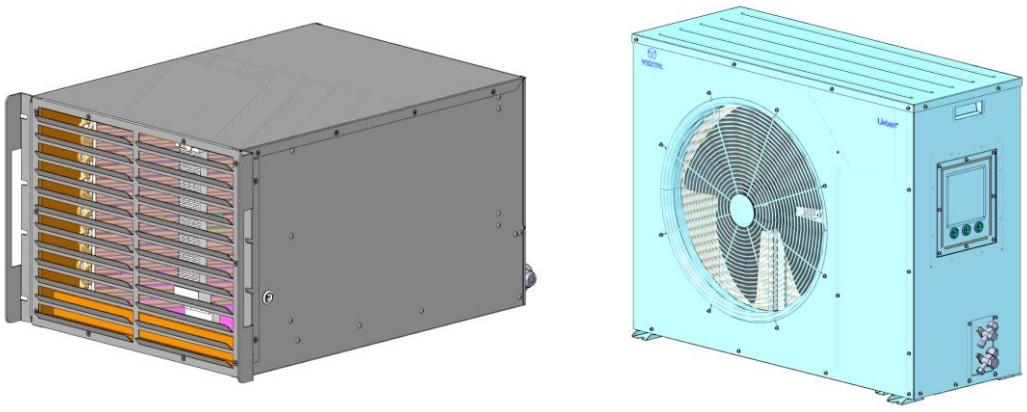
Rack Cooling 6.5 kW

User Manual

1 Product Overview

1.1 Product Model Description

The physical appearance of air conditioner is shown in Figure 1-1.



Indoor unit **condensing unit**

Figure 1-1 Appearance of the air conditioner

The indoor unit is installed in the rack or at the ceiling. The condensing unit is mounted external to the rack, preferably outside in an exposed environment.

1.2 Model Nomenclature

The nomenclature of the units is shown in Figure 1-2.

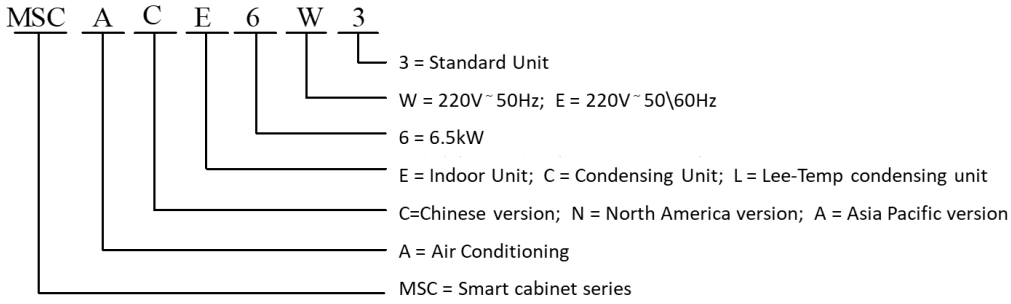


Figure 1-2 Nomenclature

Table 1-1 below mentions the description of the indoor and condensing units as per the nomenclature.

Table 1-1 Model coding description

Sort	Model	Power Supply	Description
Indoor unit	MSC-ACE6W3	220V/ 50Hz	6.5kW，PTC electric heater，Accessory box ,Chinese Version
	MSC-ACE6W4	220V/ 50Hz	6.5kW，Aaccessory box，Chinese Version

condensing unit	MSC-ACC6W3	220V/ 50Hz	6.5kW，PTC electric heater，Accessory box，Chinese Version

1.3 Indoor Unit

The main components of the indoor unit include evaporator coil,condensate drain tray,EC fan,electronic expansion valve.The components of the indoor unit are depicted in Figure 1-3.

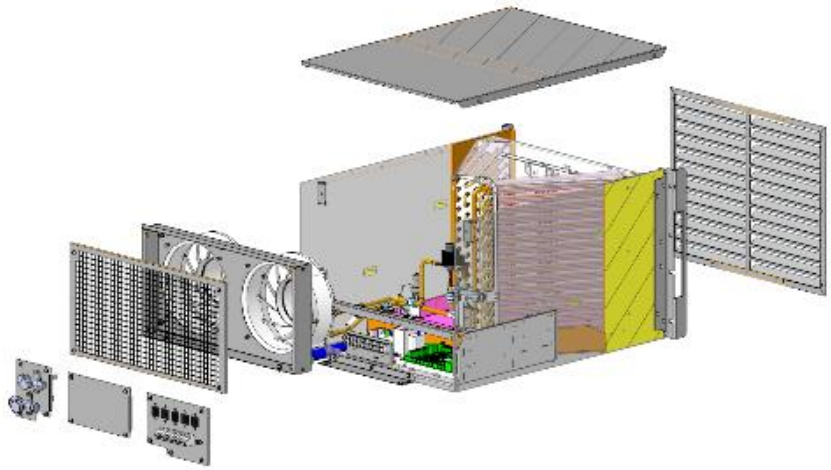


Figure 1-3 Indoor unit

1.4 condensing unit

The main components of the condensing unit include compressor, condenser coil and condenser fan，The components of the condensing unit are depicted in Figure 1-4.

