OFF 1: ON	R/W	3/6/16
01311	Fast DHW	0: OFF 1: ON	R/W	3/6/16
01312	DHW priority	0: OFF 1: ON	R/W	3/6/16
01313	Zone1 enable	0: OFF 1: ON	R/W	3/6/16
01314	Zone2 enable	0: OFF 1: ON	R/W	3/6/16
01315	ECO mode	0: OFF 1: ON	R/W	3/6/16
01316	Tank heater enable	0: OFF 1: ON	R/W	3/6/16
01317	Tank heater ON ambient temperature	0.5 °C	R/W	3/6/16

DI: Digital Input

DO: Digital Output

MSByte: Most Significant Byte (High Byte)

LSByte: Least Significant Byte (Low Byte)

R/W: Read and write

R: Read-only

Note:

In the context of error codes, the high byte signifies the error type. The codes 1 to 218 represent errors E1 to E218, while the code 0 indicates no error. The low byte signifies the system involved: 0 stands for the entire system, 1 for System A, 2 for System B, 3 for System C, and 4 for System D. The addresses 01004 to 01013 can sequentially represent the errors that occur, with a maximum of 10 errors being displayed.

Data Types and Ranges

Data Type	Range
Temperature	-400~1500 corresponds to -40~150°C
Current	0~800 corresponds to 0~80A
Pressure	0~4150 corresponds to 0~4.15MPa (High pressure 0~4.15MPa; Low pressure 0~1.7MPa)
EEV Opening	0~2000 corresponds to 0~2000PLS
Error Code	1~218 represents E01~E218; 0 represents no error
DI	0: Open-circuit input; 1: Closed-circuit input
DO	0: OFF; 1: ON
Power ON/OFF	0: OFF; 1: ON
Mode	0: HEAT; 1: COOL; 2: DHW

Note:

0xFFFF indicates invalid data.

Function Code

In alignment with the standard Modbus protocol and its interpretation of function codes, the following function codes are utilized:
Function Code 1: Read the status of a set of digital outputs.
Function Code 2: Read the status of a set of digital inputs.
Function Code 3: Read the status of a set of analog outputs.
Function Code 4: Read the status of a set of analog inputs.
Function Code 6: Read/Write the status of a specific analog output.
Function Code 16: Read/Write the status of a set of analog outputs.

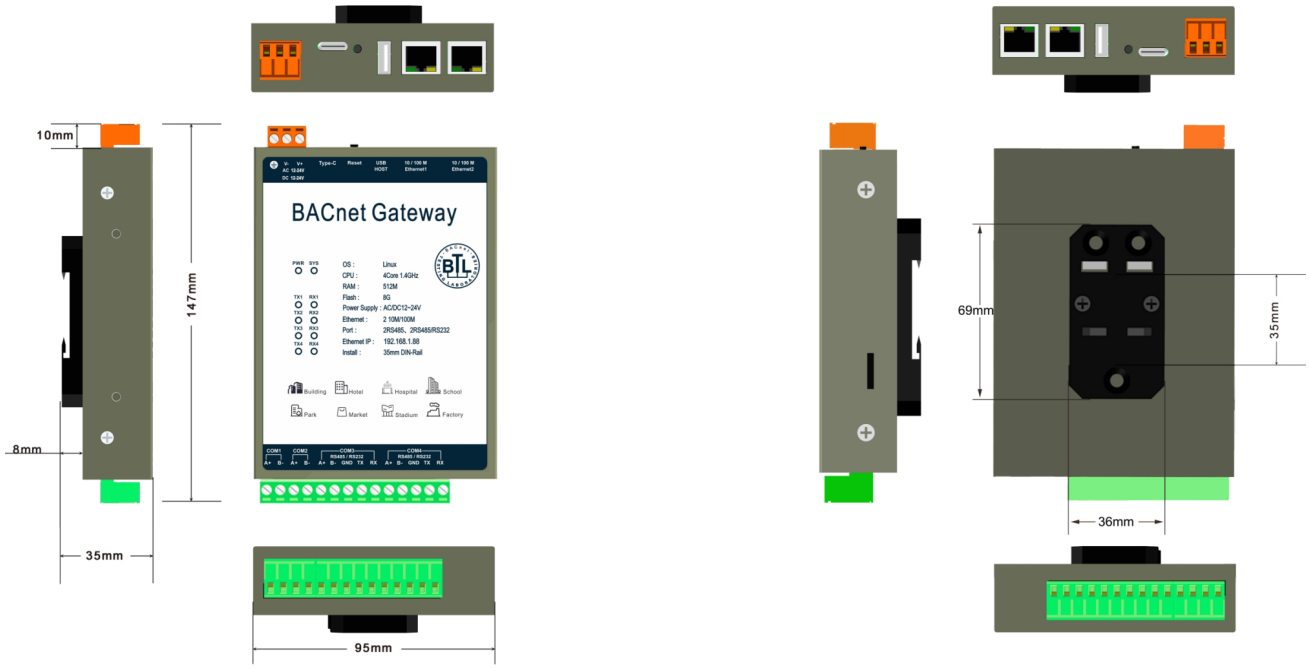
Note:

When multiple chillers are used in combination, only the Main module can be connected to the central controller and cloud service. Communication with Sub modules will fail.

