AirBoost Air Cooled Screw Chiller

Installation, Operation and Maintenance Manual

Inverter, SCAF***

Please keep this manual carefully for future reference
and read it carefully before operation

Description

- The installation section in this manual is provided only for professional installation personnel.
- Before using the unit, carefully read the "Unit and Controller Operating Instructions" to avoid damaging the unit and causing accidents due to incorrect operation.
- This manual is subject to change without notice.
- Product implementation standards: GB/T18430.1, AHRI 550/590.
- Register the pressure vessel unit with the local management organization before and after it is used.
- The inverter air cooled screw chiller is designed to operate within the following temperature range:

	Standard type (T1)	Low temperature type (LA)	High temperature type (T3)	Direct free cooling (FCD)	Indirect free cooling (FCI)
Ambient temperature	5ºC~48ºC	-20ºC~48ºC	5ºC~52ºC	-25ºC~48ºC	-25ºC~48ºC
Water outlet temperature	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC
Minimum water flow	50%	50%	50%	50%	50%
Maximum water flow	130%	130%	130%	130%	130%

Special note: When antifreeze solution is used in the engineering water system, the unit can operate at a lower water outlet temperature. But specific requirements must be explained to the manufacturer before purchasing.

Contents

1 Introduction

1.1 Functions

The inverter air cooled screw chiller is at the forefront of air cooled unit technology. It does not require multiple auxiliary attachments such as a cooling tower, cooling water pump, boiler, or pipe system, and so the system structure is simple and occupies little space. Maintenance and management are easy and energy consumption is low, and the unit is especially suitable for arid areas. Installed outdoors, the chiller comprises an advanced, low-noise, and high efficiency semi-hermetic twin-rotor screw compressor; a fin heat exchanger, which uses hydrophilic aluminum foil fins/specially coated aluminum foils and high efficiency but low-noise axial flow fan for better heat exchange effects; and a shell-and-tube heat exchanger, which uses high efficiency inner-grooved copper tubes. The combination of the high efficiency inverter screw compressor, advanced inverter technology, high efficiency evaporator, condenser, and microcomputer controller ensures that the unit operates efficiently.

The application of inverter technology can greatly reduce the annual electricity consumption of users by more than 30% when compared with fixed speed screw units.

All the inverter air cooled screw chillers are transported to the installation site as a whole. All the pipelines have been assembled and charged with the required refrigerant and lubricating oil before delivery.

The inverter air cooled screw chiller adopts the most advanced inverter twin-rotor screw compressor which supports 0.1 Hz frequency adjustment in a wide range, thus achieving high energy efficiency. The user friendly microcomputer control system enables remote control, while the multi self-protection function guarantees safety, reliability, and smooth operation. The unit comes in a wide range of models tailored to needs in a customer-first approach. It is compact and features high COP, a long life cycle, and simple O&M. It is widely used in hotels, restaurants, office buildings, stores, hospitals, and in the metallurgical, chemical, mechanical, and electronic sectors, all of which have stringent requirements for air conditioning solutions.

Midea inverter air cooled screw chiller can operate at a wide temperature range. The standard type can operate in full load at the ambient temperature of 48ºC and the water outlet temperature of 7ºC. The lowest operating temperature can be up to 5ºC. In order to meet the needs of different customers in different environments, Midea inverter air cooled screw chillers are available in low temperature series, high temperature series and free cooling series. Thus, within the extreme temperature of -25~52ºC, users can always find a suitable product.

1.2 Main Parts

1.2.1 Compressor

◆ The chiller adopts the advanced inverter 5-toothed and 6-toothed asymmetrical spiral twin-rotor screw compressor, which is specifically designed for the inverter technology. It features high-precision male and female rotors, which are well matched and designed to work together, minimizing the friction resistance and ensuring that the unit has quiet and long-lasting operation. Compared with the single-rotor screw compressor, the twin-rotor screw compressor has advantages such as eliminating clearance loss, high volume efficiency, low noise, and fewer wearing parts. And compared with the fixed speed compressor, the twin-rotor screw compressor improves the energy efficiency by more than 10%.

◆ This system features a differential pressure-type oil supply. All the moving parts in the compressor can stay well-lubricated without an external oil pump. Working without a complicated oil circuit system, the entire system is simplified, making it easier to service and providing more reliable operation.

◆ The special high-precision zero clearance bearing is used to maximize service life.

◆ The SKF compressor bearing from Sweden has a long service life, so the screw compressor can operate continuously for at least 30,000 hours.

1.2.2 High Efficiency Shell-and-tube Heat Exchanger

The shell-and-tube heat exchanger adopts a high-efficiency heat exchange tube and uses a unique tube bundling and laying design to ensure sufficient heat exchange by fully considering the state change, flow rate, and pressure drop rate of the refrigerant, thereby strengthening the unit capacity.

1.2.3 Fin-coil Heat Exchanger

The fin-coil heat exchanger adopts a corrosion-resistant high-efficiency heat transmission tube, a reliable and low-noise fan, and copper tubes on which the hydrophilic aluminum fins/specially coated aluminum foils are staggered, increasing the heat transfer coefficient and effectively preventing corrosion.

1.2.4 VFD

Each compressor of the unit has a refrigerant-cooled VFD. Compared with the air-cooled VFD, the refrigerant-cooled VFD operates stably and is less affected by the external environment. The relatively closed VFD panel can effectively reduce the adverse effects caused by external corrosion, dust, sand, rat and rain, and ensure the stability of the inverter system.

In addition, to meet the needs of different customers, the unit can be optionally equipped with partial inverter fan or full inverter fan to further improve the energy efficiency level.

High-precision inverter adjustment can track the load change of the unit at any time, adjust the refrigerant flow, and ensure smooth operation with high compressor efficiency under both full load and partial load, thus achieving stable water outlet temperature while greatly reducing the energy consumption of the unit.

1.2.5 Liquid Ejector System

Midea inverter air cooled screw chiller can effectively monitor the compressor motor temperature. The standard liquid ejector system located at the rear of the compressor is able to cool down the motor, so as to control the compressor discharge temperature, to prevent the motor or lubricating oil overheating.

1.2.6 Intelligent Control System

◆ Controlled by a microcomputer controller, it has many automatic control functions, such as fault diagnosis, energy management, anti-freeze monitoring, and more, ensuring efficient operation and making the unit easier to service. The unit is equipped with a RS485 communication interface to implement networking control between multiple units. Due to the RS485 conversion interface, the unit can be controlled by the upper computer. The starting and shutdown of each unit can be controlled by the PC according to load requirements and operation time.

◆ The multi self-protection function guarantees safety, reliability, and smooth operation.

2 Operating Range

2.1 Installation Environment

Refer to the following to select an appropriate model.

	Standard type (T1)	Low temperature type (LA)	High temperature type (T3)	Direct free cooling (FCD)	Indirect free cooling (FCI)
Ambient temperature	5ºC~48ºC	-20ºC~48ºC	5ºC~52ºC	-25ºC~48ºC	-25ºC~48ºC
Water outlet temperature	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC	4ºC~20ºC
Minimum water flow	50%	50%	50%	50%	50%
Maximum water flow	130%	130%	130%	130%	130%

Note that the unit must be installed on a foundation with good drainage. In addition, corrosive atmospheric environment or extremely high humidity environment will cause corrosion to the unit. Units need to be specially customized for such environments.

2.2 Water-side Pressure Drop of Shell-and-tube Heat Exchanger

To ensure the normal operation of the unit, the water flow of the shell-and-tube heat exchanger must be within 50~130% of the rated flow. Low water flow may result in freezing in the copper tubes of the heat exchanger or cause refrigerant leakage; and excessive water flow may bend or break the copper tubes of the heat exchanger and baffle plate and damage the entire shell-and-tube heat exchanger. Even when the unit is shut down, the water flow in the shell-and-tube heat exchanger must not exceed 150% of the rated water flow.

To reduce the corrosion caused to the shell-and-tube heat exchanger and prolong the service life of the unit, remember to turn off the circulating water pump and drain water from the heat exchanger and from the pipes in the event that the unit is shut down for a long time.

For parameters and water-side pressure loss of shell-and-tube heat exchanger, refer to the selection software.

2.3 Variable Flow of Shell-and-tube Heat Exchanger

For a standard unit, the flow in the evaporator can be variable. Despite the flow of water, the unit can achieve a constant water outlet temperature. The water flow must be greater than the specified minimum water flow, and the change of water flow per minute cannot exceed 30%.

If the water flow changes too quickly, the system water capacity should be changed from 4.7L/kW to 7.1L/kW.

The minimum water capacity of the water circulation system is derived from the following formula:

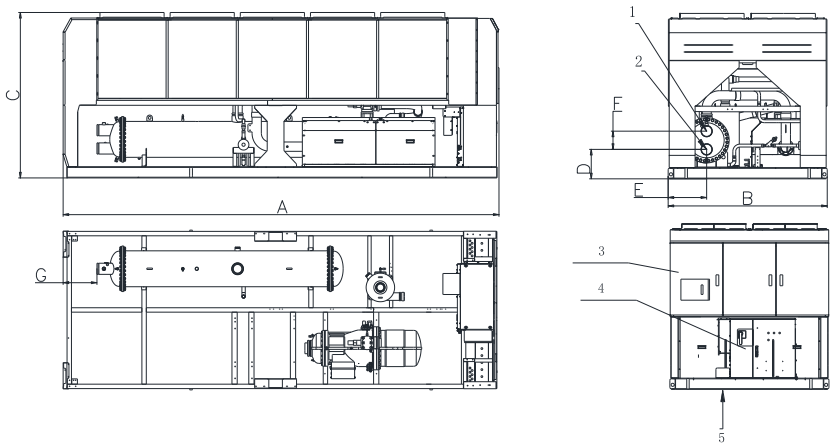
Volume = Q (kW) * N (L)	
Type	N (L)
Air conditioning conditions	4.7
Process conditions	7.1

Q (kW): Nominal cooling capacity under standard operating conditions.

To facilitate proper operation of the unit and achieve precise control, it is usually necessary to add a tank to ensure the required water capacity is met. The tank has a built-in baffle plate to ensure total mixing. For example:

3 Dimensions

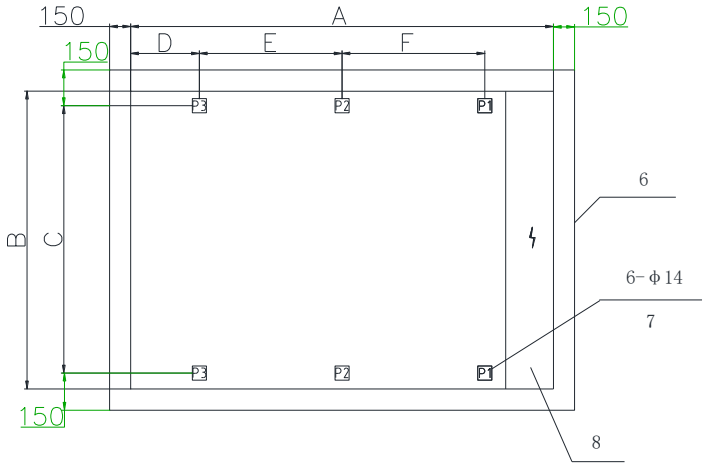
3.1 Dimensions of SCAF80~145HV, SCAF80~145HV(T3), SCAF80~145HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
80~120	4440	2300	2460	420	550	260	60
125~145	5240	2300	2460	420	550	260	65

Foundation of SCAF80~145HV, SCAF80~145HV(T3), SCAF80~145HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

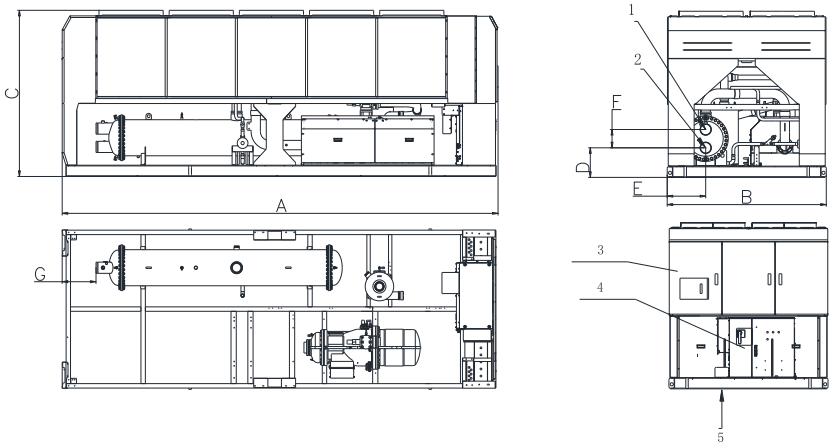
Model	Dimensions (unit: mm)					
	A	B	C	D	E	F
80~120	4440	2300	2180	600	1670	1200
125~145	5240	2300	2180	800	2000	1700

Models of spring isolators at all points			
Model	P1	P2	P3
80~120	MHD-850	MHD-850	MHD-850
125~145	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

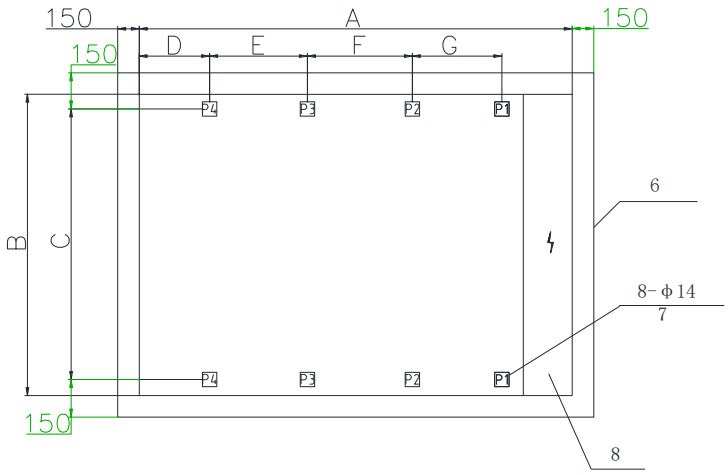
3.2 Dimensions of SCAF150~175HV, SCAF150~175HV(T3), SCAF150~175HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
150~175	6245	2300	2460	420	550	260	405

Foundation of SCAF150~175HV, SCAF150~175HV(T3), SCAF150~175HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

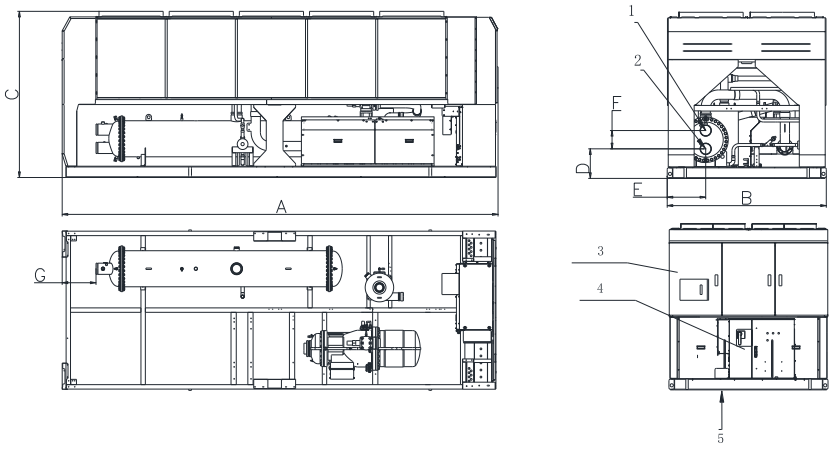
Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
150~175	6245	2300	2180	1080	2000	1200	1200

Models of spring isolators at all points				
Model	P1	P2	P3	P4
150~175	MHD-850	MHD-850	MHD-850	MHD-850

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

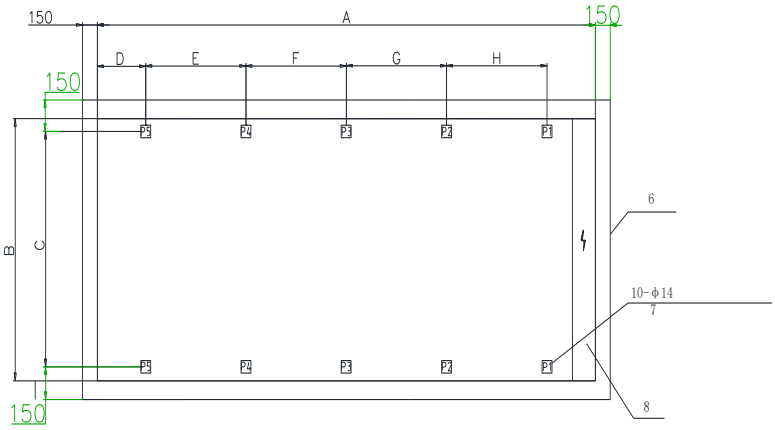
3.3 Dimensions of SCAF185~205HV, SCAF185~205HV(T3), SCAF185~205HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
185~205	7250	2300	2460	420	550	260	1300

Foundation of SCAF185~205HV, SCAF185~205HV(T3), SCAF185~205HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

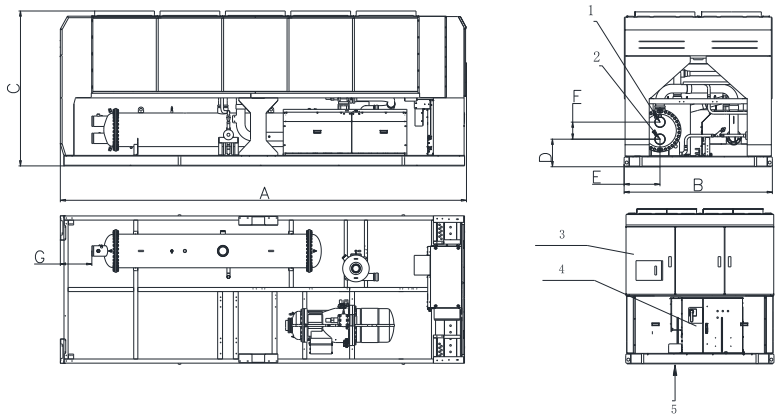
Model	Dimensions (unit: mm)							
	A	B	C	D	E	F	G	H
185~205	7250	2300	2180	635	1800	1800	1050	1200

Model	Models of spring isolators at all points				
	P1	P2	P3	P4	P5
185~205	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

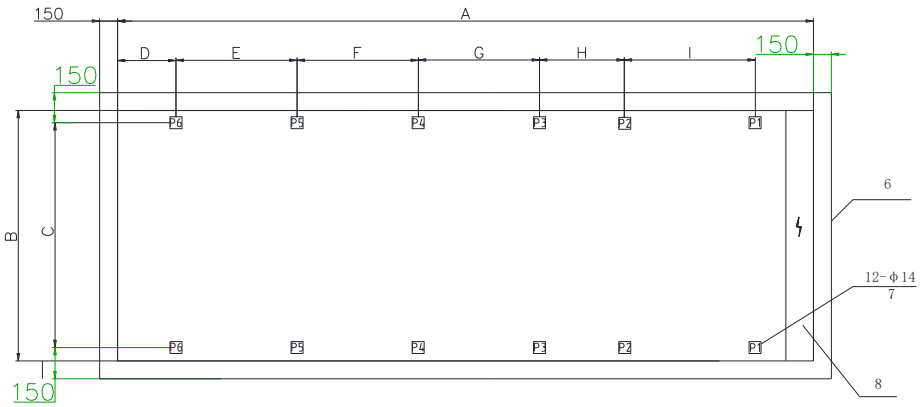
3.4 Dimensions of SCAF215~255HV, SCAF215~255HV(T3), SCAF215~255HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Foundation of SCAF215~255HV, SCAF215~255HV(T3), SCAF215~255HV(LA)

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
215~255	8255	2300	2460	420	550	260	2305



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

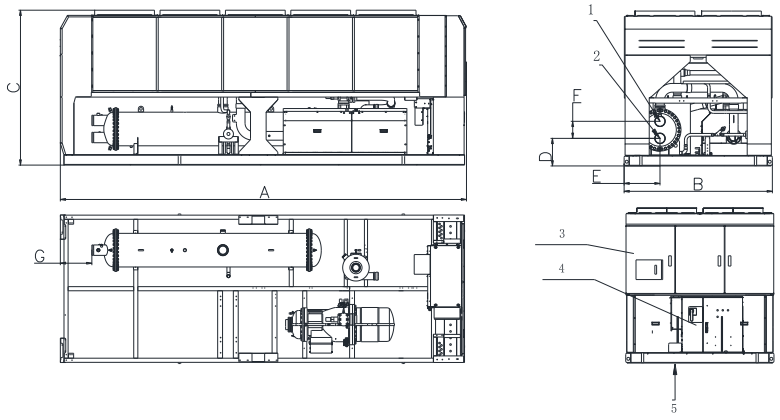
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
215~255	8255	2300	2180	440	1200	1800	1800	1050	1200

Model	Models of spring isolators at all points					
	P1	P2	P3	P4	P5	P6
215~255	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

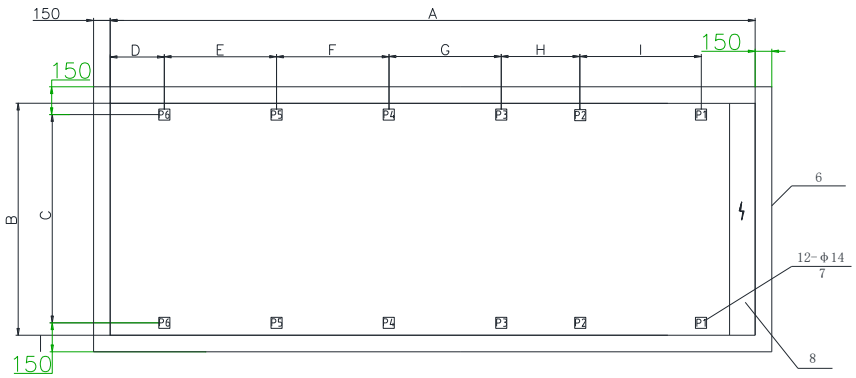
3.5 Dimensions of SCAF265~275HV, SCAF265~275HV(T3), SCAF265~275HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
265~275	9260	2300	2460	420	550	300	3310

Foundation of SCAF265~275HV, SCAF265~275HV(T3), SCAF265~275HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

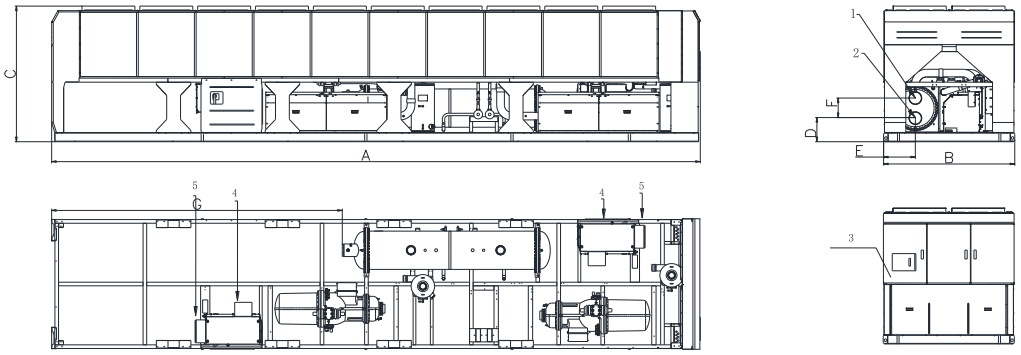
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
265~275	9260	2300	2180	845	1800	1800	1800	1050	1200

Model	Models of spring isolators at all points					
	P1	P2	P3	P4	P5	P6
265~275	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

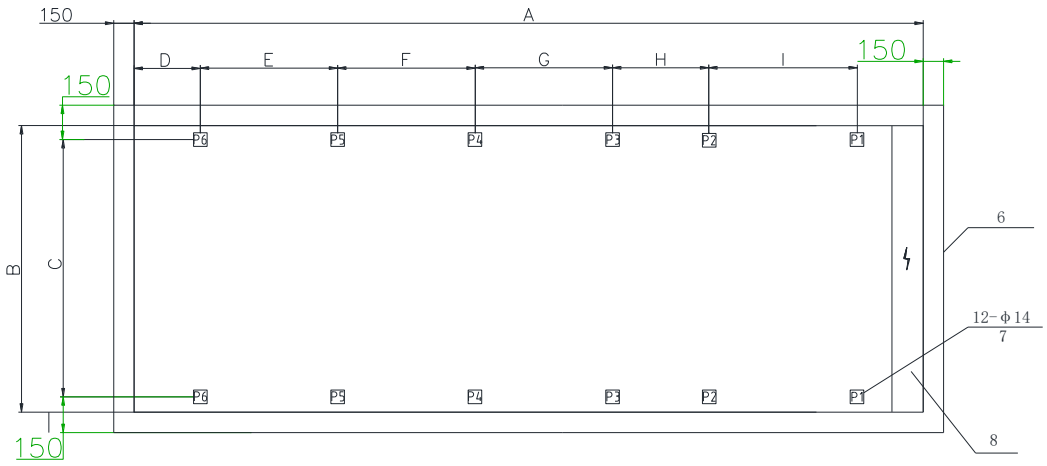
3.6 Dimensions of SCAF285~295HV, SCAF285~295HV(T3), SCAF285~295HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
285~295	9260	2300	2460	410	550	350	2960

Foundation of SCAF285~295HV, SCAF285~295HV(T3), SCAF285~295HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

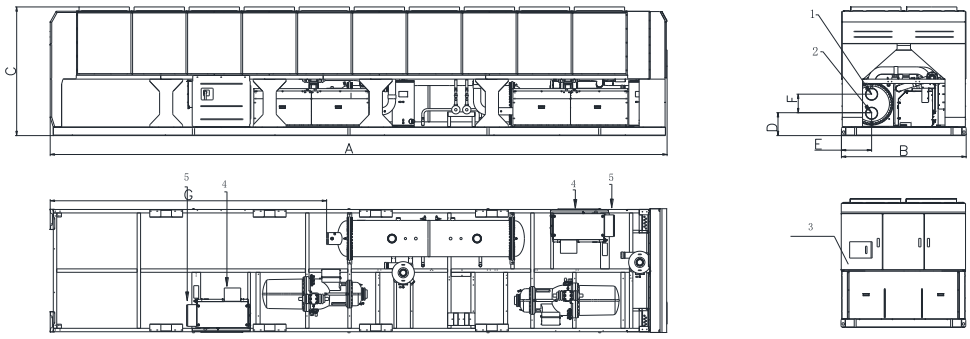
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
285~295	9260	2300	2180	590	1500	2000	2000	1200	1200

Model				Models of spring isolators at all points		
	P1	P2	P3	P4	P5	P6
285~295	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

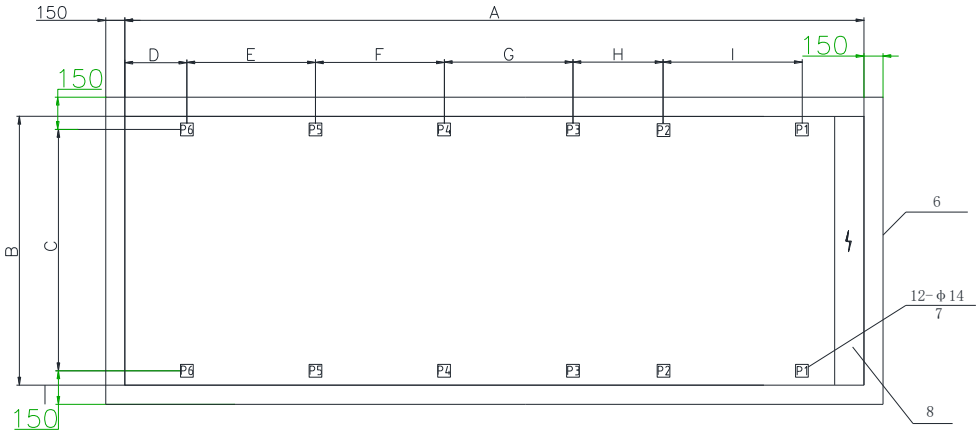
3.7 Dimensions of SCAF310~340HV, SCAF310~340HV(T3), SCAF310~340HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
310~340	10265	2300	2460	410	550	350	3965

Foundation of SCAF310~340HV, SCAF310~340HV(T3), SCAF310~340HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

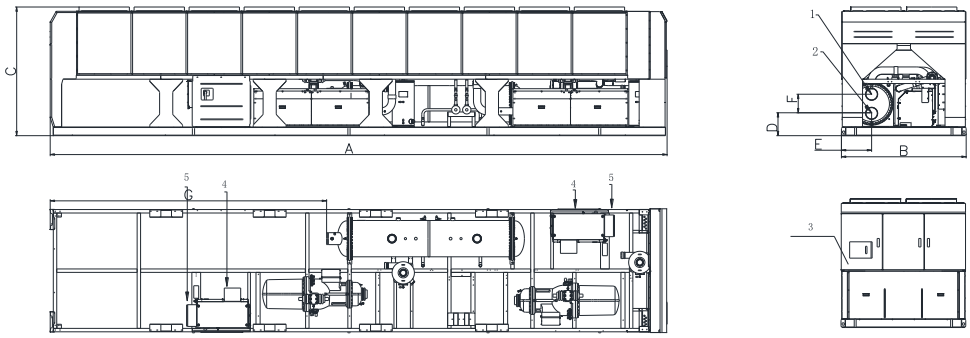
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
310~340	10265	2300	2180	1100	2000	2000	2000	1200	1200

Model	Models of spring isolators at all points					
	P1	P2	P3	P4	P5	P6
310~340	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

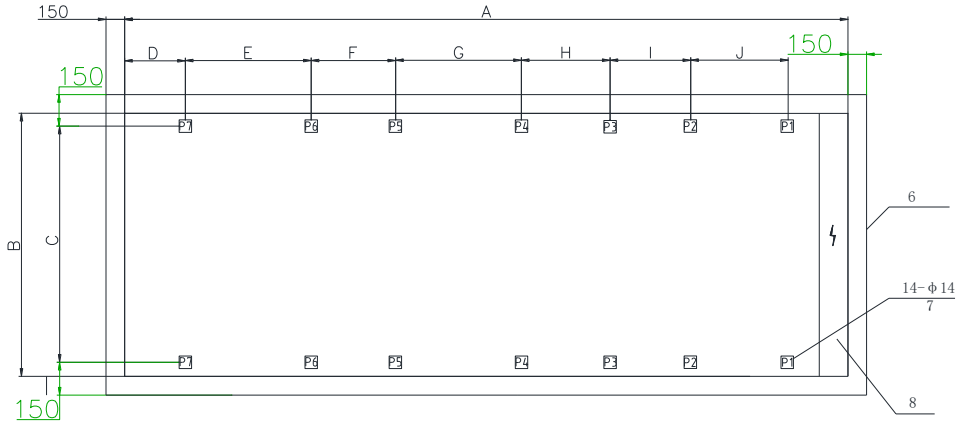
3.8 Dimensions of SCAF350~410HV, SCAF350~410HV(T3), SCAF350~410HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
350~410	11270	2300	2460	410	550	350	4970

Foundation of SCAF350~410HV, SCAF350~410HV(T3), SCAF350~410HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

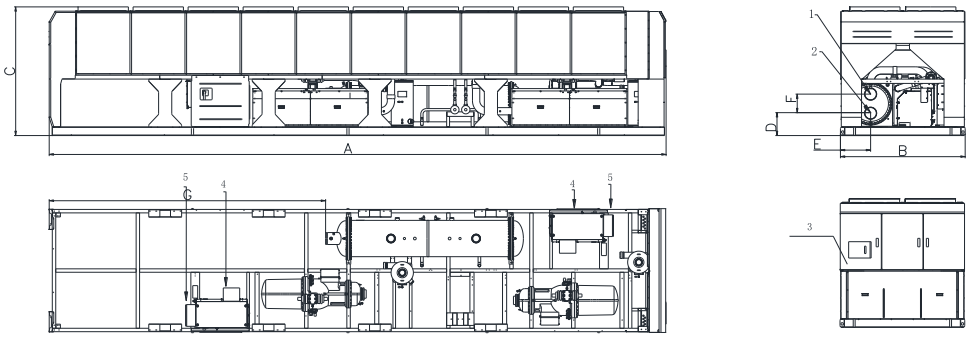
Model	Dimensions (unit: mm)									
	A	B	C	D	E	F	G	H	I	J
350~410	11270	2300	2180	405	1700	2000	2000	2000	1200	1200

Model	Models of spring isolators at all points						
	P1	P2	P3	P4	P5	P6	P7
350~410	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

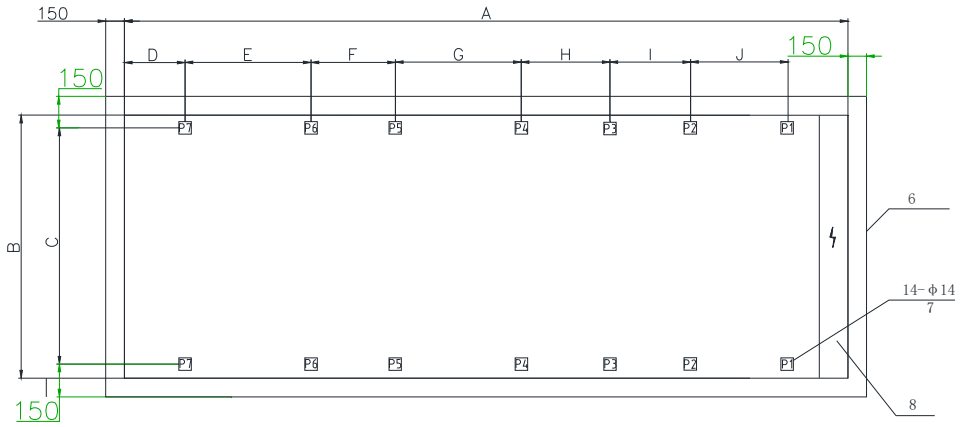
3.9 Dimensions of SCAF420~450HV, SCAF420~450HV(T3), SCAF420~450HV(LA)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
420~450	11855	2300	2460	410	550	350	5555

Foundation of SCAF420~450HV, SCAF420~450HV(T3), SCAF420~450HV(LA)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

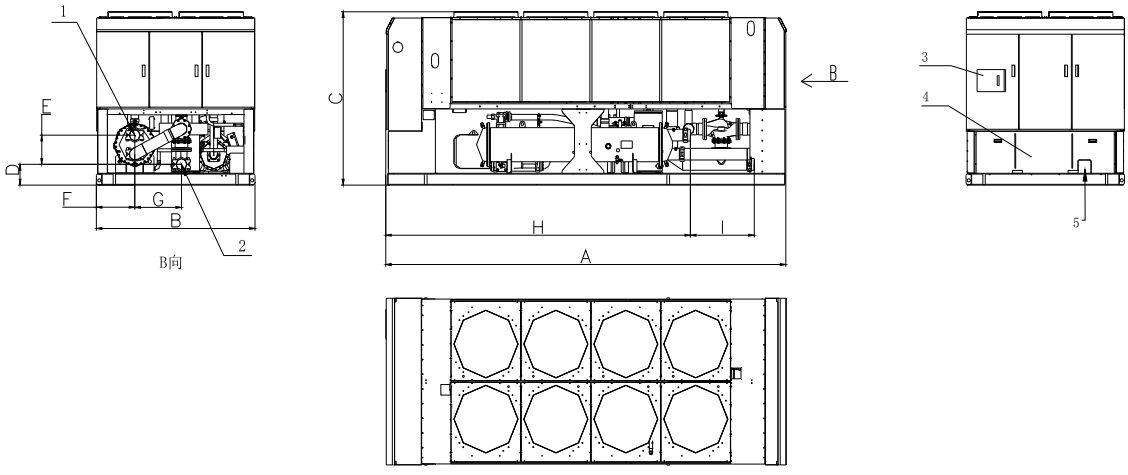
Model	Dimensions (unit: mm)									
	A	B	C	D	E	F	G	H	I	J
420~450	11855	2300	2180	990	1700	2000	2000	2000	1200	1200

Model	Models of spring isolators at all points						
	P1	P2	P3	P4	P5	P6	P7
420~450	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

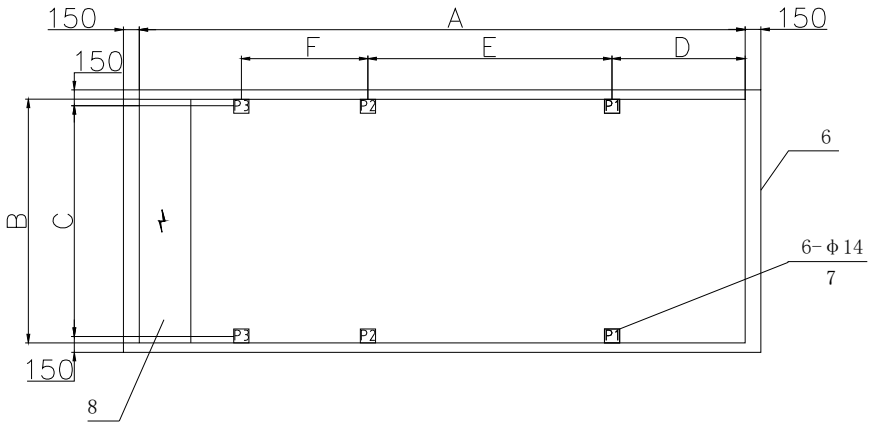
3.10 Dimensions of SCAF110HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
110HV(FCD)	5740	2300	2460	293	397	550	670	4378	917

Foundation of SCAF110HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

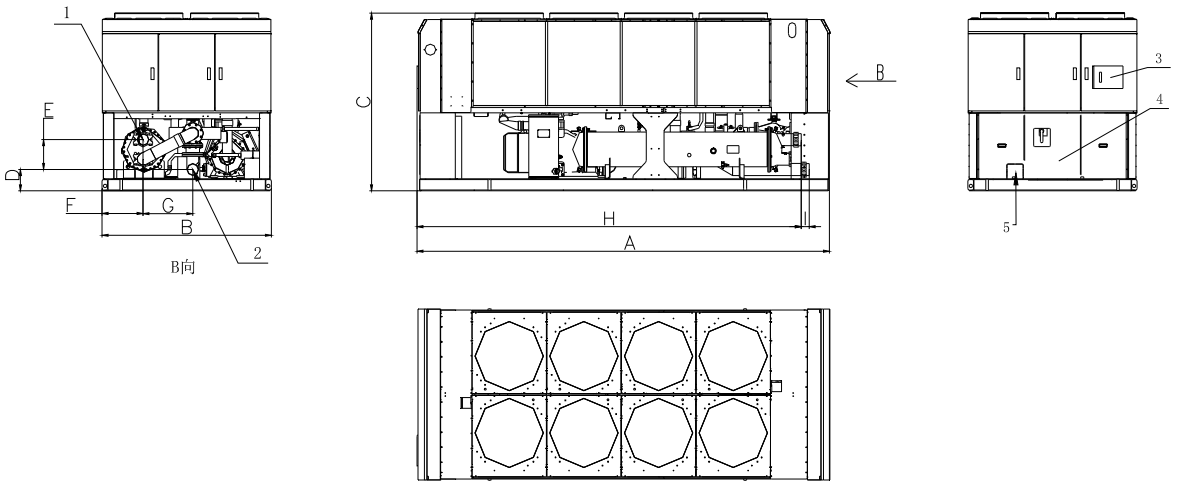
Model	Dimensions (unit: mm)					
	A	B	C	D	E	F
110HV(FCD)	5740	2300	2180	1263	2317	1200

Models of spring isolators at all points			
Model	P1	P2	P3
110HV(FCD)	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

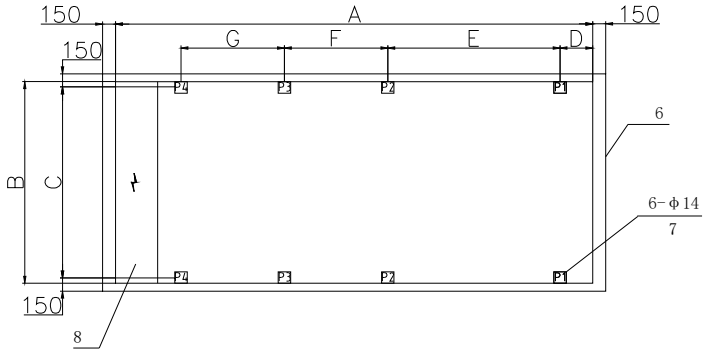
3.11 Dimensions of SCAF130HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
130HV(FCD)	5540	2300	2460	283	397	550	670	5170	108

Foundation of SCAF130HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

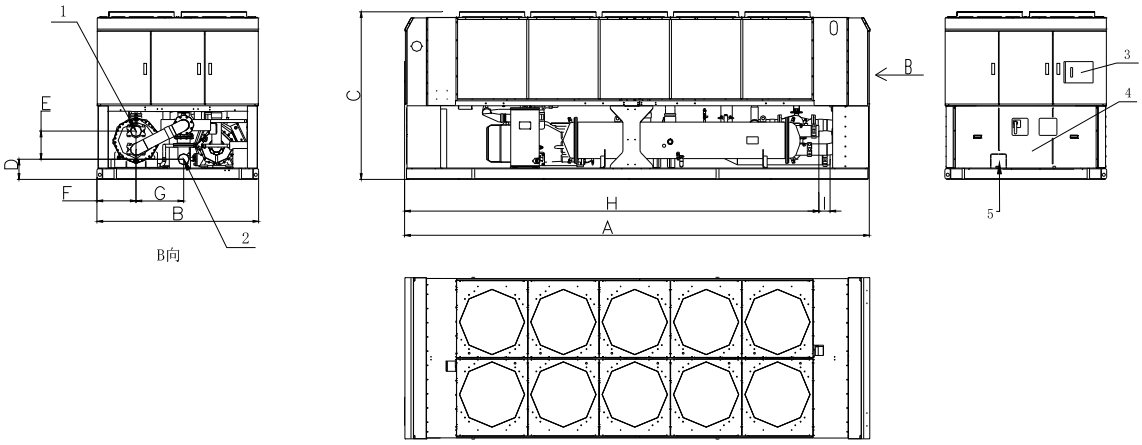
Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
130HV(FCD)	5540	2300	2180	308	2000	1200	1200

Models of spring isolators at all points				
Model	P1	P2	P3	P4
130HV(FCD)	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

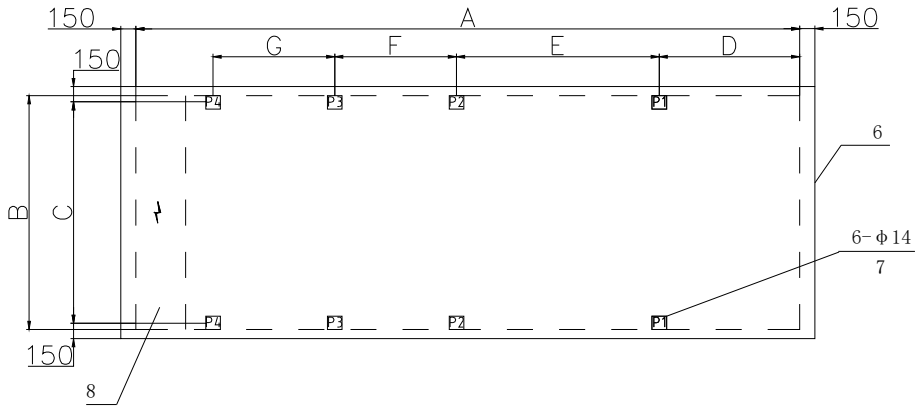
3.12 Dimensions of SCAF165HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
165HV(FCD)	6545	2300	2460	283	397	550	670	583	157

Foundation of SCAF165HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

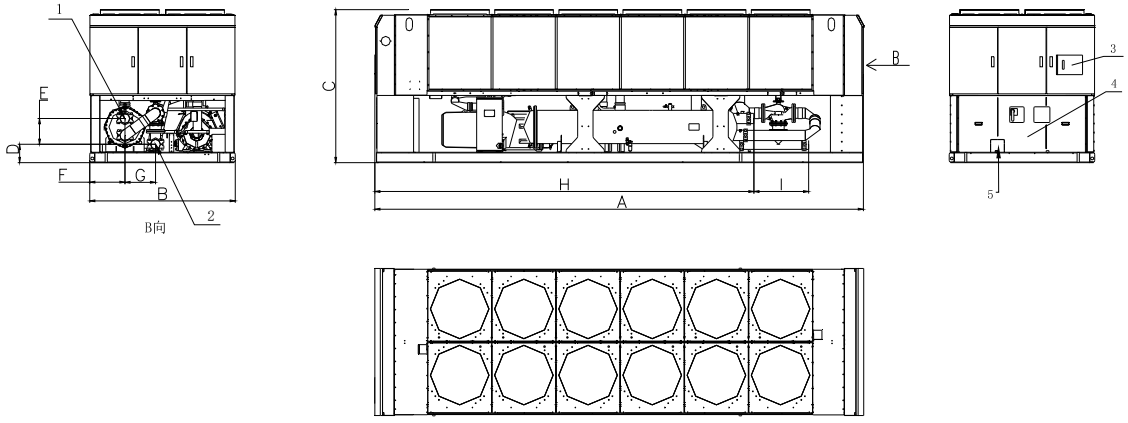
Model	Dimensions (unit: mm)						
	A	B	C	D	E	F	G
165HV(FCD)	6545	2300	2180	1385	2000	1200	1200