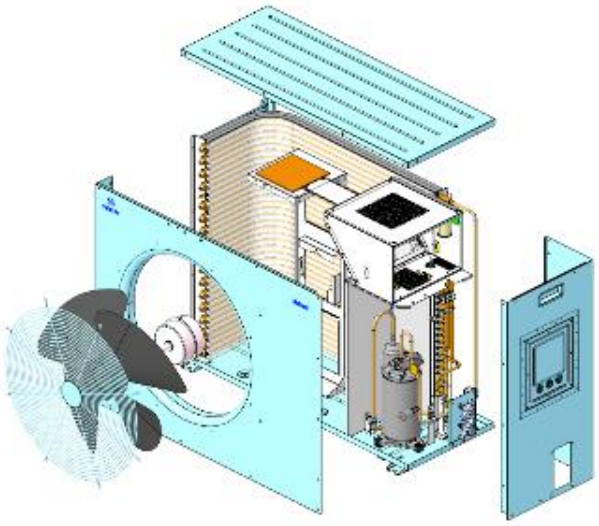


Figure 1-4 condensing unit

2. Mechanical Installation

2.1 Install air conditioning components

For models with optional heaters, keep a minimum distance of 150mm between the indoor unit and the surrounding combustible surfaces. When testing the unit, please keep the external static pressure of the test below 100Pa to prevent the unit's air volume from being too low and the heater from overheating.

The indoor unit has been installed in the cabinet when it leaves the factory, and the condensing unit is packaged and shipped separately. The customer site needs to reasonably place the outdoor unit of the air conditioner, connect the copper pipes of the indoor unit and condensing unit, extract the air from the system, and connect cables.

The condensing unit must be installed vertically. The condensing unit can either be installed higher than the indoor unit or lower than the indoor unit. Figure 2-1 shows the scenario where the condensing unit is installed higher than the indoor unit.

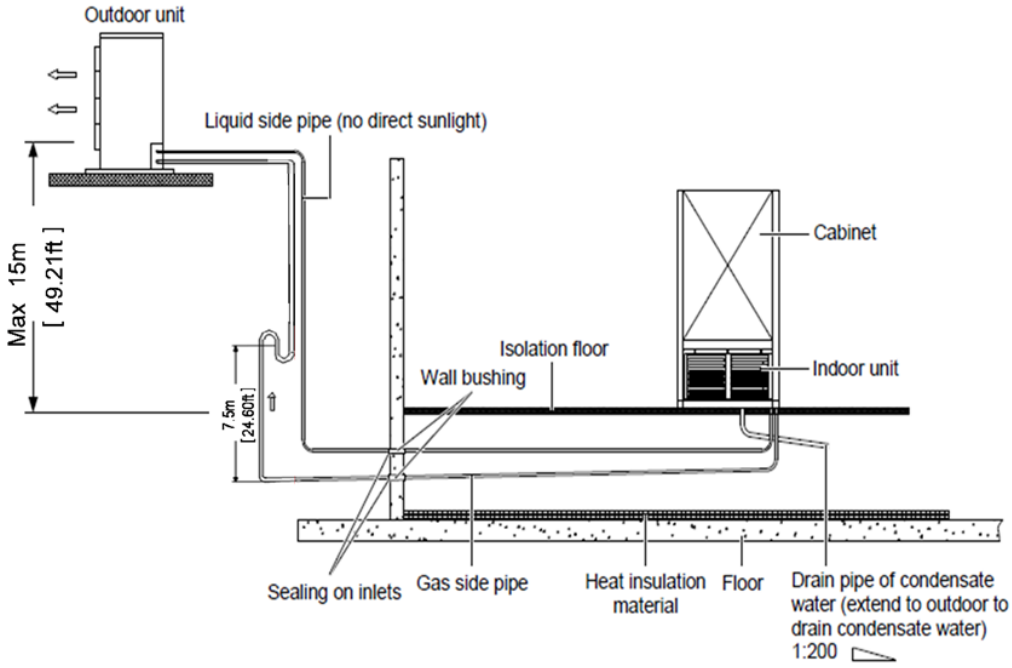


Figure 2-1 The Condensing unit is installed higher than the indoor unit

Figure 2-2 shows the scenario where the condensing unit is installed lower than the indoor unit.