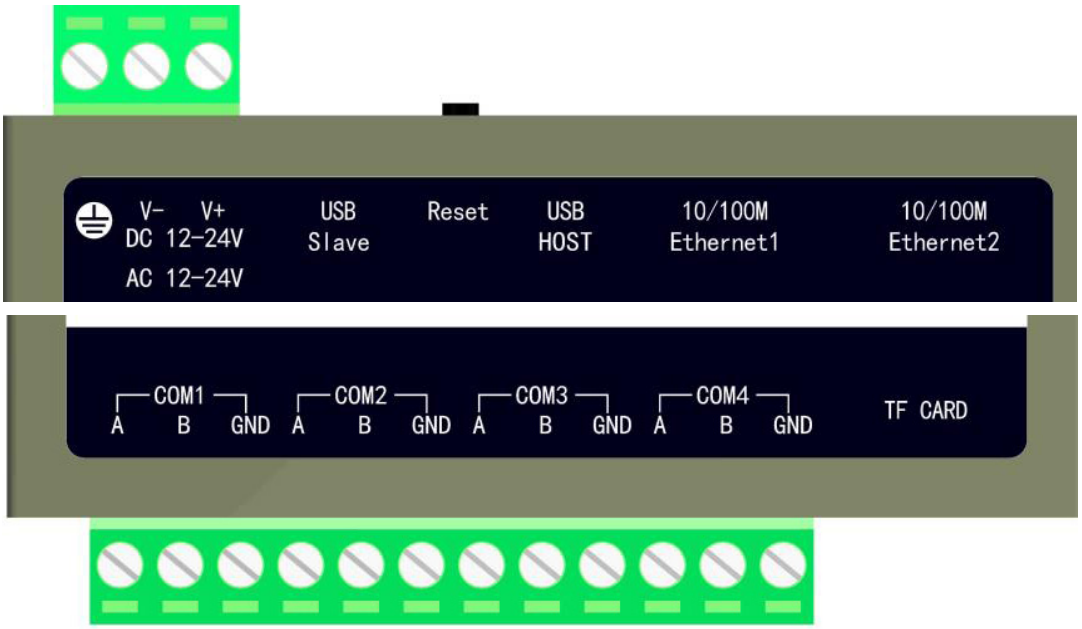
17. Appendix —— Modbus to BACnet

17.1 About Protocol Adapter HCM-04

External Appearance



Interface Features



Power Supply	V-	GND
	V+	+24V
Modbus Interface 1 COM1	A	“A” of COM1 (Access device at address 1 or address 2)
	B	“B” of COM1 (Access device at address 1 or address 2)

Specification

Item		Description
Power Supply		AC/DC 24V
CPU		4 Core 1.4GHz
ROM		8G
RAM		512M
Temperature	Operating	-20~70°C
	Storage	-40~85°C
Relative Humidity	Operating	20%-90% (no condensation)
	Storage	15%~95% (no condensation)
Dimension (W*D*H)		95mm*147mm*35mm
Ethernet Communication		
Specification		High-performance 100M/10M Ethernet interface supports AUTO MDI/MDIX
Protocol		BACnet IP
RS485 Bus Communication		
Bus Quantity		2RS485 with two contacts, each supports 2 Modbus Sub devices
Communication Parameters		Baud Rate: 9600 / Data Bits: 8 / Parity: None / Stop bit: 1