Models of spring isolators at all points				
Model	P1	P2	P3	P4
165HV(FCD)	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

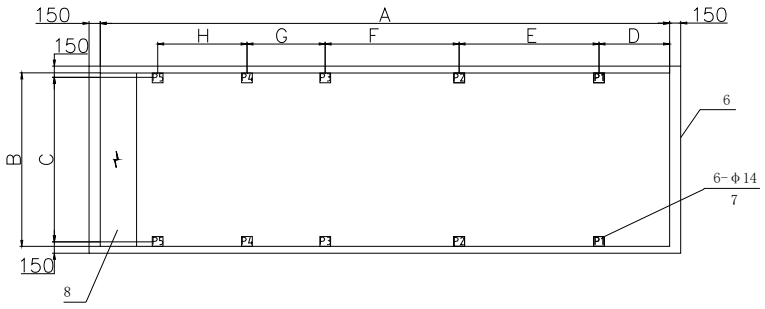
3.13 Dimensions of SCAF195HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
195HV(FCD)	7650	2300	2460	283	397	550	480	5935	857

Foundation of SCAF195HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

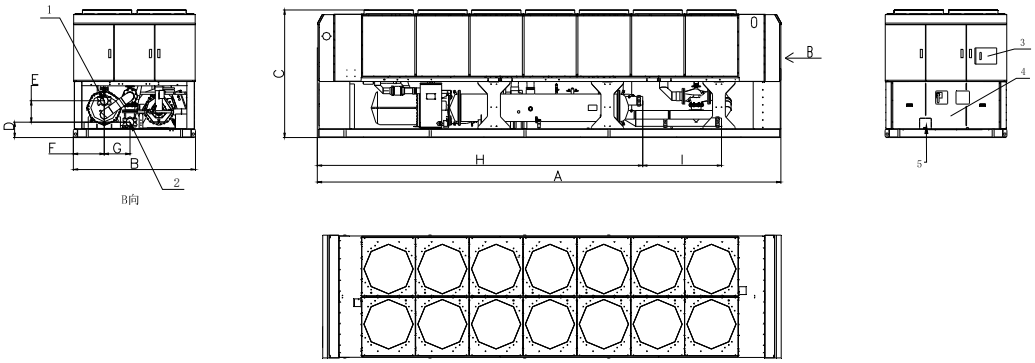
Model	Dimensions (unit: mm)							
	A	B	C	D	E	F	G	H
195HV(FCD)	7650	2300	2180	948	1880	1800	1050	1200

Model	Models of spring isolators at all points				
	P1	P2	P3	P4	P5
195HV(FCD)	MHD-850	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

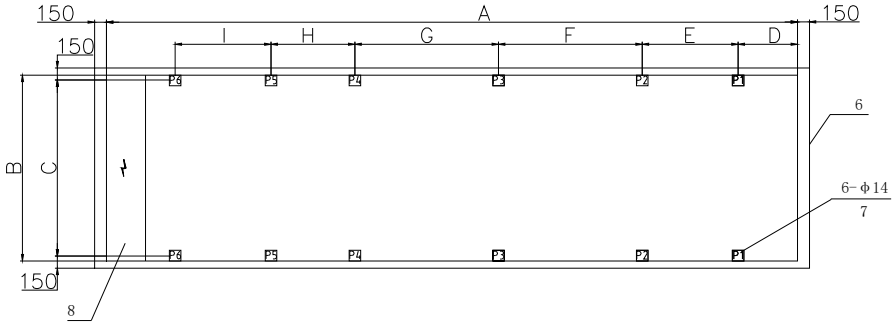
3.14 Dimensions of SCAF225HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
225HV(FCD)	8655	2300	2460	283	397	576	480	5973	1474

Foundation of SCAF225HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

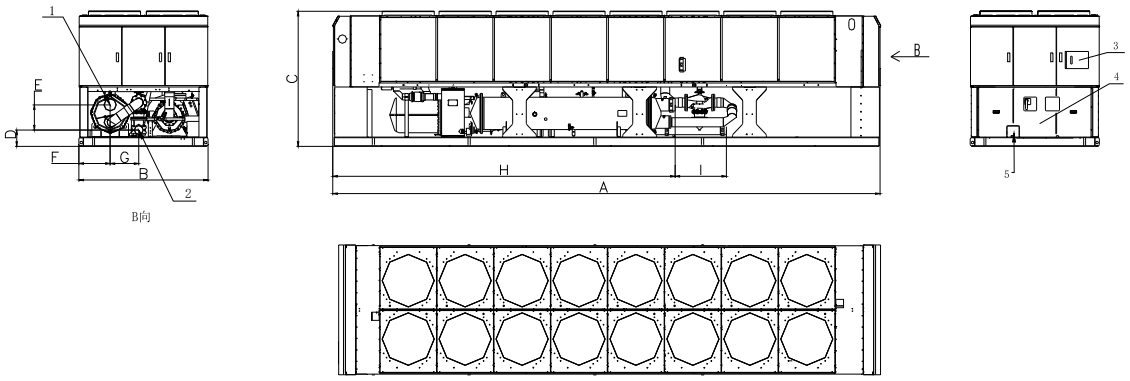
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
225HV(FCD)	8655	2300	2180	745	1200	1800	1800	1050	1200

Model	Models of spring isolators at all points					
	P1	P2	P3	P4	P5	P6
225HV(FCD)	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

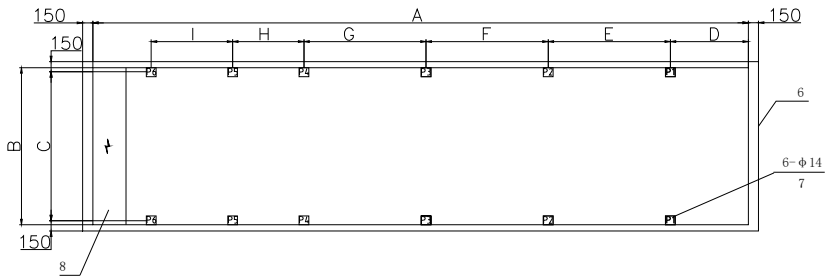
3.15Dimensions of SCAF260HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
260HV(FCD)	9660	2300	2460	283	442	550	505	5942	905

Foundation of SCAF260HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

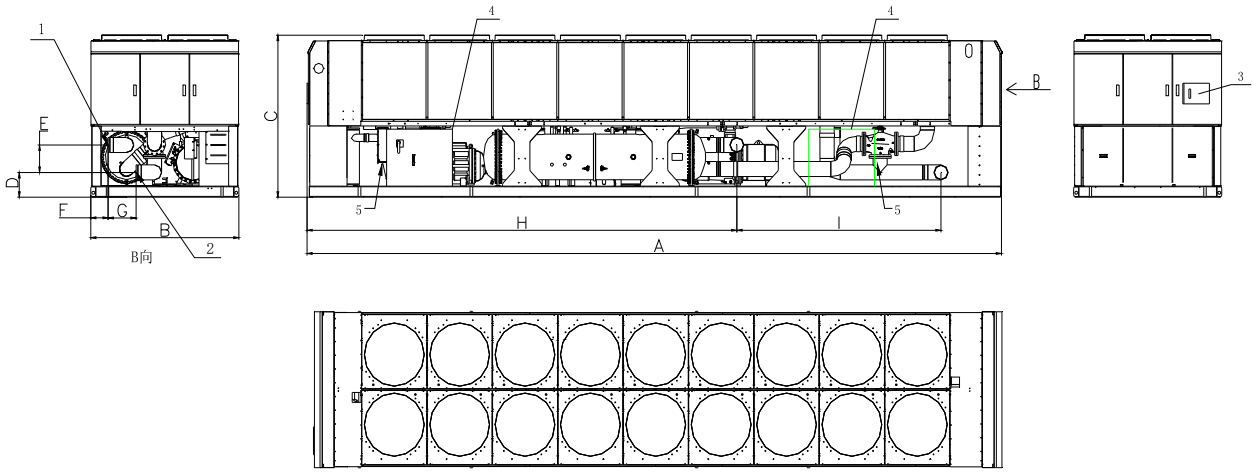
Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
260HV(FCD)	9660	2300	2180	1150	1800	1800	1800	1050	1200

Model	Models of spring isolators at all points					
	P1	P2	P3	P4	P5	P6
260HV(FCD)	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

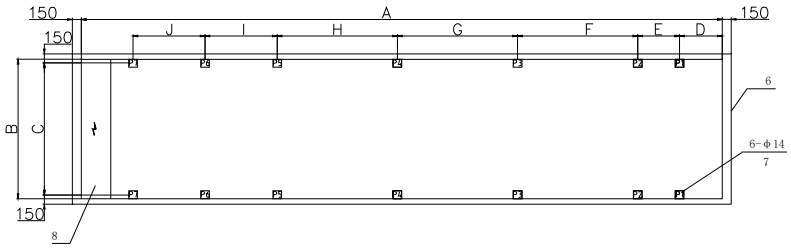
3.16 Dimensions of SCAF310HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
310HV(FCD)	10665	2300	2460	360	400	268	429	6508	3138

Foundation of SCAF310HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

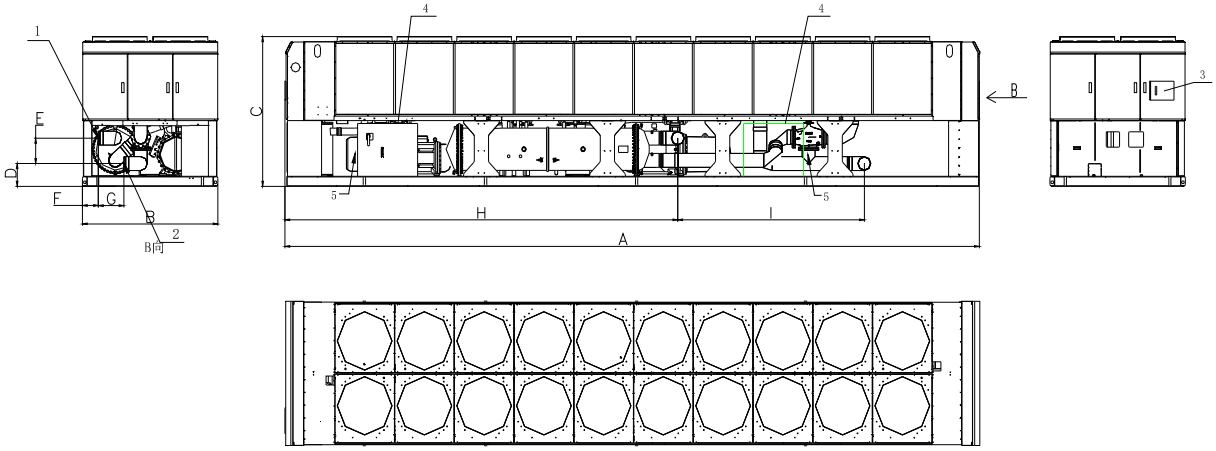
Model	Dimensions (unit: mm)									
	A	B	C	D	E	F	G	H	I	J
310HV(FCD)	10665	2300	2180	710	695	2000	2000	2000	1200	1200

Model	Models of spring isolators at all points						
	P1	P2	P3	P4	P5	P6	P7
310HV(FCD)	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

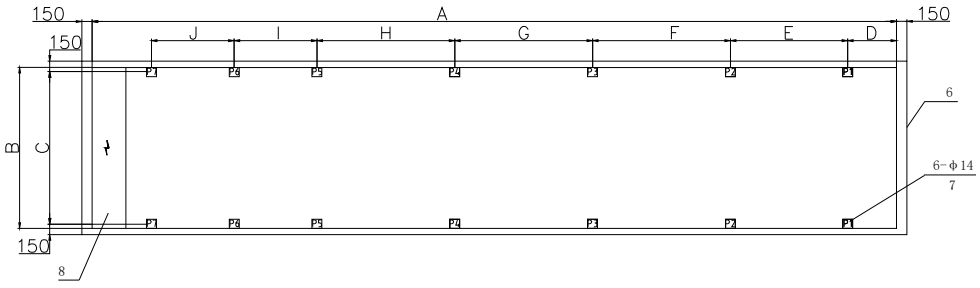
3.17 Dimensions of SCAF370HV(FCD)



① Chilled water outlet ② Chilled water inlet ③ Control panel ④ VFD ⑤ Power incoming line

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
370HV(FCD)	11670	2300	2460	360	400	268	429	6608	3138

Foundation of SCAF370HV(FCD)



⑥ Installation foundation ⑦ Spring isolator installation hole ⑧ Electric control box

Model	Dimensions (unit: mm)									
	A	B	C	D	E	F	G	H	I	J
370HV(FCD)	11670	2300	2180	710	1700	2000	2000	2000	1200	1200

Model	Models of spring isolators at all points						
	P1	P2	P3	P4	P5	P6	P7
370HV(FCD)	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Notes: 1. The spring isolator is optional.

2. The value in the spring isolator model indicates bearable weight (unit: kg); for example, "1050" in "MHD-1050" indicates 1,050 kg.

4 Unit Installation

4.1 Unit Installation and Positioning

! WARNING
Reading this manual does not mean that the user can undertake any of the tasks of installation, commissioning, operation, or maintenance. Such work can only be performed by qualified installers. Commissioning, operation, and maintenance shall only be carried out by professionals trained and authorized by Midea. **Due to the relative pressure inside the unit, electrical components, and the installation position of the unit, be especially careful when performing any operations. It is necessary to read the manual and familiarize yourself with the safety precautions listed on the labels in advance. The Company does not assume any liabilities for damages of the unit resulting from failure to comply with the steps or guidance specified in this manual.**

4.2 On-site Acceptance

1. Check whether the unit is damaged or has any missing parts. In the event that there is any damage or missing parts arising from transportation, contact the transport company immediately.
2. Check the unit according to the list. Check the nameplate data as required.
3. The unit nameplate must contain the following information:

(1) Name and model of unit
(2) Factory No.
(3) Ex-factory date
(4) Nominal cooling/heating capacity
(5) Rated power of unit (cooling/heating)
(6) Power supply of unit
(7) Refrigerant
(8) Unit size
(9) Unit weight

Make sure that the ordered accessories are delivered to the installation site in good condition.

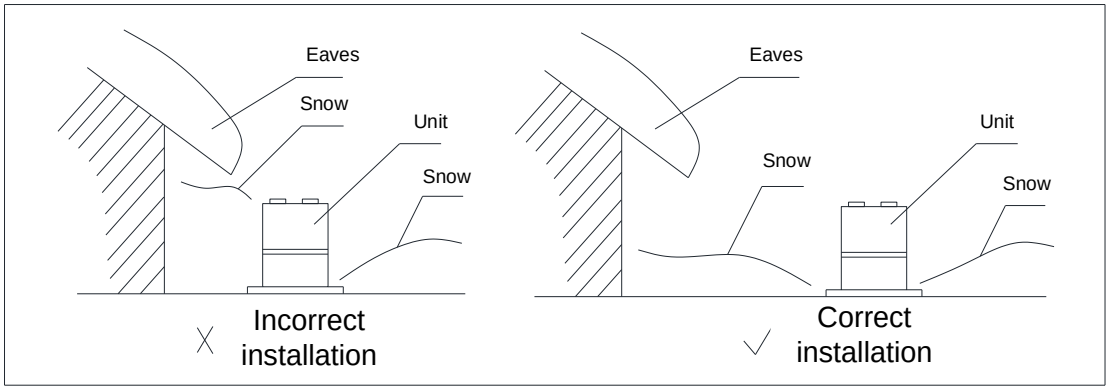
4.3 Installation Conditions

1. Keep the unit away from fire or flammables.
2. Select a place with ambient temperature below 48ºC and good ventilation;
3. Select a place with little dust.
4. The site shall be exposed to sunlight for the convenience of maintenance and check.
5. To meet the demand for maintaining, servicing and cleaning, keep sufficient clearance around the unit (for specific dimensions, see the following figure).
6. Ensure that the unit and equipment room provide fully water drainage.

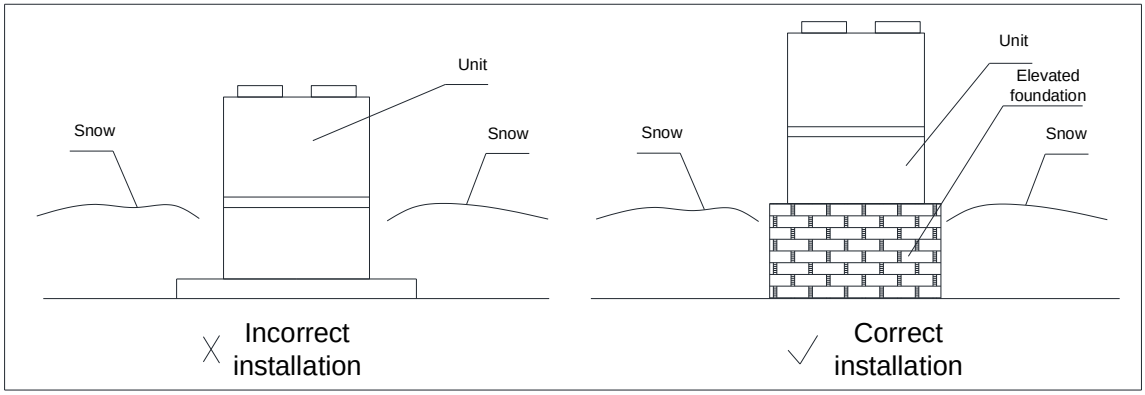
Because the unit requires that there is sufficient fresh air for heat exchange through the air-side heat exchanger, ensure there is enough space provided around and between units. To enable maintenance and repairs, do not store materials around the unit.

Note the following points when installing the unit in areas affected by snow.

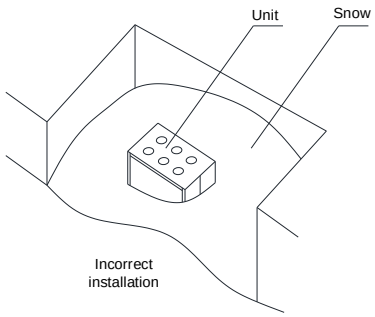
1. Do not install the unit under eaves. Keep the unit a certain distance from the eaves so that the snow falling from the eaves will not prevent fresh air from entering the fin-coil heat exchanger, as shown in the figure below.



2. Raise the installation height of the unit according to snow accumulation (Foundation height of the unit must be 1 m above the local maximum snow accumulation height, as show in the figure below). Otherwise, the lower part of the unit could become buried in snow, which may seriously affect the performance and reliability of the unit.

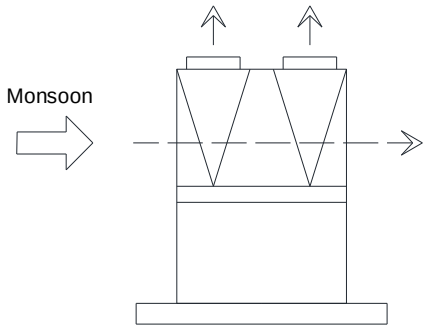


3. Do not install the unit where snow might pile up. Make sure that the unit is not buried in snow even when snow accumulates at the record height, as shown in the figure below.



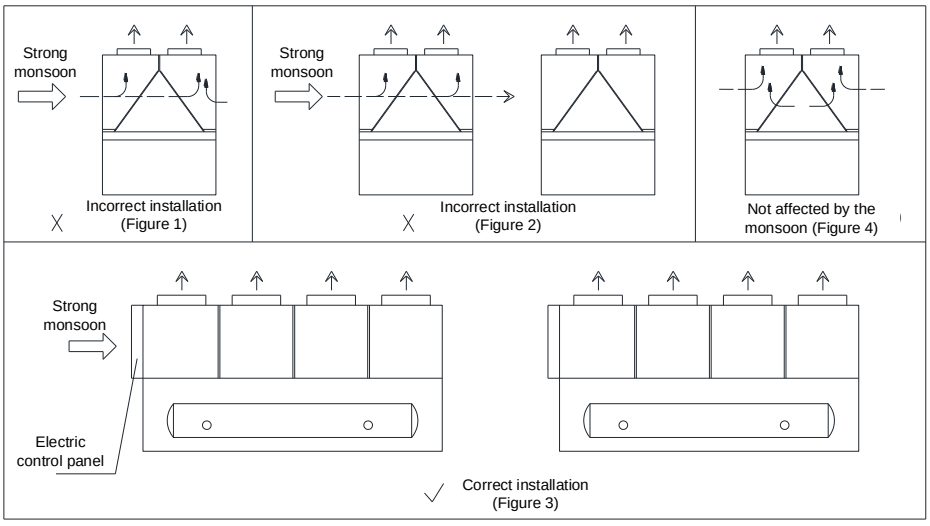
In monsoon regions where the fin heat exchanger will encounter monsoon conditions, air flow is like the broken line in the following figure because the air speed is higher than the air inlet speed of the fan.

a. If the condenser fins of the unit are V-shaped, air that has undergone heat exchange will undergo it again in another heat exchanger, reducing cooling capacity and possibly causing a fault. Although unit designers have considered this problem, do not install the unit facing a monsoon to avoid unnecessary faults.



b. If the condenser fins of the unit are in inverted-M shape:

Figure 1: Air at the left fins that has undergone heat exchange will undergo it again at the right fins, which may adversely affect the heat exchanging effect at the right fins; Figure 2: When the monsoon wind speed is high, the monsoon wind will pass through the left part of the unit and enter the fins of the right part of the unit. As a result, air at the left fins that has undergone heat exchange will undergo it again at the right fin heat exchanger, which may adversely affect the heat exchanging effects at the right fin heat exchanger and the performance of the right part of the unit, triggering alarms. To avoid scenarios like this, make sure that the direction of the heat exchanger's air inlet does not face the monsoon wind, like in Figure 3 (correct installation method). Figure 4 shows the instance in which no monsoon wind may affect the unit or the case with improved installation measures, which avoids impact by the monsoon wind.



If a unit has to be installed facing a monsoon, take the following measures

Install a windproof wall.

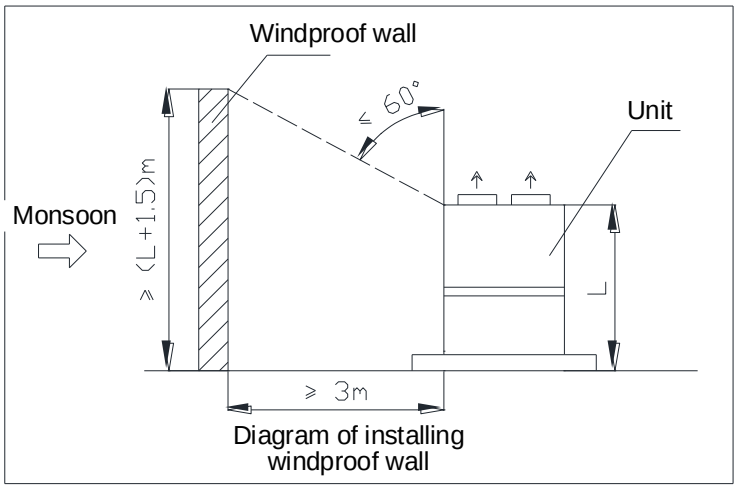
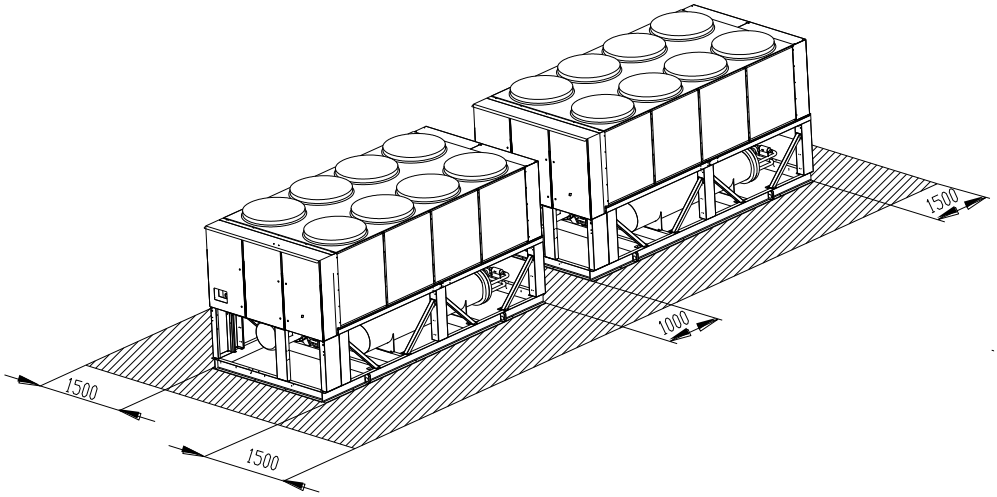


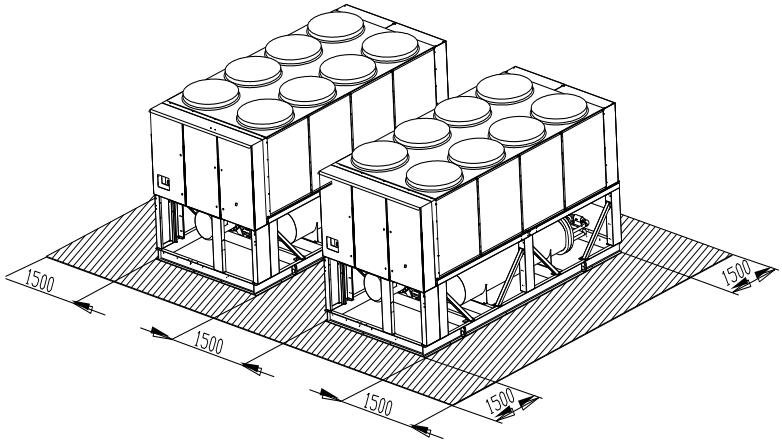
Diagram of installing windproof wall

If the installation site is limited, multiple units can be installed in the following way and the space between units for overhaul must comply with the following figures:

Horizontal placement



Vertical placement



4.4 Foundation Construction Requirements

To prevent erosion to the unit feet, water needs to be properly drained around the unit. The plane on which the bottom steel plate of the unit is to be installed shall be smooth and flat. The following requirements must be met:

1. The maximum height difference (horizontal) between foundation planes is less than 3 mm.
2. To facilitate chiller servicing, the foundation is higher than 100 mm.
3. A drainage trench is set around the unit.

4.5 Moving Requirements

1. Transport precautions

(1) Transport of the units must comply with national and local laws and regulations;

(2) Avoid collision during transport;

(3) Do not put other goods on or inside the unit.

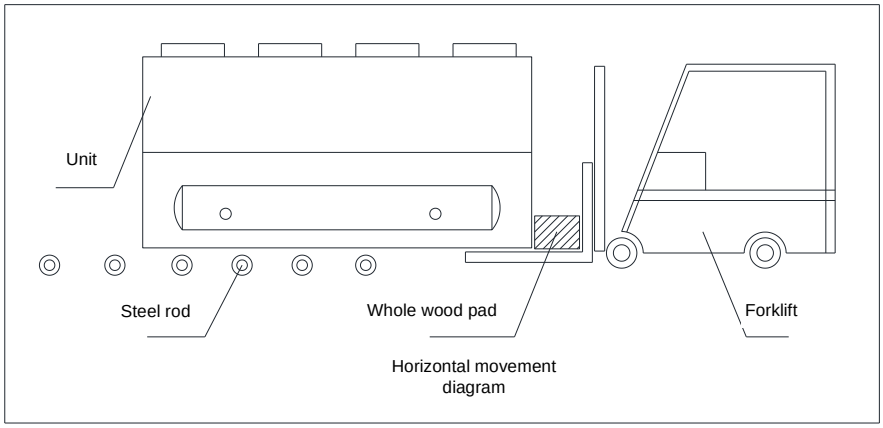
(4) The unit should not be transported on its side.

(5) Temperature range of storage during transport: -25 to 55ºC.

Check the unit according to the following table.

No.	Inspection Items and Requirements	What to Do When You Find the Unit isn't Meeting Requirements
1	The unit shall not be damaged during transport.	In the event of any damage resulting from transport, specify the damage on the waybill of the transport company and immediately make a written request for inspection by the transport agent.
2	The specifications and quantity of unit accessories shall be consistent with the packing list attached to the unit.	Please contact your dealer.
3	The inlet and outlet caps of the shell-and-tube heat exchanger of the unit shall be intact, and the caps shall not be opened before the unit is connected to the water pipe.	Please contact your dealer.

2. Exercise caution when handling the unit, lest any unit parts be damaged. We recommend using a crane to load and unload the unit. For transportation over short distances, a mechanical carrier can be used, on which a wood pad is placed to ensure the base of the unit is subject to uniform force. It is recommended that you place 3-6 steel rods under the base of the unit, as shown in the following figure.



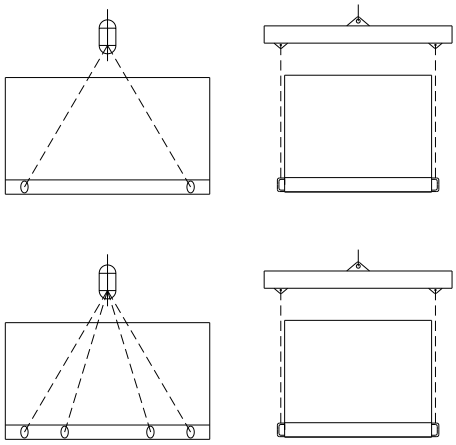
3. Lift and installation

(1) Please select the crane according to the weight of the unit (insurance recommended).

(2) Hoisting shall be carried out strictly according to the method shown in the following figure. Use the wire rope to make one circle around the hook, or the wire rope could slide and pose a hazard in the event of weight imbalance.

(3) Spreader bars must be used to prevent damage to the unit caused by the suspension cable.

(4) Local safety regulations must be complied when lifting the unit. Protective measures must be taken to prevent persons other than installers from entering the installation site. No one is allowed to stand under the crane and the unit.



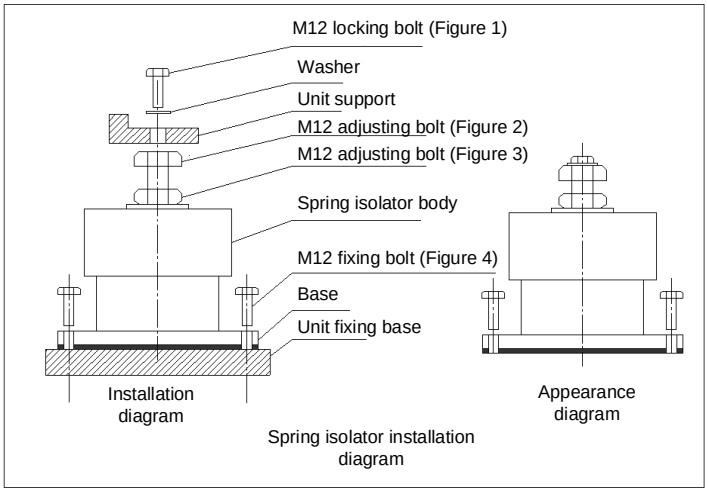
! WARNING

It is forbidden to modify the use and function of the product without authorization.

4.6 Installation Requirements

Air source units are intended to be installed outdoors, for example, on roofs, floors or next to buildings. The unit must be installed on a solid base, like a whole concrete slab, which is able to bear the weight of both the unit and maintenance personnel.

When installing the unit, use a spring isolator between the base and foundation to avoid vibration and noise. The spring isolator is optional for air source screw heat pump units/chillers. The load of single spring isolator is 70%-90% of its rated load. See the following figure for installation method.



Instructions on installing the spring isolators:

1. Check the printing code model on the spring isolator, and verify the model to be configured for each point before starting installation.

2. Screw out the M12 locking bolt on the spring isolator, and place the spring isolator under the unit support (Figure 1 shown above).

3. Align the center hole on the M20 adjusting bolt on the spring isolator with the mounting hole on the unit support, and screw the M12 locking bolt (as shown above in Figure 1). Do not tighten the M12 locking bolt.

4. After ensuring the verticality of the spring isolator, use the M12 fixing bolt to lock the spring isolator on the base (as shown above in Figure 4). After installation, use a ruler to measure the heights of the unit support and the base. If it is found that the unit support is not level, adjust the free height of the spring isolator according to requirements.

How to adjust the spring isolator height:

(1) Use a spanner and loosen the M20 locknut anticlockwise (upward) (as shown above in Figure 3).

(2) Then turn the M20 adjusting bolt (as shown above in Figure 2). The required free height can be adjusted according to requirements to ensure the unit operates horizontally.

5. After installation, lock the M20 locknut (Figure 3 shown above) and then tighten the M12 locking bolt (as shown above in Figure 1) on the unit support.

6. Ensure that the spring isolator operates vertically. Do not use a hard object to knock or impact the spring isolator.

! CAUTION

After the unit arrives at the site, it is necessary to prevent children from entering the unit during installation, operation and all other processes.

5 Installing the Water System

5.1 Water System Installation Requirements

Installation of the water system must comply with conventional installation criteria to achieve optimal operating efficiency. Ensure that no foreign substances are present in the pipes. All water system pipes used must comply with local rules and regulations for such projects.

■ Install a safety valve with an opening pressure no higher than 1.0 MPa.

■ The water pipeline must be bypassed for cleaning. Do not connect the shell-and-tube heat exchanger to the water pipeline system before the pipeline is cleaned. Install a bypass cleaning pipeline as shown in the water system diagram. Do not use the shell-and-tube heat exchanger in the unit to clean the system's pipes.

! WARNING
Do not connect the pipeline to the unit before the pipeline is cleaned.

■ Ensure that sufficient maintenance space is left during pipe construction. Ensure that drain valve installation and maintenance can be performed on the water system pipeline.

■ If the unit does not come with a circulating water pump, install a water pump where the flow and lift match the resistance of the water system and unit pipelines. The water pump must be installed on the water inlet side of the unit evaporator. Configure one standby water pump, of which the lift and water flow are the same as those of an average water pump. For the specific installation method, see the diagram of the recommended water system.

■ Since the elbow, tee joint, and valve reduce pump lift, all pipes should be kept as straight and simple as possible.

■ It is advised that you use manual stop valves on all the water system pipelines to make maintenance operations more convenient.

■ Install drain pipes at all the low positions so that water can be completely drained from the shell-and-tube heat exchanger and water system pipeline.

■ Install a bleed valve at the highest point of the water system pipeline to remove air from the pipeline, eliminating air from the water system and maximizing unit capacity. To make maintenance more convenient, thermal insulation measures are not required for the bleed and drain pipe joints.

■ When the unit is stopped, adopt natural freezing prevention measures (e.g., water drainage, operation of the water circulating pump, and heating by the heater) for the water loop in the region where the ambient temperature is lower than 0°C. Freezing of the water loop will damage the shell-and-tube heat exchanger. Please adopt practical and effective measures according to conditions of use.

■ For the unit equipped with anti-freezing water pump or anti-freezing electric heater, in the area where the ambient temperature is below 0ºC, if the unit experiences a power outage for over 20 minutes, the refrigerating medium needs to be added with anti-freezing agent, or the unit shall be equipped with UPS, to ensure the normal operation of anti-freezing water pump and anti-freezing electric heater before the power supply resumes.

■ Take measures to fully ensure cold insulation and heat insulation of the water system pipeline and

outdoor damp-proofing. Wrap the water system pipeline with thermal insulation cotton that is more than 10 mm thick. If heat insulation measures are incomplete, heat loss may occur and the unit may be damaged by freezing in particularly cold weather.

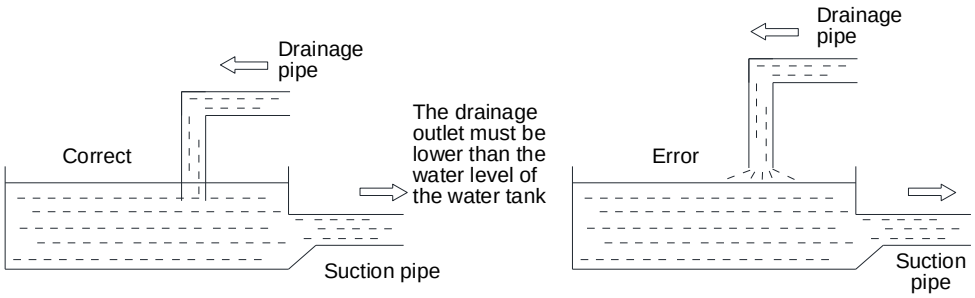
■ Water quality standards for the water system should be regarded as the circulating water standards, and one instance of water leakage will lead to corrosion.

■ Water must meet the quality standard stipulated in JRA-GL-02 for the chilled water system.

■ The amount of water kept in the system should be within the operating range. Insufficient water will cause scale deposits, which may degrade performance or cause pitting corrosion and leakage of refrigerant gas. Excessive water will lead to corrosion.

■ Do not expose water in the circulating system to air, as shown in the following figure.

Water exposure to air may increase the amount of dissolved oxygen. Pollutants in the air are condensed in the water and thus the water will become corrosive.



■ Do not connect the ground wires of any other electrical appliances to the pipes of the water system, because this may lead to electrolytic corrosion of the water pipe.

■ Take anti-corrosion measures on buried pipes.

■ Pay attention to the water flow rate, location of the expansion water tank, and discharge location to avoid cavitation.

■ If the PH value exceeds the standard, copper corrosion may increase. Therefore, change water before the PH value reaches the standard value. If the heat storage water tank is still used after the expiration period, cracks in the heat storage water tank may lead to water spattering and leaks. Water leaks may not result in serious problems in the water quality control, but spattering of seawater or polluted ground water may lead to micro-organisms growing in the heat storage water tank. In this case, residue is generated in the system and calcium carbonate will conglutinate.

■ Install hoses on both the inlet and outlet water pipes of the unit and water pump to prevent vibrations in water pipes from reaching the unit.

■ Install drainage pipes on all drainage outlets. Pay attention to the layout before and after the water inlet/outlet of the unit. Figure out the inlet and outlet labels of the unit.

■ Based on engineering needs, the designed water inlet and outlet pipes for the shell-and-tube heat exchanger must comply with the following criteria:

1. The outlet of the circulating water pump in the pipeline is connected to the inlet of the shell-and-tube heat exchanger, and the water return pipeline of the system (not the shell-and-tube heat exchanger) is at the inlet side of the water pump.

2. A stainless steel filter of not less than 40 meshes must be installed on the inlet pipeline of the shell-and-tube heat exchanger.

3. All the water pipelines must be rinsed thoroughly to remove foreign matter before being put into operation. Do not rinse any foreign matter into the shell-and-tube heat exchanger.

4. For the sake of convenient maintenance, install a thermometer and a pressure gauge respectively on the inlet and outlet water pipes.

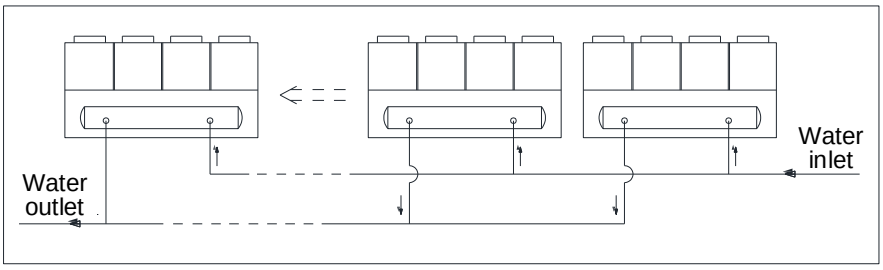
5. Make sure to install one water flow switch on the water outlet pipe of each shell-and-tube heat exchanger. There must be a horizontal straight pipe section more than five times the pipe diameter at the two ends of the switch. Adjust the water flow switch blade according to the water pipe specifications. Refer to the manual provided by the water flow switch manufacturer. This switch connects to the water flow switch reserved on the terminal block of the control panel. For the specific connection details, see the electrical wiring diagram.

! WARNING

Confirm the water flow direction when installing the water flow switch.

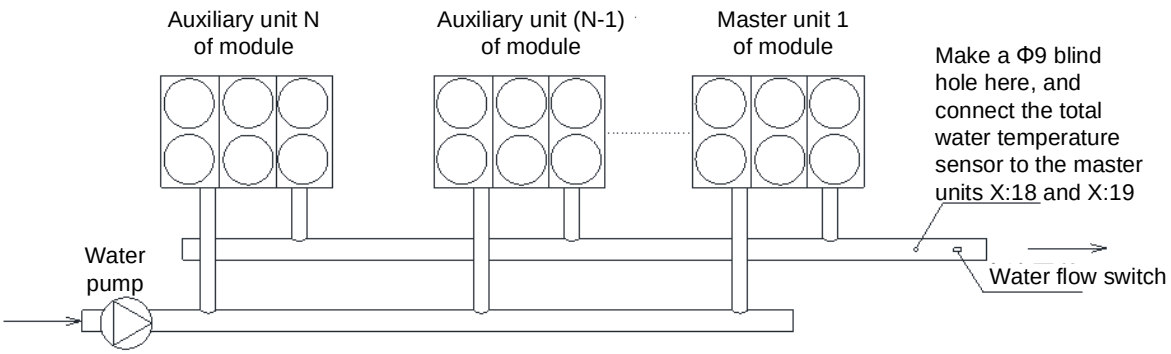
The water flow switch cannot be used to turn the unit on or off. It is only a safety switch.

When multiple units share one water system, the reversed return mode, as shown below, should be adopted for the water pipe connection. Otherwise, the water may be distributed unevenly in the unit, which may cause damage to the shell-and-tube heat exchanger.

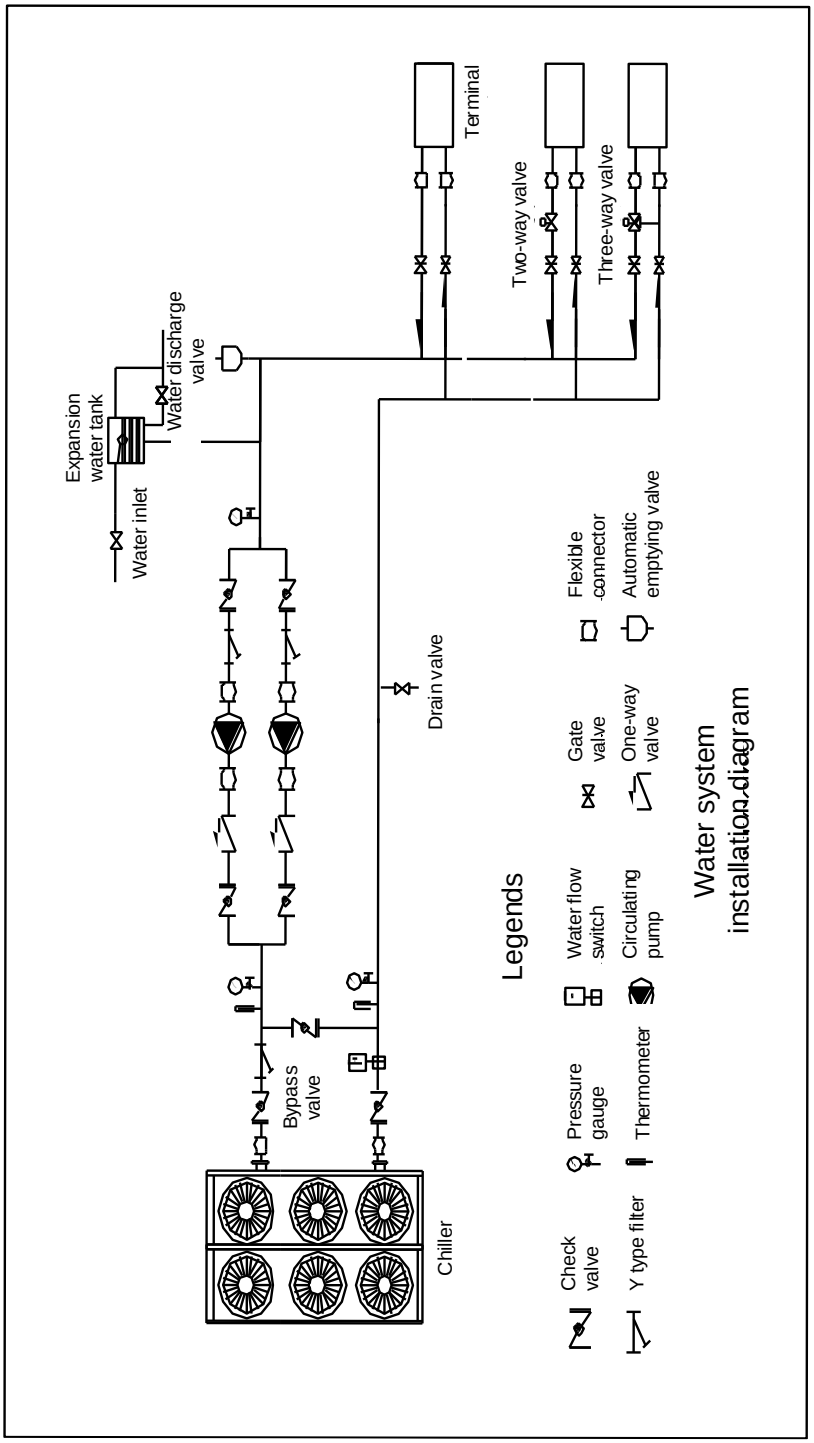


When multiple units are used in combination, the gross water outlet temperature sensor must be installed on the main water outlet pipe. Specific steps are as follows:

(Note: The gross water outlet temperature sensor is an accessory of the unit.)