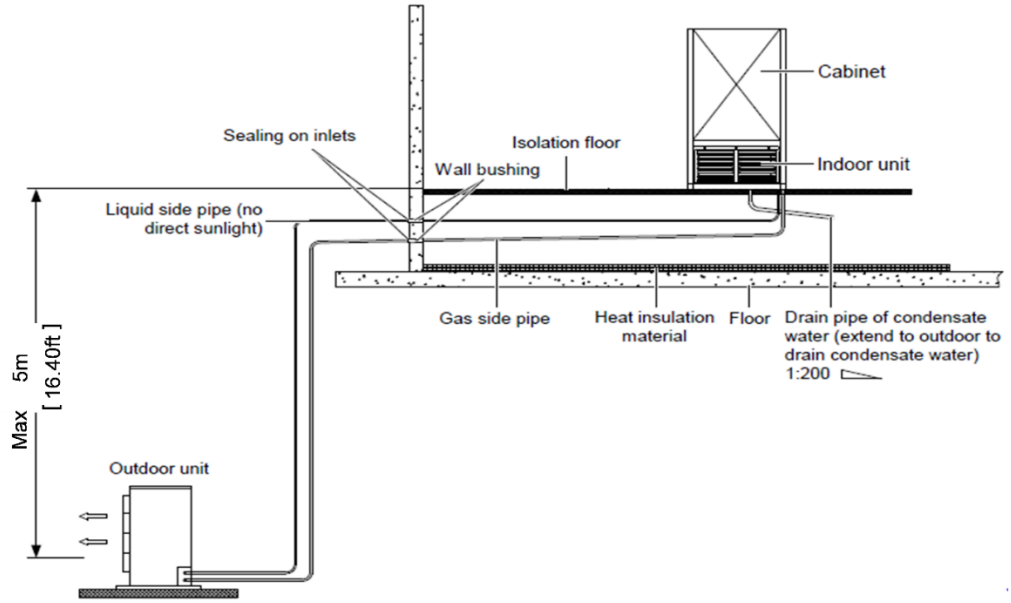


Figure 2-2 The Condensing unit is installed lower than the indoor unit

Following are the steps that need to be observed for the regular installation of the condensing unit:

1. Place the condensing unit on the base
2. Use expansion bolts to fix the condensing unit on the base.

If there are multiple condensing units, they need to be placed on top of the other. The method to implement placement of the condensing units on top of the other is shown in Figure 2-3.