17.2 Wiring Instructions

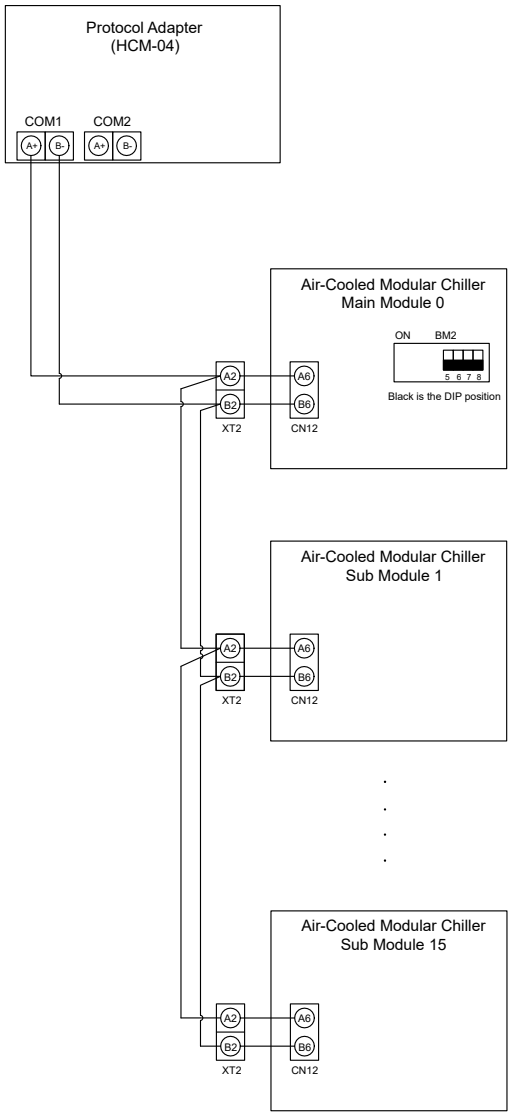
HCM-04 default Ethernet parameters are as follows:

- IP Address: 192.168.1.88
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1

HCM-04 can pair with either an air-cooled modular chiller or VRF , with VRF being the default setting. To use it with an air-cooled modular chiller, you need to replace the project file. For detailed instructions, refer to Software Configuration.

NOTE:

- COM1 is a Modbus interface, capable of connecting to chiller at address 1 (Only address 1 can be used; communication with equipment at address 2 will fail).
- Ensure that DIP5-8 of the Main module's BM2 is set to OFF (Modbus address 1).
- Set "LEVEL 2 PARAMETRS > Interface type" to "Central controller" on the wired controller.



17.3 Software Configuration

Replace Project File

The default IP address of HCM-04 is 192.168.1.88.

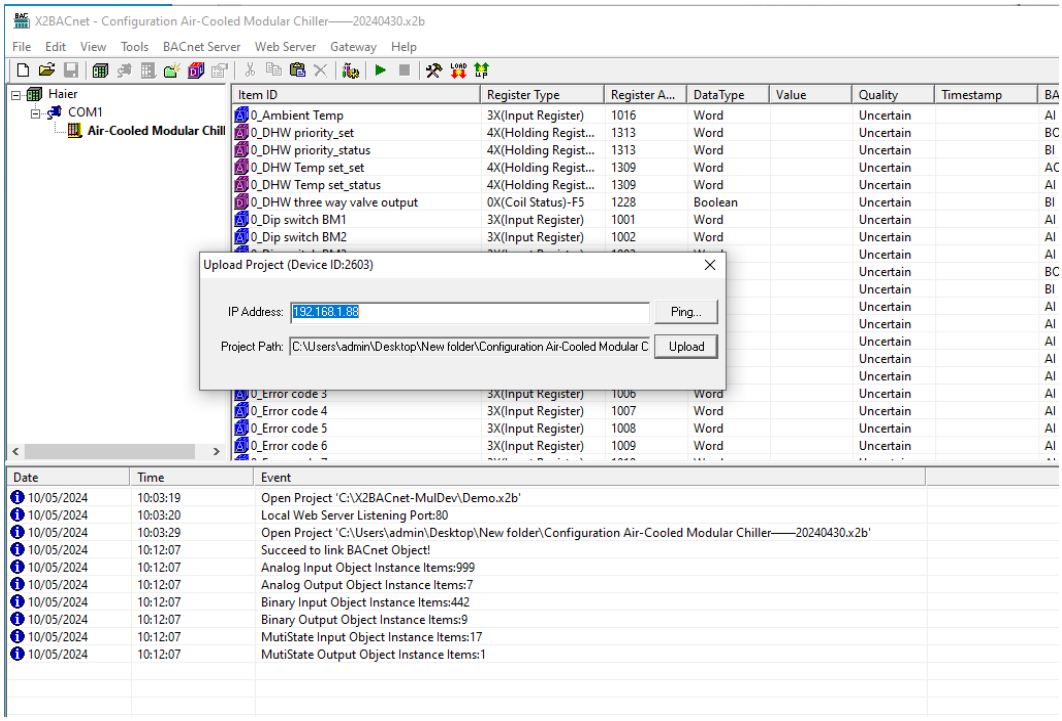
First, set your computer's IP address to be in the same network segment as HCM-04. Use the ping command to check if 192.168.1.88 is reachable. If it is not reachable, press and hold the RESET button for 8 seconds. Once the HCM-04 restarts, try pinging 192.168.1.88 again. After a successful ping test, you can begin the next configuration.