5.2 Recommended Water System



5.3 Water Treatment Requirements

Using untreated or improper water may reduce the operating efficiency of the unit and damage the heat exchanger. If scale, corrosion, rust, algae, or stagnation occurs due to improper water use, ask a specialist for help.

The following table shows the relationship among the water quality, scale and corrosion:

No.	Water quality	Scale	Corrosion	Remarks
1	Acidic water with PH ≤ 6	Hard	High	Easily accumulates insoluble $CaSO_4$
2	Alkaline water with PH not smaller than 8	Soft	--	Soft liquid sediment generated by iron or aluminum ions
3	Water containing more Ca^{2+} and Mg^{2+}	Hard	--	Hard scale easily formed
4	Water containing more Cl^-	Dirt formation	Especially strong	Strong corrosion of copper and iron
5	Water containing more SO_4^{2-} and SiO_2^{2-}	Hard	High	Easily generates hard $CaSO_4$ and $CaSiO_2$
6	Water containing more Fe^{3+}	More scale generated, hard	High	$Fe(OH)_3$ and Fe_2O_3 sediment
7	Water with foreign odor	Dirt	Especially strong	Easily generates sulphide; copper is significantly corroded by ammonia and methane gas, especially H2S
8	Contains organic compounds	Dirt	--	Scale easily accumulated
9	Discharge gas discharged from automobiles, chemical plants, electroplating plants, sewage treatment plants, ammonia refrigeration plants, fiber plants, etc.		High	Poor water quality easily perforates the copper tube in the heat exchanger due to corrosion
10	Powder, e.g., from a plastic plant	Dirt		
11	Sulfite gas in the air		Especially strong	

The following table lists the recommended water quality criteria for reference:

	Item	Unit	Supplemented water	Chilled water	Tendency	
					Corrosion	Scale
Basic items	PH value (25ºC)		6.5-8.0	6.5-8.0	0	0
	Conductivity (25ºC)	μS/cm	<200	<800	0	0
	Chloride ion (Cl-)	mg Cl-/L	<50	<200	0	
	Sulfate ion (SO4-2)	mg SO4-2/L	<50	<200	0	
	Acid consumption (pH = 4.8)	mgCaCO3/L	<50	<100		0
	Total hardness	mgCaCO3/L	<50	<200		0
Reference item	Iron (Fe)	mg Fe/L	<0.3	<1.0	0	0
	Sulfide ion (S2-)	mgS2-/L	Not found	Not found	0	
	Ammonium (NH4+)	mgNH4+/L	<0.2	<1.0	0	
	Silicon dioxide (SiO2)	mgSiO2/L	<30	<50		0

! WARNING

Midea is not responsible for the corrosion, flushing, or unit performance deterioration caused by untreated water or improper water treatment.

6 Electrical Installation

6.1 General Requirements for Electrical Operation

◆The personnel who operate and maintain the electrical components of the unit must receive professional training and be authorized by Midea to avoid damage to the unit and injury to the personnel.

◆Electrical component operators must comply with national/local laws and regulations.

◆It should be noted in particular that all power connected to the unit must be shut off before any operation is performed on the electric control panel. The main power supply can be cut off by disconnecting the main circuit breaker.

! WARNING
After-sales personnel must comply with the following five safety rules during the maintenance of electric control parts: **(1) Cut off the power supply;** **(2) Avoid re-closing;** **(3) Ensure no voltage;** **(4) Grounding;** **(5) Set compartment or guard for adjacent live parts;**

➢ Do not operate on electrical components, including electric control boxes, switches, starter panels and oil heaters, until all power supplies have been switched off and voltage on capacitors or solid state components is released. The open circuit is locked and marked prominently during maintenance. If operation is interrupted, all circuits must be confirmed to be open before restarting operation.

➢ Parts with the same original component number must be used for maintenance of the unit. And only the approved parts provided by Midea can be used for replacement.

➢ The unit is controlled by a microprocessor and must not be shorted or jumped to the terminals on the circuit board or module to avoid damage to the circuit board or controller.

➢ When touching the circuit board or module, watch out for static electricity discharge. Before operating the inside of the control panel, touch the grounding bracket to discharge static electricity. Special care must be taken when operating, removing and installing terminal connectors near the circuit board. The circuit board is easily damaged. When holding the circuit board, hold its edge and avoid touching the components and connectors.

Electric safety requirements!
(1) Reliable grounding: The unit must be grounded. The grounding cable diameter and grounding resistance must meet the relevant national standards. Midea is not liable for any electrical accidents caused by incorrect grounding or user negligence. **(2) Leakage protectors must be installed in accordance with the national standards. For the inverter unit, type B (delay type) leakage protector must be used;**

(3) If the diameter of the user power cord is too small, it may result in overheating and even fire.
(4) Upon completion of wiring, seal the inlet holes to prevent rats from entering the electric control panel.

Notes:

➢ Use of unqualified personnel or failure to comply with the relevant provisions specified in the WARNING may result in serious personal injury or substantial property damage. Only professionals qualified in the training relating to electrical installation and maintenance are permitted to perform the electrical installation on this equipment.

➢ Permanently fasten the input power cord. The unit must be grounded reliably. Grounding must be performed on site according to the local grounding regulations.

➢ Power the system on only after all the completed wiring operations have been carefully checked.

➢ To avoid damage or injury, do not attempt to repair the line by yourself. Improper repairs may result in damage to the unit, injuries or property damage. For any repairs, contact the maintenance center.

➢ Only use electrical components from brands and models approved by Midea. Users can apply for installation services or technical support from the manufacturer or authorized distributor.

➢ Carefully read the labels attached to the electric control box.

6.2 General Requirements for Power Supply and Environment

The standard operating range of the unit is as follows. If it is out of this range, please customize:
Altitude ≤ 1000 m
Installation mode: outdoors
Power frequency: 50 Hz ± 2%
Voltage: 380 V ± 10%
Unbalanced voltage is allowed: Negative and zero sequence components of three-phase power supply voltage are not greater than 2% of positive sequence component but are allowed to be lower than 4% temporarily.
The sinusoidal distortion rate of the voltage waveform is not greater than 5%.

! WARNING

Improper voltage may trigger an alarm. If the three-phase imbalance of the unit voltage exceeds 2% or the current imbalance exceeds 10%, immediately contact the local electrical department and shut down the unit.

If the power supply of the unit does not meet the requirements, the unit will not be able to work normally or even be damaged. Use an independent power supply for the unit. If the unit shares a power supply with other devices, calculate and select the power distribution capacity according to the power provided in the table and the electrical design specifications. Doing so will avoid overloading. Apply EMI protection measures to stop other devices from interfering with the unit and preventing it from running properly.
In order to prevent the electronic components on the chiller from being damaged due to environmental factors such as moisture, excessively high or low temperature, the operation and storage of the unit must

meet the environmental requirements in the following table.

Environmental conditions - operation	
Temperature	Please refer to the “Description” part at the first page of this manual
Relative humidity	≤90%, no condensing
Altitude	≤ 1000m
Pollution degree	II (no corrosive gas and conductive dust)
Environmental conditions - storage	
Temperature	-25ºC~55ºC
Relative humidity	≤90%, no condensing

! CAUTION

Do not place a water container on a live unit. Water immersing in the unit will weaken the electrical insulation, resulting in electric shock or fire.

! CAUTION

If the unit is left unused for long time, take damp-proof measures for the electric control panel and starter panel to avoid damage of electronic components due to moisture.

! CAUTION

The operating environment of the unit must have good ventilation and heat dissipation design.

! CAUTION

It is forbidden to reconstruct the power cord without permission.

6.3 General Grounding Requirements

1) During the operation of the unit, non-insulated metal parts that may be touched by personnel must be connected to the grounding wire.
2) Grounding screws and ground points shall not be used for other mechanical fastening.
3) For grounding wire, use copper wire instead of aluminum wire.
4) The grounding terminal of the unit shall be indicated with grounding symbols.
5) Each electrical device shall be grounded by connecting to the grounding main line with a separate grounding wire. Do not connect several electrical devices in series with one grounding wire.
6) Grounding wires shall be protected against mechanical damage and chemical corrosion.

6.4 General Wiring Requirements

! WARNING

Do not check the power supply without proper devices or precautions. Otherwise, it will result in serious injury. Please comply with the provisions of the electricity company.

! WARNING

Wiring must be conducted by personnel authorized by the company. Otherwise, it will result in damages.

During maintenance or first power-on, the wiring of electric control panel and starter panel must be carefully inspected from following aspects:

1) Before checking the wiring, disconnect the power supply from user's power distribution panel, lock the circuit breaker and place the warning. Make sure that there is no voltage at the operation side (you have to wait 15 minutes in case of a VFD starter panel) and no residual current at the electrical parts before any operations proceed.
2) Check whether there are scraps (such as metal filings) inside the unit. If yes, remove them and check whether there is short circuit between phases or between the phase line and grounding cable.
3) Check whether there is dust or corrosive gas around the unit and whether the ambient temperature meets the requirements.
4) Check whether the internal and external wiring of the control panel, starter panel, and various electric devices are correct, all sensors are correctly installed, and connectors are properly connected. Meters and controllers must be checked and rectified. Damaged parts must be repaired or replaced.
5) Make sure that the factory settings for operation and safety control measures (such as the circuit breaker) are not altered.
6) Check the starter panel incoming cables and control panel incoming cables L1, L2 and L3. Connect the wires according to the phase sequence of the power supply. If wires are connected in reverse, correct the direction immediately. Check the wires between the starter panel and the motor. Make sure the wires are connected according to wiring diagram and in the right phase sequence.
7) Make sure that there is sufficient creepage distance and electrical clearance between the starter panel cables (including power cables, bolts, nuts, and washers) and between the cables and case. Make sure the cables are intact.
8) The grounding must be reliable and in accordance with local and national standards.

9) Implement waterproofing, dustproofing, rat preventing and sealing measures on the wire inlet hole after wiring.

10) Check whether the user's power distribution panel is equipped with circuit breakers and whether the setting parameters are correct.

11) When wiring the power cable, make sure that the clearance between the energized parts and metals (current-passing or non-current-passing) is larger than or equal to 11 mm and the creepage distance is larger than or equal to 16mm.

12) When multiple cables are used, cables of the same specifications (the same length, same cross-sectional area and the same manufacturer) must be configured; otherwise cable overheating and synthesized voltage unbalance may occur.

13) During power cable connection, it is advisable to select or make cable connectors (which must use red copper material), and ensure reliable contact between the power cable and the chiller so as to prevent abnormal heating.

14) After laying and crimping the cables, make sure to put on the cover plate tightly and take reliable waterproof measures.

! WARNING

After the unit is installed and debugged, keep it energized if it is left unused for a long time.

6.5 Recommended Selection of Unit Cable:

Model	Sub-modules	Unit data		Cable inlet (GB/UL)	Ground wire(GB/UL)	Recommended capacity of breaker device (A)
		Startup current (A)	Maximum operating current (A)			
SCAF115HV, SCAF115HV(LA)	——	≤199.6	264.6	95/ Kcmil250	50/ AWG3/0	400
SCAF140HV, SCAF140HV(LA)	——	≤248.2	329.8	120/ Kcmil300	70/ AWG4/0	400
SCAF175HV, SCAF175HV(LA)	——	≤314.3	392.3	185 Kcmil500	95 Kcmil250	630
SCAF205HV, SCAF205HV(LA)	——	≤365.0	449.9	240 / Kcmil500	120/ Kcmil250	630
SCAF240HV, SCAF240HV(LA)	——	≤430.6	524.8	300/ 2×Kcmil250	150/ Kcmil250	630
SCAF275HV, SCAF275HV(LA)	——	≤492.7	595.3	2*150 2×Kcmil300	2*95/ Kcmil300	800
SCAF330HV, SCAF330HV(LA)	——	≤293.3/293.3	428/337.5	2*185 2×Kcmil500	2*95/ Kcmil500	1000

SCAF385HV, SCAF385HV(LA)	——	≤345.9/345.9	465/375.8	2*240 / 2×Kcmil500	2*120/ Kcmil500	1000
SCAF410HV, SCAF410HV(LA)	——	≤371.3/371.3	488/398.3	2*240 / 2×Kcmil500	2*120/ Kcmil500	1200

Model	Sub-modules	Unit data		Cable inlet (GB/UL)	Ground wire(GB/UL)	Recommended capacity of breaker device (A)
		Startup current (A)	Maximum operating current (A)			
SCAF115HV(T3)	——	≤199.6	264.6	120/ Kcmil400	70/ AWG4/0	400
SCAF140HV(T3)	——	≤248.2	329.8	150/ Kcmil500	95/ Kcmil250	400
SCAF175HV(T3)	——	≤314.3	392.3	240/ 2×Kcmil250	120/ Kcmil250	630
SCAF205HV(T3)	——	≤365.0	449.9	2*120/ 2×Kcmil300	2*70 Kcmil300	630
SCAF240HV(T3)	——	≤430.6	524.8	2*150/ 2×Kcmil400	2*95/ Kcmil400	630
SCAF275HV(T3)	——	≤492.7	595.3	2*185/ 2×Kcmil500	2*95 Kcmil500	800
SCAF330HV(T3)	——	≤293.3/293.3	428/337.5	2*240/ 2×Kcmil600	2*120/ Kcmil500	1000
SCAF385HV(T3)	——	≤345.9/345.9	465/375.8	2*300/ 2×Kcmil750	2*150/ Kcmil500	1000
SCAF410HV(T3)	——	≤371.3/371.3	488/398.3	2*300/ 2×Kcmil750	2*150/ Kcmil500	1200

Model	Sub-modules	Unit data		Cable inlet (GB/UL)	Ground wire(GB/UL)	Recommended capacity of breaker device (A)
		Startup current (A)	Maximum operating current (A)			
SCAF110HV(FCD)	——	≤219.3	274.3	95/ Kcmil250	50/ AWG3/0	400
SCAF130HV(FCD)	——	≤253.6	338.8	120/ Kcmil300	70/ AWG4/0	400
SCAF165HV(FCD)	——	≤328.7	403.5	185 Kcmil500	95 Kcmil250	630
SCAF195HV(FCD)	——	≤385.5	463.4	240 / Kcmil500	120/ Kcmil250	630
SCAF225HV(FCD)	——	≤450.9	540.6	300/ 2×Kcmil250	150/ Kcmil250	630

SCAF260HV(FCD)	——	≤518.0	613.3	2*150 2×Kcmil300	2*95/ Kcmil300	800
SCAF310HV(FCD)	——	≤304.7/304.7	438/337.5	2*185 2×Kcmil500	2*95/ Kcmil500	1000
SCAF370HV(FCD)	——	≤373.6/373.6	510/398.3	2*240 / 2×Kcmil500	2*120/ Kcmil500	1000

Notes:

■ The above current values (A) are under GB/T18430.1, 380V-3Ph-50Hz.

■ For cable specifications of other models, refer to the maximum current value in the selection report.

■ For low-voltage wiring, refer to *GB/T 16895.6 Low-voltage Electrical Installations - Part 5-52: Selection and Erection of Electrical Equipment - Wiring Systems*. Routing conditions: Cable tray routing (flat routing, i.e., horizontal placement with spacing); ambient temperature: 45ºC; wire body temperature: 70ºC; cable type: PVC insulation & copper core.

■ If the cable material and routing method are inconsistent with the recommendations (such as the use of multi-layer cable trays, pipe penetration, and high temperature), or the line pressure loss is > 2% due to distance, please re-select a model according to the maximum operating current of the unit. When using other types of cables, please pay attention to the size of the wiring lugs to ensure that the electrical clearance meets the standard.

■ Description of writing mode of cable: Taking SCAF115HV as an example, it means that one YJV95 or Kcmil250 cable is used for each phase of the three phases, and one YJV50 or AWG3/0 cable is used for the grounding cable; Taking SCAF410HVas an example, it means that two YJV240 or Kcmil500 cables are used for each phase of the three phases, and two YJV120 or Kcmil500 cable is used for the grounding wire.

■ The above recommended cables have the minimum cable diameter allowed by the unit.

■ Cables of the same specification must be configured for parallel use (the same length, same cross-sectional area and the same manufacturer).

6.6 Water Pump Wiring

➢ Verify that the unit is correctly connected to the ground cable to avoid leakage. The grounding device must be configured strictly according to electrical engineering rules. A ground cable is used to prevent electric shock.

➢ Install the control box of main power switch in a proper place.

➢ Seal the main power cable hole.

➢ Connect the main power cable, power neutral cable, and ground cable into the unit's electrical control box through the connecting hole.

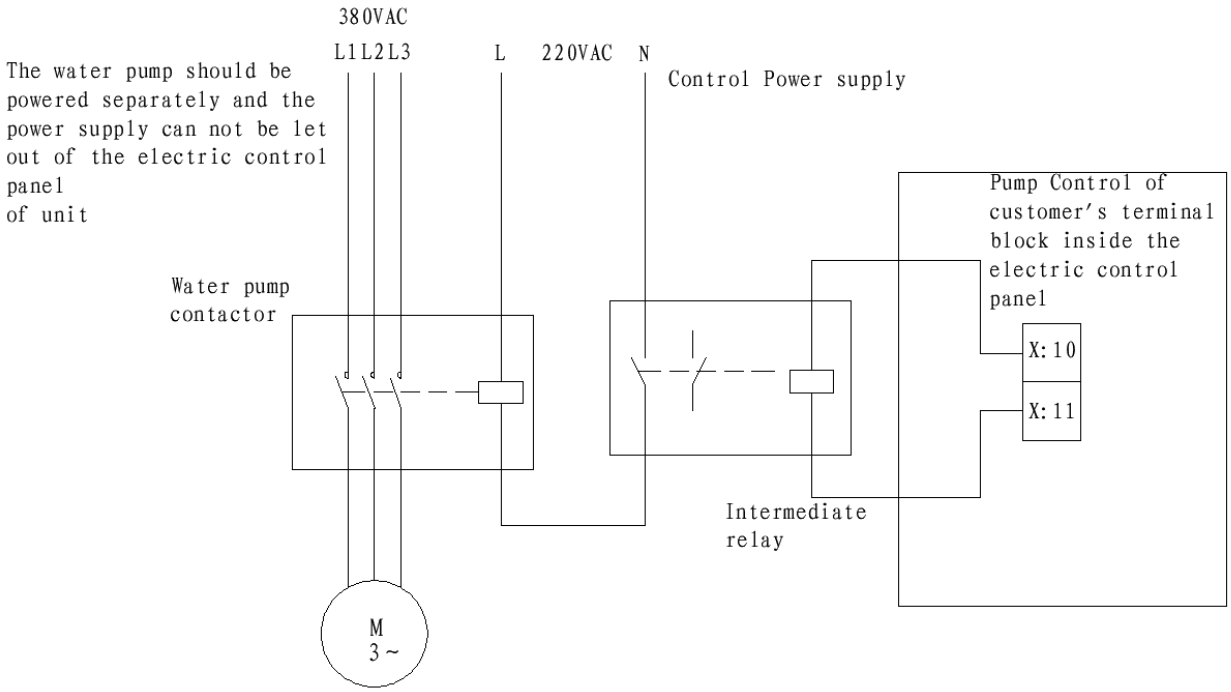
➢ Ensure that the phase sequence of the main power cable is consistent.

➢ Put the main power in a place that is not easily accessible to people other than professional maintenance personnel, to avoid malfunctioning and increase security.

➢ Connecting the remote control line: Use a jog switch. See the wiring terminal diagram in the appendix.

➢ Connecting the water flow switch control line: Prepare a water flow switch. See the wiring terminal diagram in the appendix.

➢ For connection of the water pump control line, refer to the figure below.

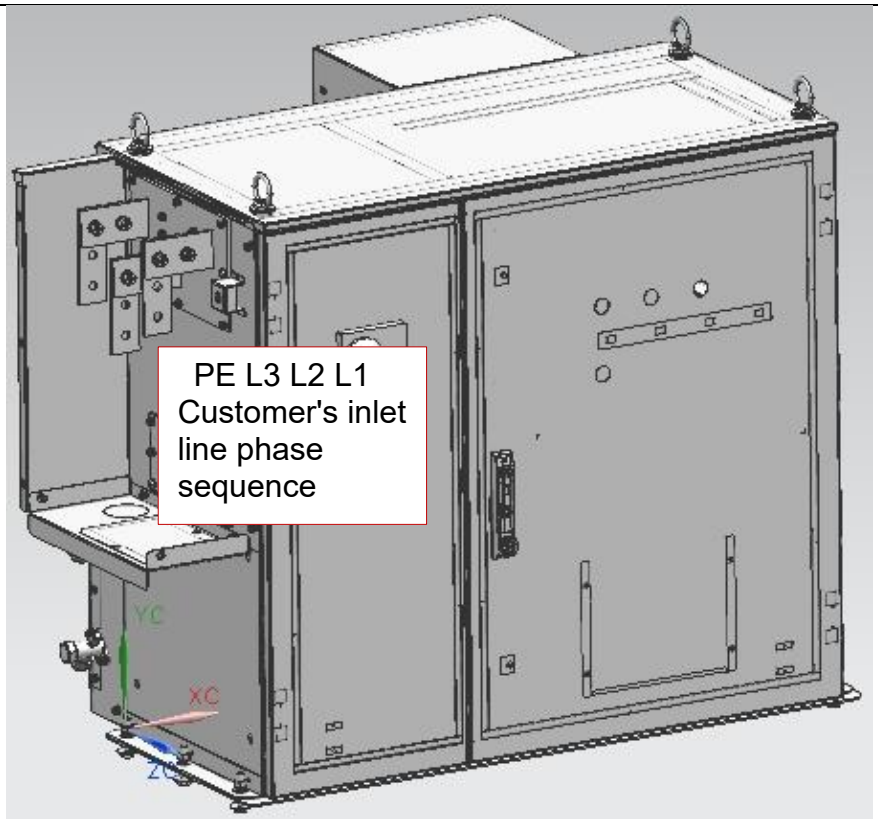


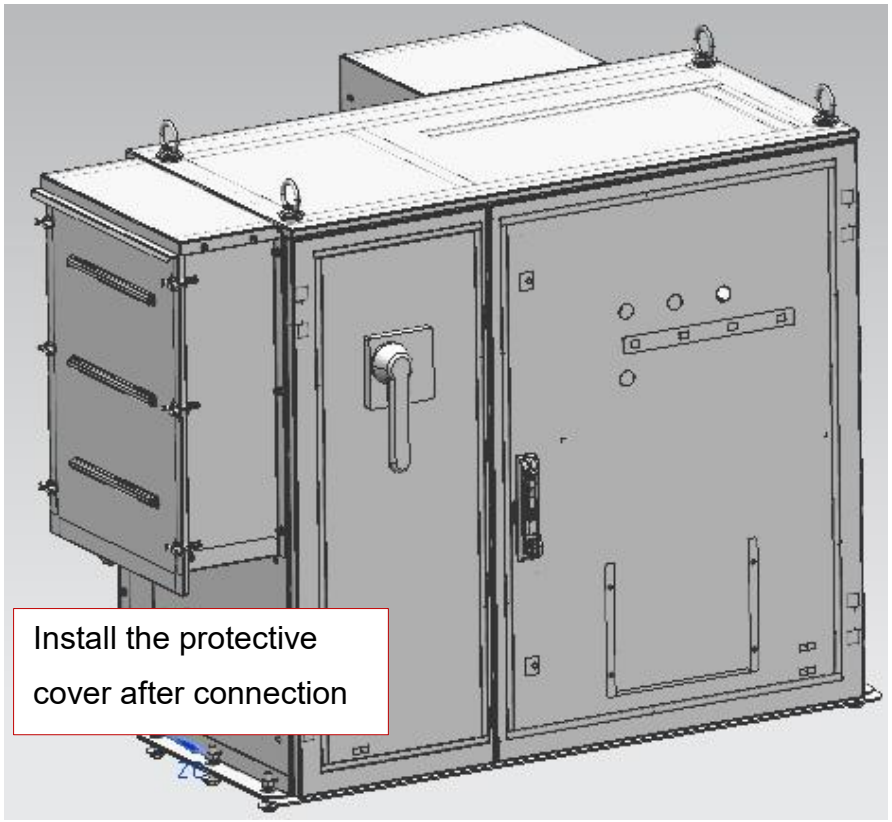
6.7 Unit Wiring

1. Power supply wiring diagram

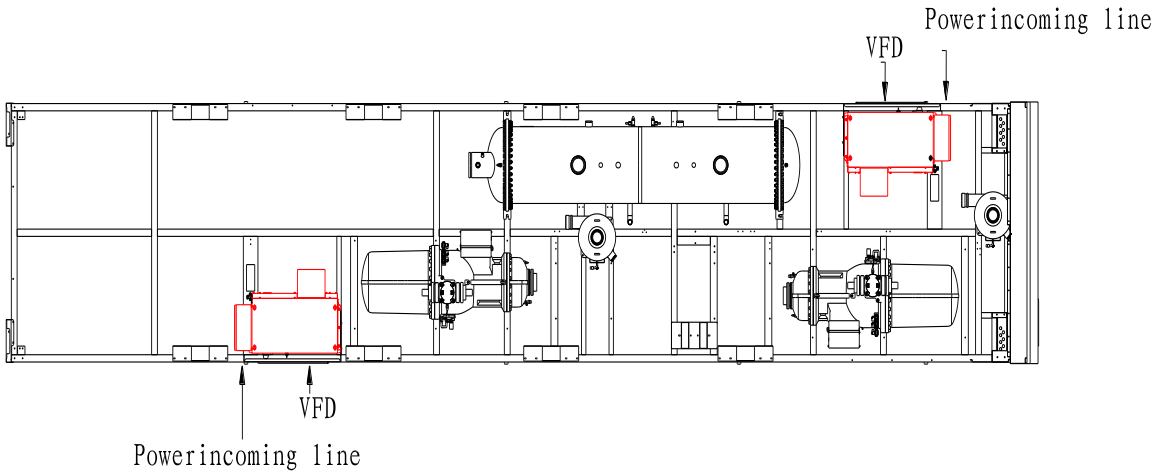
The specifications of the power wire shall comply with the national standard. Make sure that the grounding connection is safe and reliable and that the grounding resistance complies with national standards. Take waterproofing, dust proofing, and sealing measures at the power wire inlet hole after wiring. Midea is not liable for any electrical accidents caused by incorrect grounding or user negligence. The power wire connection scheme of the unit is as shown below:

The power wire connection scheme of the single-compressor unit is as shown below:





The power wire connection scheme of the two-compressor unit is as shown below:



Note: All inputs are passive dry contacts. The output must be switched using an intermediate relay. If the unit will not be used for a long time, turn off the main switch in the panel. When servicing the unit, disconnecting the circuit breaker of the unit and prevent closing accidentally.

2. Power distribution requirements of the cable inlet for the customer

Configure an inlet circuit breaker with sufficient capacity for each group of power input wires to the unit to avoid damaging the transformer, wiring, and other electrical appliances and allow independent control of startup and shutdown for the compressor in case a short circuit occurs in the line. Note: An inlet circuit breaker is provided for each unit. Do not provide a single inlet circuit breaker for several units.

3. Power distribution and installation precautions

Only professional electricians can assume power distribution construction work for the unit. The following items must be noted during power distribution:

(1) The power voltage must be stable when the unit is running and all voltage drop factors need to be considered. Keep the operating voltage of the unit within 10% of the rated value. Excessively high or low voltage will negatively affect the unit.

(2) The voltage difference between phases does not exceed 2% of the rated value. The difference between the maximum phase current and the minimum phase current is smaller than 3% of the rated value to avoid overheating the compressor due to unbalance.

(3) Keep the power frequency within 2% of the rated value.

(4) Keep the grid voltage of the unit during startup at more than 90% of the rated value.

(5) An excessively long power cable may prevent the compressor from starting up. Therefore, the power cable must be long enough that the voltage drop at the end and tail of the power cable is less than 2% of the rated value. If the power cable cannot be shortened, use a cable in greater diameter.

(6) Wiring from the power supply to the unit must be conducted strictly according to national standards, and insulation must be adequate. After the unit is wired, use a 500 V megger to measure insulation between terminals and the unit body of the electrical accessories. Insulation resistance must be greater than 2 M.

(7) In accordance with the requirements of electrical law, to ensure personal safety, the unit housing must be reliably and properly grounded to avoid electric shock.

(8) Parameters, such as operating current and input power indicated on the unit nameplate, are values tested under standard conditions. These may differ significantly from actual values due to changes in system loads and ambient temperature during actual operations. Therefore, select the power supply, transformer, cable inlet circuit breaker, cabling capacity and other devices based on extreme operating conditions.

(9) The electromagnetic switch used in the water circulating pump must interlock with the operating circuit of the unit body. All the above electromagnetic switches are assembled on the construction site, but not attached inside the unit's power distribution box.

7 Unit Commissioning

7.1 Precautions before Commissioning

7.1.1 Water System

■ The water pipes should be kept clean and connected in the correct direction.

■ Check whether the inlet and outlet pipes are properly connected.

■ Turn on the water valve.

■ Start the pump.

■ Inspect all pipes and connections for leaks.

■ Turn on the discharge valve to remove air from the water system and then close it.

■ Check the loss of water side resistance and whether the water flow is proper.

■ Check whether the water inlet/outlet temperature of the control panel is consistent with the temperature shown on the thermometer.

7.1.2 Circuit

■ Disconnect the main power switch and check all the startup and control circuits of the panel.

■ Check whether the power supply of the unit is consistent with the requirements specified on the nameplate. The voltage fluctuation range shall not exceed ± 10% of the rated voltage and the phase voltage imbalance shall not exceed 2%. The phase sequence of the power supply shall be consistent with that of the unit.

■ Check whether there is enough power supply capacity to meet the start-up and full-load operation of the unit.

■ Check whether the unit is grounded.

■ Make sure that all wires and protective measures match the unit, and that all interlocked control lines are connected and DIP settings are performed according to the relevant schematic diagrams.

■ Make sure that the unit accessories and control devices work properly.

7.1.3 Unit

■ Check whether the pressure of the unit is normal and whether the oil level of the compressor is normal.

■ Check that all safety control devices are in their original state and are set correctly.

■ Check whether the unit valve is in the correct position and whether the unit has a refrigerant leak sound.

■ Check whether the compressor coil winding is normal (phase resistance, inter-phase resistance and grounding resistance).

■ Turn on the unit and check if the star-delta switching is normal (check if the voltage between the three contacts is 380V) (power supply to the compressor has been cut off).

■ Check if there is a phase loss (voltage to earth for each phase should be 220 V).

■ Check whether settings are properly made on-site via the control panel.

■ Check whether the expansion valve can be opened and closed normally (observe from the sight glass of the expansion valve whether the valve stem works properly).

■ Make sure that the loading/unloading solenoid valve works properly.

■ Check whether the compressor oil heater is normal and whether the oil has been heated for 8 hours.

■ After that, start the auxiliary equipment and the circulating water pump.

■ Plug in the power and turn on the unit.

7.2 Commissioning Operation Procedure

■ Connect the refrigerant pressure gauge to the unit, install the temperature probe, and start the compressor. Observe whether the star-delta switching of the compressor is normal. Check the voltage at the bottom of each contactor.

■ Check the compressor current.

■ Inspect the rotation direction of the fan and its operating current.

■ Observe whether the oil level is normal and whether the energy-regulating solenoid valve of the compressor is working correctly. (A non-magnetic blade can be used to check whether the solenoid valve is magnetic)

■ Run the compressor for at least 20 minutes, inspect and monitor all parameters, and observe the suction/discharge pressure of the unit.

■ Check the discharge temperature of the air discharge pipe to make sure that the oil separator is working well. Observe the flow of refrigerant from the sight glass on the liquid supply pipe.

■ Check through return air superheat whether the EXV opening is within a reasonable range.

■ After the unit begins operating, check whether the unit's return air superheat, discharge overheat and condensation supercooling are normal.

■ When the discharge temperature is high, observe whether the solenoid valve on the sparge pipe and capillary tube are working normally. (A non-magnetic blade can be used to check whether the solenoid valve is magnetic and whether the solenoid valve is working)

■ Turn off the unit and check whether the compressor oil level is normal.

■ To keep the unit running, sufficient air conditioning load is required, so all terminal equipment should be turned on.

■ After that, check and tighten all valve caps, and clean the unit and all refrigerant system joints.

7.3 Precautions When the Unit is Running

7.3.1 Check before Unit Running

1. Judge whether the compressor refrigerant oil has been heated for enough time. The unit must be preheated for 8 hours for its first startup after power-off. In other cases, the unit is usually preheated for 4 to 8 hours, and the oil temperature is kept above 20ºC. (The heating time of compressor refrigerant oil depends on the ambient temperature, the lower the ambient temperature, the longer the heating time; the longest heating time is 8 hours; when the ambient temperature is above 10ºC and persists for one minute, no heating is required). The specific oil heating time can be queried in status information section on the touch screen.
2. Check whether the water flow meets the unit requirements.
3. Check the control switches and components on the power distribution panel for abnormalities.
4. Check whether the power supply and voltage are normal.
5. Check whether the pressure gauge of master unit is normal. Normally, when the outdoor ambient temperature is 25°C to 35°C, the pressure of the high/low pressure gauge should be about 5.0 to 9.0 bar.

7.3.2 Unit Startup Sequence

1. Start the water circulating pump;
2. Start the compressor;
3. Start the fan motor (the fan is turned on according to the discharge saturation temperature when the unit is in cooling mode).

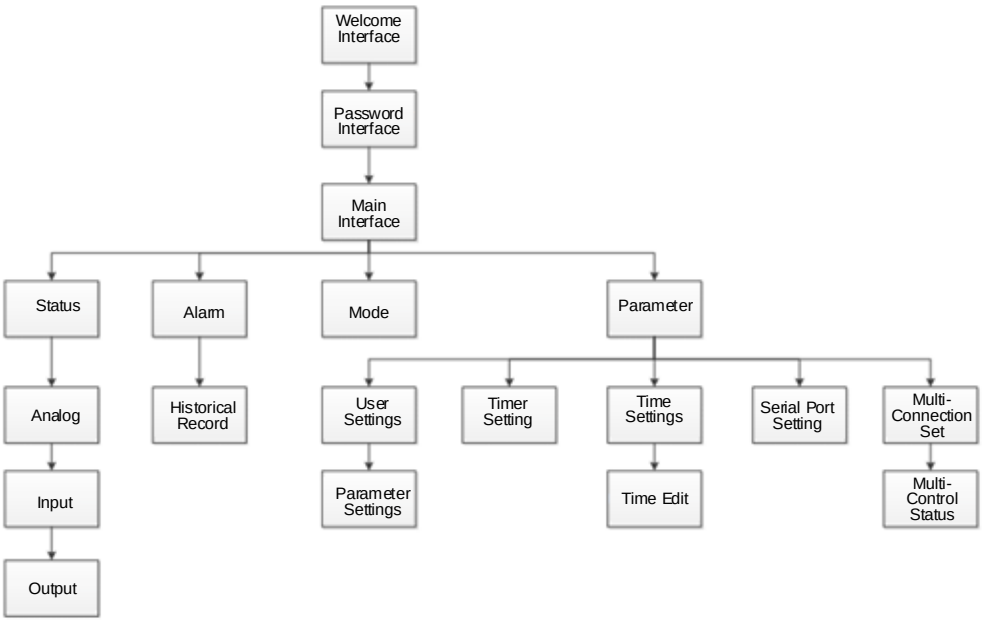
7.3.3 Unit Shutdown Sequence

1. Shut down the compressor;
2. Shut down the fan motor;
3. Shut down the water circulating pump.

8 Operation Instructions

Note: The unit is equipped with the remote service module to realize global positioning and information transmission of the unit. The remote service module is capable of collecting any information but the user's personal information, including the frequency, temperature and pressure when the unit is running.

8.1 Unit Operation Flowchart



8.2 Controller Operating Instructions

Before powering on the unit for the first time, ensure that the wiring from the user side to the control box is firm, the insulation resistance between the four wires meets the requirements, and the unit is well-grounded.

Since the wiring in the control box may be loose during transportation, check to ensure that the wiring of each terminal is firm in the event of power failure.

Check whether there is enough power supply capacity to meet the start-up and full-load operation of the unit.

Check whether the red emergency stop button on the control box is naturally released.

8.2.1 Operation Instructions

Note: 1. All the time displayed on the touch screen refer to the time of the touch screen except for the time of the welcome page (which is the controller time). If any time is inconsistent with the current time, set the time to the current time on the time setting interface.

2. Unless otherwise permitted, the implementation of remote control through disassembling of the touch screen and extended communication cables is prohibited, because unit failure may occur due to the signal interference. We assume no liability or responsibility for any damage brought by or results arising thereof. Customers who require remote control can apply to us for a customized configuration.

Note: Below is a stand-alone figure, which may be modified without prior notice. The actual figure shall take precedence.

8.2.2 Welcome Interface

Figure 4.1 Welcome interface

Controller and HMI program version number

8.2.3 Password Interface

Click the "Enter" button to enter the password input page, as shown in the figure below.

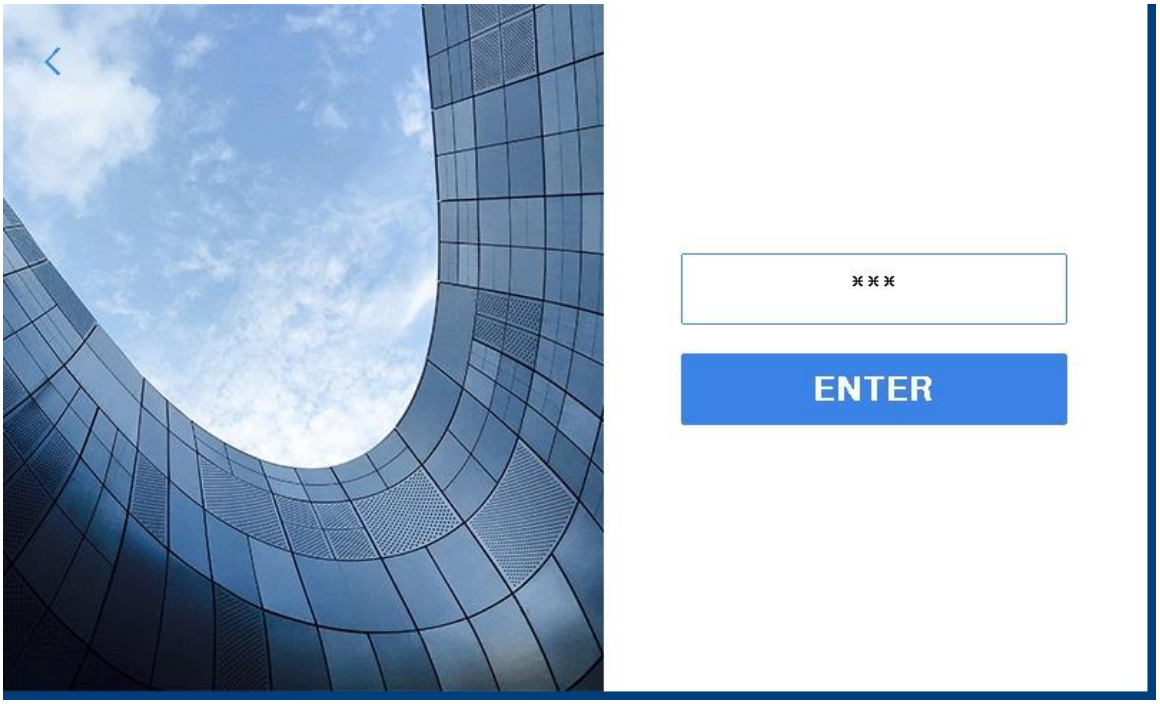


Figure 4.2 Password interface

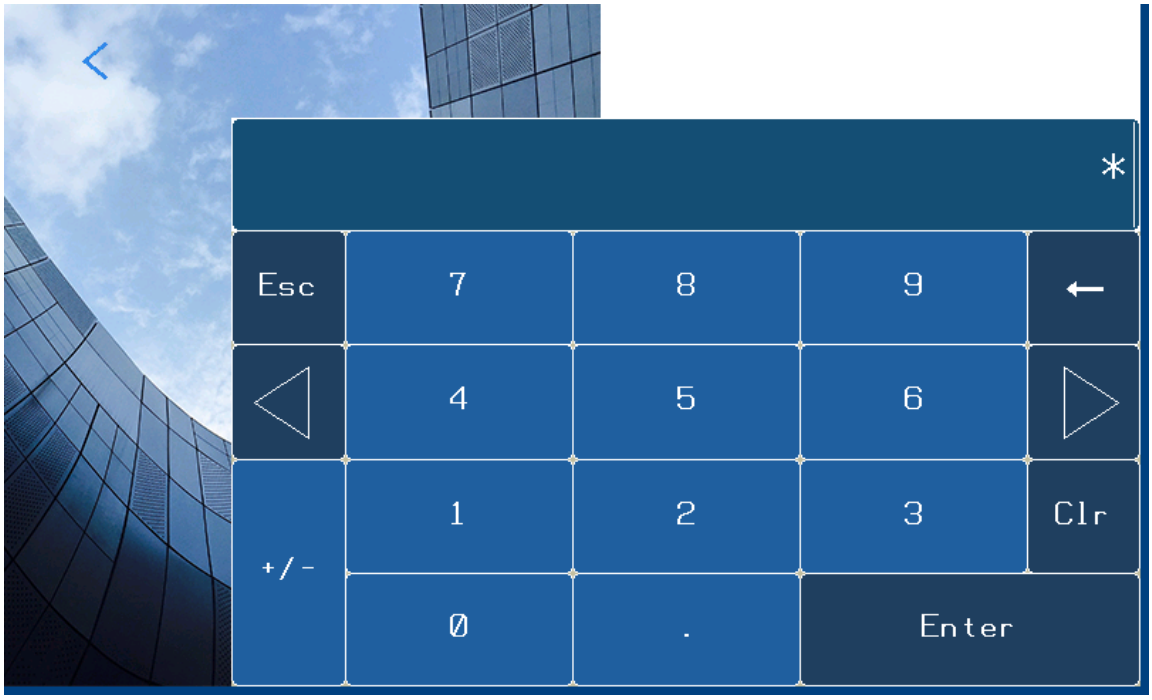


Figure 4.3 Password input interface

Enter the password 40828, and confirm by tapping ENTER on the keyboard. After that, tap "Login" to enter the main interface.

8.2.4 Main Interface

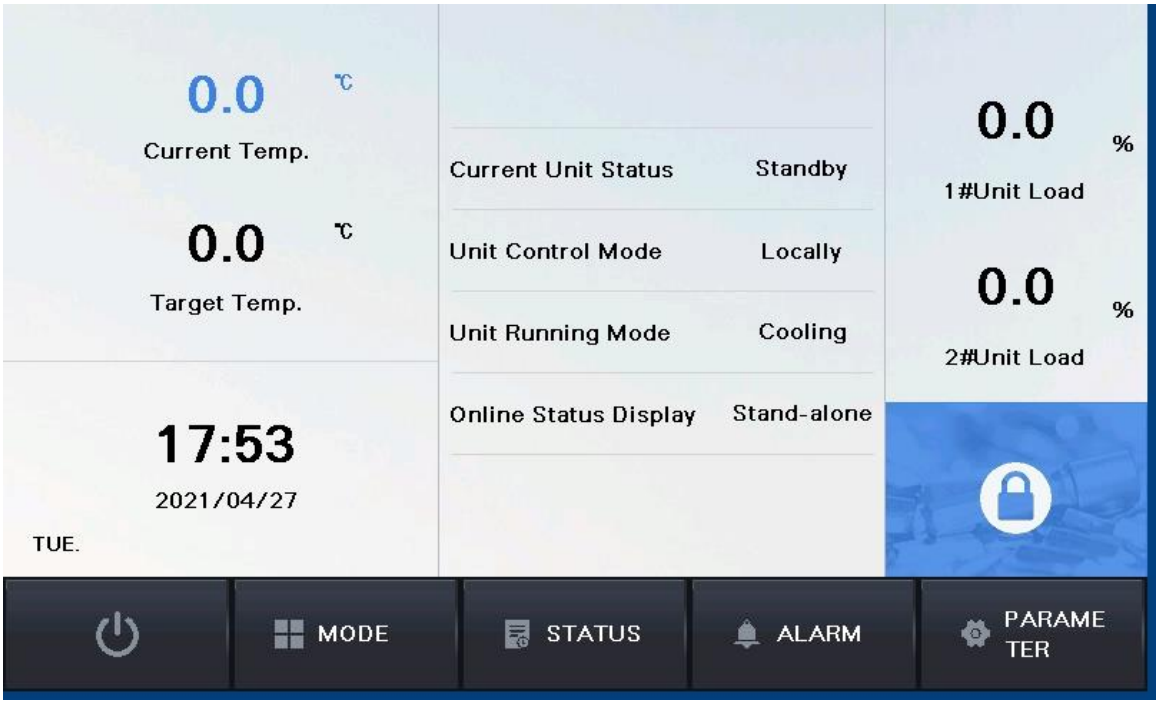


Figure 4.4 Main interface

When the unit is not online-controlled, "Stand-alone" is displayed. The online mode is set by "Multi-Connection Set" in the parameter settings (do not set to online mode when there is only one unit).