Download configuration tool X2BACnet and the project file from GTM+ (https://gtmplus.haier.net/).

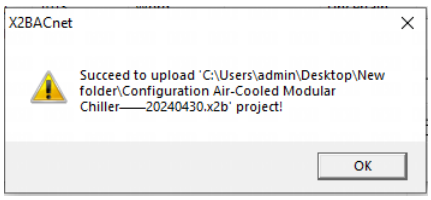
Double-click to open "X2BACnet.exe". Select File > Open or click on the file icon to open the project "Configuration Air-Cooled Modular Chiller——20240524.x2b".

Select Gateway > Upload or click on the upload icon to upload the project.

In the pop-up dialog box, enter the gateway IP address and upload.



After uploading, the pop-up dialog box will indicate a successful upload.

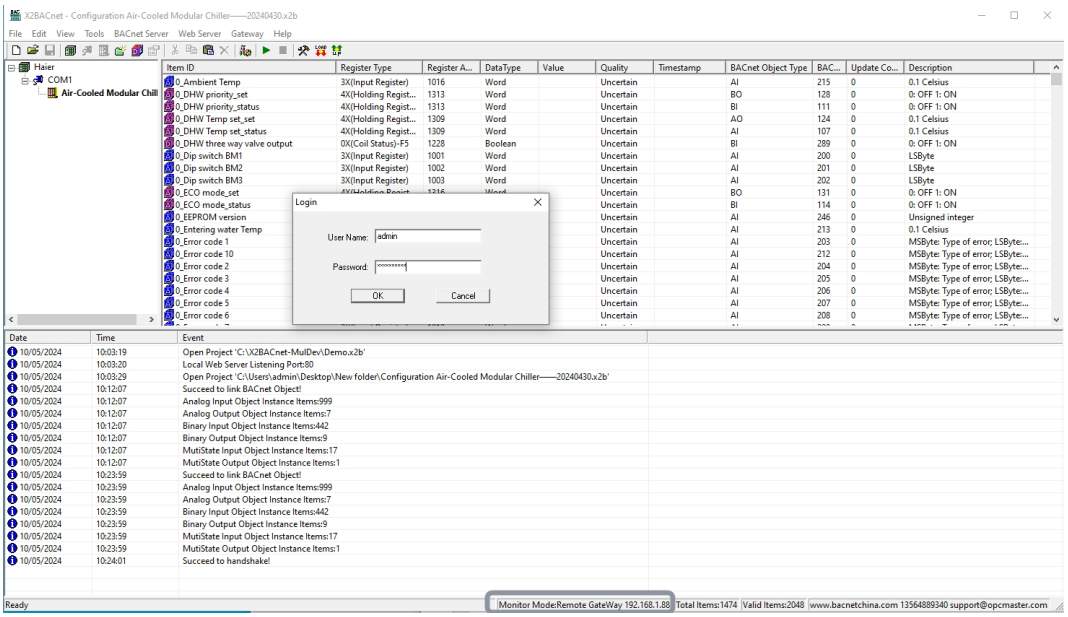


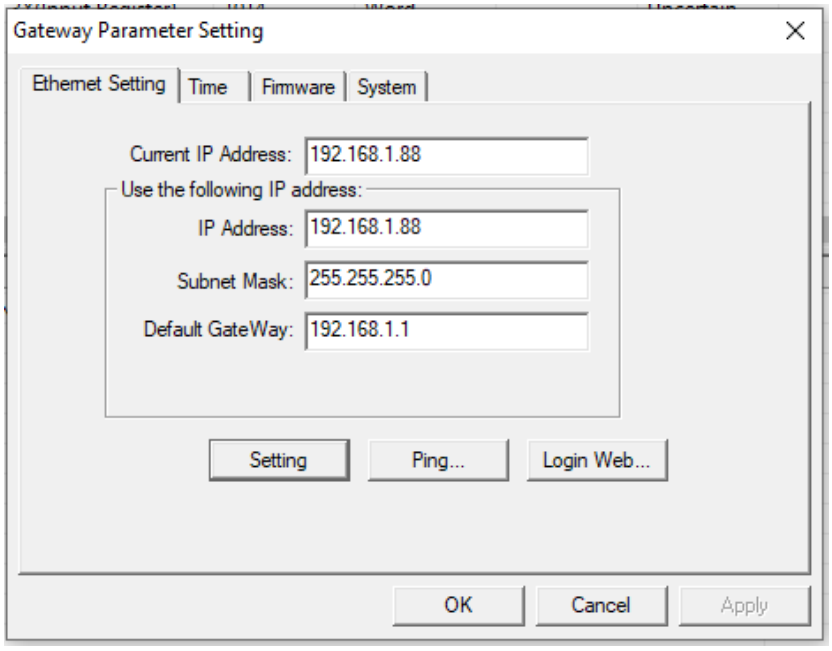
Modify HCM-04 IP Address

Double click to open "X2BACnet.exe".

In Monitor Mode, select Gateway>Setting or click on the setting icon.

In the pop-up dialog box, enter the username and password. The username is "admin" and the password is "admin123456". After successfully entering the credentials, you can change the gateway parameters.





Ethernet Setting: You can change the current IP address (default is 192.168.1.88). After setting, click OK. Ping test if the setting is successful. "Login Web..." allows you to log in to the web server where the gateway is located.

17.4 BACnet/IP Points List

No.	Chiller (Main) Modbus Address	Device Port	Instance No.	BACnet/IP Port
1	1	COM1	10	192.168.1.88:47808

No.	Object Type	
1	BI	Binary Input
2	BO	Binary Output
3	MSI	Multi-state Inuput
4	MSO	Multi-state Output
5	AI	Analog Input
6	AO	Analog Output

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
100	Remote wired controller-power ON/OFF_ status	0_Remote wired controller-power ON/OFF_ status	BI	OFF	ON		
101	Remote wired controller-mode_status	0_Remote wired controller-mode_status (NOTE *1)	MSI	-	HEAT	COOL	DHW
102	Freeze Protection Temp_status	0_Freeze Protection Temp_status	AI	0.5 Celsius			
103	Zone2 total leaving water Temp(COOL)_ status	0_Zone2 total leaving water Temp(COOL)_ status	AI	0.1 Celsius			
104	Zone1 total leaving water Temp(COOL)_ status	0_Zone1 total leaving water Temp(COOL)_ status	AI	0.1 Celsius			
105	Zone2 total leaving water Temp(HEAT)_status	0_Zone2 total leaving water Temp(HEAT)_ status	AI	0.1 Celsius			
106	Zone1 total leaving water Temp(HEAT)_status	0_Zone1 total leaving water Temp(HEAT)_ status	AI	0.1 Celsius			
107	DHW Temp_status	0_DHW Temp_status	AI	0.1 Celsius			
108	Sterilization_status	0_Sterilization_status	BI	OFF	ON		
109	Quiet mode_status	0_Quiet mode_status	BI	OFF	ON		
110	Fast DHW_status	0_Fast DHW_status	BI	OFF	ON		
111	DHW priority_status	0_DHW priority_status	BI	OFF	ON		

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
112	Zone1 enable_status	0_Zone1 enable_status	BI	OFF	ON		
113	Zone2 enable_status	0_Zone2 enable_status	BI	OFF	ON		
114	ECO mode_status	0_ECO mode_status	BI	OFF	ON		
115	Tank heater enable_status	0_Tank heater enable_status	BI	OFF	ON		
116	Tank heater ON ambient Temp_status	0_Tank heater ON ambient Temp_status	AI	0.5 Celsius			
117	Remote wired controller-power ON/OFF_set	0_Remote wired controller-power ON/OFF_set	BO	OFF	ON		
118	Remote wired controller-mode_set	0_Remote wired controller-mode_set	MSO	-	HEAT	COOL	DHW
119	Freeze Protection Temp_set	0_Freeze Protection Temp_set	AO	0.5 Celsius			
120	Zone2 total leaving water Temp(COOL)_set	0_Zone2 total leaving water Temp(COOL)_set	AO	0.1 Celsius			
121	Zone1 total leaving water Temp(COOL)_set	0_Zone1 total leaving water Temp(COOL)_set	AO	0.1 Celsius			
122	Zone2 total leaving water Temp(HEAT)_set	0_Zone2 total leaving water Temp(HEAT)_set	AO	0.1 Celsius			
123	Zone1 total leaving water Temp(HEAT)_set	0_Zone1 total leaving water Temp(HEAT)_set	AO	0.1 Celsius			
124	DHW Temp_set	0_DHW Temp_set	AO	0.1 Celsius			
125	Sterilization_set	0_Sterilization_set	BO	OFF	ON		
126	Quiet mode_set	0_Quiet mode_set	BO	OFF	ON		
127	Fast DHW_set	0_Fast DHW_set	BO	OFF	ON		
128	DHW priority_set	0_DHW priority_set	BO	OFF	ON		
129	Zone1 enable_set	0_Zone1 enable_set	BO	OFF	ON		
130	Zone2 enable_set	0_Zone2 enable_set	BO	OFF	ON		
131	ECO mode_set	0_ECO mode_set	BO	OFF	ON		
132	Tank heater enable_set	0_Tank heater enable_set	BO	OFF	ON		
133	Tank heater ON ambient Temp_set	0_Tank heater ON ambient Temp_set	AO	0.5 Celsius			
200	Dip switch BM1	0_Dip switch BM1	AI	LSByte			
201	Dip switch BM2	0_Dip switch BM2	AI	LSByte			
202	Dip switch BM3	0_Dip switch BM3	AI	LSByte			