4.2.4.1 Mode setting

Click "MODE" to enter the mode setting page.

Figure 4.5 Mode setting

Set the control mode and operation mode on this page. The current system control mode and operation

mode are displayed on the main interface.

Notes:

1. During operation, you can only switch the control mode and cannot select other modes.
2. The control mode is used for selecting the on/off modes. In the "Locally" mode, you can only click the "ON/OFF" button on the touch screen to turn the unit on/off; in the "Remote Control" mode, you can only utilize this function through the "Remote Start/Stop" hardware interface; in the "TIMED" mode, you can only utilize this function by setting a time; in the "BMS" mode, you can only utilize this function through communication with the upper computer.
3. "Heating" is only applicable to heat pump units.

4.2.4.2 Power-on Operation

Tap  , and a “Confirm Start?” window pops up, as shown in Figure 4.6. Tap **Yes** to start the unit. If the compressor startup conditions are not met, the unit will access the halt state after running the pump. The main interface displays "Comp. Start Not Allowed. Please Check Status."

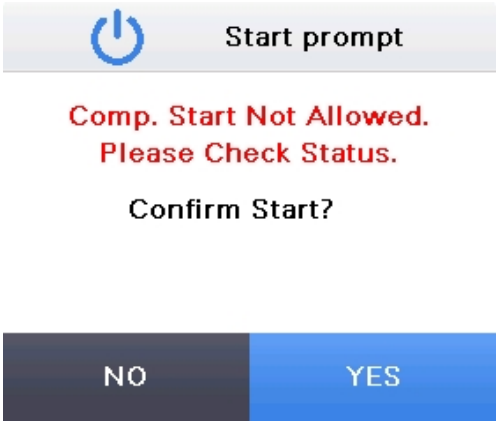


Figure 4.6

4.2.4.3 Power-off Operation

Tap  , and a "Confirm Stop?" window pops up, as shown in Figure 4.7. Tap **Yes**, and the unit status displays "Shutdown". (Note: The interface still displays "Shutdown", even if the shutdown conditions have not been met. After the shutdown conditions have been met, the unit will automatically shut down.)

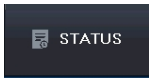
Figure 4.7

Power-on/off and status description:

1. Standby: The unit accesses the standby state in normal cases after it is powered on.
2. Running: The unit has been started up.
3. Pause: The unit enters the pause status and the compressor stops running if the control water temperature is lower than the pause temperature. The unit enters the running status and the compressor starts up when the control water temperature is higher than the compressor startup temperature.
4. Stop: The unit accesses the standby state after it awakens from the manual stop state.
5. Alarm: The unit displays "Fault" when a fault alarm occurs.

For some models, there is a rotary button with a key next to the touch screen. If a user or after-sales person wants to view parameters on the touch screen during unit maintenance, the user or the after-sales person can rotate the button to the maintenance position. Then, the "Maintenance mode, do not start up the system" message is displayed at the bottom of the homepage. In this case, system startup is prohibited. All maintenance and live-line operations can only be performed by qualified persons who had received professional training. (Refer to the actual unit for this function)

8.2.5 Status Information

On the main interface, click 

to query information about the unit status.

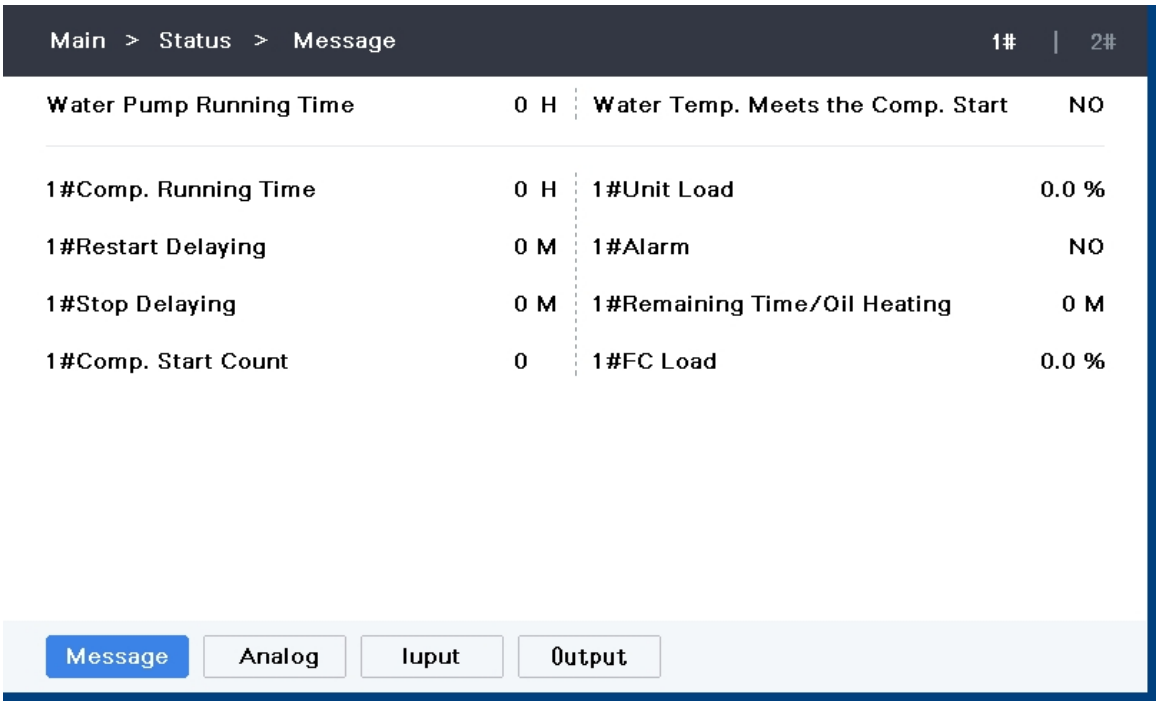


Figure 4.8 Status information

Notes:

Startup must meet the following conditions:

1. "Restart Delaying" must be "0". If it is not "0", the delay required for startup has not concluded.
2. "Water Temp. Meets the Comp. Start" must be "YES". If it is "NO", the current water temperature does not meet the compressor's startup conditions.

3. "Remaining Time/Oil Heating" must be "0". If it is greater than "0", the unit is in the oil heating status.

Conditions to be met before shutdown:

"Stop Delaying" must be "0". If it is not "0", the delay required for shutdown has not yet concluded.

8.2.5.1 Real-time Data Display

Click Analog in Figure 4.8 to enter the Analog real-time data display interface, and the interface displays the real-time detection value, as shown in Figure 4.9.

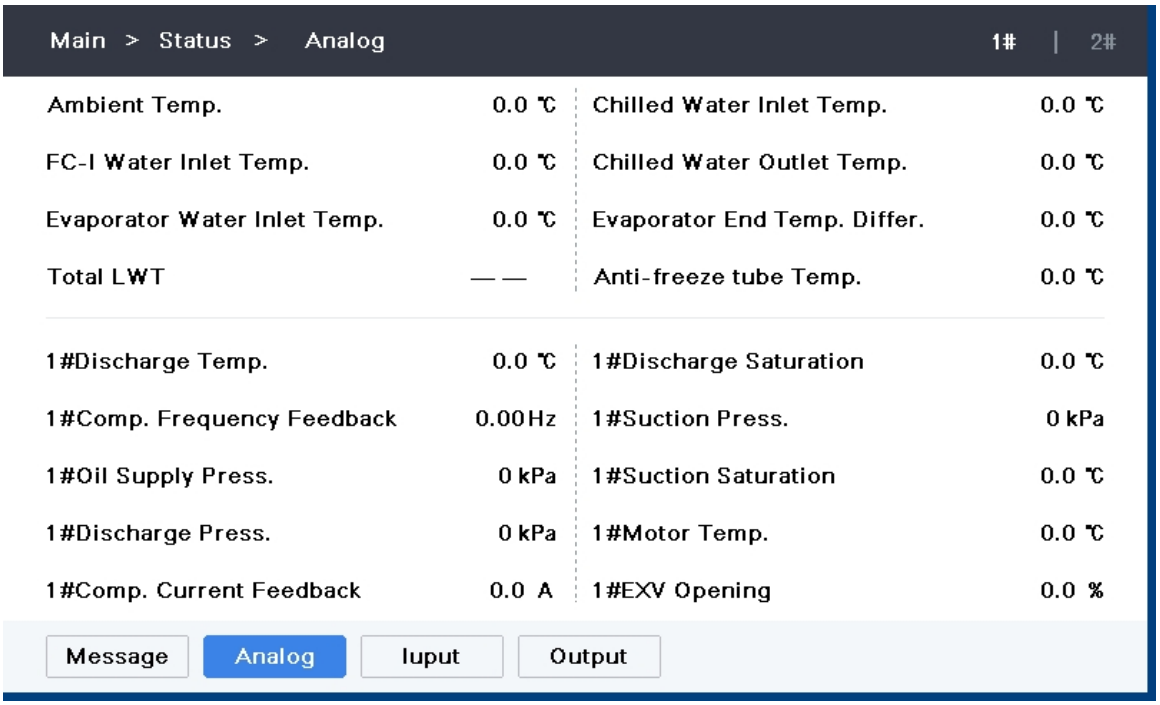


Figure 4.9 Real-time data display

8.2.5.2 Input Status Display

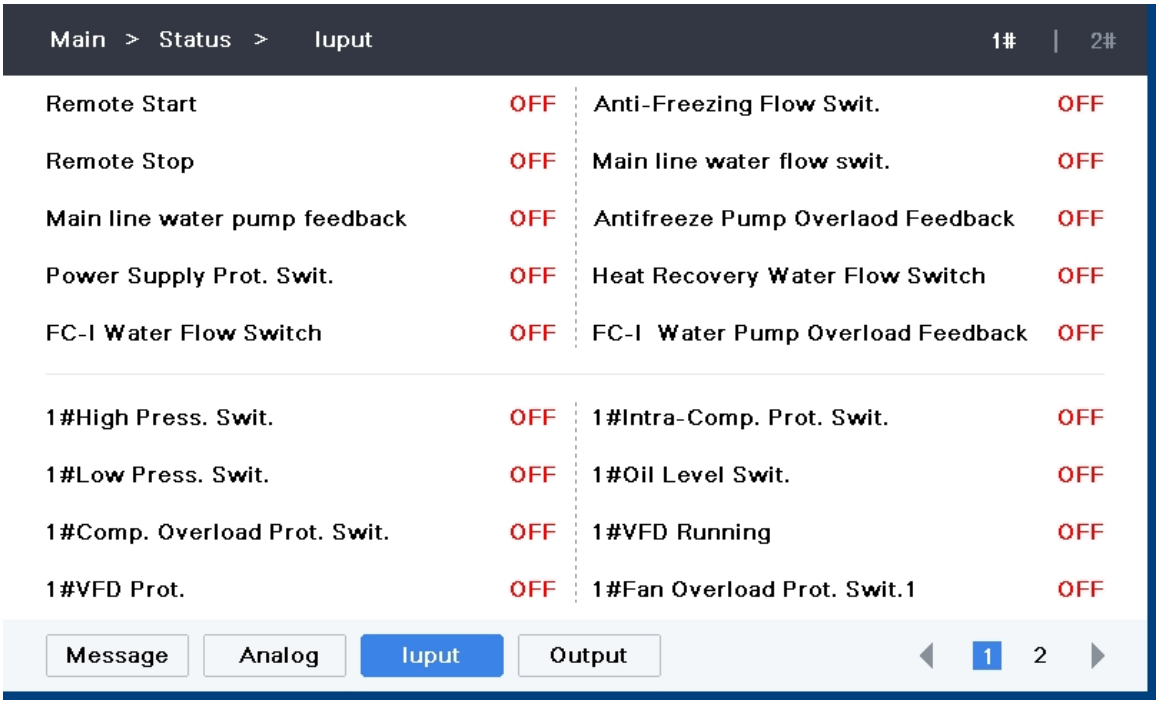


Figure 4.10 Input status

"ON" indicates that the input point is connected to the power supply, and "OFF" indicates that the input point is disconnected from the power supply.

Notes:

1. "Remote Start/Stop" is valid in the "REMOTE" mode. When the remote switch hardware of a jog type or the hold type is selected, you need to contact Midea after-sales department to set the jog type or the hold type.
2. The "Main line water flow swit." is OFF if there is no water flow and ON when there is water flow.

Iput	Display	Description
Remote Start	OFF	Hardware start point location disconnected
	ON	Hardware start point location connected
Remote Stop	OFF	Hardware stop point location disconnected
	ON	Hardware stop point location connected
Main line water pump feedback	OFF	When main line water pump is running, abnormal
	ON	When main line water pump is running, normal
Power Supply Prot. Swit.	OFF	Abnormal
	ON	Normal
FCI Water Flow Switch	OFF	When internal circulating water pump is running, abnormal
	ON	When internal circulating water pump is running, normal
Anti-Freezing Flow Swit.	OFF	When anti-freeze water pump is running, abnormal
	ON	When anti-freeze water pump is running, normal
Main line water flow swit.	OFF	When main line water pump is running, abnormal
	ON	When main line water pump is running, normal
Antifreeze Pump Overlaod Feedback	OFF	Normal
	ON	Abnormal
Heat Recovery Water Flow Switch (only for full heat recovery unit)	OFF	When heat recovery water pump is running, abnormal
	ON	When heat recovery water pump is running, normal
FCI Water Pump Overload Feedback	OFF	Normal
	ON	Abnormal
High Press. Swit.	OFF	Abnormal
	ON	Normal
Low Press. Swit.	OFF	Abnormal
	ON	Normal
Comp. Overload Prot. Swit.	OFF	Normal

	ON	Abnormal
VFD Prot.	OFF	Normal
	ON	Abnormal
VFD Running	OFF	When VFD is running, abnormal
	ON	When VFD is running, normal
Intra-Comp. Prot. Swit.	OFF	Abnormal
	ON	Normal
Oil Level Swit.	OFF	Abnormal
	ON	Normal
Fan Overload Prot. Swit.	OFF	When fan is running, normal
	ON	When fan is running, abnormal

8.2.5.3 Output Status Display

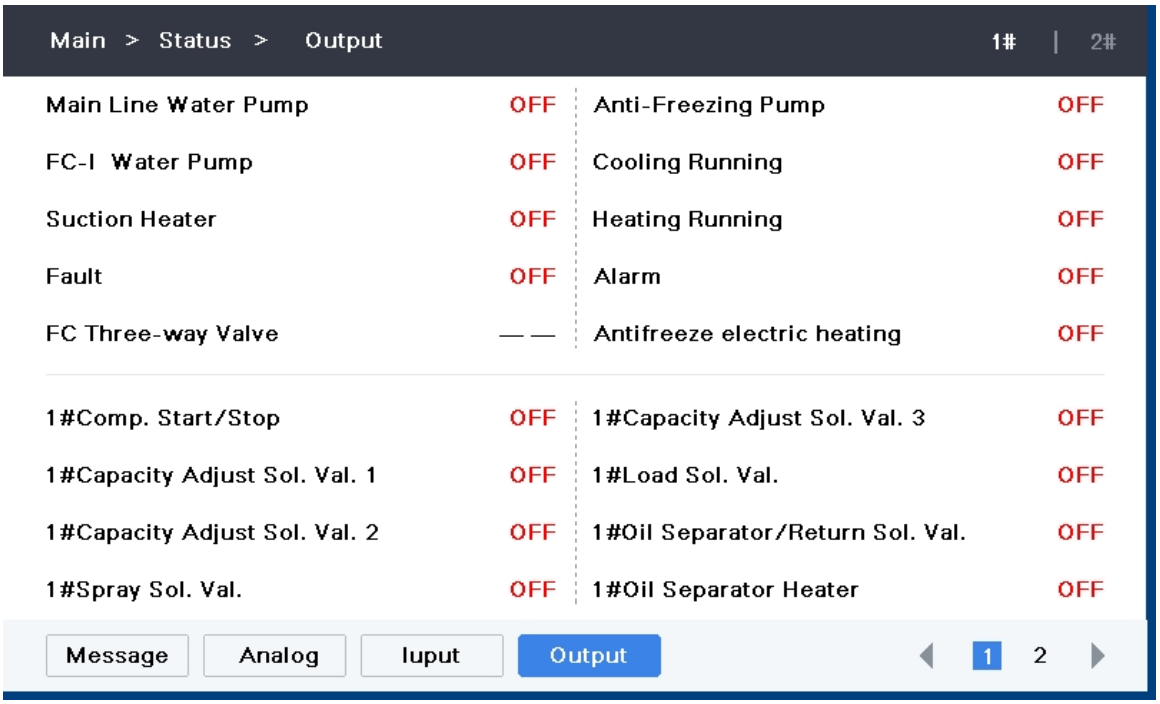


Figure 4.11 Output status

"ON" indicates that the input point is closed, and "OFF" indicates that the input point is disconnected.

8.2.6 Parameter Setting

On the main interface, click 

to access the User Parameters Settings interface.

The User Parameters Settings interface is as follows:

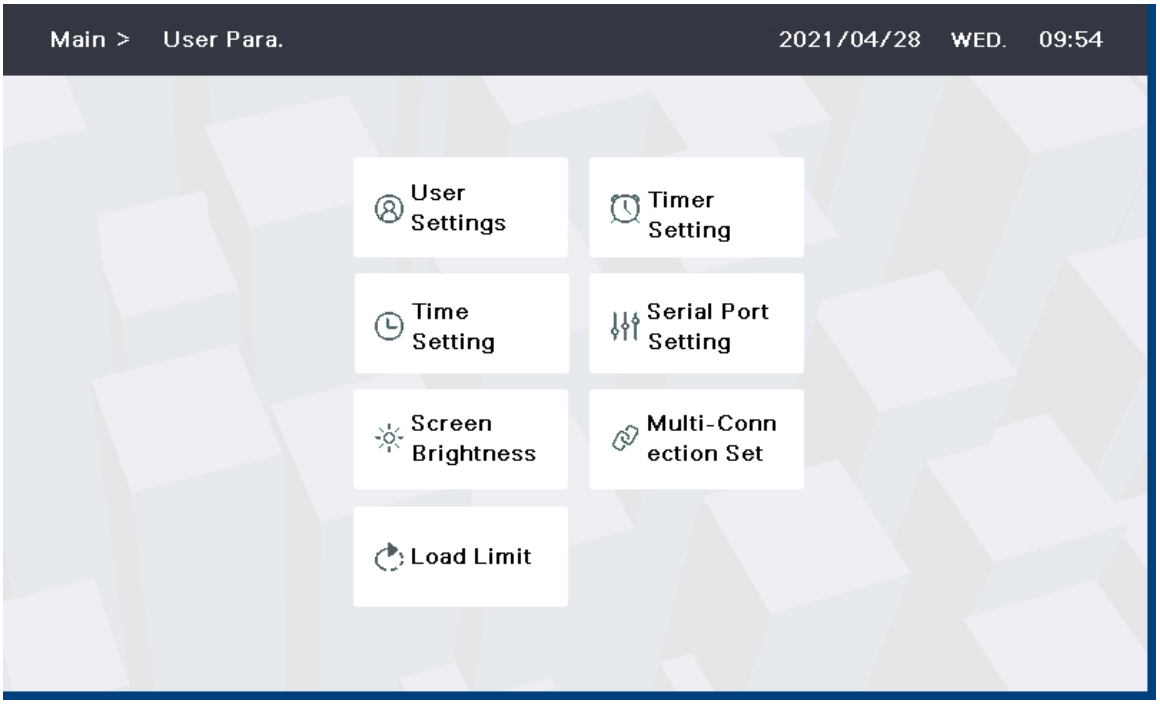


Figure 4.12 User parameters setting interface

On the interface, click User Settings to access the User Parameters Settings interface, as shown in Figure 4.13.

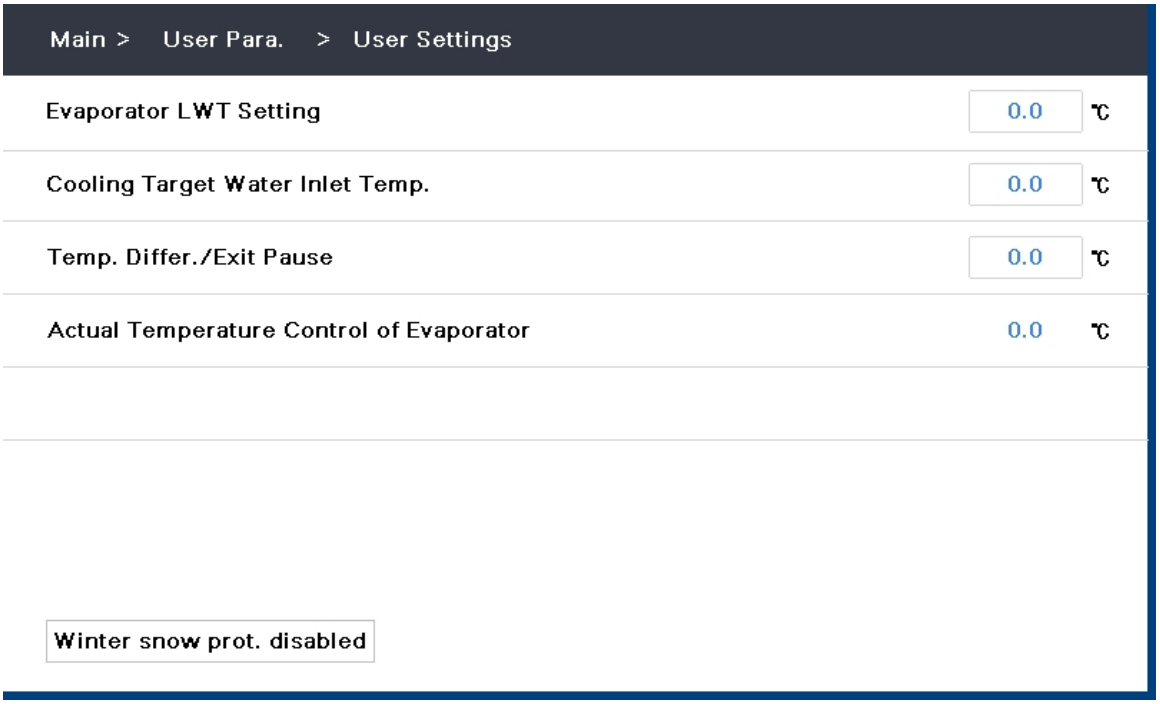


Figure 4.13. User parameters setting

Notes:

1. Set the Max of the input window to the upper limit of set parameter and Min to the lower limit of the set parameter. Press "Enter" to confirm the input. Press "Esc" to cancel the input.

2. Manual defrosting can be effective after 10 minutes of compressor operation.

3. The interface display relevant cooling parameters setting in the Cooling mode and relevant heating parameters setting in the Heating mode.

Definitions of Terms:

1. Cooling Target Water Outlet Temp.: target value of water temperature adjustment.

2. Temp. Differ./Exit Pause: a condition for the compressor of the unit to restart after entering the pause mode. In Cooling mode, the compressor starts only when the (water outlet) temperature is higher than (control target temperature + exit pause temperature difference).

3. Cooling Target Water Inlet Temp.: target value of water inlet temperature adjustment.

4. Winter snow prot. enabled: a switch for winter snow protection. When the switch is turned on, the fan is intermittently turned on and off according to the ambient temperature to achieve snow prevention under standby conditions.

8.2.7 System Clock Setting

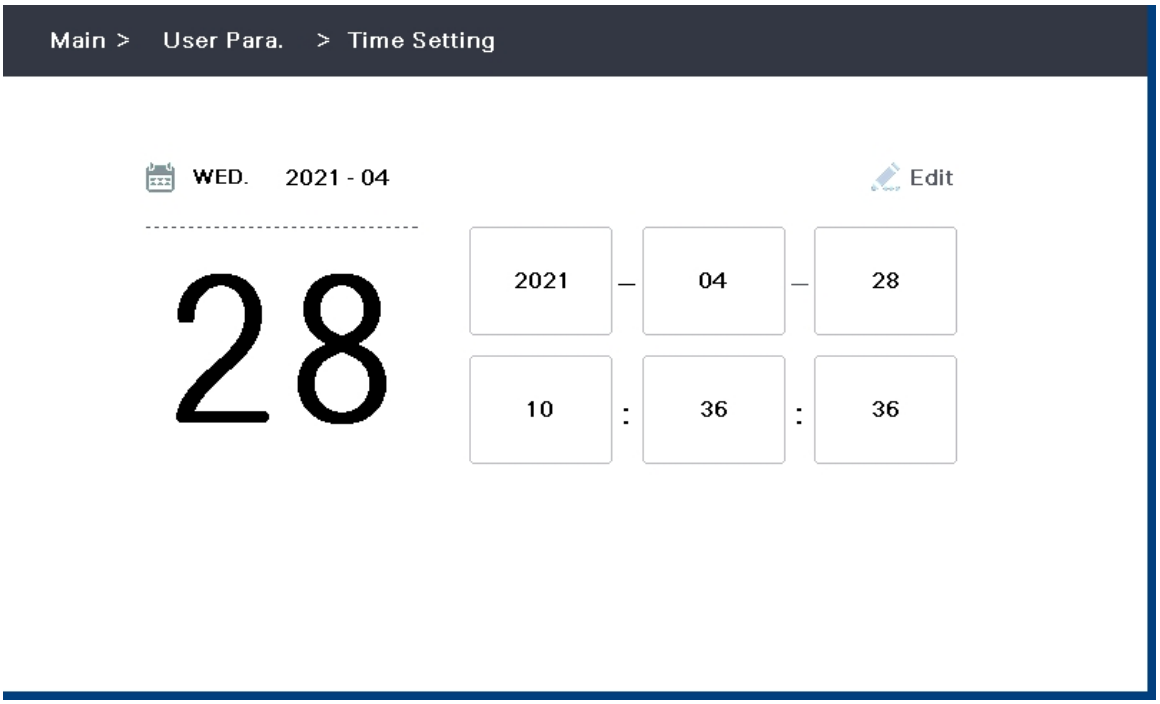


Figure 4.14 Setting the Clock

Click **Edit** to access the clock setting interface, as shown in Figure 4.15.

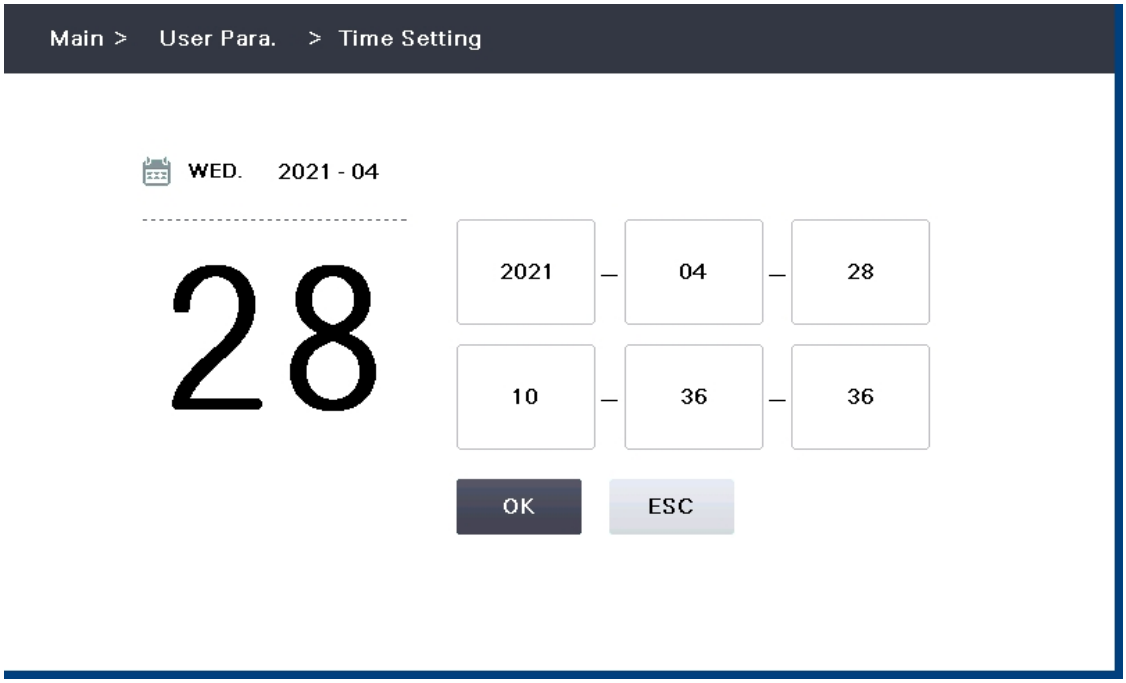


Figure 4.15 Setting the Clock

Click a box and a digital keypad appears. Enter the time and press Save to save the setting. The input takes effect upon entry.

Note: The date and time must be set in a reasonable manner. For any consequences resulting from an unreasonable date/time setting, Midea does not shoulder any liability.

8.2.8 Serial Port Setting Interface

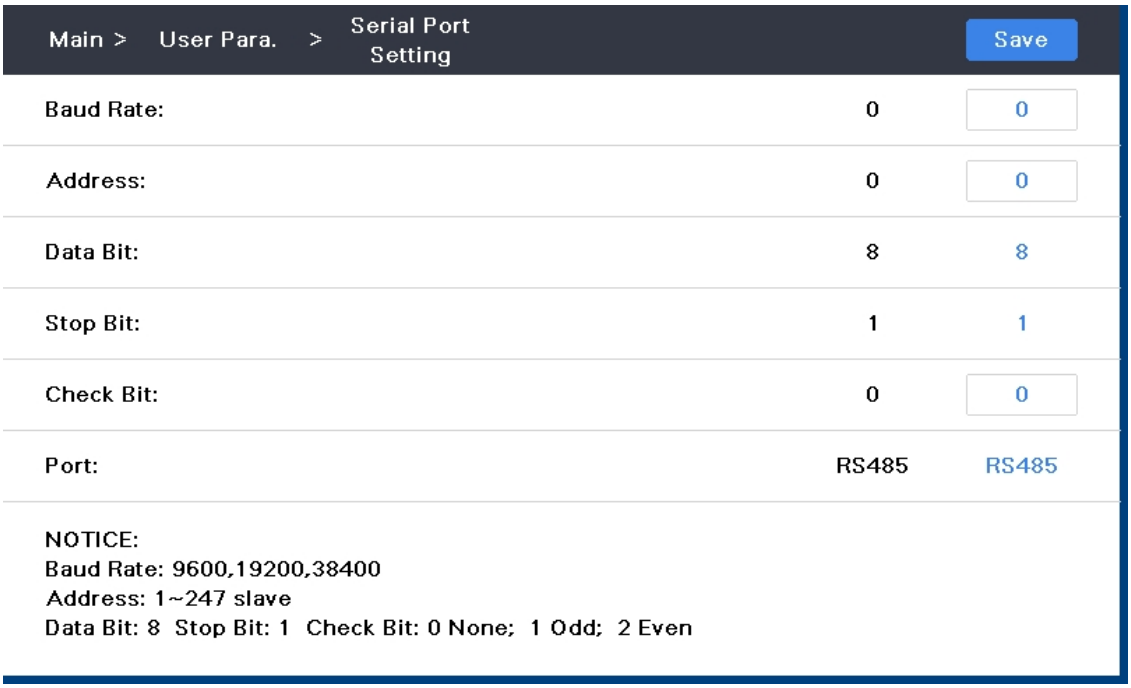


Figure 4.16 Serial port setting

BMS communication port, through which the baud rate, address, check bit can be set according to the

instructions. Click Save to save the setting, then the setting takes effect.

8.2.9 Multi-Connection Set

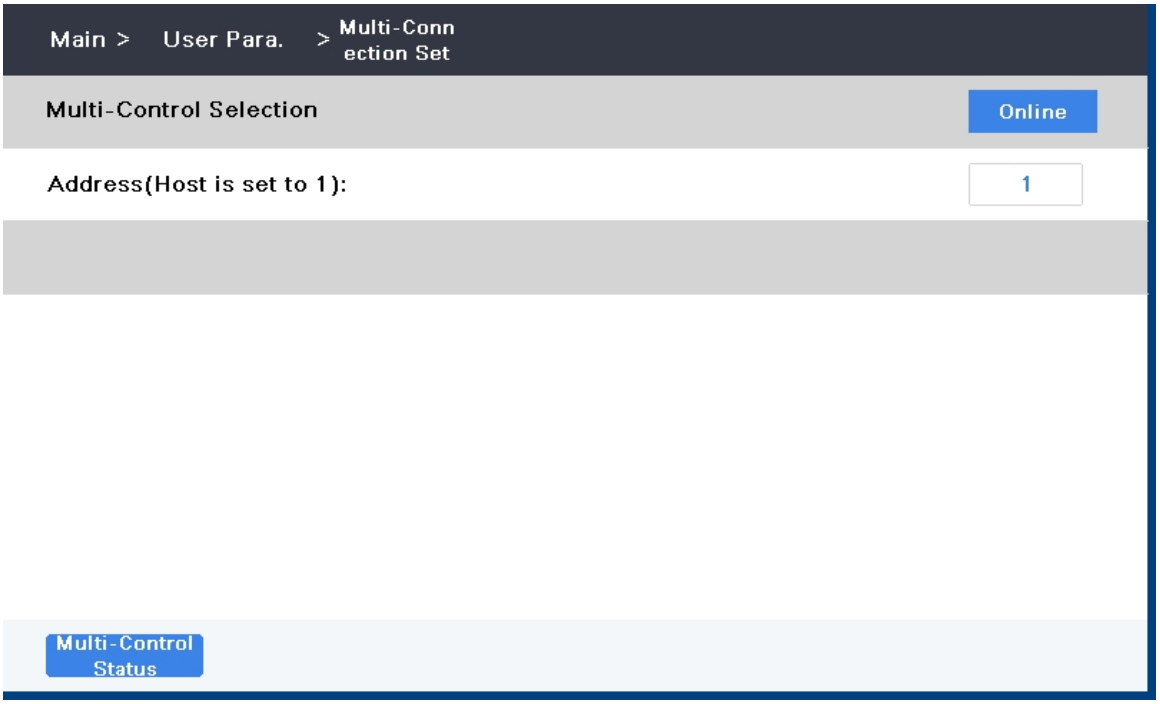


Figure 4.17 Multi-Connection Set

For the Multi-Control Selection, there are two options available: "Stand-alone" or "Online". The Address can be set as 1-16, where 1# is the only multi-connection master unit.

Click “Multi-Control Status” to view Figure 4.18 and Figure 4.19.

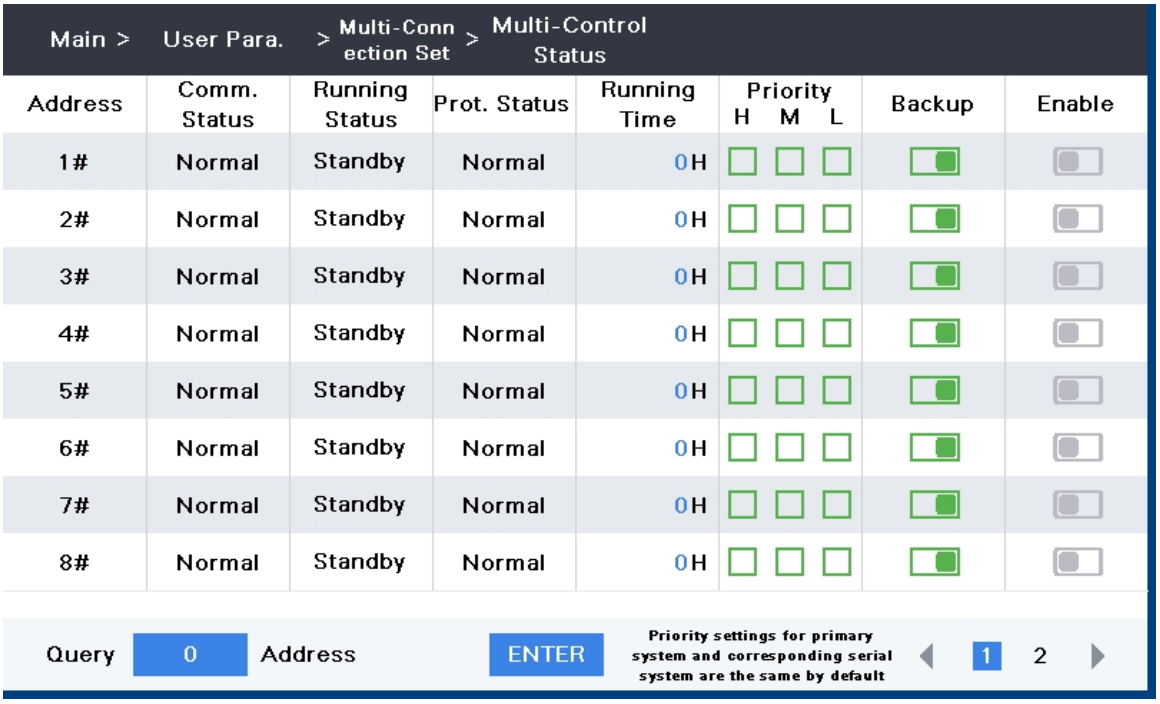


Figure 4.18 Multi-connection unit display

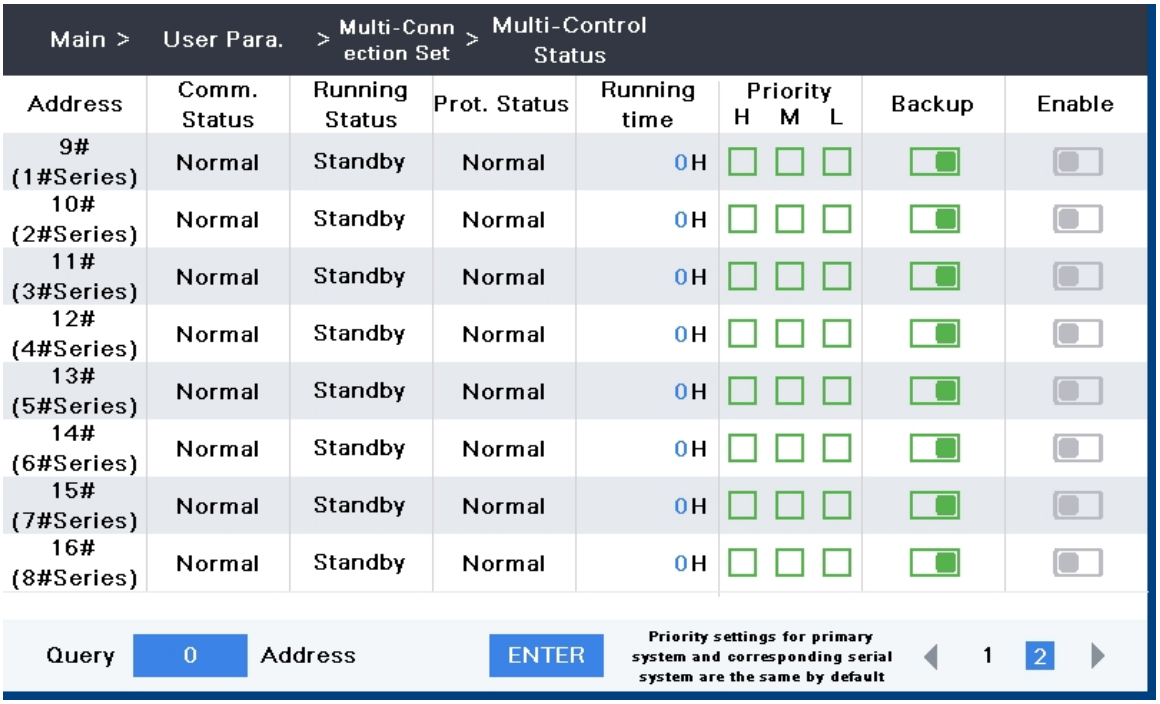


Figure 4.19 Multi-Connection serial system display

"Enable", "Backup" and "Priority" can be set separately for each unit in the multi-connection system. The 9-16# addresses correspond to 1-8# series, which needs to be set according to the actual situation.

By querying the n# unit, click "Enter" to query the multi-connection unit information, as shown in Figure 4.20.

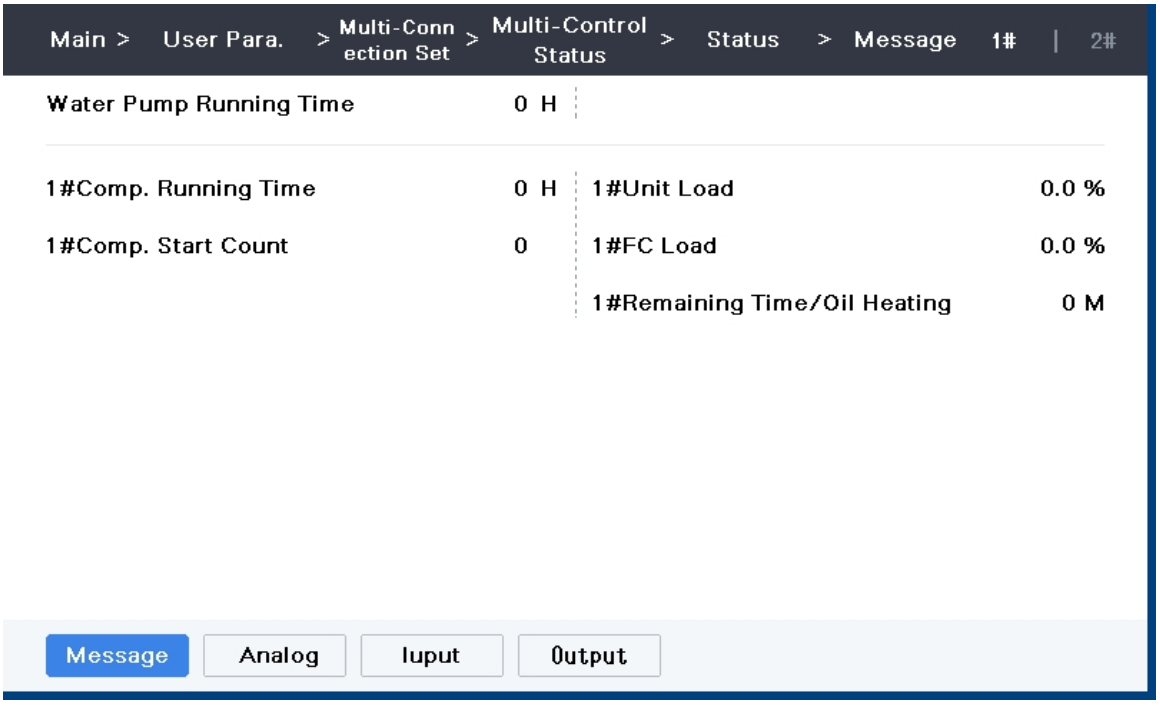


Figure 4.20 Multi-connection unit information

8.2.10 Alarm Information

On the main interface, click 

to access the alarm query interface.

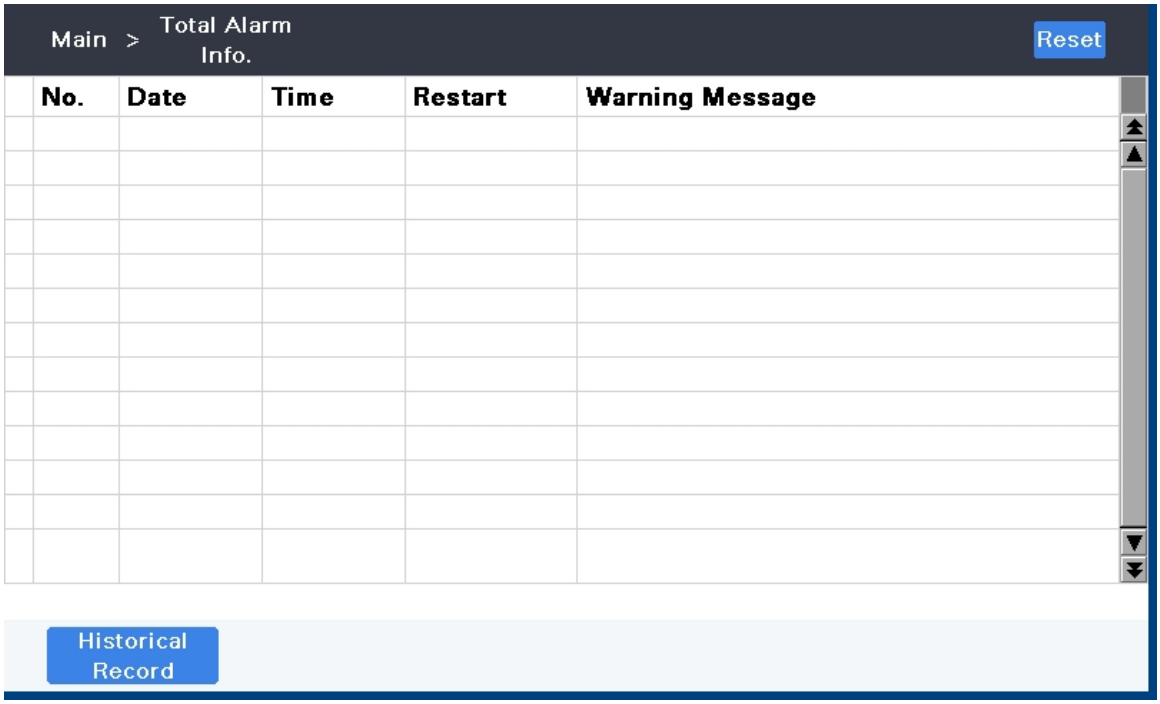
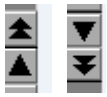


Figure 4.21 Alarm information interface

In the event of an alarm, the unit will perform actions according to the fault program. To debug all faults, tap 

to release the unit fault status. The “Unit fault” on the main interface disappears. If there are multiple faults, click the  button to query the faults. Flashing indicates that the fault has not been rectified; otherwise, it indicates that the fault is rectified.

Click 

button to enter the historical record interface. This interface records the relevant parameters when fault occurs during compressor operation. Max. 10 records can be achieved.

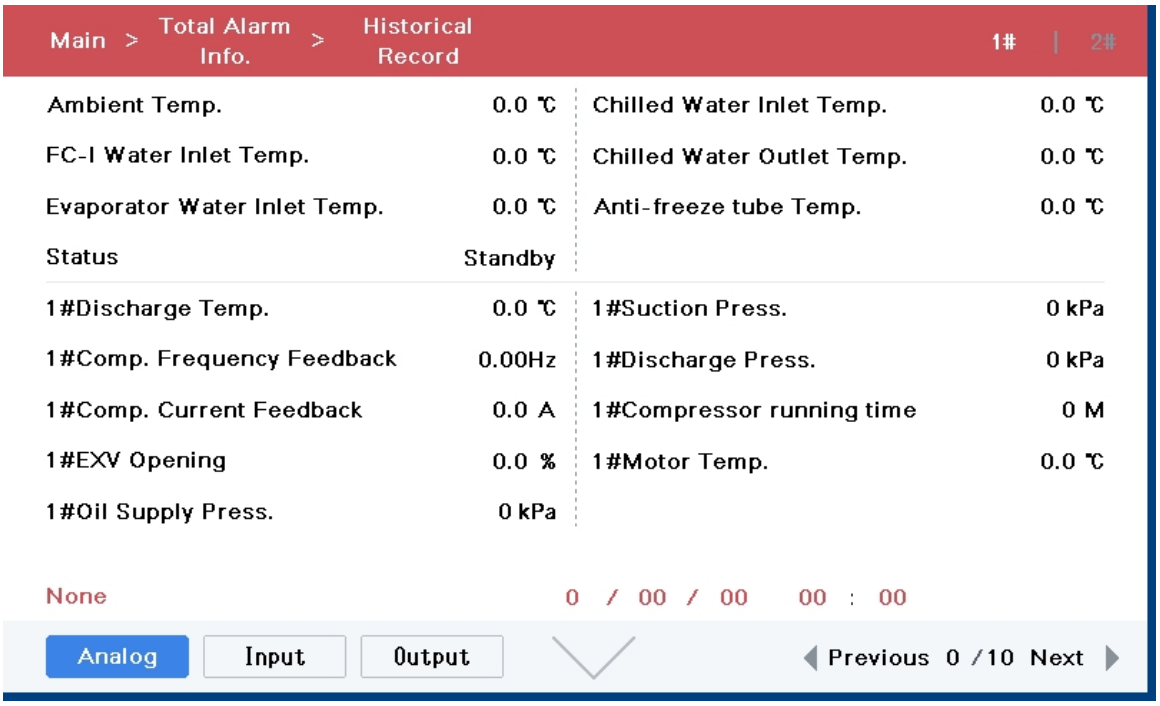


Figure 4.22 Historical Record information interface

Notes:

1. The high pressure protection switch cannot be automatically reset. Users need to find the high pressure switch (installed on the unit) and manually reset the protection switch.

2. The compressor overload protector cannot be automatically reset as well. Find the relevant thermal relay in the electric control panel and manually reset the protector.

8.2.11 Timer Setting

Timer setting: set the timer to on/off while in timer mode. Such timer setting is only valid when the control mode of the unit is set to "Timed". See Figure 4.23 for the timer setting interface.

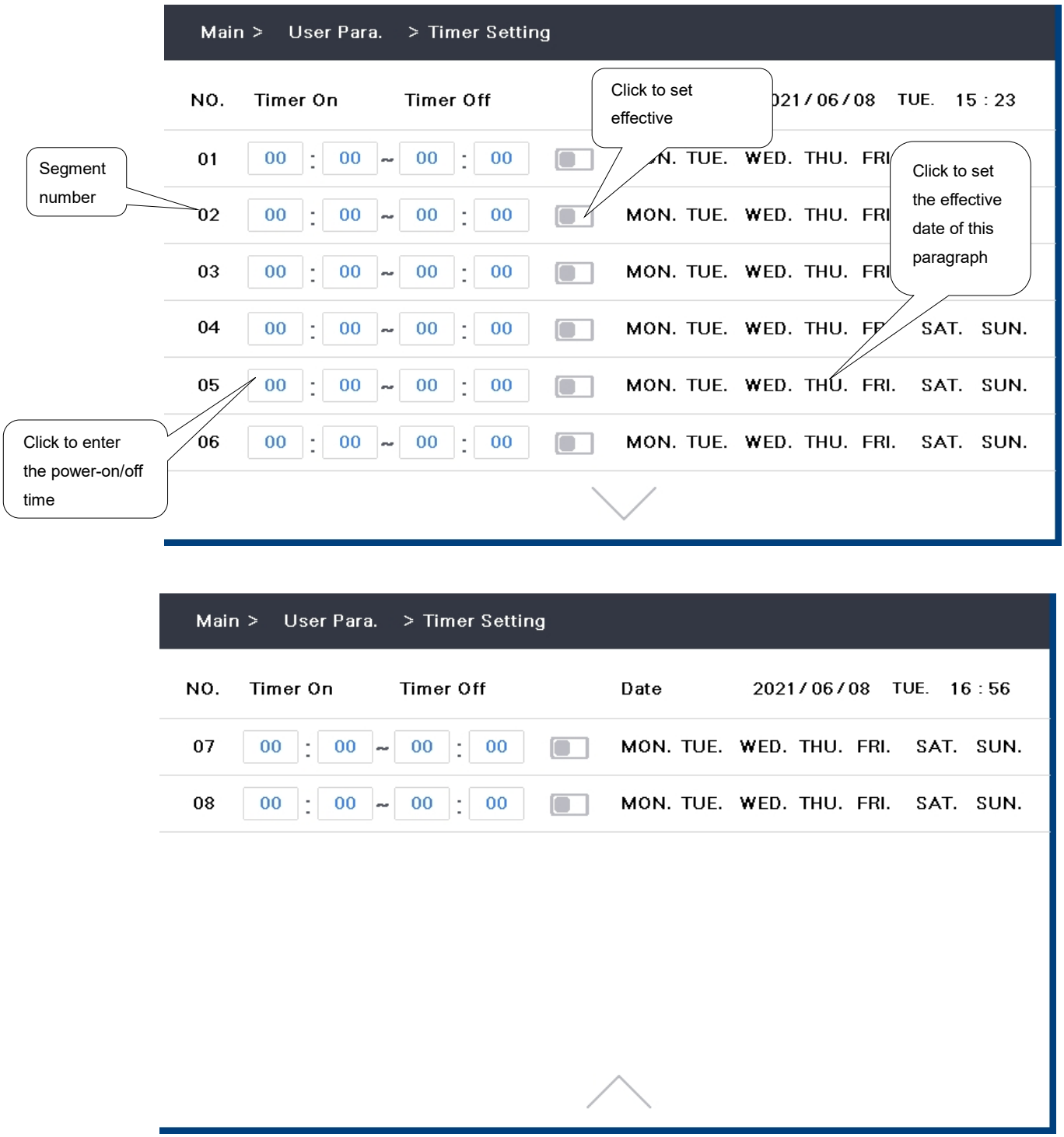


Figure 4.23 Timer on/off Setting Interface (different units may vary)

You can set eight timed periods, each of which is to be enabled with the "enable" buttons. 

indicates that timing is disabled, while 

indicates that it is enabled. 

indicates the timing is applicable to Monday (in blue), rather than Tuesday.

Notes: ① If the unit is in standby mode and the "Timer On" and "Timer Off" settings in this segment

are the same, when the set start/stop time arrives, the shutdown priority rule will prevent the unit from starting up.

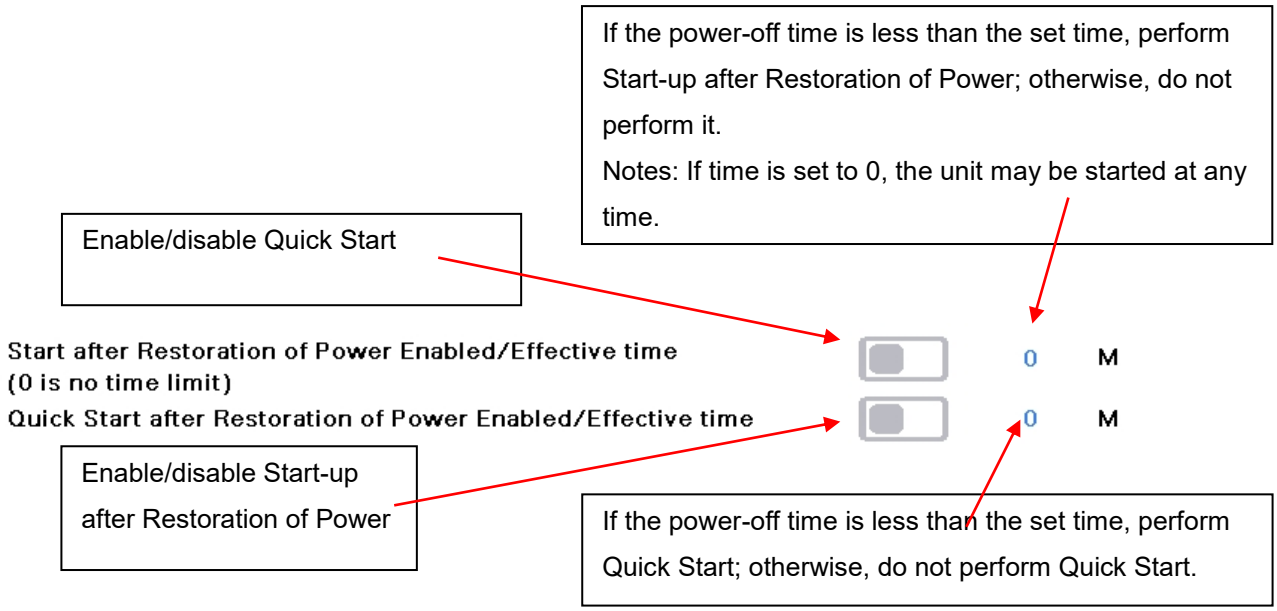
② If the unit is in operating mode and the "Timer Off" of the current segment is the same as the " Timer On " of the other segments of the current day, when the set start/stop time comes, the unit will be stopped normally and will not be started again during this period of time.

③ It is advised to set a difference of over 15 minutes between the " Timer On " of other segments of the current day and the " Timer Off " in this segment of the current day; otherwise, if the unit is in operating mode, the stopping of the unit will be triggered when the " Timer Off " of this segment arrives. Because it takes a certain period of time to complete a stop, if the " Timer On " of other segments comes during stopping of the unit, the startup signal will be ineffective, and the unit will not be started again in this period of time after being stopped.

8.2.12 Quick Start and Start-up after Restoration of Power

This function needs to be customized. On [Main interface]-[Parameter settings]-[User Para.], click Quick Start and then set the time. If the power-off time is less than the set time, perform Quick Start; otherwise, do not perform Quick Start.

Enable Start-up after Restoration of Power and set time. If the power-off time is less than the set time, perform Start-up after Restoration of Power; otherwise, do not perform it. If time is set to 0, the unit may be started at any time. If Start-up after Restoration of Power is enabled, the main interface displays "Start-up after Restoration of Power Enabled".



8.3 Unit Operation Precautions

! WARNING

In order to prevent casualties caused by contact with operating parts or live parts, disconnect the main power supply before maintenance and check, and hang prominent no-close sign at the switch position!

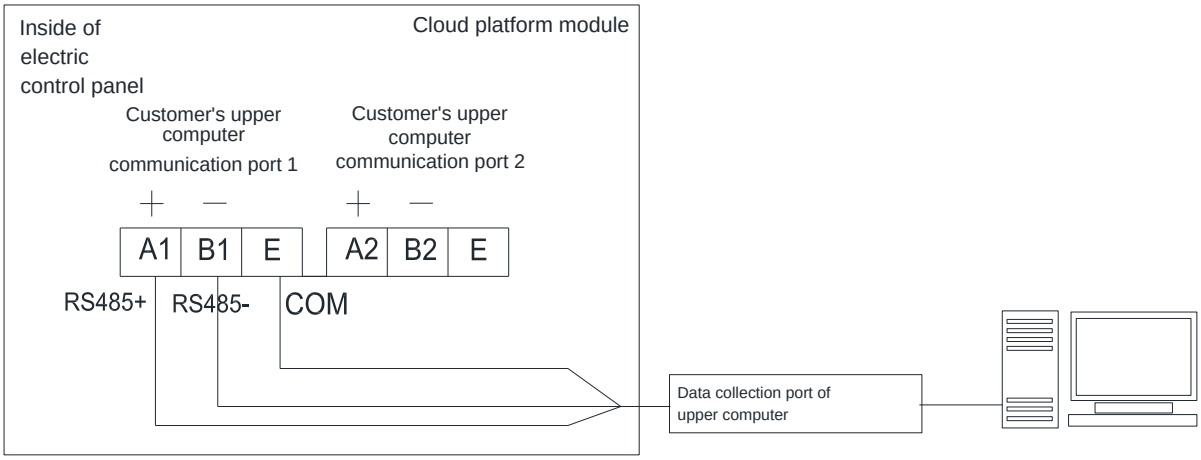
1. Before powering the unit on for the first time, connect the power supply for at least eight hours and ensure the refrigerant oil does not foam during startup. When the ambient temperature is low, the oil heating time must be prolonged accordingly. The reason is that problems with difficult startup and poor compressor loading will occur due to high oil viscosity if the unit starts at a low temperature. Therefore, when the ambient temperature is low, the heating time of the refrigerant oil heater must be longer. The refrigerant oil heater must usually be heated continuously when the system stops. Do not turn off the power supply, unless the unit will not be used for a long time.
2. Never mix different brands of refrigerant oil. Confirm the brand and specifications before adding new oil. If the refrigerant oil needs to be replaced, clean the residual oil completely from the compressor and system before adding new oil and replacing dry filter. Some synthetic oil is compatible with mineral oils, leading to qualitative changes. Therefore, after adding new oil, start operation and then drain the oil thoroughly. After that, add new oil again.
3. If any unexpected situation occurs when the compressor starts, stop it using the emergency stop button on the panel.
4. The controller parameters of the EXV cannot be adjusted without the authorization of Midea's after-sales personnel; otherwise, the unit will not operate normally.
5. If the safety valve on the liquid reservoir is turned on, good ventilation must be ensured around the unit. Freon will generate harmful phosgene in case of fire. Therefore, no open fire is allowed around the unit.

8.4 Cloud Platform Module Operation

! CAUTION

The unit is equipped with the remote service module to realize global positioning and information transmission of the unit. The remote service module is capable of collecting any information but the user's personal information, including the frequency, temperature and pressure when the unit is running.

The chiller is equipped with a standard cloud platform and uses advanced cloud service technology to provide customers with high-quality cloud service through the Internet.
If the customer needs to communicate via the upper computer, note that the communication wiring terminal of the upper computer is connected to the terminal of the cloud platform in the electric control panel.



The default baud rate, data bit, stop bit and parity bit of the customer upper computer communication port 1 are 19200, 8, 1 and N respectively.
The default baud rate, data bit, stop bit and parity bit of the customer upper computer communication port 2 are 9600, 8, 1 and N respectively.

Schematic diagram of communication wiring of customer's upper computer

9 Fault Analysis and Troubleshooting

Fault	Possible Cause	Solution
Multi-connection communication fault	Communication wire breakage	Replace the communication wire.
	Slave unit is not energized	Supply power to the slave unit
Nothing on unit display	The unit control circuit air switch is not closed	Close the air switch
	The emergency switch of the unit is disconnected or the emergency stop device of the remote control is disconnected	Close the emergency stop device or switch provided that the operation is safe
Power Supply Prot.	The set value for the power phase sequence protector parameter is incorrect	Set it according to the factory parameters
	The power supply connection is wrong or the power supply quality is poor, and there are problems such as phase inversion, lack of phase, or three-phase imbalance	Connect the line correctly according to the electrical schematic diagram; Improve the power quality so that it matches the unit requirements
	The phase sequence protector connection is incorrect	Connect the line correctly according to the electrical schematic diagram
Main circuit cut-off prot./Anti-freeze water cut-off prot.	The water pump stops; The water system valve is not started or started incompletely; The selected water pump is too small	Start the water pump and start the water system valve; When the water flow fails to meet the nominal requirements of the unit after the water pump starts, replace it with a large-flow water pump
	The installation direction of the water flow switch or the set value is incorrect	Change the installation direction of the water flow switch or the set value for the water flow switch
	The electrical connection of the water flow switch is incorrect	Connect the line correctly according to the electrical schematic diagram
Compressor running failure	The compressor is not energized	Check whether the power supply connection of the compressor has gotten loose
	Intra-compressor protection	Perform operations according to the measures for "internal protection"
	The compressor contactor coil fails	Replace the contactor
	The control circuit fuse of the unit is burnt	Replace the burnt fuse
	The unit alarm is not reset	Reset the alarm
	The compressor motor is burned out	Replace the compressor.
	The compressor is mechanically stuck	Replace the compressor.
The compressor cannot be stopped	Contactor contacts are adjoined	Replace the contactor (Do not attempt to repair the contact)
The compressor fails to increase or decrease the load	The capacity adjusting solenoid valve coil for the compressor is not energized	Check whether the electrical connection of the solenoid valve is correct or has gotten loose
	The capacity adjusting solenoid valve body for the compressor or the coil has failed	Replace the solenoid valve body or coil
	The oil supply pressure difference of the compressor is too low or the pressure difference before and after of the oil filter is too high	Replace the compressor oil filter

	The capacity adjusting oil supply pipeline or capillary tube of the compressor is blocked	Clean the oil pipeline and capillary tube and replace the oil filter
Contactor Prot.	The set time for the time relay is incorrect	Set it according to the factory parameters
	The contactor connection is incorrect	Connect the line correctly according to the electrical schematic diagram
	The contactor is damaged	Replace the contactor
Intra-Comp. Prot.	The compressor power supply has failed, and there are problems such as phase inversion, lack of phase, and three-phase imbalance	Please eliminate the unit power supply failures first; If the compressor power supply connection is incorrect, reconnect the line correctly
	The compressor motor temperature or discharge temperature is too high	The filled refrigerant for the unit is insufficient or the liquid injection of the unit is disabled.
	The intra-unit protection module connection is incorrect	Connect the line correctly according to the electrical schematic diagram
Low Oil Level Prot.	The compressor leaks oil or refrigerant oil leaks	Add refrigerant oil
	The oil level switch has failed	Replace the oil level switch
	The electrical connection of the oil level switch is incorrect	Connect the line correctly according to the electrical schematic diagram
Prot. of low oil supply press. differ.	The oil pressure and suction pressure sensor has failed	Replace the pressure sensor
	Operating conditions are beyond the allowable operating range of the unit	Adjust the water temperature to make it within the allowable range of the unit
Prot. of high oil supply press. differ.	The oil pressure and discharge pressure sensor has failed	Replace the pressure sensor
	The oil filter is blocked by dirt	Replace the oil filter
Comp. Overload Prot.	The set value for the compressor overload protection is incorrect	Set it according to the factory parameters
	There is a failure of internal protection, oil level protection and oil pressure difference protection of the compressor	Perform operations according to the measures of internal protection, oil level protection, and oil pressure difference protection respectively
	The power voltage is too low	Improve the quality of the power supply
	Too much refrigerant has been charged.	Discharge some of the refrigerant
	(Cooling) The heat exchange air flow of the fin heat exchanger is insufficient: e.g., the fin heat exchanger is blocked by dirt, the fan rotates in reverse or does not rotate, or ventilation around the unit is poor.	Remove debris, and clean the fins (stop the unit beforehand) when necessary; Connect the fan power supply correctly according to the electrical schematic diagram; Make sure that no obstacle is present in a certain scope around the unit.
	The ambient temperature and water temperature exceed the unit operating range	Improve the operating conditions
Fan Overload Prot.	The set value for fan overload protection is incorrect	Set it according to the factory parameters
	The fan power is connected incorrectly	Connect the fan power supply correctly according to the electrical schematic diagram

	The fin is blocked by dirt	Remove debris, and clean the fins (stop the unit beforehand) when necessary
Temperature sensor fault	The electrical connection of the temperature sensor is incorrect	The connected wire has gotten loose (resulting in broken wire); the wire is shorted (resulting in short circuit)
	The temperature sensor is faulty	Replace the temperature sensor.
Pressure sensor failure	The electrical wiring is incorrect	The connected wire has gotten loose (resulting in broken wire); the wire is shorted (resulting in short circuit)
	Pressure sensor is damaged	Replace the pressure sensor
High Discharge Press. Prot.	Too much refrigerant has been filled in.	Discharge some of the refrigerant
	Non-condensing gas enters the system	Recharge refrigerant after vacuumizing
	The heat exchange air flow of the fin heat exchanger is insufficient: e.g., the fin heat exchanger is blocked by dirt, the fan rotates in reverse or does not rotate, or ventilation around the unit is poor	Remove debris, and clean the fins (stop the unit beforehand) when necessary; Connect the fan power supply correctly according to the electrical schematic diagram; Make sure that no obstacles are present in a certain scope around the unit
	The ambient temperature is too high and beyond the operating range of the unit	The maximum ambient temperature for operation of the unit is 46°C
Low Suction Press. Prot.	The amount of charged refrigerant is insufficient	Check whether there are refrigerant leaks and add more refrigerant
	Some unit valves are not opened	Open all the valves
	The drying filter is blocked	Replace the drying filter core
	The cooling load is too low	Stop the unit or increase the cooling load
	The water flow is insufficient	Rectify the water system to ensure water flow
	Scaling occurs at the water side of the shell-and-tube heat exchanger	Clean the water system, and replace the water system filter when necessary
	Regulation of the EXV is improper and the opening is incorrect	Replace the suction temperature sensor of EXV module
	The EXV does not work	If the connections of the EXV and other control modules are wrong, connect them correctly; If the EXV body is damaged, replace the valve body; If the control module is damaged, replace the module
High Press. Prot.	Some unit valves are not opened	Open all the valves
	The electrical connection of the high pressure switch is incorrect	Connect the line correctly according to the electrical schematic diagram
	The high pressure switch fails	Replace the high pressure switch
	Refer to “Discharge pressure too high” for the fault cause and handling method	
Low Pres. Prot.	Some unit valves are not opened	Open all the valves
	The electrical connection of the low pressure switch is incorrect	Connect the line correctly according to the electrical schematic diagram

	The low pressure switch fails	Replace the low pressure switch
	Refer to “Suction pressure too low” for the fault cause and handling method	
High Discharge Temp. Prot.	The amount of charged refrigerant is insufficient	Check whether there are refrigerant leaks and add more refrigerant
	Some unit valves are not opened	Open all the valves
	The drying filter is blocked	Replace the drying filter core
	The compressor is short of oil	Add refrigerant oil
	The bottom liquid injection function is not enabled	The wire of the solenoid valve has gotten loose, the valve body or coil is damaged, and the throttling capillary tube is blocked by dirt
	The ambient temperature and water temperature are too high and beyond the operating range	Refer to the maximum ambient temperature for operation
Mode/ Water Temp. Prot.	Sensor temperature drift	Replace the water temperature sensor
	Water inlet and outlet pipes or sensors are reversed	Change over the inlet and outlet pipes or sensors
Water flow switch failure	Water flow switch is short circuited	Check the water flow switch wiring
	The water flow switch is damaged	Replace with a functional water flow switch
Temp./Low Superheat Prot.	The system operates with liquid	Check and adjust system settings
	Temperature or pressure sensor is inaccurate	Check and replace the sensor
Prot. of high comp. current	Excessively high pressure	See "High discharge pressure"
	Current transformer range setting error	Change settings
Comp. Low Current	Incorrect current transformer wiring	Check the current transformer wiring
	Current transformer failure	Replace the current transformer
	Compressor not running	Check the contactor

10 Daily Use and Maintenance

10.1 Overview

The installation and routine servicing of air conditioning equipment must be carried out by professional technicians. Preventive maintenance is the best way to keep the unit in top condition:

- Improve cooling performance
- Reduce power consumption
- Prevent accidents
- Prolong the service life of the unit
- Environment-friendly

Pay special attention to the following during daily use:

(1) Do not change the unit settings at will.

Changing the unit setting at will may lead to abnormal operation. In order to ensure safe and stable operation of the unit, read this manual carefully before changing the unit setting.

(2) Parameters of the unit can be changed as follows. Be sure to change the unit settings carefully after understanding the operation instructions of each setting;

User menu				
Parameter	**Factory Setting**	**Unit**	**Value Range**	**Description**
Mode selection	Locally	/	Locally, Remote Control, Timed, BMS, Water Inlet Control, Water Outlet Control, Water Pump	It can be used to set the mode used by the control unit. When "Locally" is selected, startup and stop of the unit can be controlled on the touch screen; when "Remote Control" mode is set, the startup and stop of the unit is controlled by the remote system; when the "Timed" mode is set, the unit will be switched on and off at specified time; when "BMS" mode is set, the unit is controlled by the BMS; when the "Water Inlet Control" mode is set, the unit load will be adjusted according to the water inlet temperature; when the "Water Outlet Control" mode is set, the unit load will be adjusted according to the water outlet temperature; when the "Water Pump" mode is set, the unit can control the continuous operation of the water system pump.
Target water outlet temperature Ts (T1)	7.0	°C	4 to 20	The water outlet temperature can be set as required by the customer. It should be noted that low water outlet temperature is conducive to indoor cooling, and the high water outlet temperature is beneficial to energy conservation and consumption reduction.
Target water outlet temperature Ts (FC)	10	°C	4 to 20	Set for FC unit

Target water outlet temperature Ts (LA)	-5.6	°C	-6 to 15	Set for LA unit
Set gross water outlet temperature target value Ts (T1)	7.0	°C	4 to 20	When using BMS, this temperature must be set.
Set gross water outlet temperature target value Ts (FC)	10	°C	4 to 20	Set for FC unit
Set gross water outlet temperature target value Ts (LA)	-5.6	°C	-6 to 15	Set for LA unit
Quick start	Off	/	On/Off	After setting it as "On", the unit will be started up quickly and automatically if the power supply becomes available in three minutes after the unit is powered off.
Restart after power supply is available	Off	/	On/Off	After setting it as "On", the unit will be normally started up if the power supply becomes available after the unit is powered off.
Power limit of 1# system compressor	100%	%	50%~100%	When this parameter is set, the unit will limit compressor loading.
Power limit of 2# system compressor	100%	%	50%~100%	When this parameter is set, the unit will limit compressor loading.
1# system compressor	Enable	/	On/Off	Selecting "Off" will disable the system compressor.
2# system compressor	Enable	/	On/Off	Selecting "Off" will disable the system compressor.
Free cooling system	Enable	/	On/Off	If "Off" is selected for the FC unit, the unit will not operate the free cooling system.
Heat recovery	Enable	/	On/Off	If "Off" is selected for the heat recovery unit, the unit will not operate the heat recovery system.
Ice storage	Enable	/	On/Off	If "Off" is selected for the ice storage unit, the unit will not operate the ice storage mode.
Low temperature cooling	Enable	/	On/Off	If "Off" is selected for the low temperature type unit, the unit will not operate the low temperature cooling mode.
Automatic snow protection	Off	/	On/Off	After "On" is selected, the fan will automatically run every certain period of time when the unit is shut down.

(3) Before starting up the unit, check whether the water system operates normally and whether the air in the water system has been basically drained. Before startup for the first time, manually open the drainage valves at both ends of the shell-and-tube heat exchanger of the unit. And check whether the drainage valves still discharge air after the water pump is started. Ensure that the air in the water system is completely discharged before startup of the unit.

(4) Before starting up the unit, check whether the electric control panel door and the VFD panel door of the unit have been closed. If the doors have not been closed, water may flow into the electric control box and VFD, thus causing an electrical fault, and even electrical safety accident.

(5) Before starting up the unit, check whether the water system is normal, whether the water pump is turned on, whether the valve of the engineering water system is in the normal position, and whether the water flow switch of the unit is closed. It is necessary to ensure that the water system is normal before starting up the unit.

(6) Before starting up the unit, check whether the air inlet and outlet of the fin heat exchanger of the unit are blocked by foreign matters. In case of any abnormality, remove the foreign matter before starting up the unit.

(7) Before starting up the unit in winter, check whether the unit is covered by ice and snow. For the use in an environment with ice and snow, it is recommended to turn on the automatic snow protection function, and check whether there is ice and snow blockage inside the unit before starting up the unit for the first time. If ice and snow blockage is found, the unit shall be started after the snow is discharged through the automatic snow protection function.

(8) After startup, check whether the unit operates normally and whether there is any alarm message. In case of any alarm message, contact Midea's after-sales personnel. Alarming is a normal protection measure for the unit, which can avoid the damage of the unit parts caused by the abnormal operation of the unit. For the alarm, full attention must be paid to during use. And contact Midea's after-sales personnel in time for troubleshooting.

(9) If it is found that the unit is frequently alarming during startup or operation, stop the unit and contact Midea's after-sales personnel. It is forbidden to continuously start the unit for forced operation under frequent alarm. This may lead to a sharp deterioration in the conditions of the unit, causing serious failures.

(10) In case of unit failure alarm, it is prohibited to short-circuit the alarm device of the unit and forcibly operate the unit. This will cause the unit to operate in an unsafe state, thus causing serious failures.

(11) The unit shall be shut down through the touch screen, remote control system or BMS. The unit shall be shut down first. And the water pump of the water system can be shut down after the shutdown instruction is given to the unit for 15 minutes. It is forbidden to shut down the unit directly, to turn off the pump without shut the unit down, and to turn off the pump before shutting the unit down. Such incorrect operation will result in unit compressor failure, electrical system failure and even frost and water intake of the unit.

(12) In the condition with the temperature no higher than zero degree, the water in the unit shall be completely drained to avoid damaging the unit. When draining, the drain valves at both ends of the shell-and-tube heat exchanger of the unit must be opened and kept open all the time. For the unit with water pump, open the drain plug of the water pump and keep it open all the time. For water systems with anti-freezing solution, no water drainage is required at low temperature. But please make sure that the freezing point of the anti-freezing solution is always below the local minimum ambient temperature. It is particularly important to note that the freezing point of the anti-freezing solution in the water system will also change dynamically due to possible loss of anti-freezing solution and necessary water supplement. Please check the freezing point of the anti-freezing solution periodically according to its change during use to ensure that the freezing point is always below the local minimum ambient temperature.

(13) For water systems using anti-freezing solution, it is important to note that anti-freezing solution (such as ethylene glycol solution or propylene glycol solution) will react slowly with oxygen, chloride ions and steel in steel pipeline, resulting in acidification of anti-freezing solution and final corrosion of steel and copper pipes. Therefore, for the corrosion of anti-freezing solution, it is recommended to regularly add corrosion inhibitor in the water system. Please consult the professional water treatment company for specific method. The user shall regularly monitor the pH value of the anti-freezing solution in the water system during the use of the unit, to ensure that the water system is in a neutral state, avoiding serious water intake accidents caused by corrosion of heat exchange pipes of the unit.

(14) In winter with the temperature below zero degree, if the water is not drained from the water system, add anti-freezing solution to avoid freezing, or ensure that the water pump is always in operation (whether the unit is in operation or not), and provide additional heating to the water system according to the water temperature. Otherwise, the unit and the water system pipeline will freeze, and eventually be damaged, resulting in the water intake of the unit.

(15) If the unit is not used for a long time, the unit shall be energized in advance before the first startup, and the lubricating oil of the unit shall be pre-heated, so as to ensure good lubrication of the bearing during startup of the compressor and prevent wear of the compressor bearing.

Simple routine inspection

For the simple routine maintenance, the user just needs to do the following:

- Observe oil stains (refrigerant leaks)
- Clean coils
- Check and make sure that the protective measures are in good condition
- Check the alarm report when the unit fails to work
- Keep the control box clean

Note: Look for oil stains regularly.

Regular maintenance

This level of maintenance should be performed by professionals who are knowledgeable in the fields of electronics, hydraulic power, and machinery.

The following steps are recommended:

Perform routine maintenance first, then

- tighten the power cable at least once a year
- make sure that no connectors are loose
- check the electrical protective devices
- check all the heaters
- check the pipe connection
- drain the pipe (especially when the unit is used for the first time)
- clean the filter
- replace the stuffing box of the pump after the unit has operated for 10,000 hours
- check the operating parameters of the unit and compare them with the previous parameters

■ keep maintenance records for each unit

All of the above operations must ensure safety and comply with local regulations.

Professional maintenance

This level of maintenance should be performed by the manufacturers, manufacturer representatives, or authorized persons, which require special skills and tools, including:

■ replacing the main parts (compressor, evaporator)

■ refrigerant circulation loop fault (recovering refrigerant)

■ changing factory settings (when the working environment changes and it is necessary to change settings)

■ moving or dismantling the unit

■ operational interruption due to improper maintenance

■ other faults specified in the warranty

Note: Midea does not assume any liabilities for failure of the unit arising from negligence or other improper operations.

10.2 Maintenance Items

Maintenance Item		Maintenance Frequency	Qualification Benchmark (Handling Method)	Remarks
General	Noise	Anytime	Listen for abnormal sounds	Observe the unit by standing 1 m in front of its center
	Vibration	Anytime	Observe the unit body pipes and parts for excessive amplitude	
	Power voltage	Anytime	The power voltage is within the rated voltage ±10%.	
Unit appearance	Cleanness	Anytime	Keep clean all the time	
	Rust	Anytime	Use an iron brush to remove rust, and then coat with anti-rust paint	
	Stability	Anytime	Tighten all the screws	
	Peeling of the thermal insulation material	Anytime	Paste it with bonding agent	
	Water Leakage	Once/month	Check whether the drainage pipe is blocked	
Compressor	Noise	Anytime	There is no abnormal sound at the moment of starting or stopping or during operation	
	Insulation resistance	Once/year	Use a DC500V megger to test it (which must be above 5 MΩ)	
	Ageing of shockproof rubber	Once/year	Qualified if found to be elastic when pressed with a hand	
	Interim inspection	Once/3000 hours	Pay attention to the noise vibration, oil level, etc.	
	Interim inspection	Once/6000 hours	Confirm actions of the safety device and protection device	
Fin-coil heat exchanger	Fan	Anytime	Air flow is normal and high pressure is within the reasonable range	

Maintenance Item		Maintenance Frequency	Qualification Benchmark (Handling Method)	Remarks
	Cleanliness	Once/month	Air resistance is normal and high pressure is within the reasonable range	
Shell-and-tube heat exchanger	User side water flow	Anytime	Within ±5% of the benchmark	
	Temperature	Anytime	Within the benchmark	
	Anti-freezing fluid concentration	Once/month	Ensure that the concentration is above the set value	
	Water quality	Once/month	Within the benchmark	Refer to the water quality and scale relationship table
	Cleanliness	Anytime	Ensure the low pressure is within the benchmark	
	Water discharge	Anytime	Drain the shell-and-tube heat exchanger if the unit is not used for a long time	Also drain the water from the pipe
High/low-pressure switch	Action	Once/month	Check the switch according to the action value of each protection device.	Check whether the contact mechanism is good when it is in use
Pressure gauge	Pointer	Once/half a year	Compare it to a proper pressure gauge.	
Check valve	Action	Once/month	The check valve works smoothly	
Chilled water circulation	Refrigerant leakage	Once/month	Use a leak detector to detect refrigerant leaks at the unit body and pipe joints; Drain the shell-and-tube heat exchanger, and check the water inlet/outlet for leakage	Use an electronic leak detector or a blowtorch leak detector or soapy water
Electrical control	Insulation resistance	Once/month	Use a DC500V megger to test it (which must be above 1 MΩ)	
	Contact property of wire	Once/month	The wire insulation layer cannot be broken, contact is good, and the bolt is securely fastened	
	Subsidy relay	Once/month	No action exception	
	Time limit relay	Once/month	It works according to the set time	

10.3 Torque of Main Fasteners

Tightening of electrical connections

Part	Unit identification	Torque (N.m)
Mould case circuit breaker, user connecting point		
M8		18
M10	L1/L2/L3	36

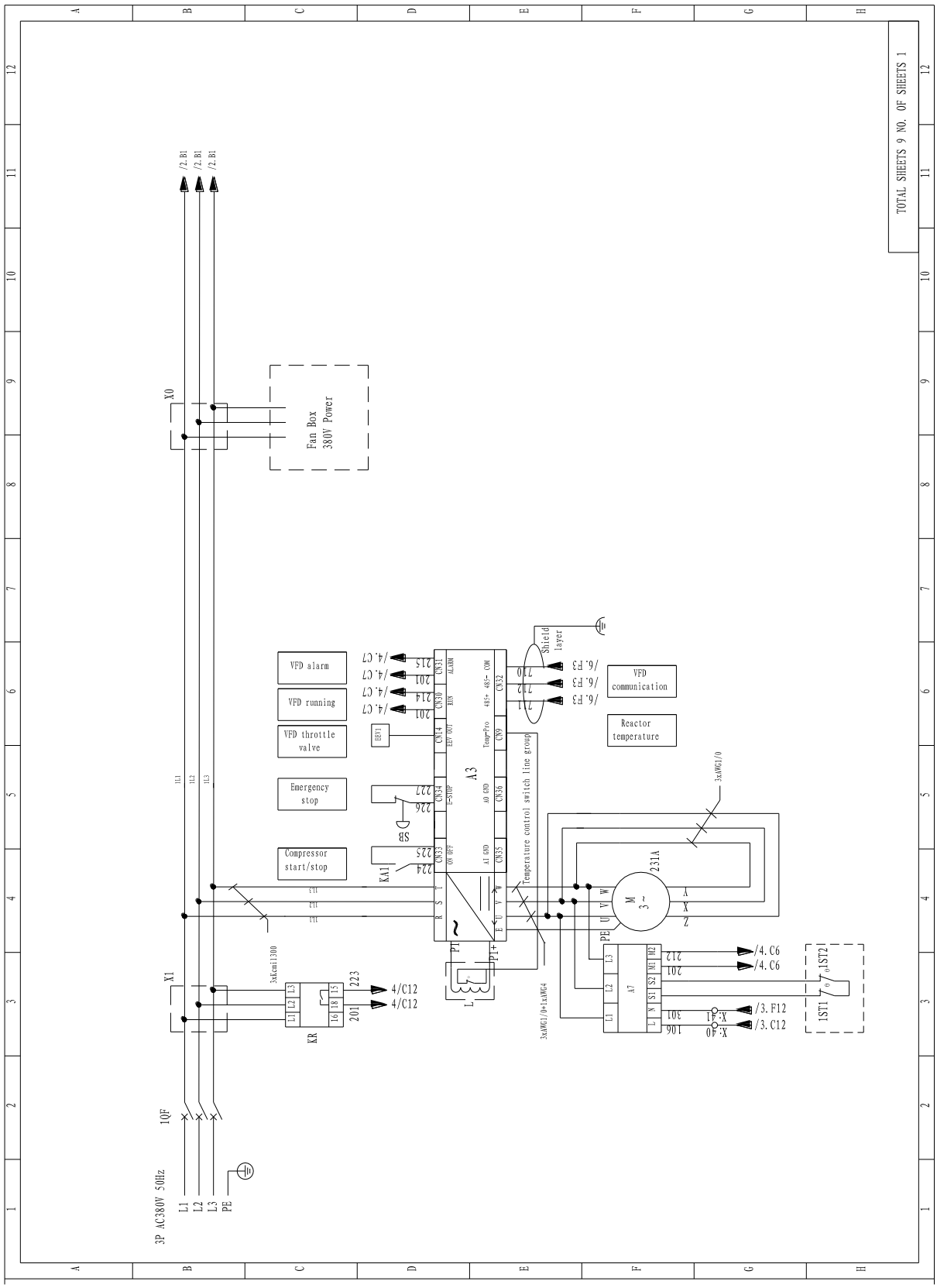
Welded bolt PE, user connecting point (M8)	PE	18
Terminal bolt, AC contactor		
9A contactor		1.2
95A contactor		6
115A contactor		14
150A contactor		14
185A contactor		14
225A contactor		24
265A contactor		24
300A contactor		24
400A contactor		24
Grounding cable of the compressor		
Compressor junction box terminal (M10)	PE	36
Compressor junction box		
M10		36
M12	U/V/W/Z/X/Y	60
M16	U/V/W/Z/X/Y	80