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
100*X+203	Error code 1	X_Error code 1	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+204	Error code 2	X_Error code 2	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+205	Error code 3	X_Error code 3	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+206	Error code 4	X_Error code 4	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+207	Error code 5	X_Error code 5	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+208	Error code 6	X_Error code 6	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+209	Error code 7	X_Error code 7	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+210	Error code 8	X_Error code 8	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+211	Error code 9	X_Error code 9	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+212	Error code 10	X_Error code 10	AI	MSByte: Type of error; LSByte: All/A/B/C/D System			
100*X+213	Entering water Temp	X_Entering water Temp	AI	0.1 Celsius			
100*X+214	Leaving water Temp sensor	X_Leaving water Temp sensor	AI	0.1 Celsius			
100*X+215	Ambient Temp	X_Ambient Temp	AI	0.1 Celsius			
216	Zone1 total leaving water Temp	0_Zone1 total leaving water Temp	AI	0.1 Celsius			
217	Zone2 total leaving water Temp	0_Zone2 total leaving water Temp	AI	0.1 Celsius			
218	Solar Temp	0_Solar Temp	AI	0.1 Celsius			
219	Water tank Temp	0_Water tank Temp	AI	0.1 Celsius			
100*X+220	System A discharge Temp	X_System A discharge Temp	AI	0.1 Celsius			
100*X+221	System A upper coil Temp	X_System A upper coil Temp	AI	0.1 Celsius			
100*X+222	System A lower coil Temp	X_System A lower coil Temp	AI	0.1 Celsius			
100*X+223	System A suction Temp	X_System A suction Temp	AI	0.1 Celsius			

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
100*X+224	System A compressor current	X_System A compressor current	AI	0.2 A			
100*X+225	System A fan current	X_System A fan current	AI	0.2 A			
100*X+226	System A suction pressure	X_System A suction pressure	AI	0.01 Bar			
100*X+227	System A saturated suction Temp	X_System A saturated suction Temp	AI	0.1 Celsius			
100*X+228	System A EEV1 opening	X_System A EEV1 opening	AI	1 PLS			
100*X+229	System A EEV2 opening	X_System A EEV2 opening	AI	1 PLS			
100*X+230	System B discharge Temp	X_System B discharge Temp	AI	0.1 Celsius			
100*X+231	System B upper coil Temp	X_System B upper coil Temp	AI	0.1 Celsius			
100*X+232	System B lower coil Temp	X_System B lower coil Temp	AI	0.1 Celsius			
100*X+233	System B suction Temp	X_System B suction Temp	AI	0.1 Celsius			
100*X+234	System B compressor current	X_System B compressor current	AI	0.2 A			
100*X+235	System B fan current	X_System B fan current	AI	0.2 A			
100*X+236	System B suction pressure	X_System B suction pressure	AI	0.01 Bar			
100*X+237	System B saturated suction Temp	X_System B saturated suction Temp	AI	0.1 Celsius			
100*X+238	System B EEV1 opening	X_System B EEV1 opening	AI	1 PLS			
100*X+239	System B EEV2 opening	X_System B EEV2 opening	AI	1 PLS			
100*X+240	System A oil Temp	X_System A oil Temp	AI	0.1 Celsius			
100*X+241	System B oil Temp	X_System B oil Temp	AI	0.1 Celsius			
100*X+242	System A high side pressure	X_System A high side pressure	AI	0.01 Bar			
100*X+243	System B high side pressure	X_System B high side pressure	AI	0.01 Bar			
244	Number of systems	0_Number of systems	AI	1 Set			
245	Program version	0_Program version	AI	Version number multiplied by 0.1			
246	EEPROM version	0_EEPROM version	AI	Unsigned integer			
100*X+247	System A total compressor running time_ MSByte	X_System A total compressor running time_ MSByte	AI	Unsigned integer			
100*X+248	System A total compressor running time_ LSByte	X_System A total compressor running time_ LSByte	AI	Unsigned integer			
100*X+249	System B total compressor running time_ MSByte	X_System B total compressor running time_ MSByte	AI	Unsigned integer			
100*X+250	System B total compressor running time_ LSByte	X_System B total compressor running time_ LSByte	AI	Unsigned integer			