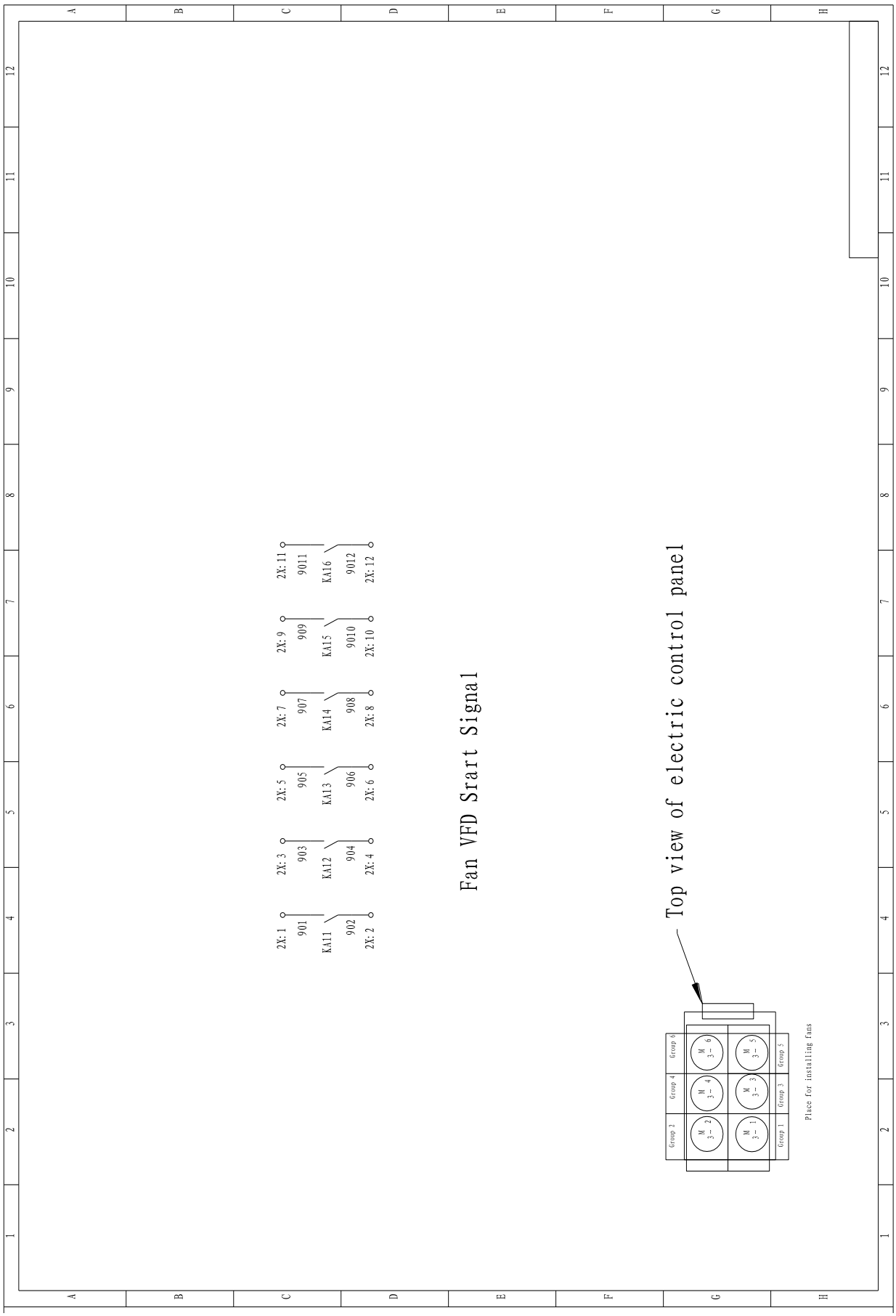
Tightening of Main Bolts

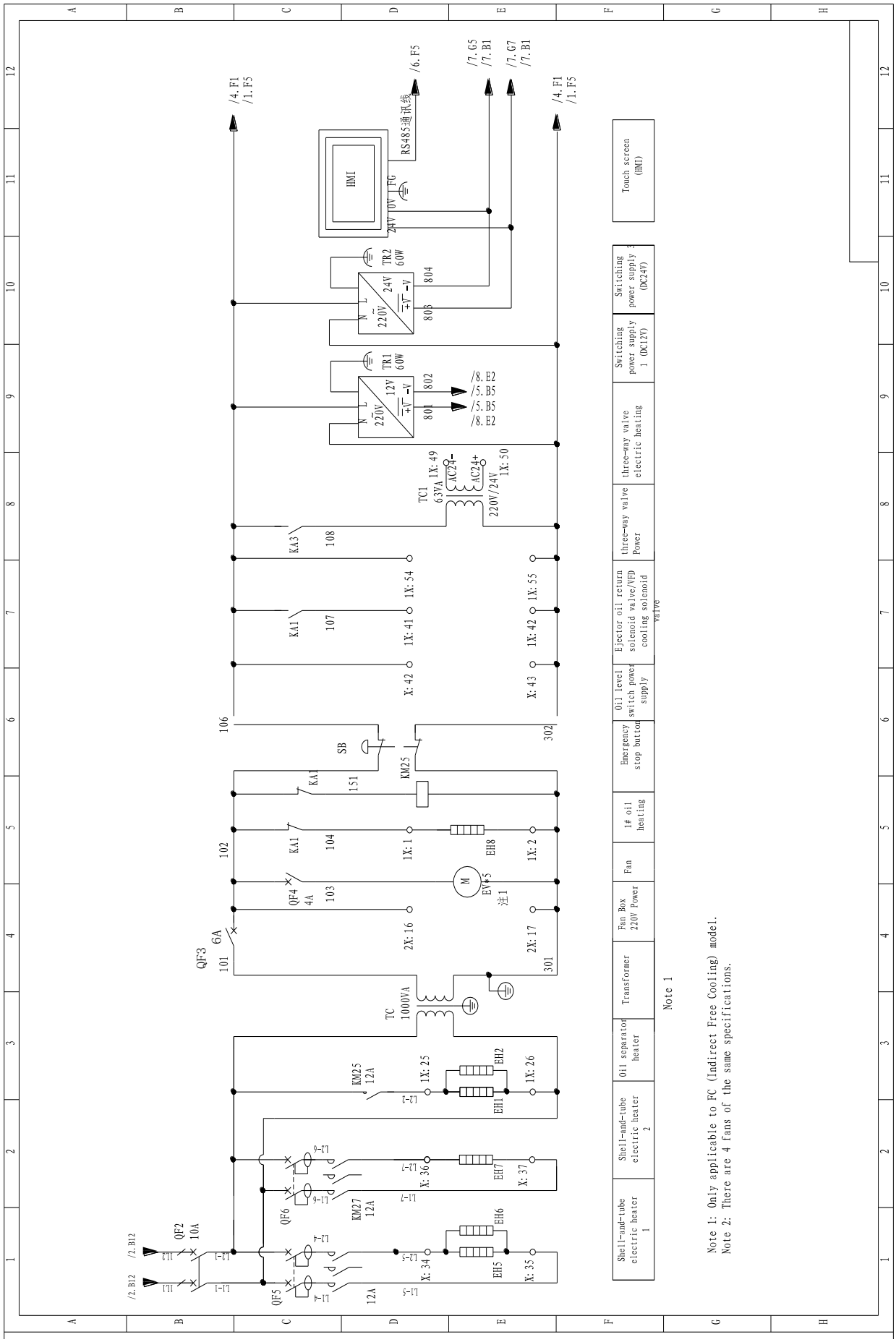
Fastening position	Bolt specifications	Torque (N.m)
Compressor suction end flange	M16	270
Compressor discharge end flange	M20	225
Condenser gas inlet pipe flange	M24	400
Condenser liquid outlet pipe flange	M20	225
Evaporator gas outlet flange	M20	195
Evaporator liquid inlet flange	M16	180
Oil separator gas inlet flange	M16	180
Oil separator gas outlet flange	M16	180
Oil filter flange of oil separator	M12	50
Dry filter flange	M10	35
	M8	35
Connecting bolts of water box and tube sheet	M16	143
Connecting bolts between tube sheets	M16	143

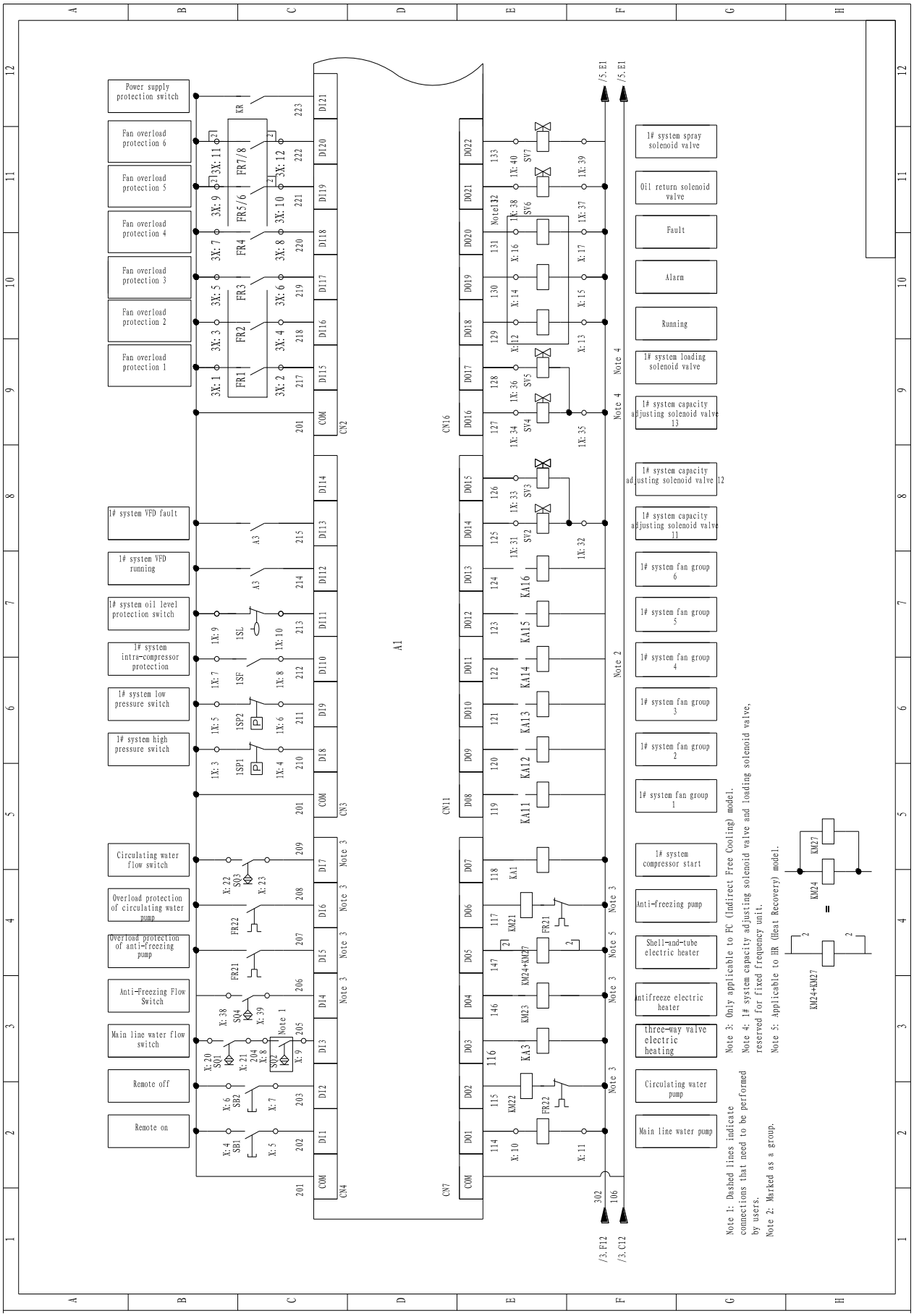
11 Electric Control Principle Diagram

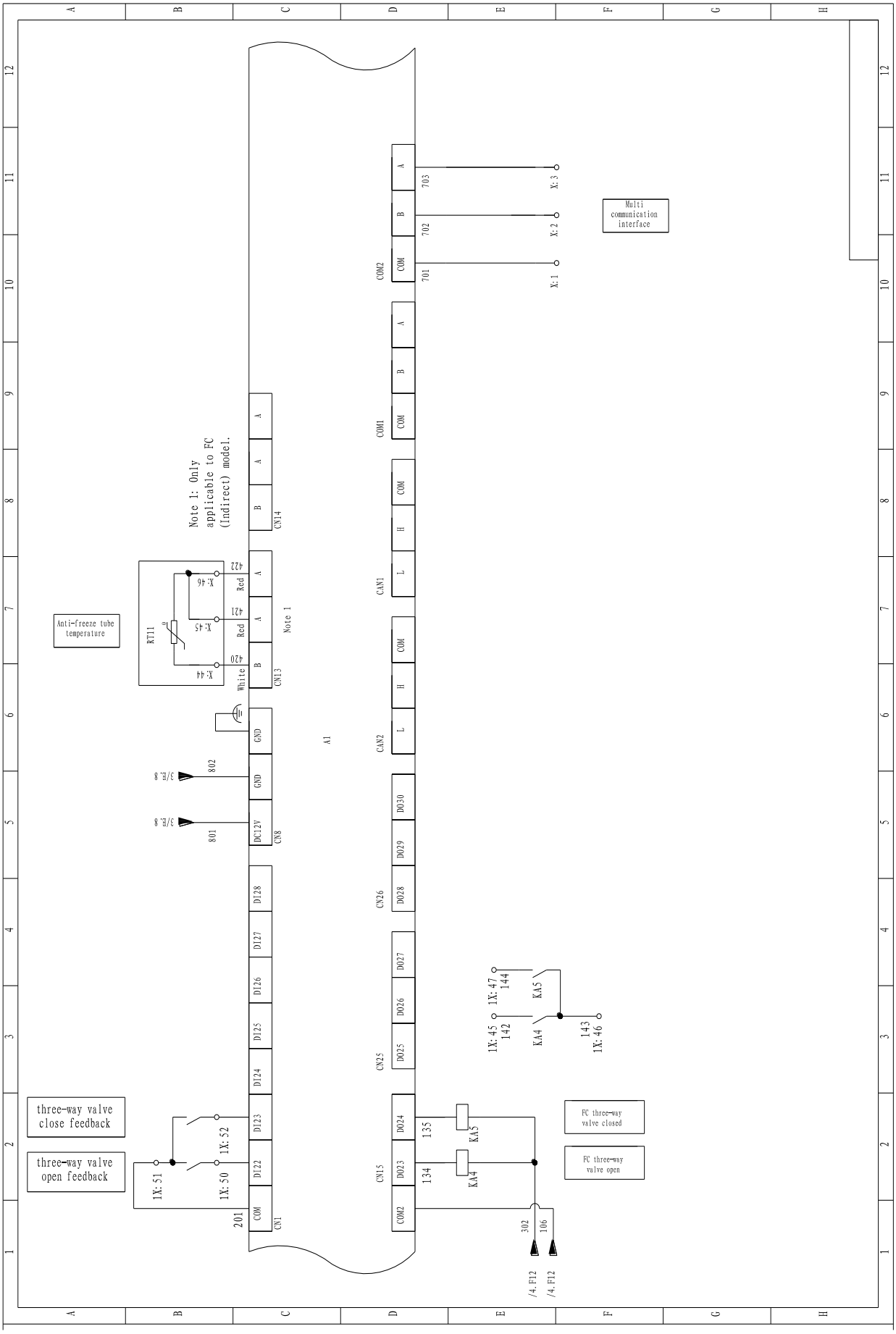
SCAF80~120HV

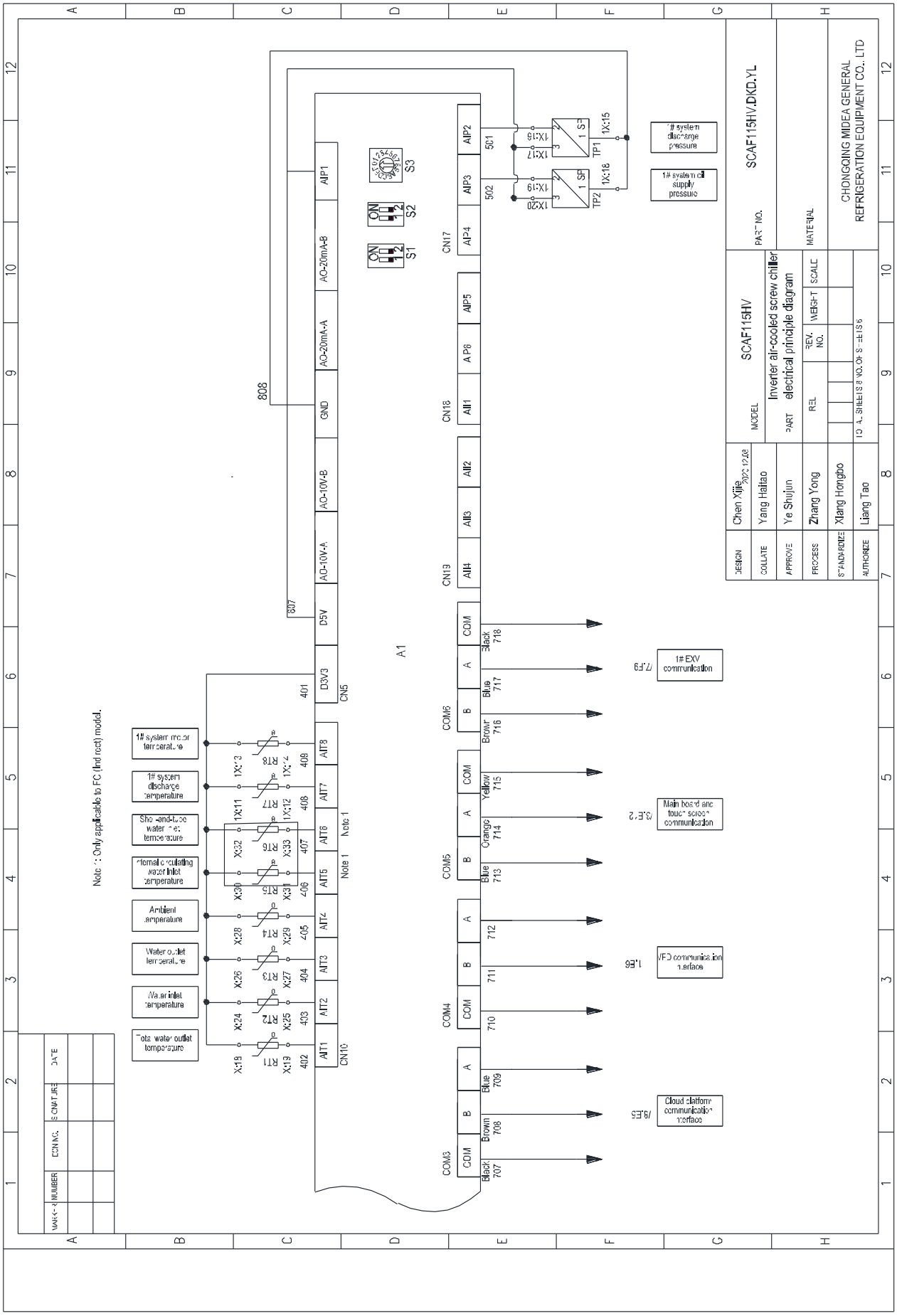


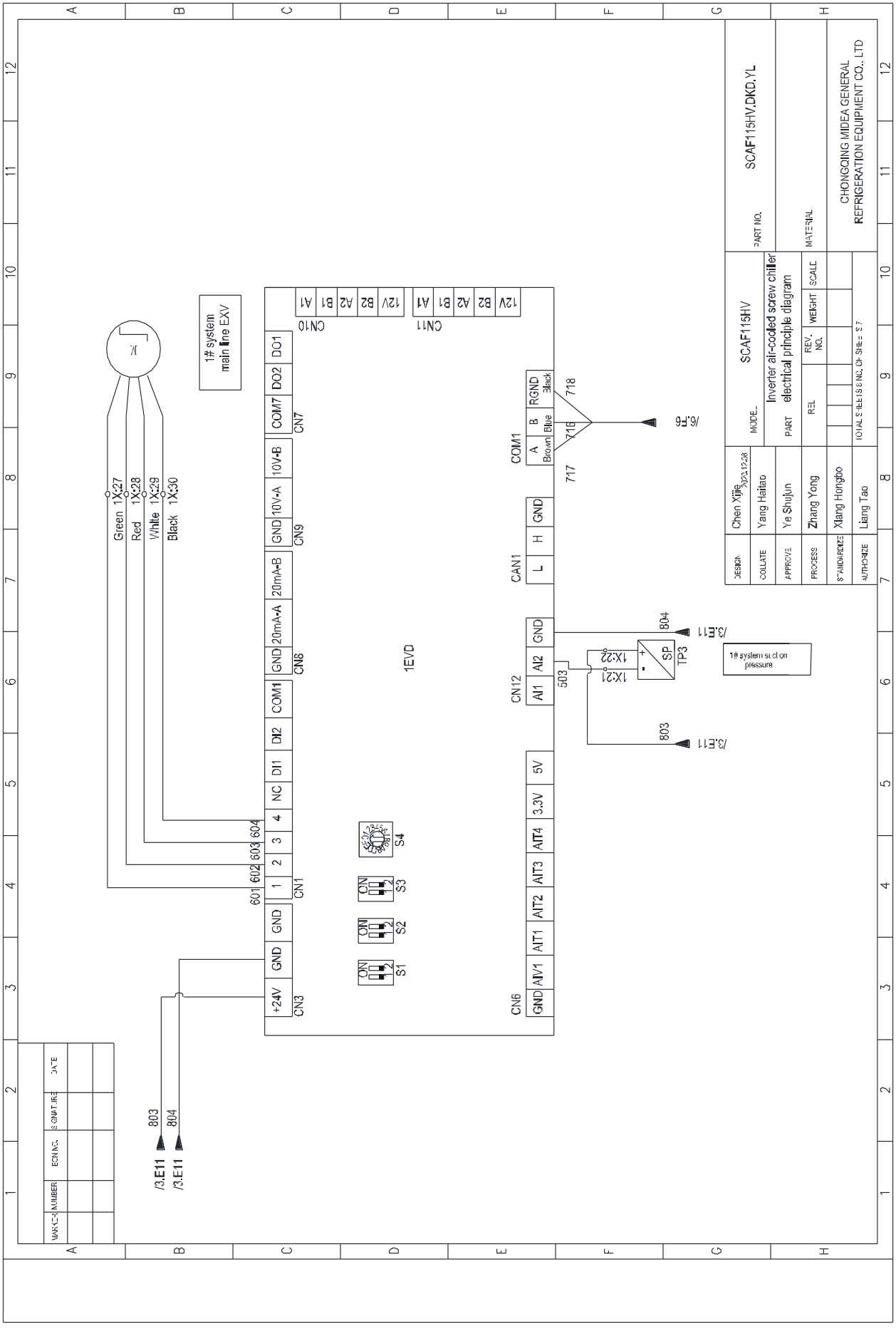

Fan VFD Srart Signal
2X:1
901
KA11
902
2X:2
2X:3
903
KA12
904
2X:4
2X:5
905
KA13
906
2X:6
2X:7
907
KA14
908
2X:8
2X:9
909
KA15
9010
2X:10
2X:11
9011
KA16
9012
2X:12
Top view of electric control panel
Group 2
Group 4
Group 6
Group 1
Group 3
Group 5
M 3~ 1
M 3~ 2
M 3~ 3
M 3~ 4
M 3~ 5
M 3~ 6
Place For installing fans

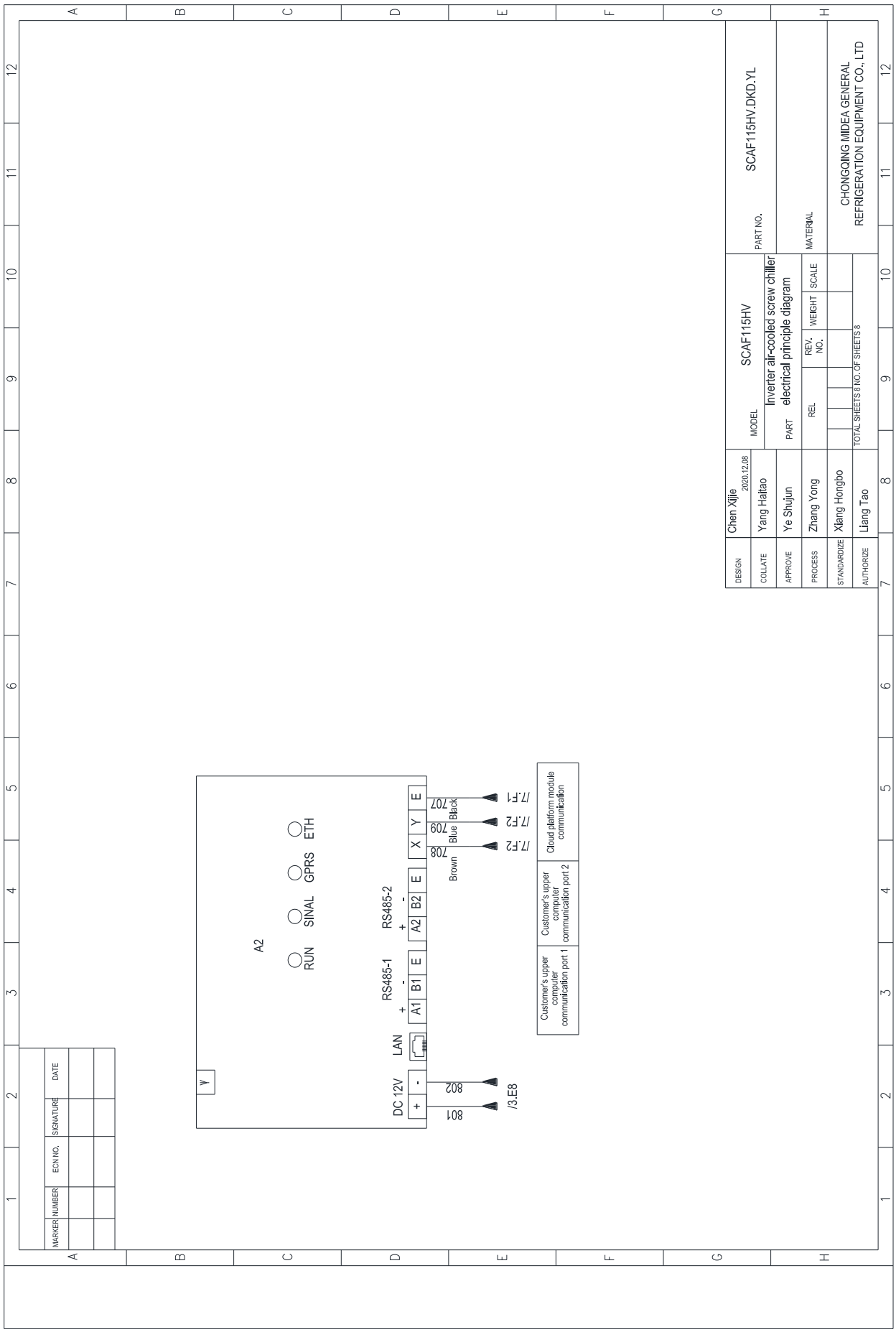

Touch screen (HMI)
Switching power supply 3 (DC24V)
Switching power supply 1 (DC12V)
three-way valve electric heating
three-way valve Power
Ejector oil return solenoid valve/VFD cooling solenoid valve
Oil level switch power supply
Emergency stop button
1# oil heating
Fan
Fan Box 220V Power
Transformer
Oil separator heater
Shell-and-tube electric heater 2
Shell-and-tube electric heater 1
Note 1
Note 1: Only applicable to FC (Indirect Free Cooling) model.
Note 2: There are 4 fans of the same specifications.


Power supply protection switch
Fan overload protection 6
Fan overload protection 5
Fan overload protection 4
Fan overload protection 3
Fan overload protection 2
Fan overload protection 1
1# system VFD fault
1# system VFD running
1# system oil level protection switch
1# system intra-compressor protection
1# system low pressure switch
1# system high pressure switch
Circulating water flow switch
Overload protection of circulating water pump
Overload protection of anti-freezing pump
Anti-Freezing Flow Switch
Main line water flow switch
Remote off
Remote on
1# system spray solenoid valve
Oil return solenoid valve
Fault
Alarm
Running
1# system loading solenoid valve
1# system capacity adjusting solenoid valve 13
1# system capacity adjusting solenoid valve 12
1# system capacity adjusting solenoid valve 11
1# system fan group 6
1# system fan group 5
1# system fan group 4
1# system fan group 3
1# system fan group 2
1# system fan group 1
1# system compressor start
Anti-freezing pump
Shell-and-tube electric heater
Antifreeze electric heater
three-way valve electric heating
Circulating water pump
Main line water pump
A1
CN2
CN3
CN4
CN7
CN11
CN16
/3. F12
/3. C12
/5. E1
/5. E1
Note 1: Dashed lines indicate connections that need to be performed by users.
Note 2: Marked as a group.
Note 3: Only applicable to FC (Indirect Free Cooling) model.
Note 4: 1# system capacity adjusting solenoid valve and loading solenoid valve, reserved for fixed frequency unit.
Note 5: Applicable to HR (Heat Recovery) model.
KM24+KM27
KM27
KM24
KM24+KM27

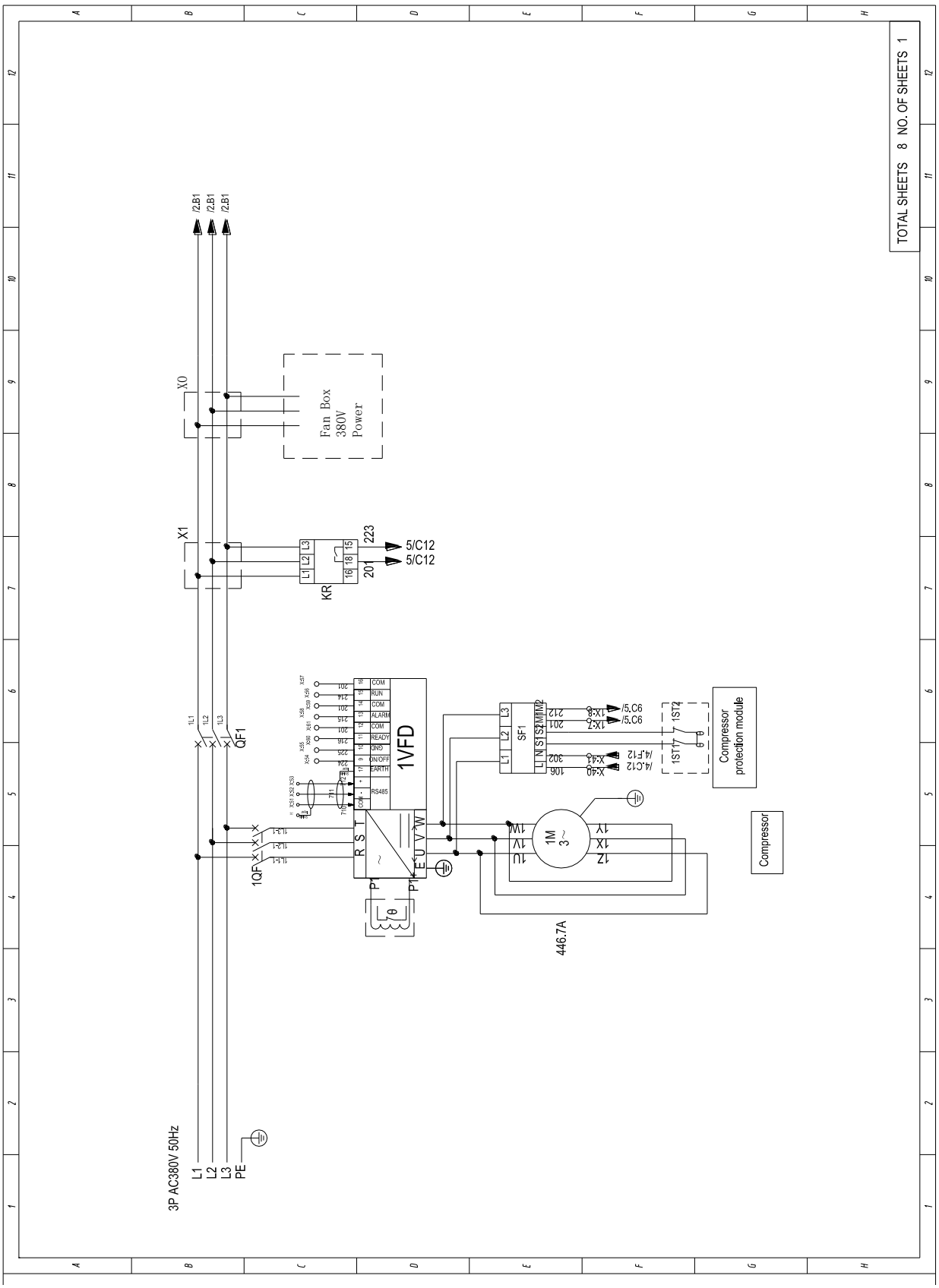

Multi communication interface
X:3
X:2
X:1
703
702
701
COM2
COM1
CAN1
CAN2
CN26
CN25
CN15
A1
Note 1: Only applicable to FC (Indirect) model.
CN14
CN13
Note 1
Anti-freeze tube temperature
RT11
X:46
X:45
X:44
422
421
420
Red
Red
White
CN8
GND
DC12V
802
801
3/E.8
three-way valve close feedback
three-way valve open feedback
1X:51
1X:52
1X:50
201
CN1
COM
D122
D123
D124
D125
D126
D127
D128
DO23
DO24
DO25
DO26
DO27
DO28
DO29
DO30
135
134
KA5
KA4
1X:47
1X:45
144
142
143
1X:46
FC three-way valve closed
FC three-way valve open
302
106
/4.F12
/4.F12

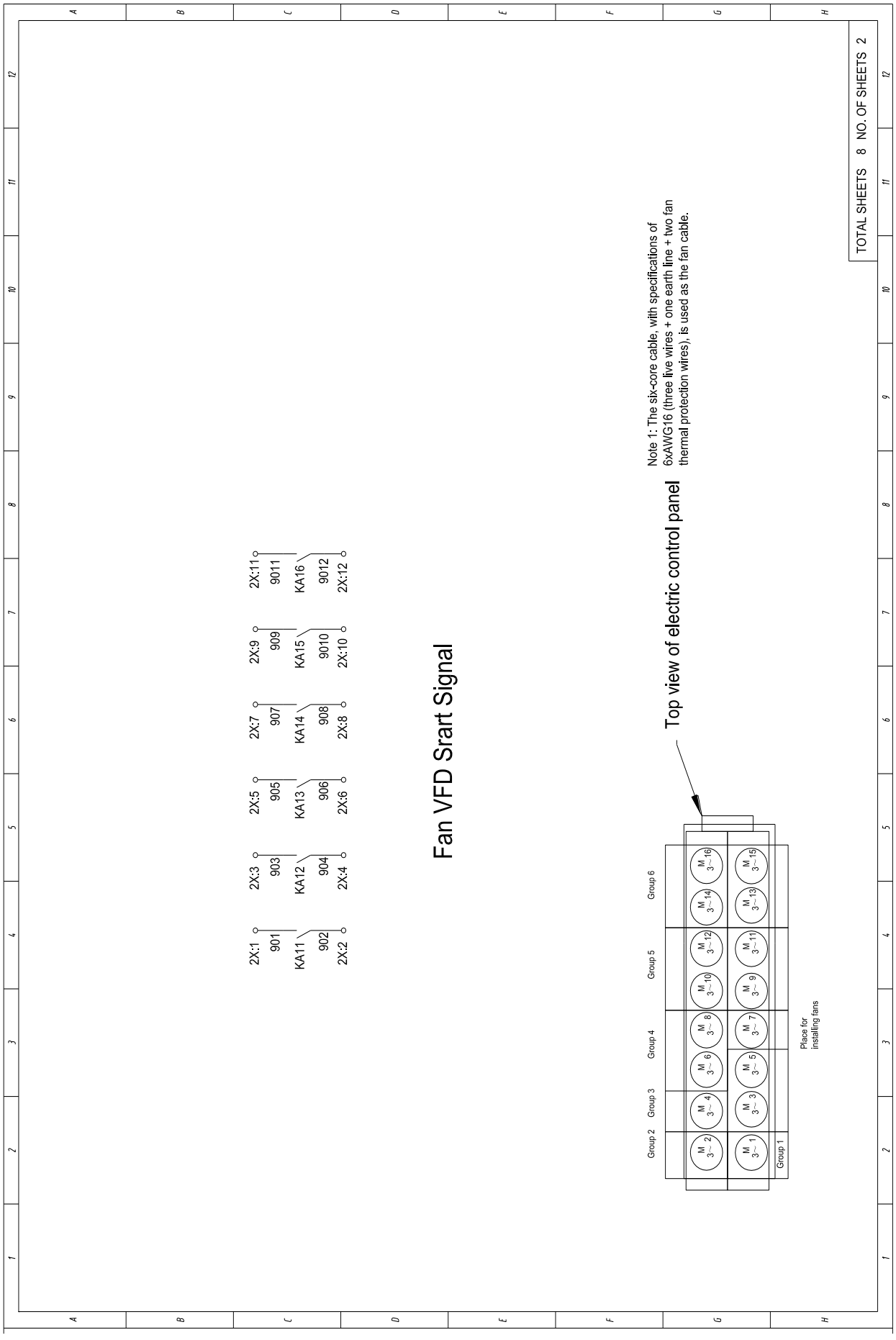

SCAF115HV
Inverter air-cooled screw chiller
electrical principle diagram
SCAF115HV.DKD.YL
CHONGQING MIDEA GENERAL
REFRIGERATION EQUIPMENT CO., LTD
Chen Xijie
Yang Haitao
Ye Shujun
Zhang Yong
Xiang Hongbo
Liang Tao
1# system discharge pressure
1# system oil supply pressure
1# EXV communication
Main board and touch screen communication
VFD communication interface
Cloud platform communication interface
1# system motor temperature
1# system discharge temperature
Shell-and-tube water outlet temperature
Internal circulating water inlet temperature
Ambient temperature
Water outlet temperature
Water inlet temperature
Total water outlet temperature
Note 1: Only applicable to FC (find coil) model.
Note 1
A1
CN5
CN10
CN16
CN17
CN18
CN19
COM3
COM4
COM5
COM6
S1
S2
S3
TP1
TP2
1X:15
1X:16
1X:17
1X:18
1X:19
1X:20

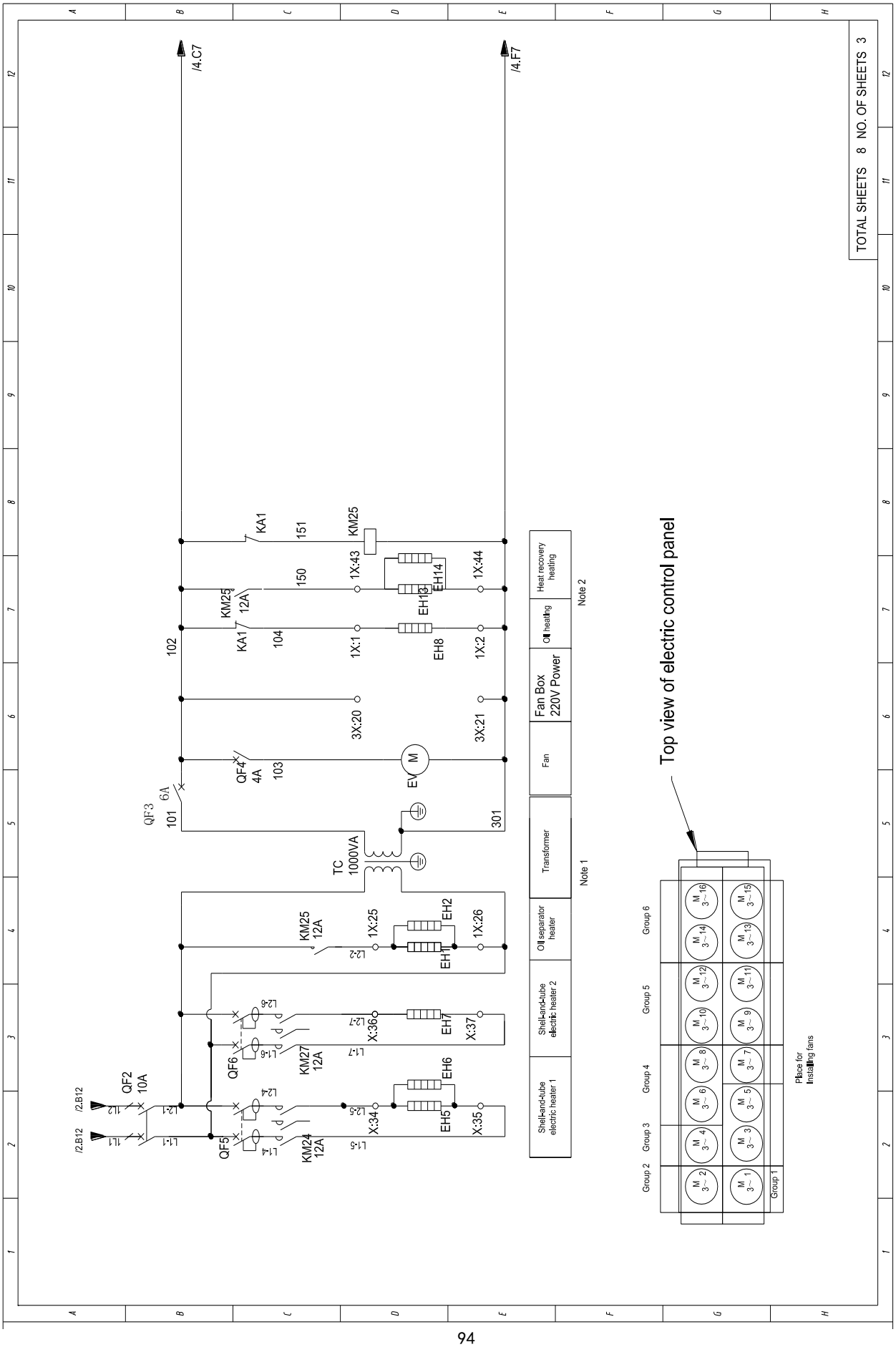

1# system main line EXV
Green 1X:27
Red 1X:28
White 1X:29
Black 1X:30
1EVD
CN1
CN3
CN6
CN8
CN9
CN10
CN11
CN12
CAN1
COM1
CN7
S1
S2
S3
S4
1X:21
1X:22
SP
TP3
1# system suction pressure
/3.E11
/3.E11
/6.F6
SCAF115HV.DKD.YL
SCAF115HV
Inverter air-cooled screw chiller
electrical principle diagram
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD

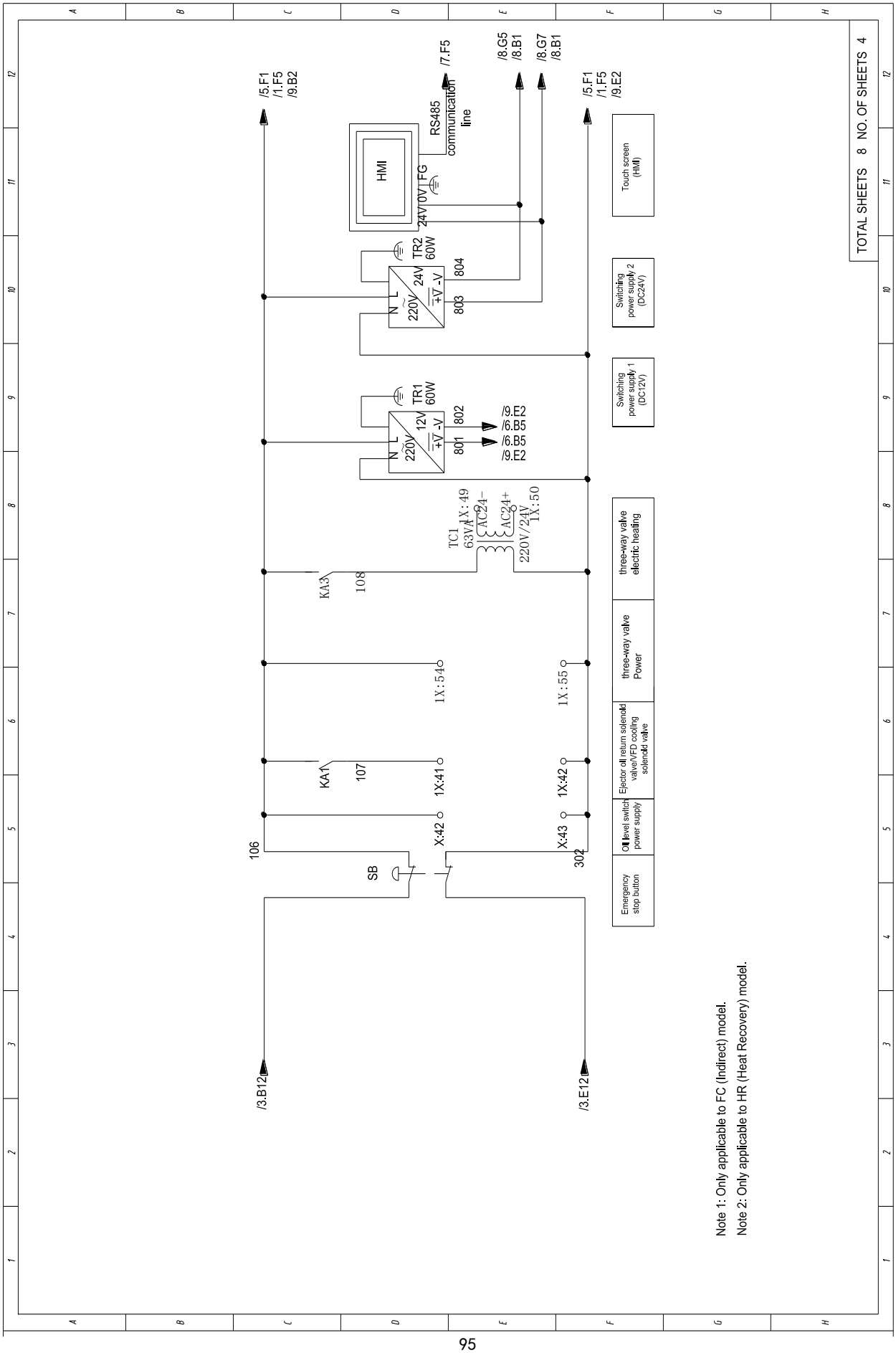

A2
RUN
SINAL
GPRS
ETH
DC 12V
LAN
RS485-1
RS485-2
A1
B1
E
A2
B2
X
Y
801
802
Brown
708
Blue
709
Black
707
/3.E8
/7.F2
/7.F2
/7.F1
Customer's upper computer communication port 1
Customer's upper computer communication port 2
Cloud platform module communication
MARKER
NUMBER
ECN NO.
SIGNATURE
DATE
DESIGN
Chen Xijie 2020.12.08
COLLATE
Yang Haitao
APPROVE
Ye Shujun
PROCESS
Zhang Yong
STANDARDIZE
Xiang Hongbo
AUTHORIZE
Liang Tao
MODEL
SCAF115HV
PART
Inverter air-cooled screw chiller electrical principle diagram
REL
REV. NO.
WEIGHT
SCALE
TOTAL SHEETS 8 NO. OF SHEETS 8
PART NO.
SCAF115HV.DKD.YL
MATERIAL
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD