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
100*X+251	System A compressor frequency	X_System A compressor frequency	AI	1 Hz			
100*X+252	System B compressor frequency	X_System B compressor frequency	AI	1 Hz			
100*X+253	System A economizer EEV opening	X_System A economizer EEV opening	AI	1 PLS			
100*X+254	System B economizer EEV opening	X_System B economizer EEV opening	AI	1 PLS			
100*X+255	System A economizer liquid inlet Temp	X_System A economizer liquid inlet Temp	AI	0.1 Celsius			
100*X+256	System A economizer gas outlet Temp	X_System A economizer gas outlet Temp	AI	0.1 Celsius			
100*X+257	System B economizer liquid inlet Temp	X_System B economizer liquid inlet Temp	AI	0.1 Celsius			
100*X+258	System B economizer gas outlet Temp	X_System B economizer gas outlet Temp	AI	0.1 Celsius			
100*X+259	System A fan speed	X_System A fan speed	AI	1 rpm			
100*X+260	System B fan speed	X_System B fan speed	AI	1 rpm			
261	Three way mixing valve travel time	0_Three way mixing valve travel time	AI	00H-0s 01H-1s 02H-2s			
100*X+262	Flow switch status	X_Flow switch status	BI	OFF	ON		
263	Remote switch status	0_Remote switch status	BI	OFF	ON		
100*X+264	System A high pressure switch	X_System A high pressure switch	BI	OFF	ON		
100*X+265	System B high pressure switch	X_System B high pressure switch	BI	OFF	ON		
266	Remote switch-power ON/OFF input	0_Remote switch-power ON/OFF input	BI	OFF	ON		
267	Remote switch-mode input	0_Remote switch-mode input	MSI	-	COOL	HEAT	
100*X+268	Waterside primary pump output	X_Waterside primary pump output	BI	OFF	ON		
100*X+269	System A four way valve output	X_System A four way valve output	BI	OFF	ON		
100*X+270	System B four way valve output	X_System B four way valve output	BI	OFF	ON		
271	Waterside heater output	0_Waterside heater output	BI	OFF	ON		
100*X+272	System A HGBP solenoid valve output	X_System A HGBP solenoid valve output	BI	OFF	ON		
100*X+273	System B HGBP solenoid valve output	X_System B HGBP solenoid valve output	BI	OFF	ON		
100*X+274	System A crankcase heater	X_System A crankcase heater	BI	OFF	ON		
100*X+275	System B crankcase heater	X_System B crankcase heater	BI	OFF	ON		
276	Zone1 pump output	0_Zone1 pump output	BI	OFF	ON		
277	Zone2 pump output	0_Zone2 pump output	BI	OFF	ON		
278	Solar pump output	0_Solar pump output	BI	OFF	ON		
279	Tank heater stage 1	0_Tank heater stage 1	BI	OFF	ON		

Instance No.	Standard Name	Object Name (X: Module number 0~15; 0: Main module; 1-15: Sub module)	Object Type	Unit			
				Inactive	Active		
				Text-0	Text-1	Text-2	Text-3
280	Tank heater stage 2	0_Tank heater stage 2	BI	OFF	ON		
100*X+281	System A throttle solenoid valve	X_System A throttle solenoid valve	BI	OFF	ON		
100*X+282	System B throttle solenoid valve	X_System B throttle solenoid valve	BI	OFF	ON		
100*X+283	System A liquid injection solenoid valve	X_System A liquid injection solenoid valve	BI	OFF	ON		
100*X+284	System B liquid injection solenoid valve	X_System B liquid injection solenoid valve	BI	OFF	ON		
100*X+285	Two way valve ON	X_Two way valve ON	BI	OFF	ON		
100*X+286	Two way valve OFF	X_Two way valve OFF	BI	OFF	ON		
100*X+287	System A drain pan heater	X_System A drain pan heater	BI	OFF	ON		
100*X+288	System B drain pan heater	X_System B drain pan heater	BI	OFF	ON		
289	DHW three way valve output	0_DHW three way valve output	BI	OFF	ON		
Points SUM	=69×16+55=1159						

NOTE:

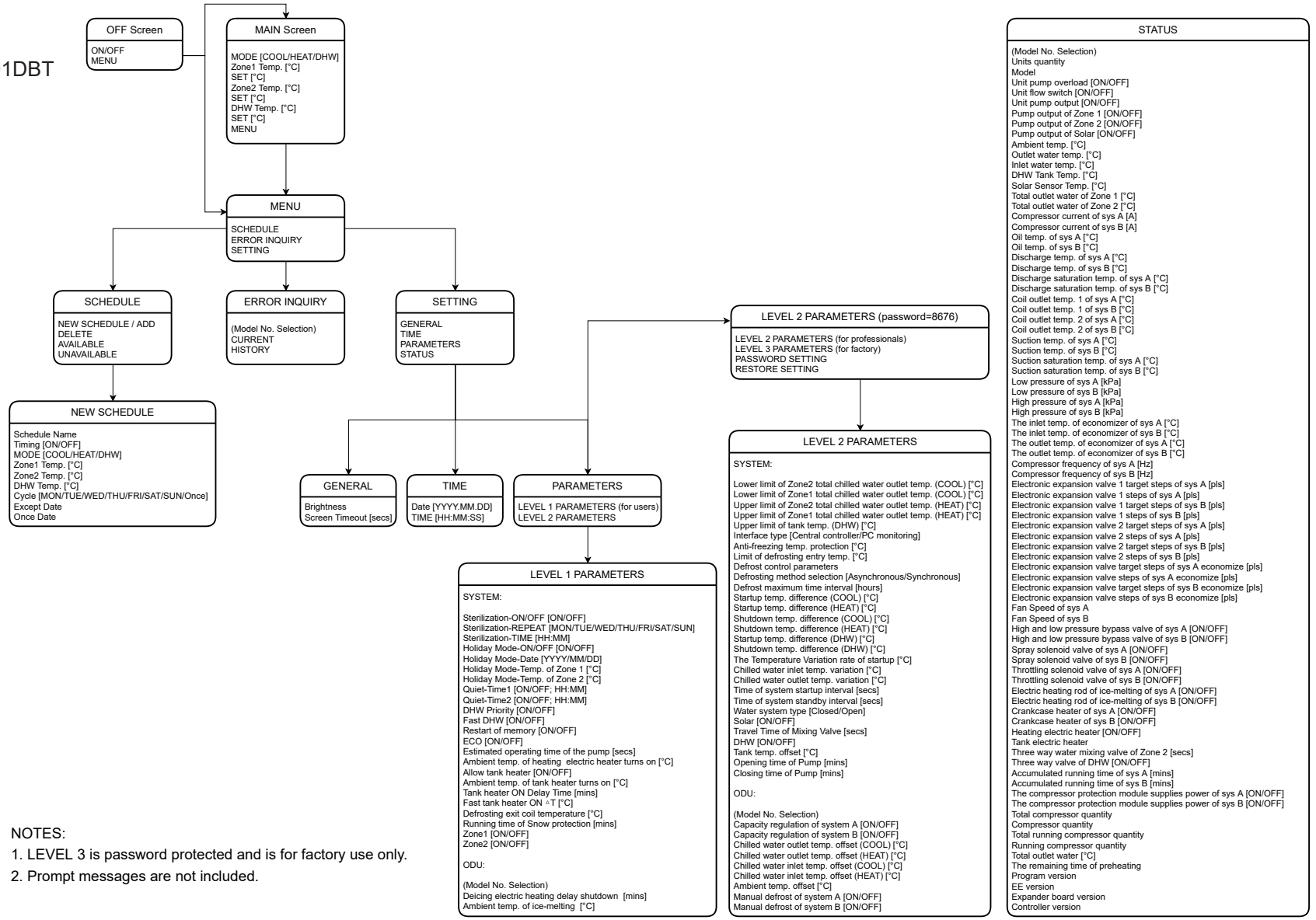
1. The DHW mode needs to be enabled on the online control before it can be set.

2. When the value is 65535, it indicates that the data is invalid.

18. Appendix —— Menu Structure

Model:

HW-WA101DBT



NOTES:

1. LEVEL 3 is password protected and is for factory use only.
2. Prompt messages are not included.

19. Revision History

Revision	Date	Description of Changes
SYJS-04-2024 REV.A	2024/04/09	Original manual
SYJS-04-2024 REV.B	2024/04/28	1) Updated: Refrigerant System > Piping Diagrams Centralized Control and Cloud Service Communication > Modular Chiller Address Table > Address 1301 3) Minor changes
SYJS-06-2024 REV.A	2024/06/19	1) Added: Specification Center of Gravity / Weight Distribution Electrical Data Appendix —— Modbus to BACnet Appendix —— Menu Structure 2) Updated: Water System > Piping Diagrams Water System > External Components > Description of SMV Capacity Performance Service Diagnosis > Error Codes Centralized Control and Cloud Service Communication 3) Minor changes

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