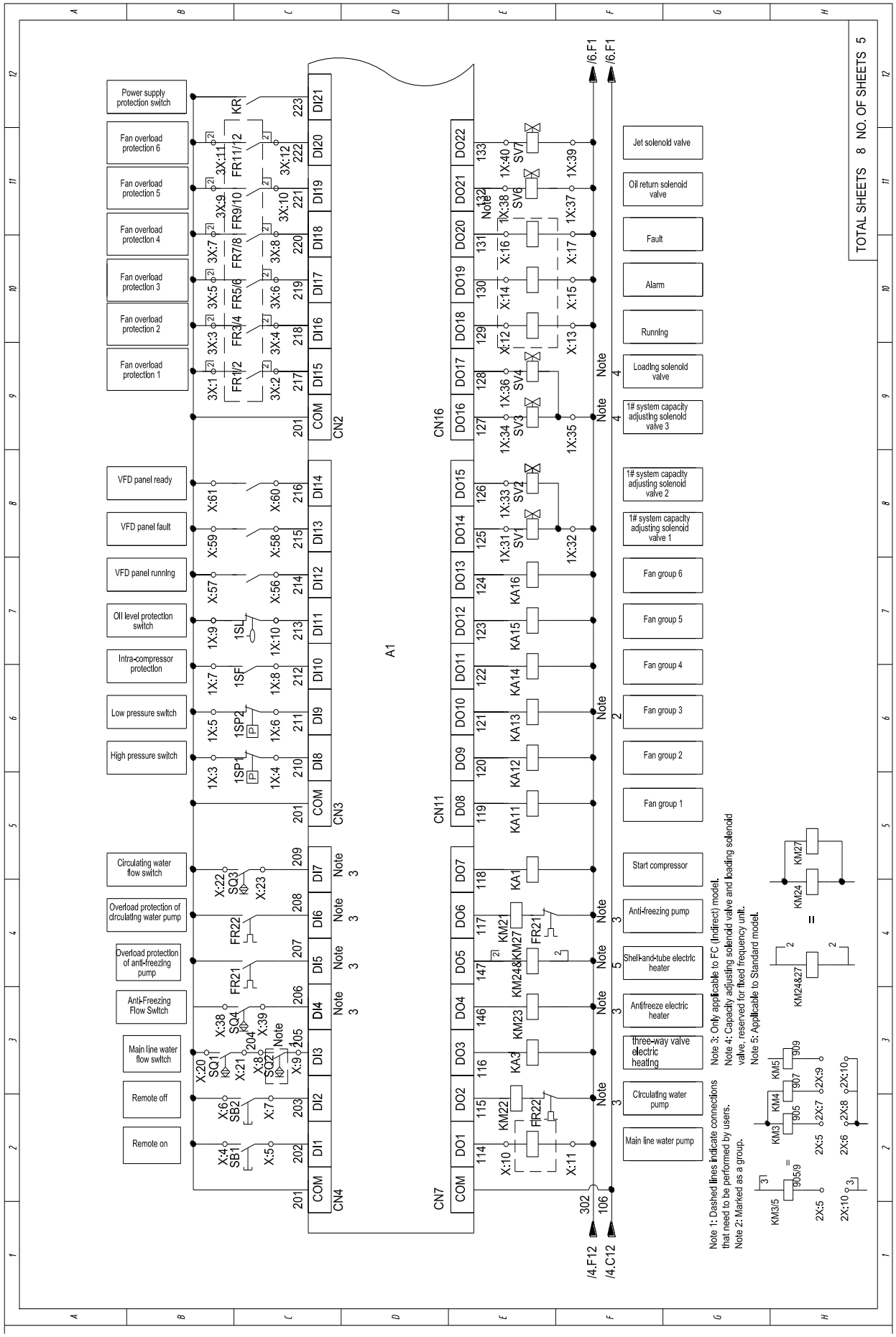
SCAF125HV - SCAF275HV (only the number of fans and the number of corresponding contactors are different)

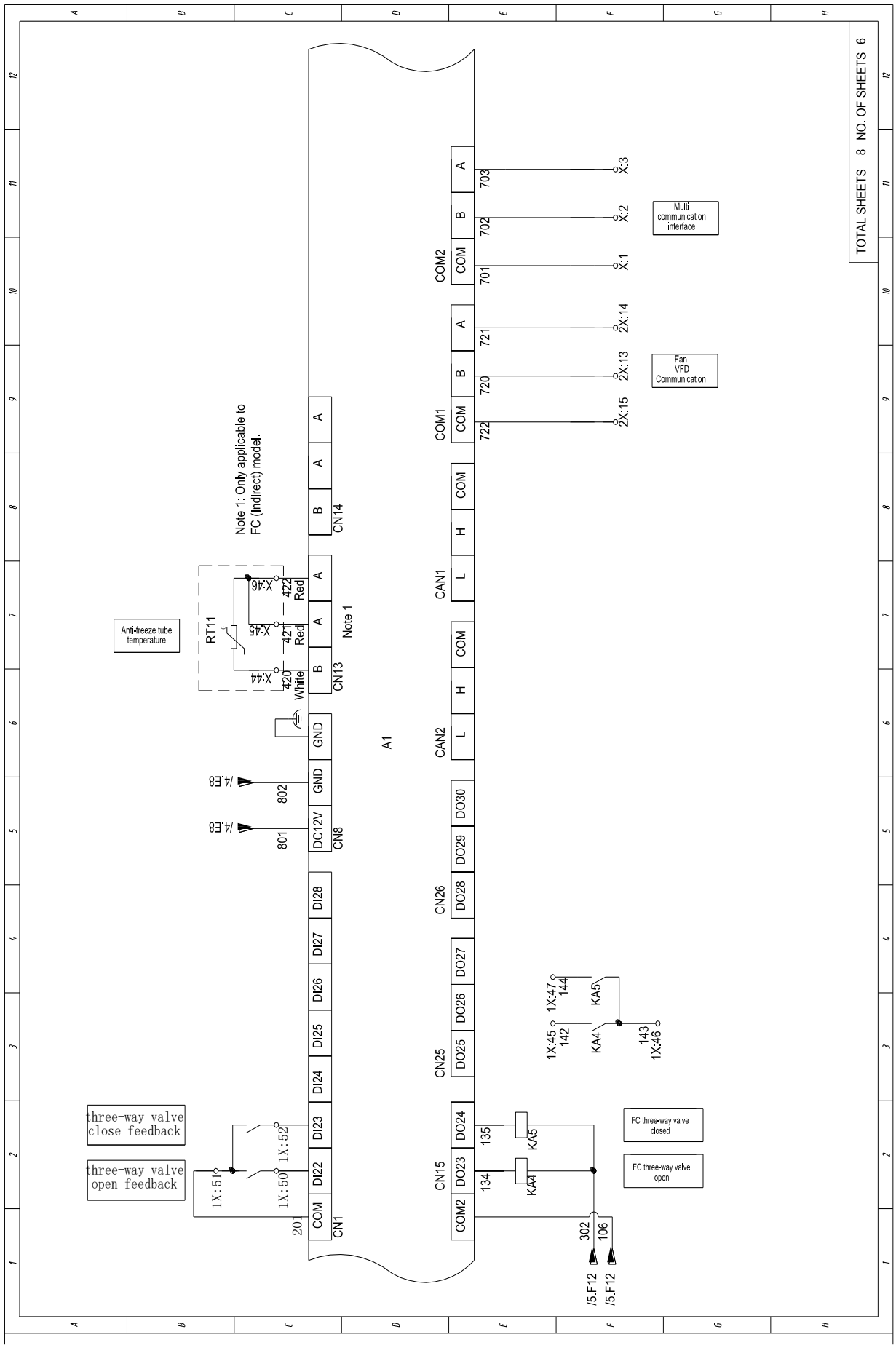


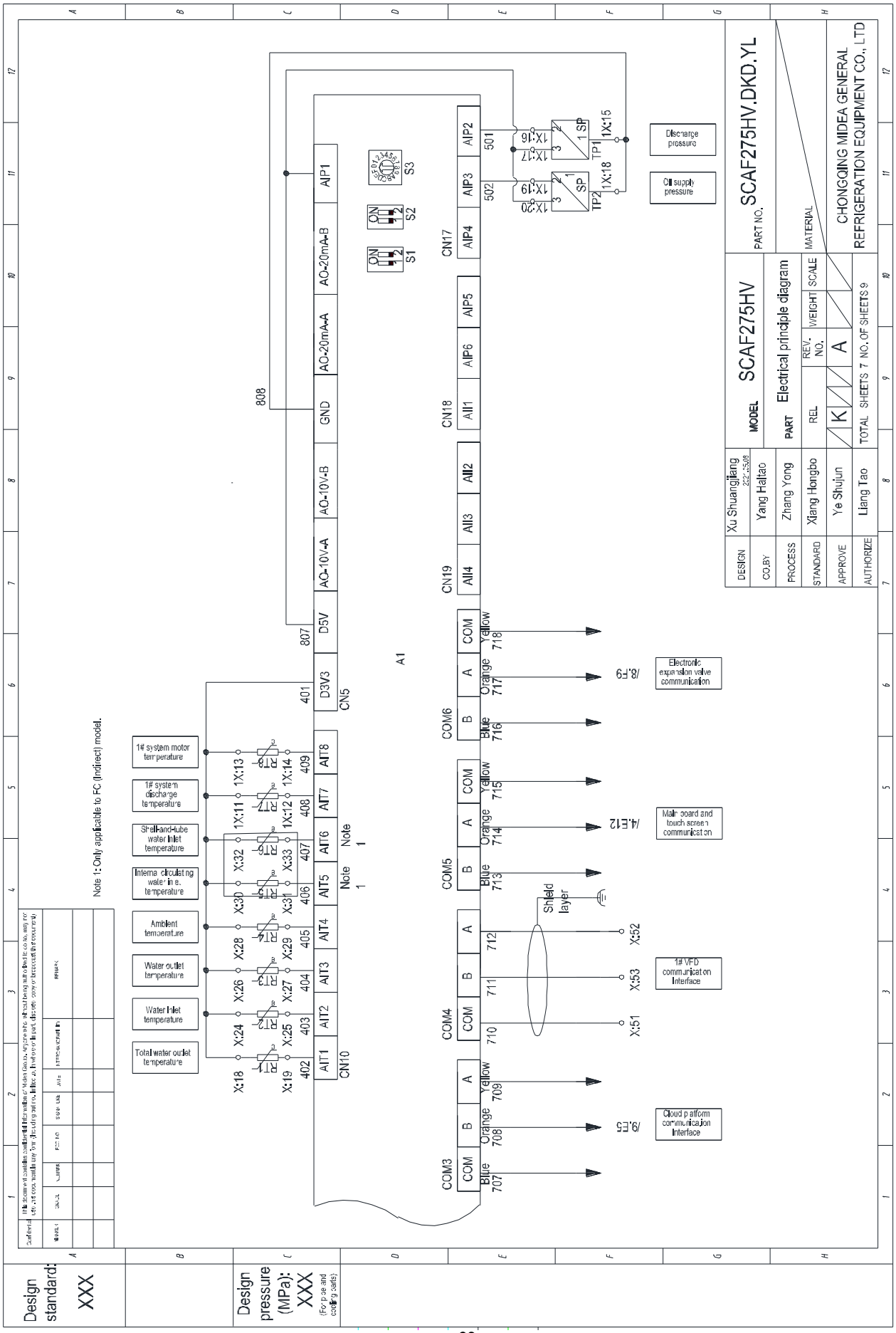

TOTAL SHEETS 8 NO. OF SHEETS 2
Fan VFD Srart Signal
2X:1
901
KA11
902
2X:2
2X:3
903
KA12
904
2X:4
2X:5
905
KA13
906
2X:6
2X:7
907
KA14
908
2X:8
2X:9
909
KA15
9010
2X:10
2X:11
9011
KA16
9012
2X:12
Top view of electric control panel
Note 1: The six-core cable, with specifications of 6xAWG16 (three live wires + one earth line + two fan thermal protection wires), is used as the fan cable.
Group 1
Group 2
Group 3
Group 4
Group 5
Group 6
M 3~ 1
M 3~ 2
M 3~ 3
M 3~ 4
M 3~ 5
M 3~ 6
M 3~ 7
M 3~ 8
M 3~ 9
M 3~ 10
M 3~ 11
M 3~ 12
M 3~ 13
M 3~ 14
M 3~ 15
M 3~ 16
Place for installing fans

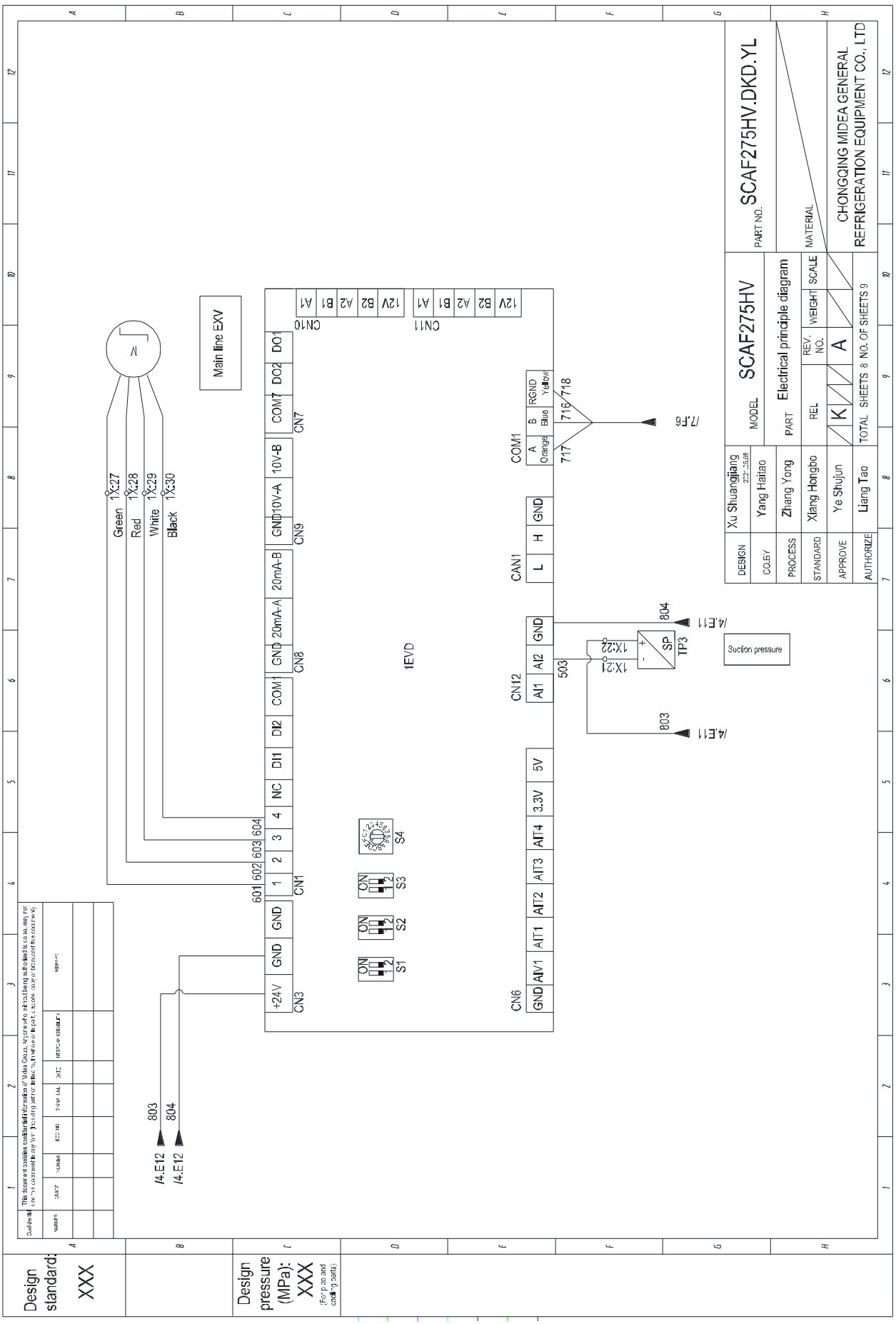

TOTAL SHEETS 8 NO. OF SHEETS 3
/4.C7
/4.F7
KA1
KM25
151
150
1X:43
1X:44
EH13
EH14
KM25 12A
KA1
104
1X:1
1X:2
EH8
102
3X:20
3X:21
QF4 4A
103
M
QF3 6A
101
301
TC 1000VA
KM25 12A
1X:25
1X:26
EH2
EH1
L2-2
L2-6
L2-7
X:36
X:37
EH7
QF6
KM27 12A
L1-7
L2-4
L2-5
X:34
X:35
EH6
QF5
KM24 12A
L1-5
QF2 10A
/2.B12
/2.B12
Heat recovery heating
Oil heating
Fan Box 220V Power
Fan
Transformer
Oil separator heater
Shell-and-tube electric heater 2
Shell-and-tube electric heater 1
Note 2
Note 1
Top view of electric control panel
Group 6
Group 5
Group 4
Group 3
Group 2
Group 1
Place for Installing fans

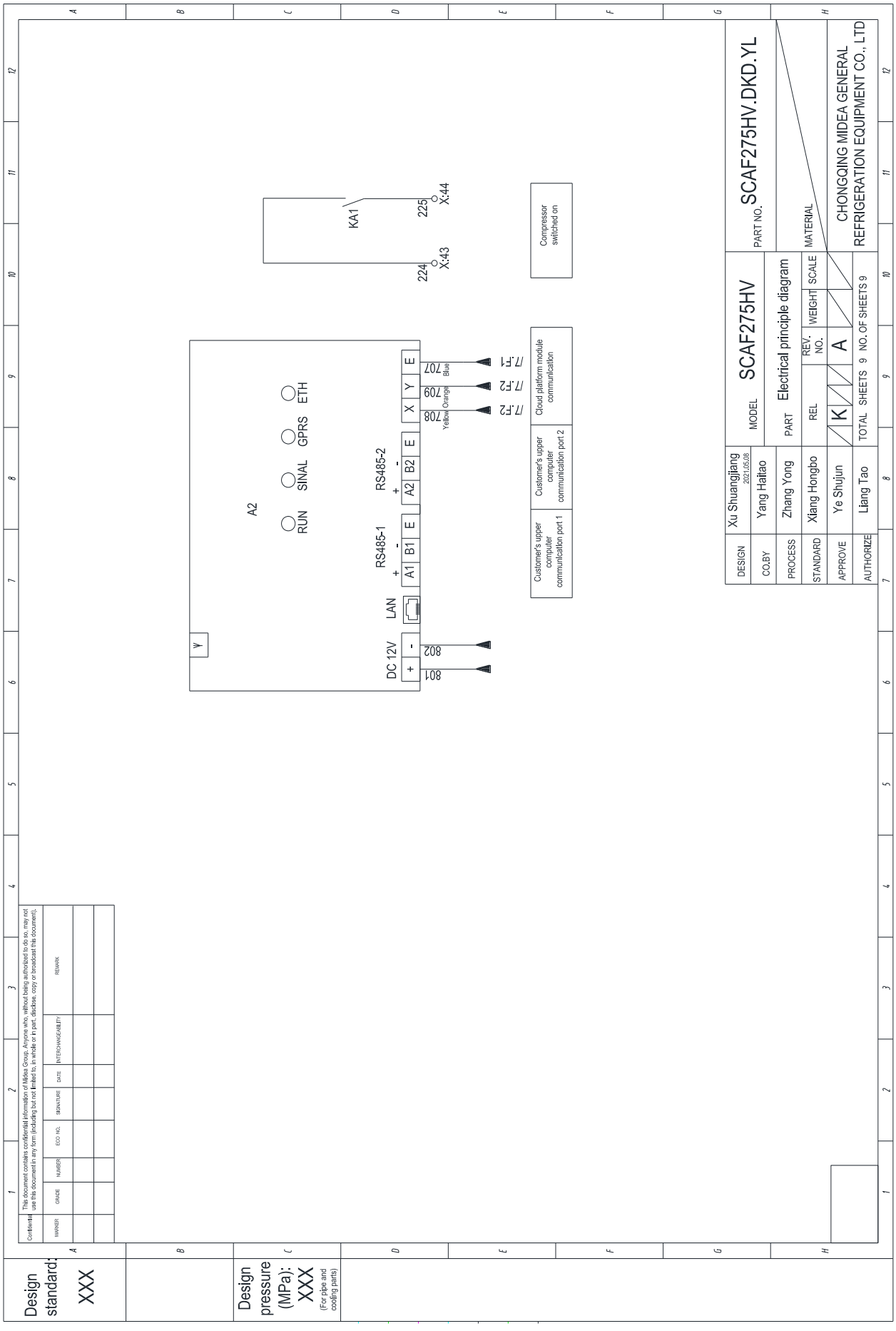

TOTAL SHEETS 8 NO. OF SHEETS 4
/5.F1
/1.F5
/9.B2
/7.F5
/8.G5
/8.B1
/8.G7
/8.B1
/5.F1
/1.F5
/9.E2
RS485 communication line
HMI
24V 0V FG
Touch screen (HMI)
TR2 60W
220V 24V
804
803
Switching power supply 2 (DC24V)
TR1 60W
220V 12V
802
801
/9.E2
/6.B5
/6.B5
/9.E2
Switching power supply 1 (DC12V)
TC1 63VA
1X:49
AC24-
AC24+
220V/24V
1X:50
three-way valve electric heating
KA3
108
1X:54
1X:55
three-way valve Power
KA1
107
1X:41
1X:42
Ejector oil return solenoid valve/VFD cooling solenoid valve
X:42
X:43
Oil level switch power supply
106
SB
302
Emergency stop button
/3.B12
/3.E12
Note 1: Only applicable to FC (Indirect) model.
Note 2: Only applicable to HR (Heat Recovery) model.


TOTAL SHEETS 8 NO. OF SHEETS 5
Power supply protection switch
Fan overload protection 6
Fan overload protection 5
Fan overload protection 4
Fan overload protection 3
Fan overload protection 2
Fan overload protection 1
VFD panel ready
VFD panel fault
VFD panel running
Oil level protection switch
Intra-compressor protection
Low pressure switch
High pressure switch
Circulating water flow switch
Overload protection of circulating water pump
Overload protection of anti-freezing pump
Anti-Freezing Flow Switch
Main line water flow switch
Remote off
Remote on
Jet solenoid valve
Oil return solenoid valve
Fault
Alarm
Running
Loading solenoid valve
1# system capacity adjusting solenoid valve 3
1# system capacity adjusting solenoid valve 2
1# system capacity adjusting solenoid valve 1
Fan group 6
Fan group 5
Fan group 4
Fan group 3
Fan group 2
Fan group 1
Start compressor
Anti-freezing pump
Shell-and-tube electric heater
Antifreeze electric heater
three-way valve electric heating
Circulating water pump
Main line water pump
Note 1: Dashed lines indicate connections that need to be performed by users.
Note 2: Marked as a group.
Note 3: Only applicable to FC (Indirect) model.
Note 4: Capacity adjusting solenoid valve and loading solenoid valve, reserved for fixed frequency unit.
Note 5: Applicable to Standard model.


TOTAL SHEETS 8 NO. OF SHEETS 6
Note 1: Only applicable to FC (Indirect) model.
A1
CN1
CN8
CN13
CN14
CN15
CN25
CN26
CAN1
CAN2
COM1
COM2
Anti-freeze tube temperature
RT11
Note 1
three-way valve close feedback
three-way valve open feedback
Multi communication interface
Fan VFD Communication
FC three-way valve closed
FC three-way valve open
KA4
KA5
/4.E8
/5.F12


Design standard: XXX
Design pressure (MPa): XXX
(Refrigerant and config cable)
Note 1: Only applicable to FC (Indirect) model.
1# system motor temperature
1# system discharge temperature
Shell-and-tube water inlet temperature
Internal circulating water inlet temperature
Ambient temperature
Water outlet temperature
Water inlet temperature
Total water outlet temperature
CN10
CN5
CN19
CN18
CN17
COM3
COM4
COM5
COM6
A1
S1
S2
S3
Discharge pressure
Oil supply pressure
Electronic expansion valve communication
Main board and touch screen communication
1# VFD communication interface
Cloud platform communication interface
Shield layer
MODEL SCAF275HV
PART Electrical principle diagram
PART NO. SCAF275HV.DKD.YL
MATERIAL
DESIGN Xu Shuangjiang
CO.BY Yang Haitao
PROCESS Zhang Yong
STANDARD Xiang Hongbo
APPROVE Ye Shujun
AUTHORIZE Liang Tao
REL K
REV. NO. A
WEIGHT
SCALE
TOTAL SHEETS 7 NO. OF SHEETS 9
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD


Design standard: XXX
Design pressure (MPa): XXX
SCAF275HV.DKD.YL
SCAF275HV
Electrical principle diagram
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD
Main line EXV
1EVD
Suction pressure
Green
Red
White
Black
CN1
CN3
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CAN1
COM1
S1
S2
S3
S4
TP3
SP
Xu Shuangjiang
Yang Haitao
Zhang Yong
Xiang Hongbo
Ye Shujun
Liang Tao


Design standard: XXX
Design pressure (MPa): XXX
(For pipe and cooling parts)
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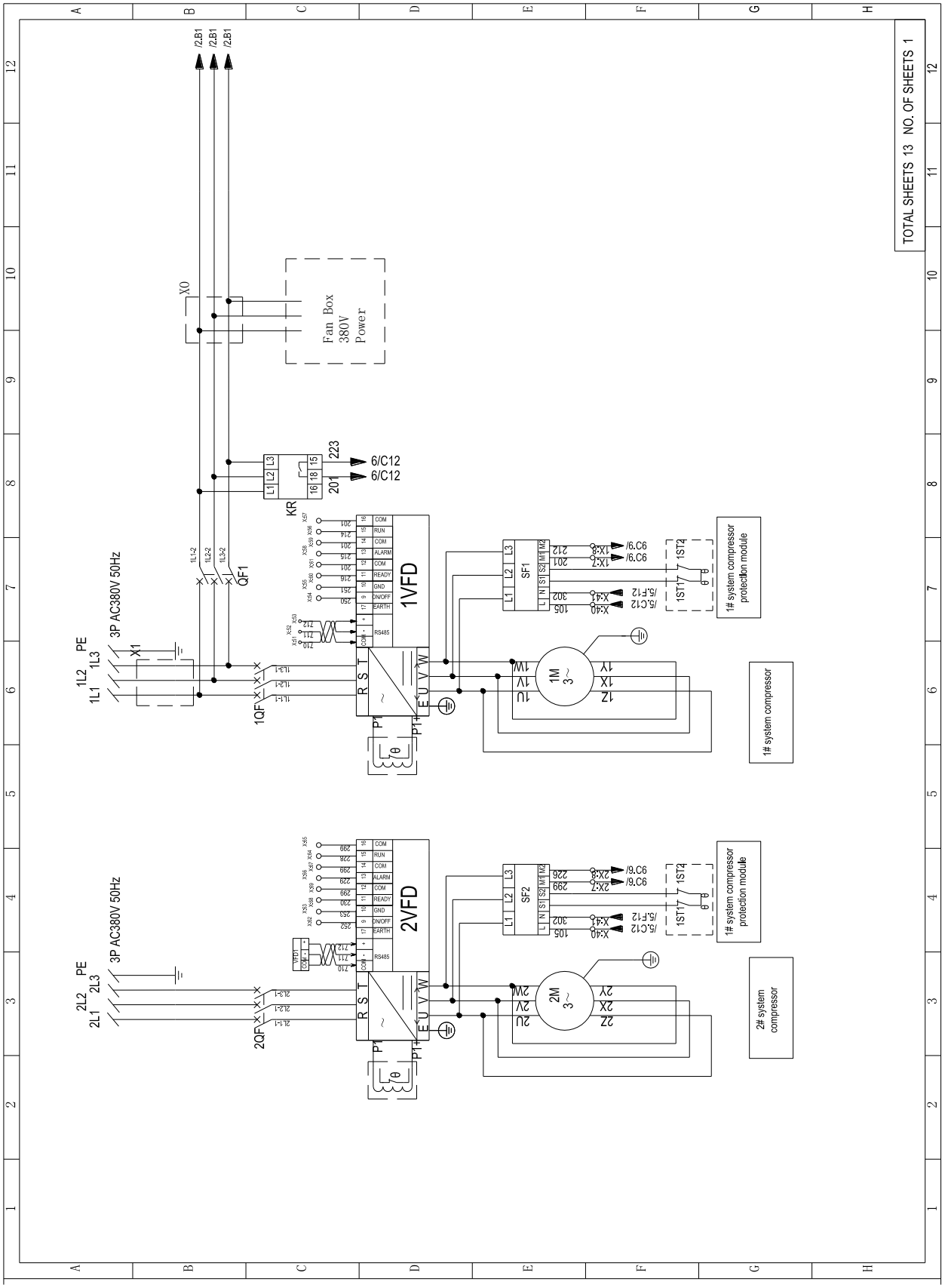
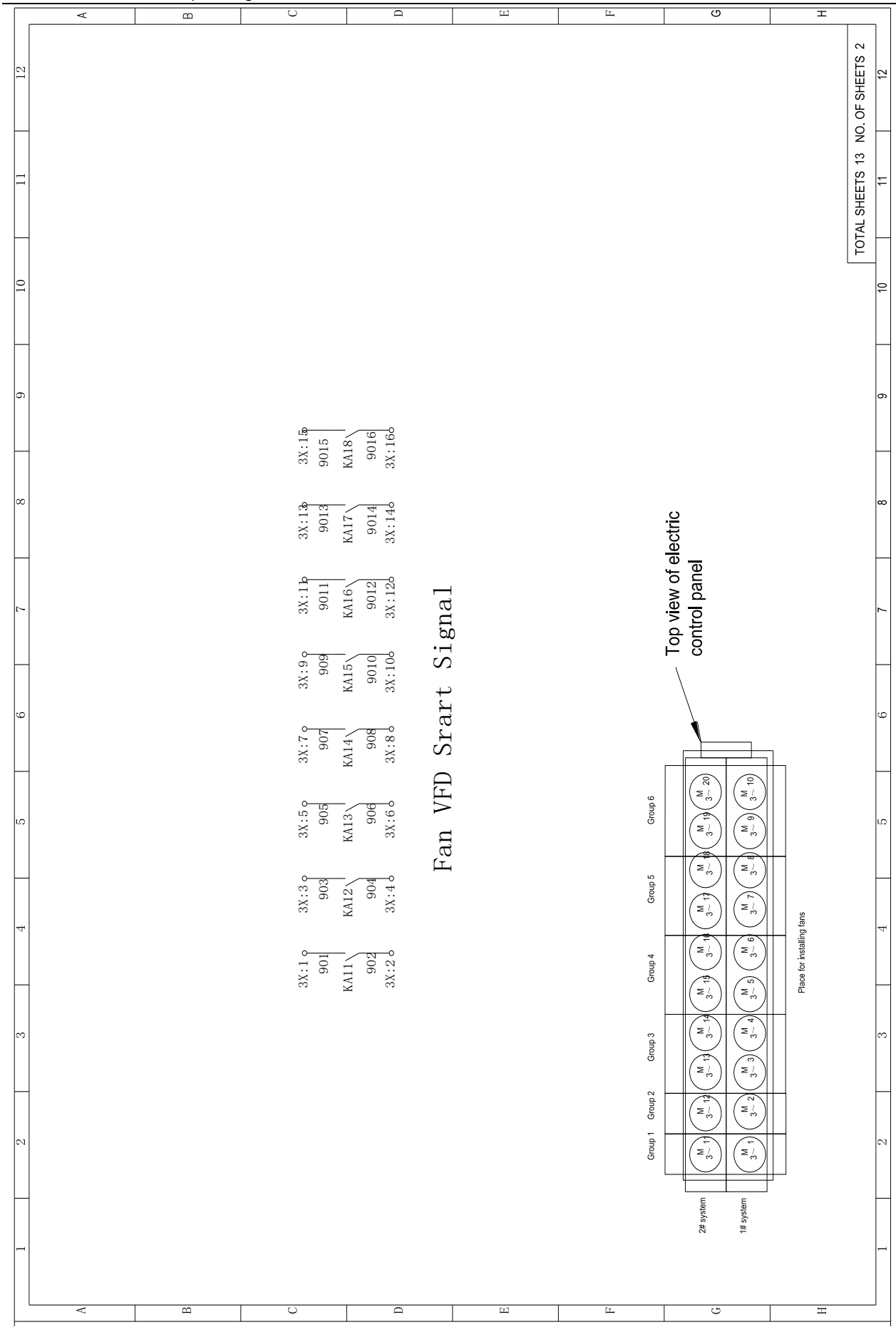
MARKER
GRADE
NUMBER
ECO NO.
SIGNATURE
DATE
INTERCHANGEABILITY
REMARK
A2
RUN
SINAL
GPRS
ETH
DC 12V
LAN
RS485-1
RS485-2
A1
B1
E
A2
B2
X
Y
801
802
708
709
707
Yellow
Orange
Blue
7.F1
7.F2
7.F2
KA1
224
225
X:43
X:44
Compressor switched on
Customer's upper computer communication port 1
Customer's upper computer communication port 2
Cloud platform module communication
DESIGN
Xu Shuangjiang
2021.05.08
CO.BY
Yang Haitao
PROCESS
Zhang Yong
STANDARD
Xiang Hongbo
APPROVE
Ye Shujun
AUTHORIZE
Liang Tao
MODEL
SCAF275HV
PART
Electrical principle diagram
REL
K
TOTAL SHEETS 9
REV. NO.
A
NO. OF SHEETS 9
WEIGHT
SCALE
MATERIAL
PART NO.
SCAF275HV.DKD.YL
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD

SCAF285HV- SCAF450HV (only the number of fans and the number of corresponding contactors are different)

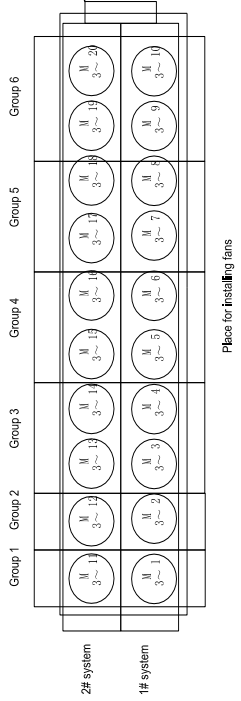


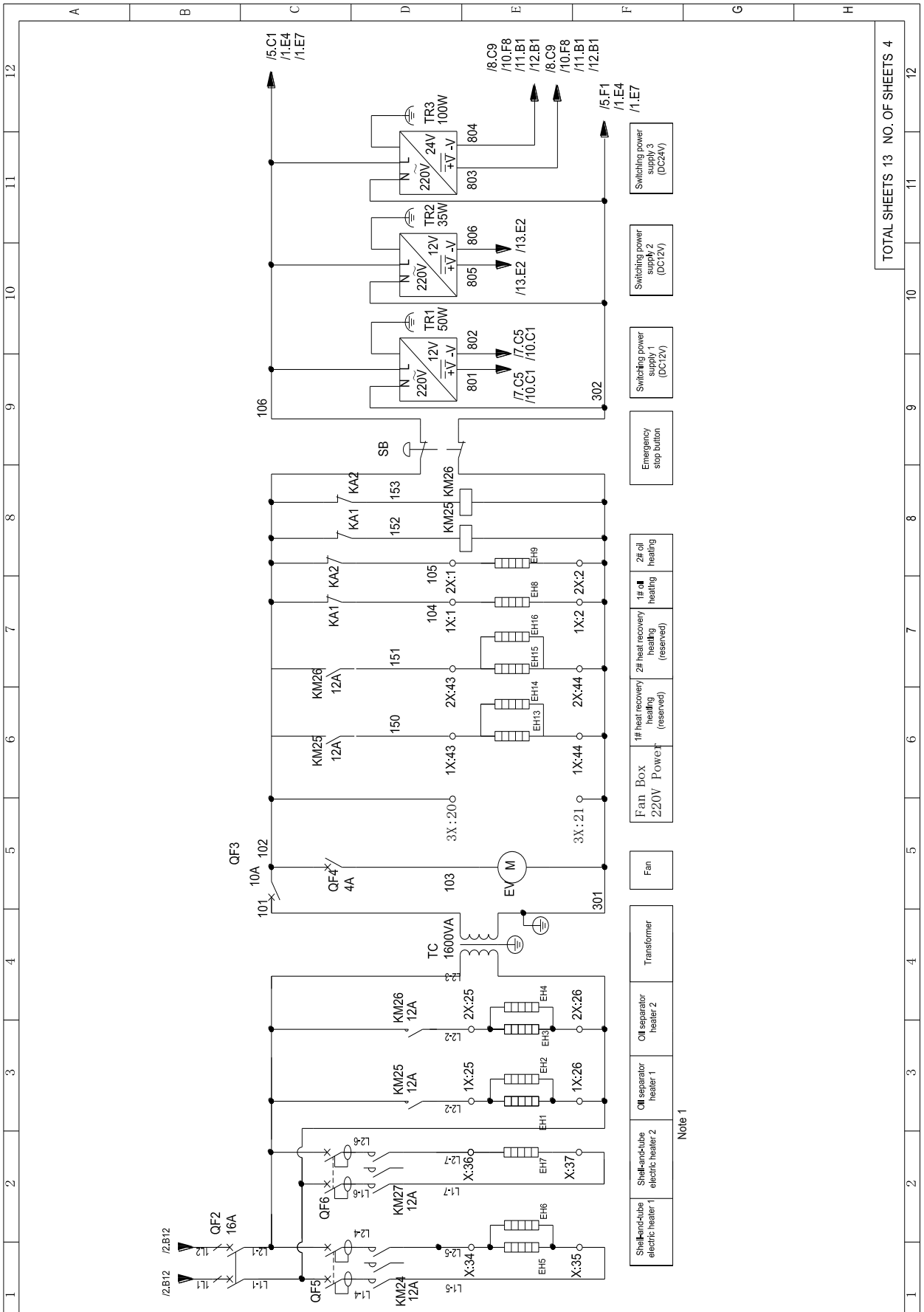

TOTAL SHEETS 13 NO. OF SHEETS 2
Fan VFD Srart Signal
3X:1
901
KA11
902
3X:2
3X:3
903
KA12
904
3X:4
3X:5
905
KA13
906
3X:6
3X:7
907
KA14
908
3X:8
3X:9
909
KA15
9010
3X:10
3X:11
9011
KA16
9012
3X:12
3X:13
9013
KA17
9014
3X:14
3X:15
9015
KA18
9016
3X:16
Top view of electric control panel
Group 1
Group 2
Group 3
Group 4
Group 5
Group 6
2# system
1# system
Place for installing fans

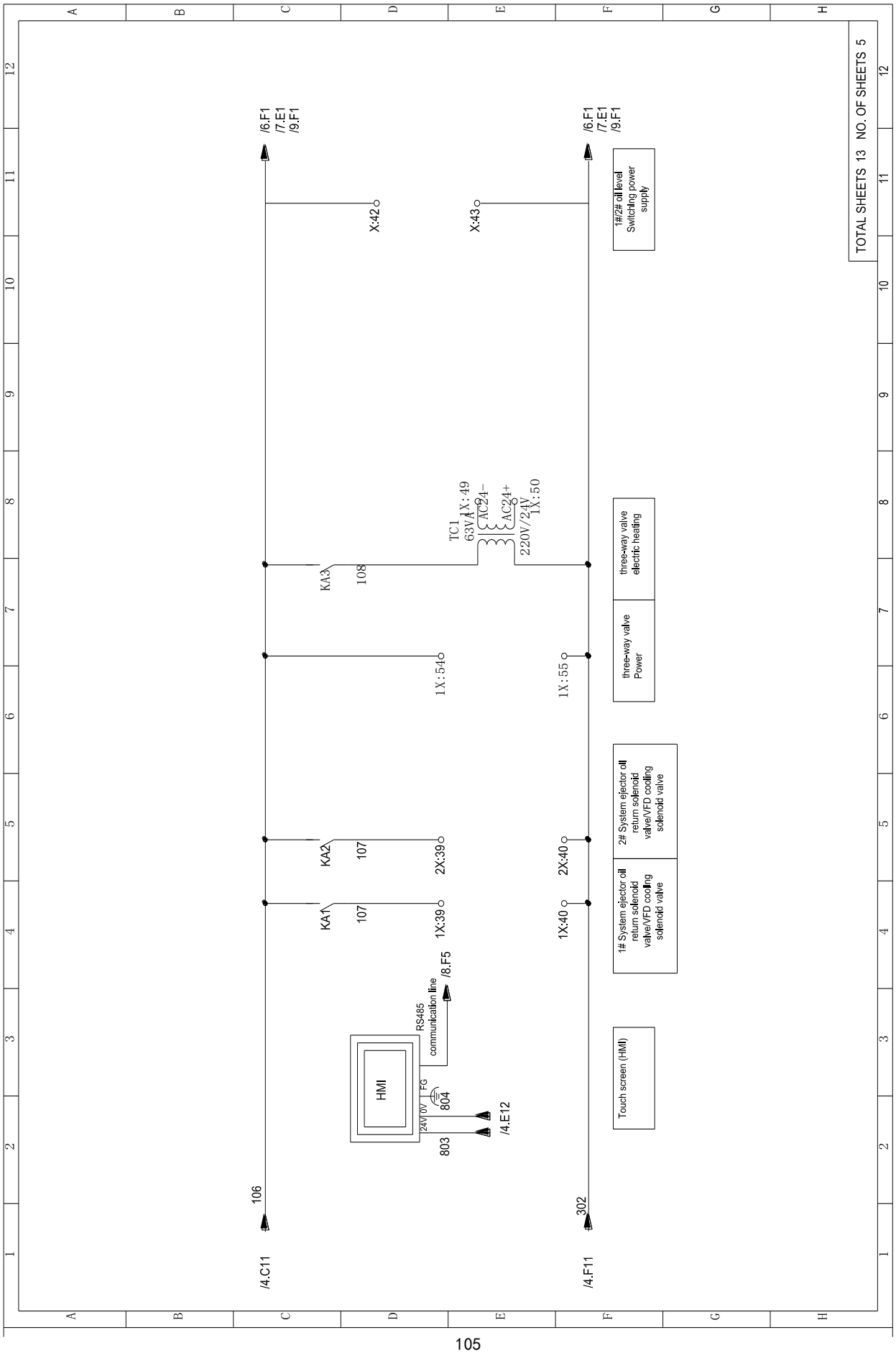
TOTAL SHEETS 13 NO. OF SHEETS 3

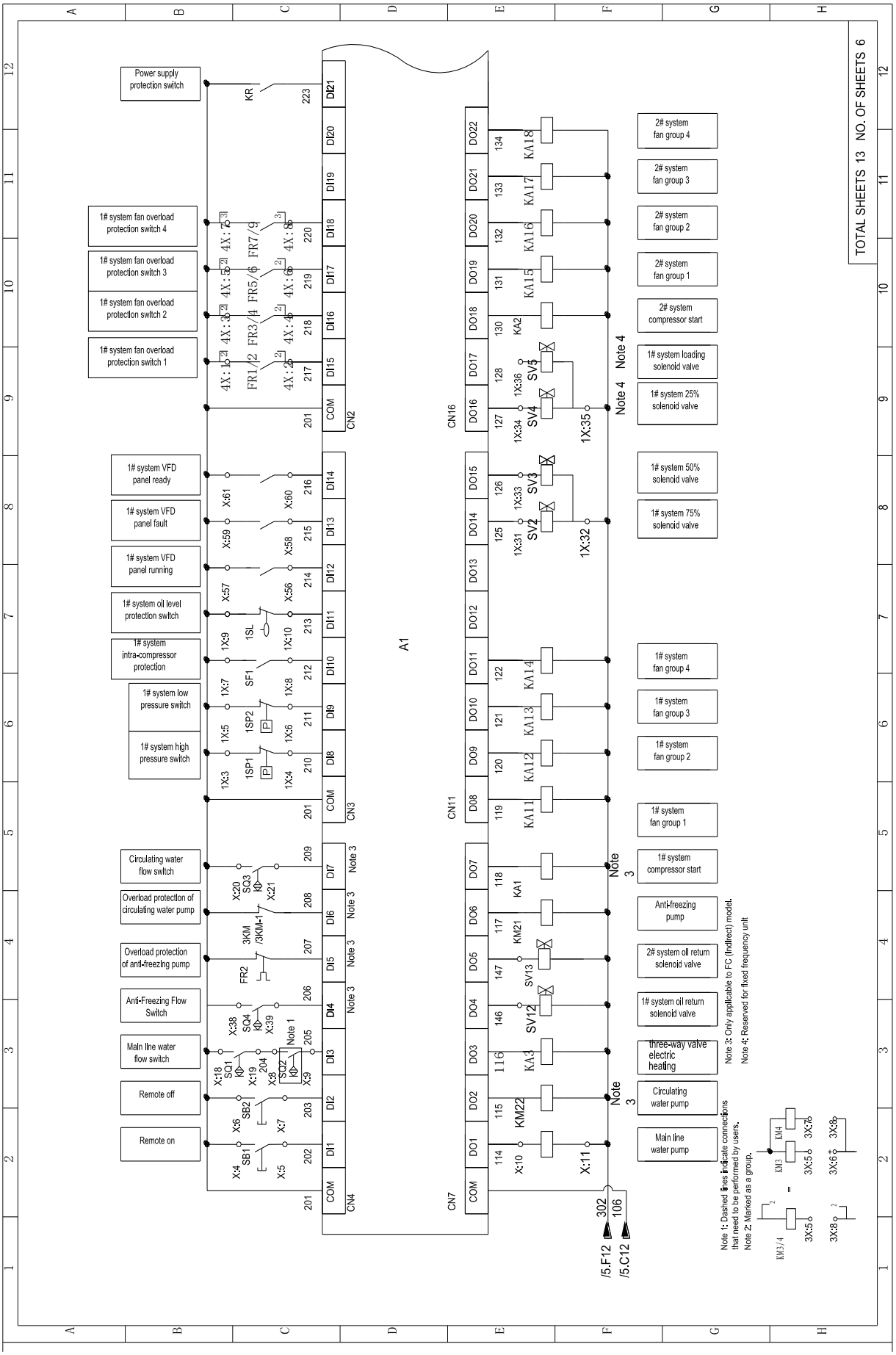
Emputy

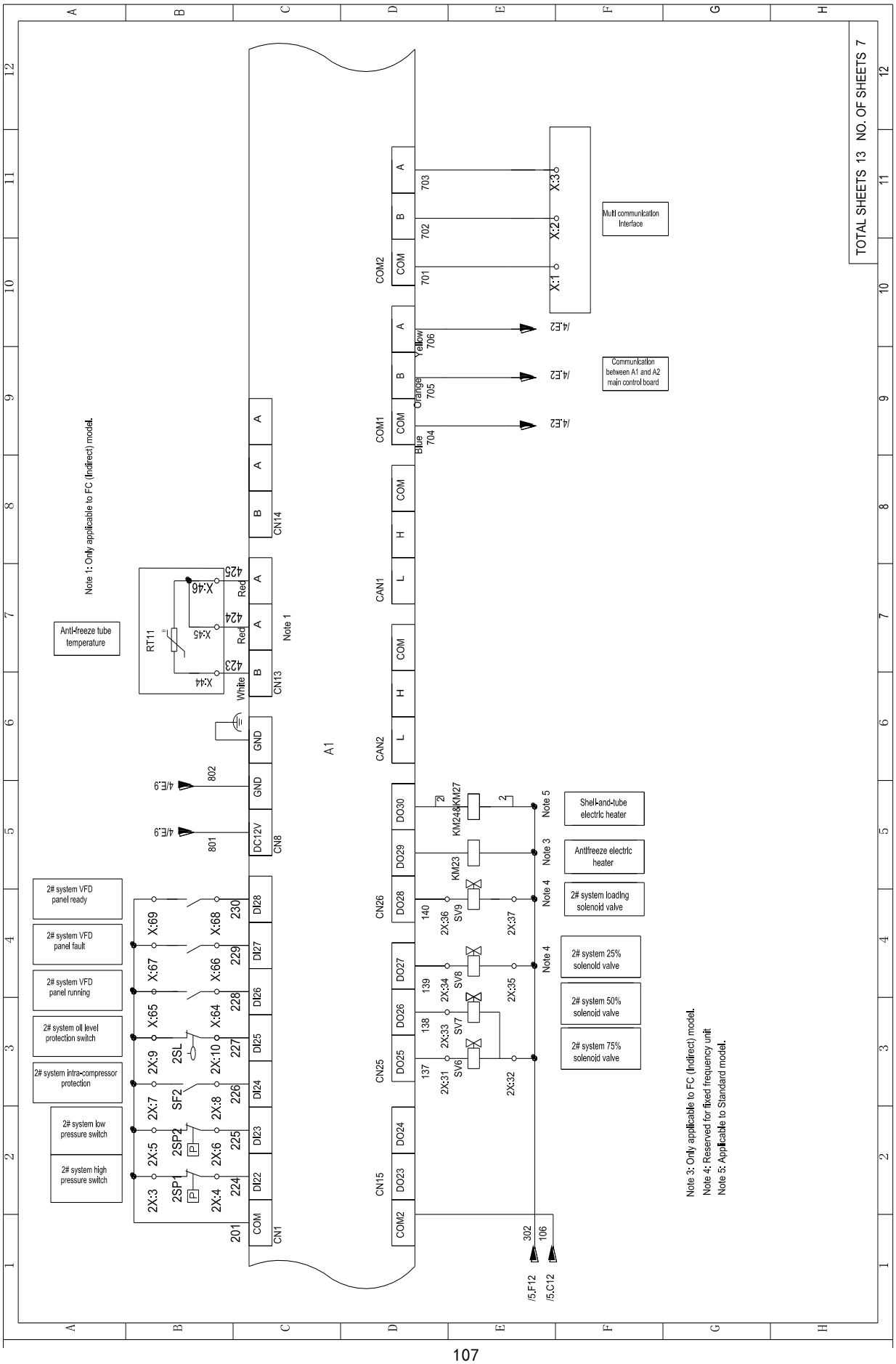
Top view of electric control panel

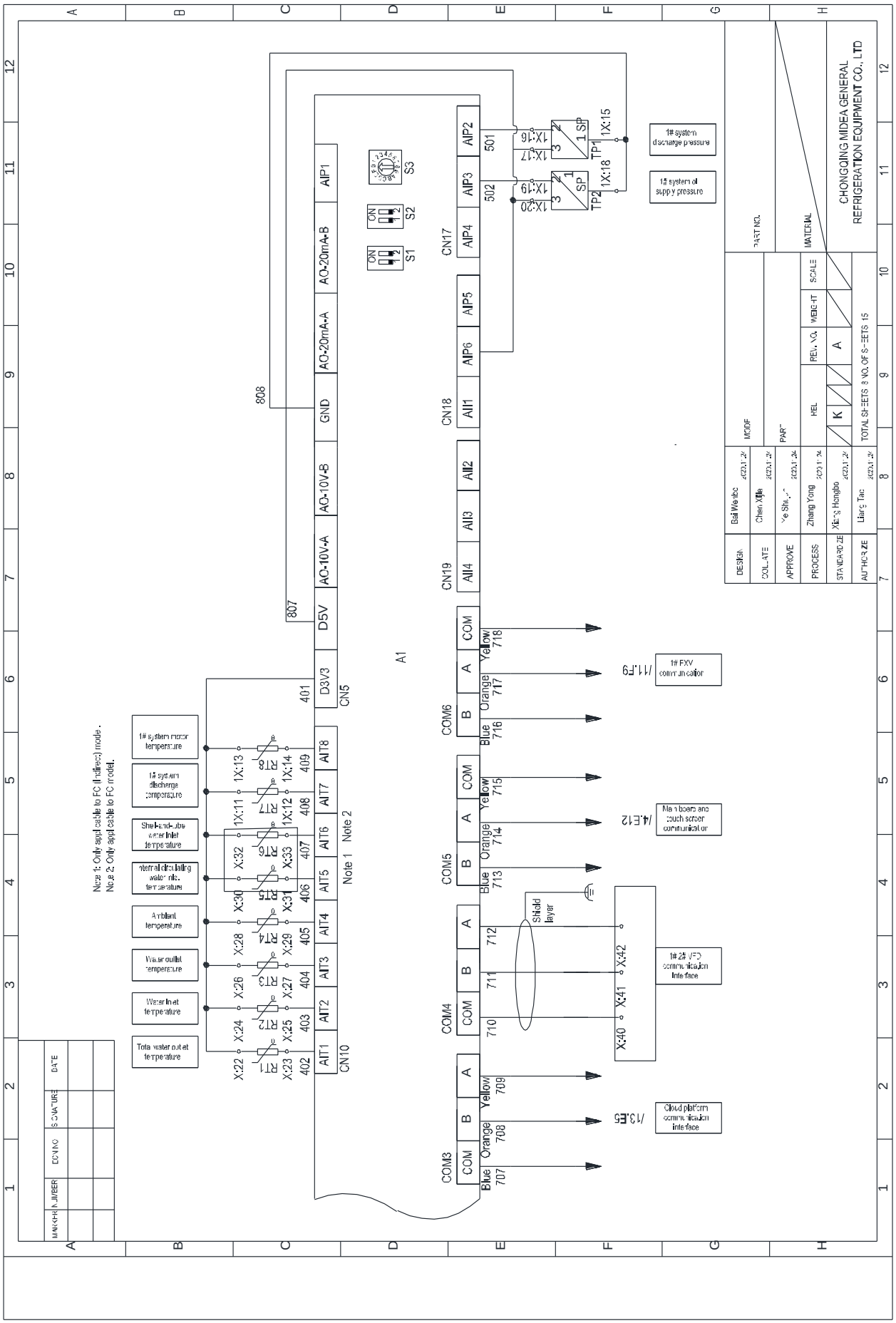


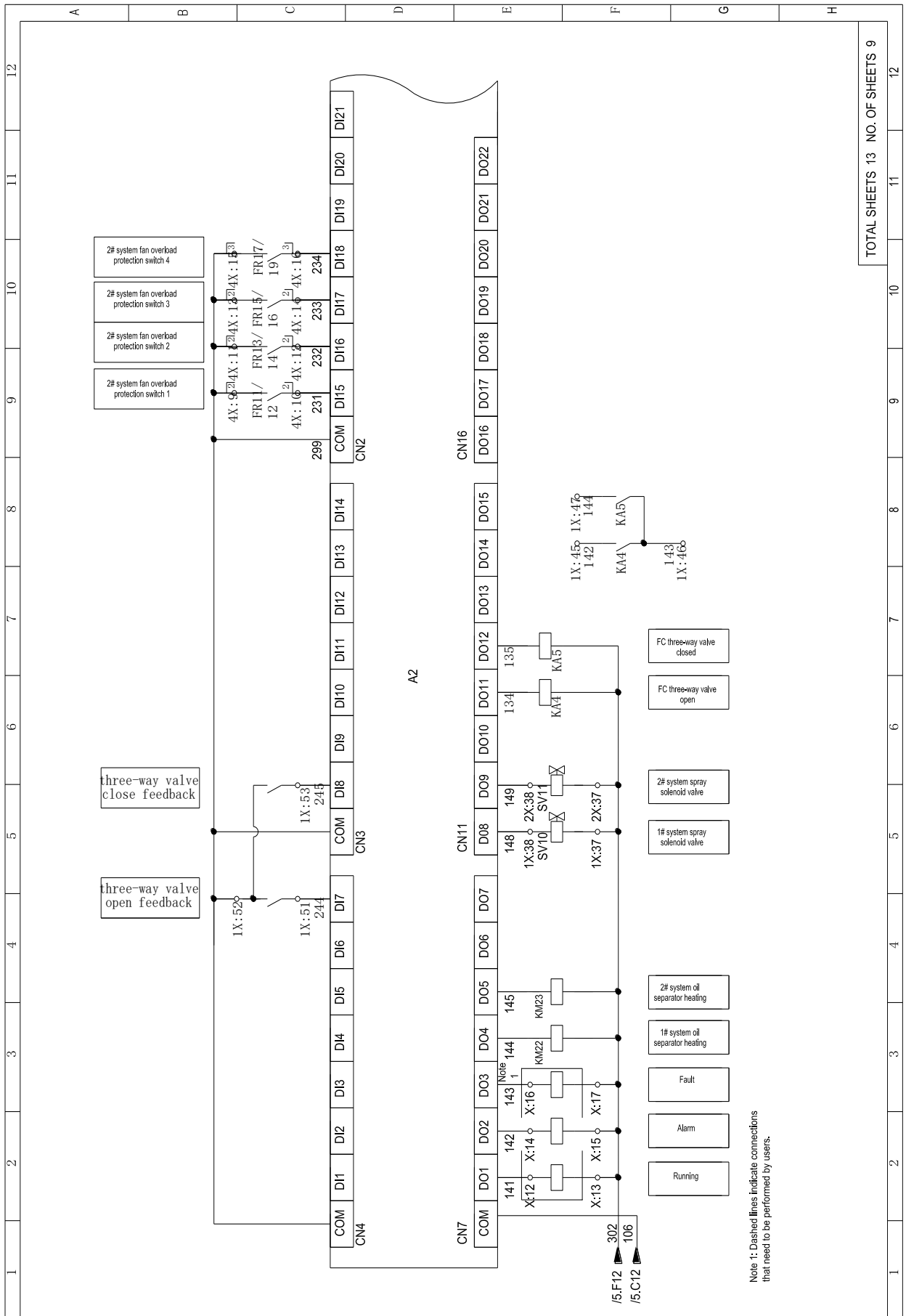

TOTAL SHEETS 13 NO. OF SHEETS 4
/5.C1 /1.E4 /1.E7
/8.C9 /10.F8 /11.B1 /12.B1
/8.C9 /10.F8 /11.B1 /12.B1
/5.F1 /1.E4 /1.E7
TR3 100W
TR2 35W
TR1 50W
220V~ N L
12V ⎓ +V -V
24V ⎓ +V -V
804
803
806
805
802
801
/13.E2
/13.E2
/7.C5 /10.C1
/7.C5 /10.C1
106
302
SB
KA2
KA1
153
152
KM26
KM25
105
104
2X:1
1X:1
2X:2
1X:2
EH9
EH8
EH16
EH15
EH14
EH13
151
150
KM26 12A
KM25 12A
2X:43
1X:43
2X:44
1X:44
3X:20
3X:21
QF3 10A
QF4 4A
101
102
103
301
M
TC 1600VA
KM26 12A
KM25 12A
2X:25
1X:25
2X:26
1X:26
EH4
EH3
EH2
EH1
KM27 12A
KM24 12A
QF6
QF5
QF2 16A
X:36
X:37
X:34
X:35
EH7
EH6
EH5
Note 1
Switching power supply 3 (DC24V)
Switching power supply 2 (DC12V)
Switching power supply 1 (DC12V)
Emergency stop button
2# oil heating
1# oil heating
2# heat recovery heating (reserved)
1# heat recovery heating (reserved)
Fan Box 220V Power
Fan
Transformer
Oil separator heater 2
Oil separator heater 1
Shell-and-tube electric heater 2
Shell-and-tube electric heater 1

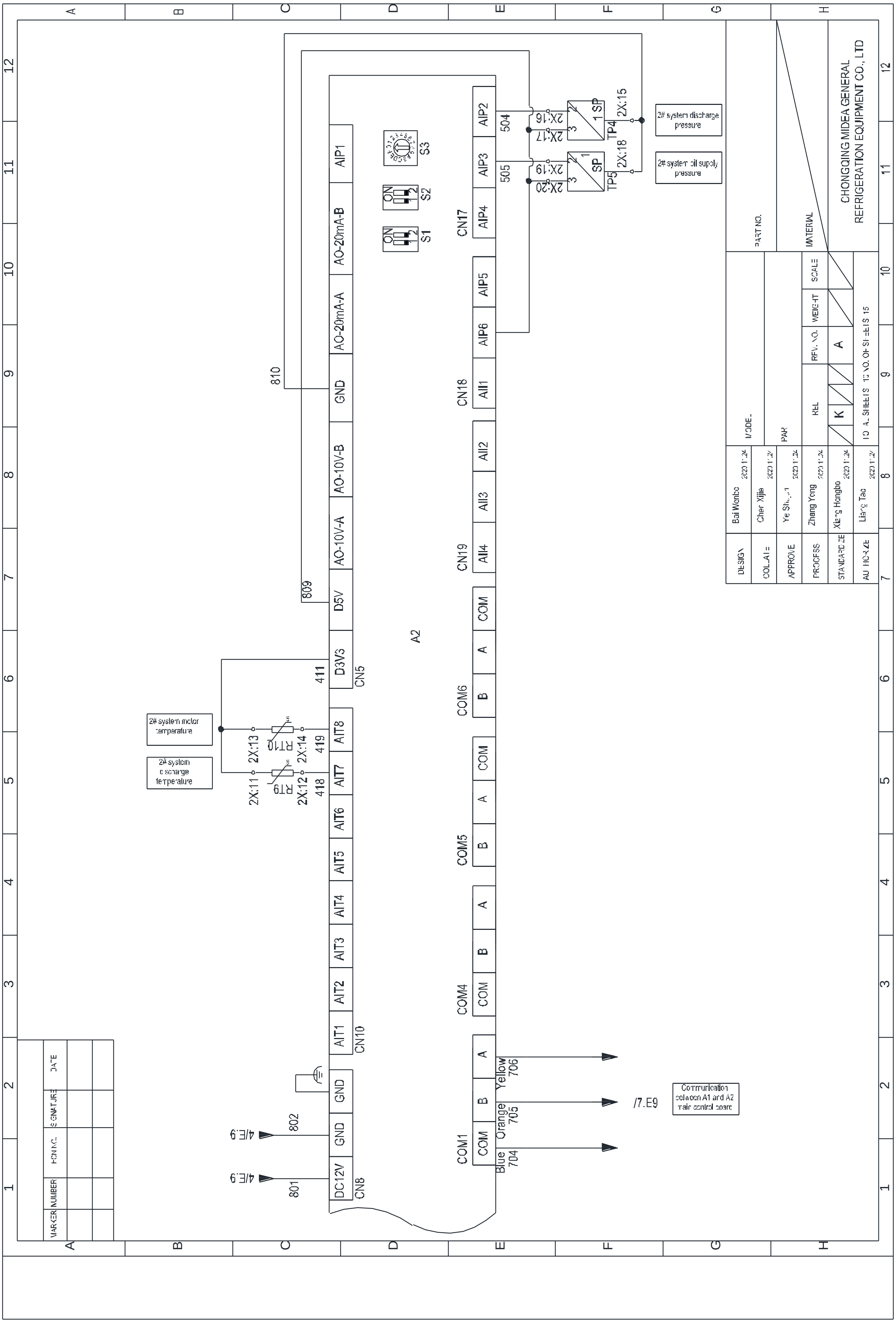

TOTAL SHEETS 13 NO. OF SHEETS 5
/6.F1
/7.E1
/9.F1
X:42
X:43
1#/2# oil level Switching power supply
TC1
63VA
1X:49
AC0
AC24-
AC24+
220V/24V
1X:50
KA3
108
three-way valve electric heating
1X:54
1X:55
three-way valve Power
KA2
107
2X:39
2X:40
2# System ejector oil return solenoid valve/VFD cooling solenoid valve
KA1
107
1X:39
1X:40
1# System ejector oil return solenoid valve/VFD cooling solenoid valve
/8.F5
RS485 communication line
HMI
24V 0V FG
804
803
/4.E12
Touch screen (HMI)
106
302
/4.C11
/4.F11


TOTAL SHEETS 13 NO. OF SHEETS 6
Power supply protection switch
1# system fan overload protection switch 4
1# system fan overload protection switch 3
1# system fan overload protection switch 2
1# system fan overload protection switch 1
1# system VFD panel ready
1# system VFD panel fault
1# system VFD panel running
1# system oil level protection switch
1# system intra-compressor protection
1# system low pressure switch
1# system high pressure switch
Circulating water flow switch
Overload protection of circulating water pump
Overload protection of anti-freezing pump
Anti-Freezing Flow Switch
Main line water flow switch
Remote off
Remote on
2# system fan group 4
2# system fan group 3
2# system fan group 2
2# system fan group 1
2# system compressor start
1# system loading solenoid valve
1# system 25% solenoid valve
1# system 50% solenoid valve
1# system 75% solenoid valve
1# system fan group 4
1# system fan group 3
1# system fan group 2
1# system fan group 1
1# system compressor start
Anti-freezing pump
2# system oil return solenoid valve
1# system oil return solenoid valve
three-way valve electric heating
Circulating water pump
Main line water pump
Note 4
Note 3
A1
CN2
CN3
CN4
CN7
CN11
CN16
/5.F12
/5.C12
Note 1: Dashed lines indicate connections that need to be performed by users.
Note 2: Marked as a group.
Note 3: Only applicable to FC (Indirect) model.
Note 4: Reserved for fixed frequency unit

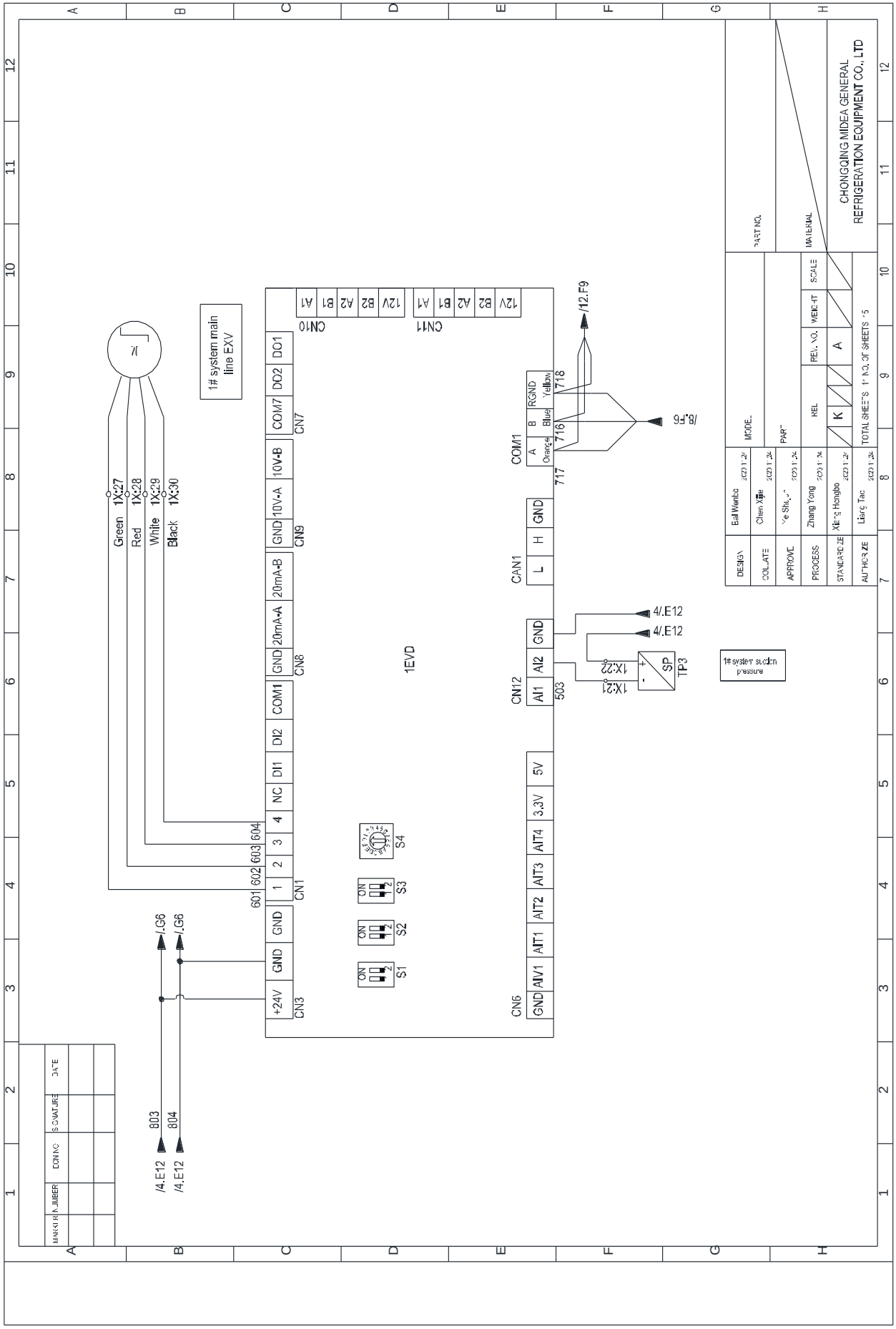

TOTAL SHEETS 13 NO. OF SHEETS 7
Note 1: Only applicable to FC (Indirect) model.
Anti-freeze tube temperature
RT11
X:46
X:45
X:44
425
424
423
Red
Red
White
CN13
CN14
Note 1
A1
CN1
CN8
CN15
CN25
CN26
CAN1
CAN2
COM1
COM2
GND
DC12V
COM
DI22
DI23
DI24
DI25
DI26
DI27
DI28
DO23
DO24
DO25
DO26
DO27
DO28
DO29
DO30
L
H
A
B
201
802
801
4/E.9
2# system VFD panel ready
2# system VFD panel fault
2# system VFD panel running
2# system oil level protection switch
2# system intra-compressor protection
2# system low pressure switch
2# system high pressure switch
2SP1
2SP2
SF2
2SL
X:69
X:68
X:67
X:66
X:65
X:64
X:10
X:9
X:8
X:7
X:6
X:5
X:4
X:3
230
229
228
227
226
225
224
2X:3
2X:4
2X:5
2X:6
2X:7
2X:8
2X:9
2X:10
Multi communication Interface
X:1
X:2
X:3
701
702
703
Communication between A1 and A2 main control board
Blue
Orange
Yellow
704
705
706
4/E.2
302
106
/5.F12
/5.C12
Shell-and-tube electric heater
Antifreeze electric heater
2# system loading solenoid valve
2# system 25% solenoid valve
2# system 50% solenoid valve
2# system 75% solenoid valve
KM24
KM27
KM23
SV9
SV8
SV7
SV6
2X:36
2X:37
2X:34
2X:35
2X:33
2X:31
2X:32
140
139
138
137
Note 5
Note 3
Note 4
Note 4
Note 3: Only applicable to FC (Indirect) model.
Note 4: Reserved for fixed frequency unit
Note 5: Applicable to Standard model.

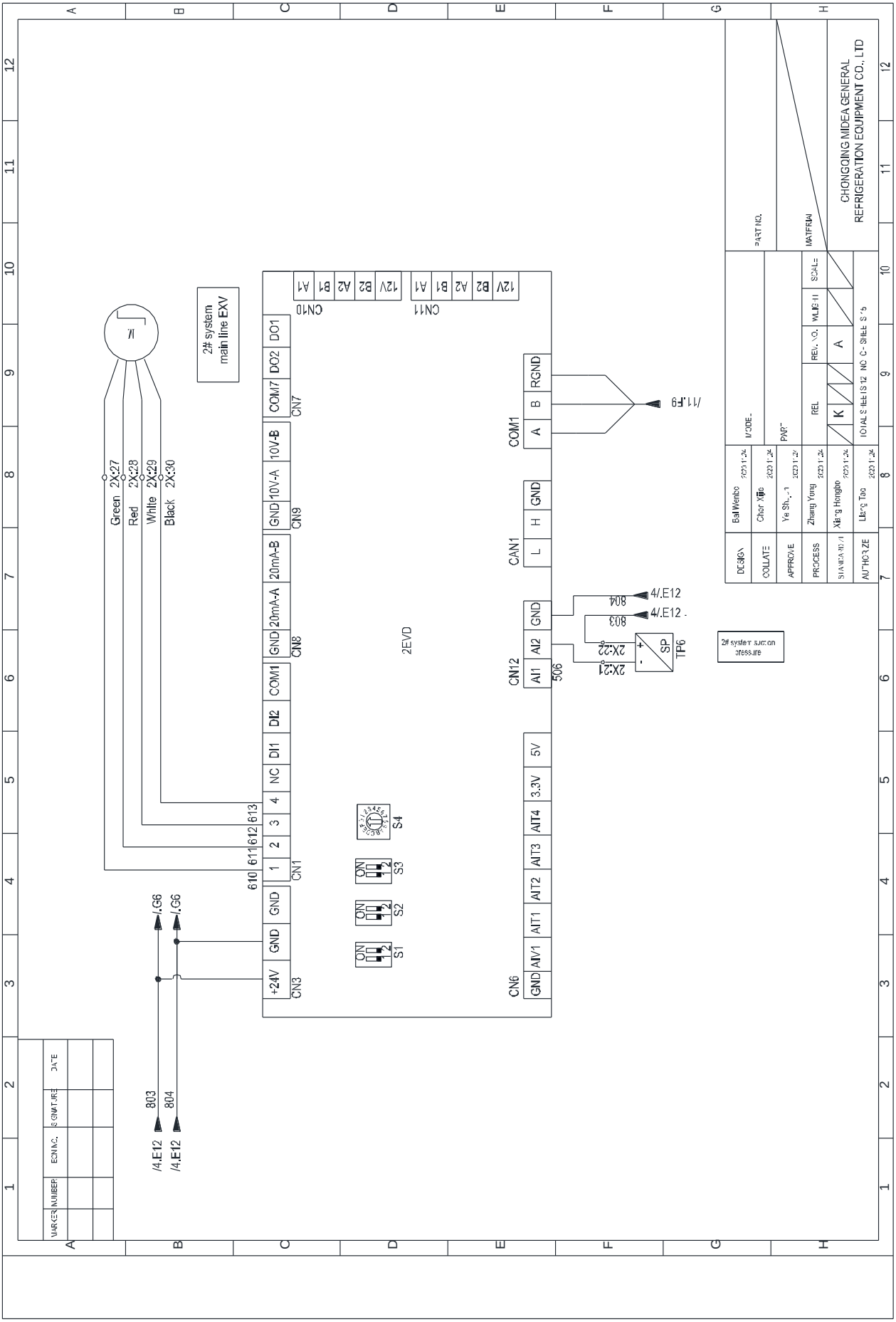

Note 1: Only appli cable to FC (Indirect) mode .
Note 2: Only appli cable to FC model.
1# system motor temperature
1# system discharge temperature
Shell-and-tube water inlet temperature
Internal circulating water inle. temperature
Ambient temperature
Water outlet temperature
Water inlet temperature
Total water outlet temperature
CN10
CN5
CN3
CN4
CN5
CN6
CN17
CN18
CN19
A1
Note 1
Note 2
1# system discharge pressure
1# system oil supply pressure
1# FXV communication
Main board and touch screen communication
1#2# VFD communication inte face
Cloud platform communication inte face
Shield layer
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD
DESIGN
CO-LATE
APPROVE
PROCESS
STANDARDIZE
AUTHORIZE
MODF
PART
MATERIAL
SCALE
WEIGHT
REV. NO.
TOTAL SHEETS 8 NO. OF SHEETS 15

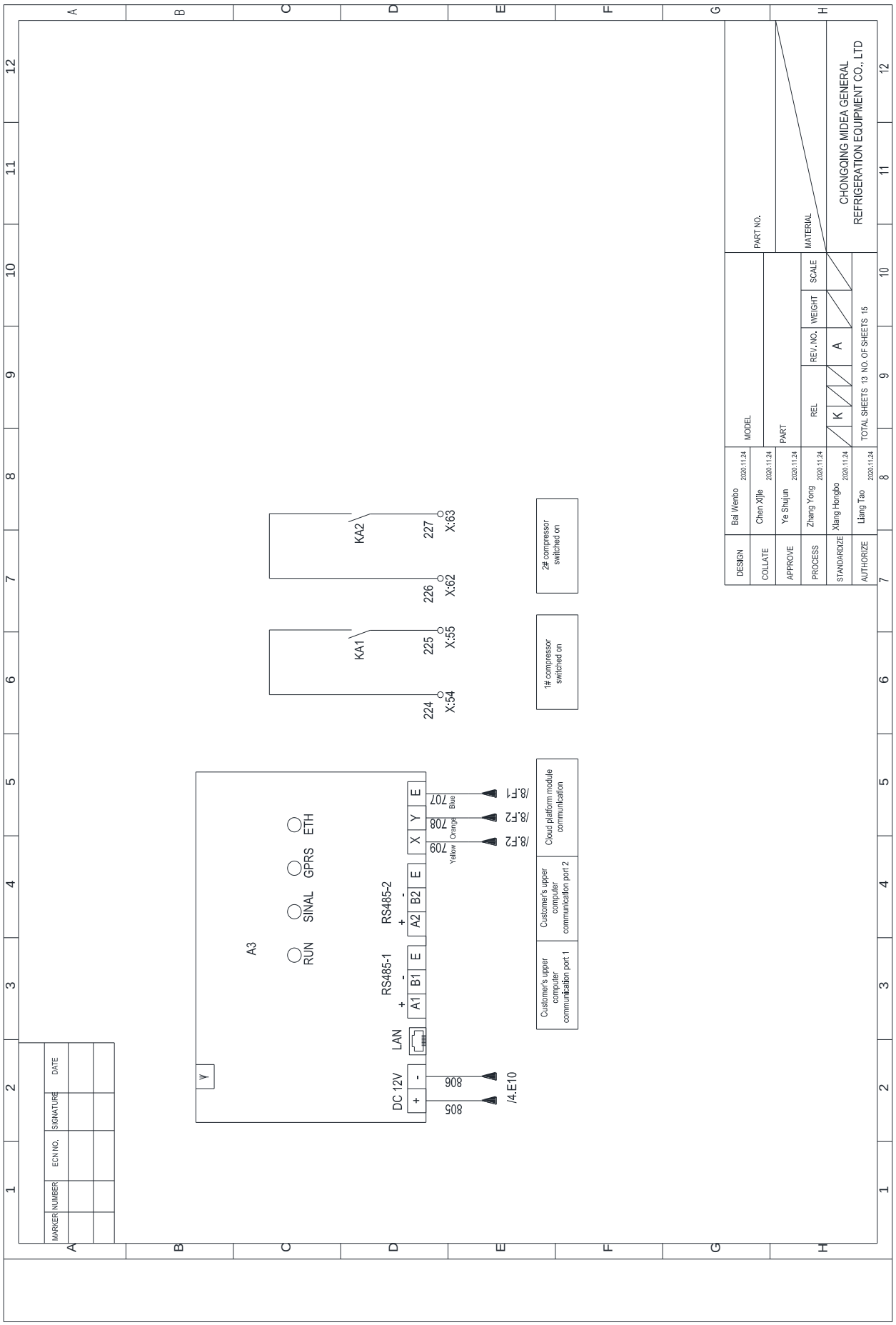

TOTAL SHEETS 13 NO. OF SHEETS 9
2# system fan overload protection switch 4
2# system fan overload protection switch 3
2# system fan overload protection switch 2
2# system fan overload protection switch 1
three-way valve close feedback
three-way valve open feedback
A2
CN2
CN3
CN4
CN7
CN11
CN16
FC three-way valve closed
FC three-way valve open
2# system spray solenoid valve
1# system spray solenoid valve
2# system oil separator heating
1# system oil separator heating
Fault
Alarm
Running
Note 1: Dashed lines indicate connections that need to be performed by users.



2# system discharge pressure
2# system oil supply pressure
2# system motor temperature
2# system discharge temperature
Communication between A1 and A2 main control board
/7.E9
4/E.9
A2
CN5
CN8
CN10
CN17
CN18
CN19
COM1
COM4
COM5
COM6
AIP1
AIP2
AIP3
AIP4
AIP5
AIP6
AII1
AII2
AII3
AII4
AIT1
AIT2
AIT3
AIT4
AIT5
AIT6
AIT7
AIT8
AO-20mA-B
AO-20mA-A
AO-10V-B
AO-10V-A
GND
D5V
D3V3
DC12V
COM
A
B
S1
S2
S3
RT9
RT10
TP4
TP5
SP
Yellow
Orange
Blue
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD
DESIGN
APPROVE
PROCESS
Bai Wenbo
Zhang Yong
Xiang Hongbo
PART NO.
MATERIAL
SCALE
WEIGHT


1# system main line EXV
Green 1X:27
Red 1X:28
White 1X:29
Black 1X:30
1EVD
CN1
CN3
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CAN1
COM1
S1
S2
S3
S4
SP
TP3
1X:21
1X:22
1# system suction pressure
/4.E12
/.G6
/12.F9
/8.F6
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD


2EVD
2# system main line EXV
Green 2X:27
Red 2X:28
White 2X:29
Black 2X:30
CN1
CN3
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CAN1
COM1
S1
S2
S3
S4
+24V
GND
AIV1
AIT1
AIT2
AIT3
AIT4
3.3V
5V
AI1
AI2
L
H
RGND
B
A
10V-B
10V-A
20mA-B
20mA-A
DI1
DI2
NC
COM1
COM7
DO2
DO1
12V
B2
B1
A2
A1
610
611
612
613
506
803
804
2X:21
2X:22
SP
TF6
2# system suction pressure
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD
DESIGN
COLLATE
APPROVE
PROCESS
STANDARDIZE
AUTHORIZE
Bai Wenbo
Chen Yibo
Ye Shu...
Zhang Yong
Xiong Hongbo
Liang Tao
2023.1.24
MODEL
PART NO.
MATERIAL
REL
REV. NO.
WEIGHT
SCALE
A
K
TOTAL SHEETS 12 NO. C - SHEET 8
MARKER
NUMBER
ECN NO.
SIGNATURE
DATE


A3
RUN
SINAL
GPRS
ETH
DC 12V
LAN
RS485-1
RS485-2
A1
B1
E
A2
B2
X
Y
805
806
707
708
709
Blue
Orange
Yellow
/4.E10
/8.F1
/8.F2
/8.F2
Customer's upper computer communication port 1
Customer's upper computer communication port 2
Cloud platform module communication
KA1
KA2
224
225
226
227
X:54
X:55
X:62
X:63
1# compressor switched on
2# compressor switched on
DESIGN
Bai Wenbo
2020.11.24
COLLATE
Chen Xifje
2020.11.24
APPROVE
Ye Shujun
2020.11.24
PROCESS
Zhang Yong
2020.11.24
STANDARDIZE
Xiang Hongbo
2020.11.24
AUTHORIZE
Liang Tao
2020.11.24
MODEL
PART
REL
K
TOTAL SHEETS 13
NO. OF SHEETS 15
PART NO.
MATERIAL
REV. NO.
A
WEIGHT
SCALE
CHONGQING MIDEA GENERAL REFRIGERATION EQUIPMENT CO., LTD
MARKER
NUMBER
ECN NO.
SIGNATURE
DATE

Attached Table 1

Air cooled screw chiller						
Part name	Hazardous substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr(VI))	Polybrominated biphenyl (PBB)	Polybrominated diphenyl ether (PBDE)
Compressor and accessories	×	×	×	×	×	×
Fan/motor	×	○	×	○	○	○
U-steel base	×	×	×	×	×	×
Heat exchanger	×	○	○	○	○	○
Pipeline parts and valve body	×	○	×	○	○	○
Refrigerant	○	○	○	○	○	○
Water pump (optional)	×	×	×	×	×	×
Electric control box	○	○	○	○	○	○
Electrical components, power cable, etc.	×	×	×	×	×	×
Fasteners such as screws and washers	×	○	○	○	○	○
Other rubber and plastic parts	×	×	×	×	×	×
Thermal insulation cotton and sound insulation cotton	○	○	○	○	○	○
Auxiliary materials such as glue and adhesive tape	×	×	×	×	×	×
Other metal parts	○	○	○	○	○	○
Printed matter	×	×	×	×	×	×

This table is prepared according to the specifications of SJ/T 11364.
○: Indicates that the content of this hazardous substance in all homogeneous materials of this part is within the limits defined in GB/T 26572.
×: Indicates that the content of this hazardous substance in at least one homogeneous material of this part exceeds the limits defined in GB/T 26572. However, it is extremely difficult to eliminate the above hazardous substance from the part based on existing technical conditions. Gradual improvements will be made to the design as technology progresses in the future.

Attached Table 2

MIDEA CHILLER INSTALLATION FEEDBACK FORM

Project name				**Project function**			
Location		**Country**		**Region**		**City**	
Customer company				**Contact/Tel**			
Agent company				**Contact/Tel**			
Installation company				**Contact/Tel**			
Commissioning engineer				**Commissioning date**			

Unit no.	Model	Serial no.	Production date
1			
2			
3			
4			
5			

Please fill in the following content faithfully and then fax or email to Midea CAC after-sales to arrange commissioning. If onsite conditions are inconsistent with the following information, the customer shall bear the related commissioning labor and travel expenses.

1. Pre-installation checks	
a) The unit was damaged during transportation	Yes [ ] No [ ]
b) Damage location (if the unit is damaged)	
c) Unit startup is affected (if the unit is damaged)	Yes [ ] No [ ]
2. Installation location	
a) The unit is installed on a foundation and shock-absorbing measures have been applied	Yes [ ] No [ ]
b) The unit is installed level (horizontal)	Yes [ ] No [ ]
c) The unit is installed with sufficient maintenance space as per the requirement in the IOM	Yes [ ] No [ ]
d) The unit meets the requirements on heat dissipation, ventilation, and drainage	Yes [ ] No [ ]
3. Unit appearance	
a) The unit appearance is damaged	Yes [ ] No [ ]
b) Refrigerant has leaked	Yes [ ] No [ ]
4. Electrical system	
a) The power supply, circuit breaker capacity, and power cable diameter meet the unit's requirements	Yes [ ] No [ ]
b) The electrical connection is correct, with all wiring terminals tightened	Yes [ ] No [ ]
c) The unit is grounded	Yes [ ] No [ ]
d) The wire between control panel and starter meet the anti-interference specification (centrifugal chiller)	Yes [ ] No [ ]

e)	The starter panel has passed the insulation test (high voltage centrifugal chiller)	Yes [ ] No [ ]
5.	**Circulating water system**	
a)	The circulating water pump is the correct model	Yes [ ] No [ ]
b)	The water capacity of circulating water system meets the requirement	Yes [ ] No [ ]
c)	Water capacity of circulating water system (L or m^3)	_____
d)	The filter is installed at the water return side	Yes [ ] No [ ]
e)	The water flow switch is correctly installed and interlocked with the unit	Yes [ ] No [ ]
f)	Accessories such as the flexible connection, thermometer, and pressure gauge are installed	Yes [ ] No [ ]
g)	The water supply and constant pressure systems are properly installed	Yes [ ] No [ ]
h)	The water treatment system is installed	Yes [ ] No [ ]
i)	The circulating water system was cleaned and drained whilst separate from the unit	Yes [ ] No [ ]
j)	The circulating water system passes the pressure test without water leakage.	Yes [ ] No [ ]
k)	The circulating water system is fully filled with water and air has been exhausted	Yes [ ] No [ ]
l)	The local temperature is lower than 0°C in winter	Yes [ ] No [ ]
m)	Freezing protection measures are taken if the local temperature is lower than 0°C in winter	Yes [ ] No [ ]
n)	The terminals (AHU/FCU) are correctly installed	Yes [ ] No [ ]
o)	Unit purpose	Commercial [ ] Industrial [ ]
p)	Two-way valves are installed at the terminals (AHU/FCU)	Yes [ ] No [ ]
q)	Bypass pipe is installed	Yes [ ] No [ ]
6.	**Pre-commissioning preparations**	
a)	A temporary power supply is being used	Yes [ ] No [ ]
b)	The power voltage is within the normal range	Yes [ ] No [ ]
c)	Power voltages	L1 _____ L2 _____ L3 _____
d)	The voltage imbalance rate is less than 2%	Yes [ ] No [ ]
e)	The installation engineer will be onsite during commissioning	Yes [ ] No [ ]
7.	**Other comments/notes**	

	Customer	**Installer**
Name:		
Signature:		
Date:		

Attached Table 3

Daily Inspection Record Table

Date	Time	Ambient temperature (°C)	Inlet water temperature (°C)	Outlet water temperature (°C)	Discharge pressure (bar)	Suction pressure (bar)	Discharge temperature (°C)	Suction temperature (°C)

Note: The customer needs to fill in and keep this form properly. It can be copied for use.

Attached Table 4

Inspection Record Table of Key Parts

Item	Compressor			Water side heat exchanger			Air side heat exchanger			Fan			Valves			Electric control box			Others		
Frequency	Date	Inspector	Content	Date	Inspector	Content	Date	Inspector	Content	Date	Inspector	Content	Date	Inspector	Content	Date	Inspector	Content	Date	Inspector	Content
6 months																					
1 year																					
2 years																					
3 years																					
4 years																					
5 years																					
6 years																					
7 years																					
8 years																					
9 years																					
10 years																					
11 years																					
12 years																					
13 years																					
14 years																					
15 years																					

Notes: 1. Fill A or B or C in each "Content" column, where A indicates the normal inspection result, B indicates that some parts are replaced, and C indicates that some parts are maintained.

2. Key points for inspection: ① Check the color of the compressor oil; ② Check the oil pressure difference; ③ Check the front and rear pressure difference of the dry filter and the test paper color of the sight glass

Note: The customer needs to fill in and keep this form properly. It can be copied for use.

Attached Table 5

Maintenance Record

No.	Fault Description	Handling Measures	Handling Results	Recorded by
1				
2				
3				
4				
5				
6				
7				

Note: Fill in this form carefully and store it properly.

EM20U-A007B

16127200018575

Midea

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