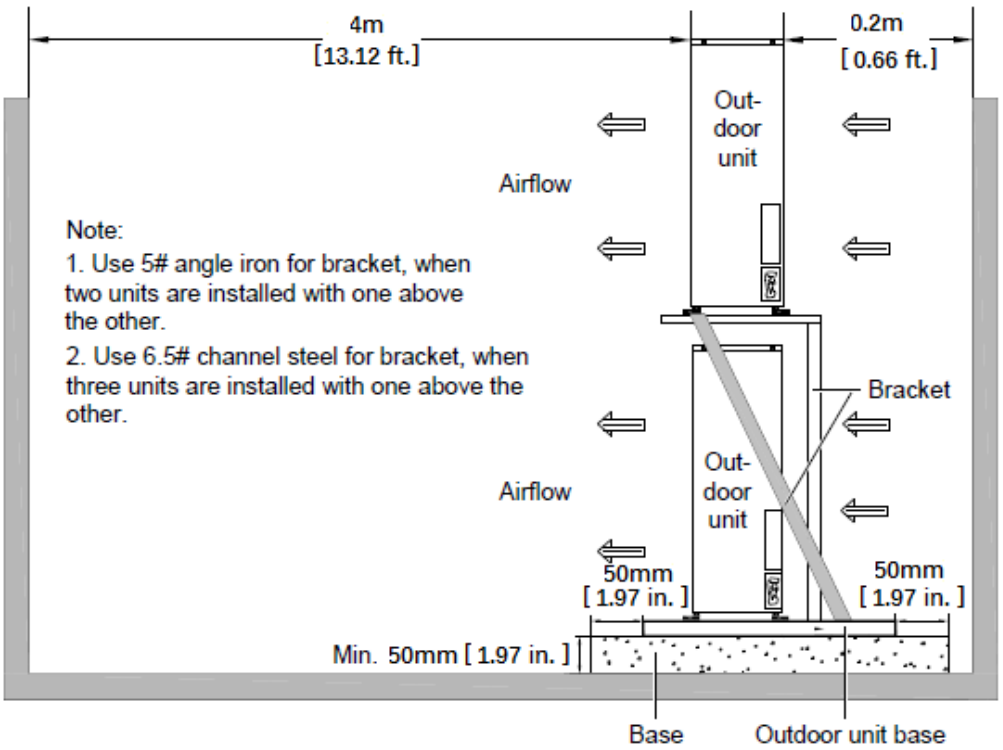


Figure 2-3 Installing multiple condensing units one above the other

Note

Following points need to be taken during the installation of the condensing unit:

- The condensing unit must be placed appropriately in a safe place for maintenance. It also should not be installed on the bottom floor of the public site. It should not be kept in a residential area.
- It should not be kept in an environment where noise levels are considered crucial.
- Keep the condensing unit in a clean environment, free of debris, dust foreign matter. This is done to avoid blocking of the heat exchanger and ensure an efficient cooling effect.
- There should be no steam, hot gas exhaust gas near the condensing unit.
- Preferably, keep above 450mm between the condensing unit and the wall, obstacles, or adjacent devices. For normal condensing unit, if the condensing unit will be installed in an outdoor environment, the recommended distance of the back side (return air side) from the wall should be 200mm (7.87 in.). It is a must to provide these clearance distances to ensure appropriate airflow across the condensing unit.
- Avoid keeping the condensing unit in places where snow may accumulate in the air intake side and air outlet side.
- Preparing a base to bear the weight of the condensing unit is important where the base should be at least 50mm (1.97in.) higher than the ground and 50mm (1.97in.) wider than the condensing unit base.
- The condensing is around 44 kg (97 lbs.); therefore, utmost care must be taken while removing it; any mishandling will result in severe injury and damage to the equipment.

Connect the indoor unit drain pipe

Down pipe drain

The indoor unit drains directly to the drain tray inside the cabinet, and the condensed water is led to the drain trough or outdoors along the drain pipe at the bottom of the cabinet, as shown in Figure 2-4. The drain pipe should not be placed in a position where the temperature is freezing, and must be laid close to the ground. , The pipeline cannot be higher than the height of the outlet of the drip tray.

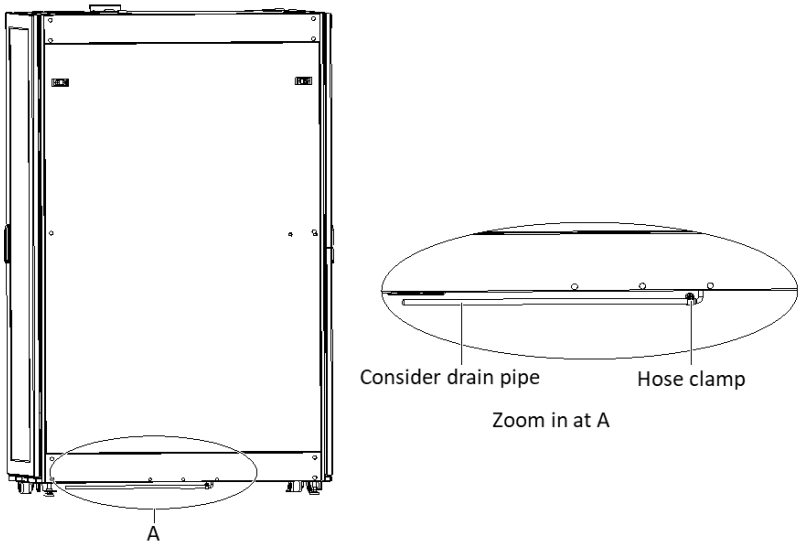


Figure 2-4 Schematic diagram of down pipe drainage

2.2 Connecting the Copper Pipes to the Unit

General Principles

- Copper pipes with quick thread connectors must be used to connect the indoor and condensing unit. If the pipe length exceeds the standard pipe length and a straight copper pipe is used, in that case, piping joints must be brazed.
- Follow standard industry practices in selection and placement of pipes, system evacuation charging with refrigerant (only when the pipeline is long). The standard refrigerant of the unit is R410A. The charging amount is 2.3kg
- Take the pipeline pressure drop and the oil return to the compressor into consideration to avoid oil leakage and clogging in parts of the system. Utmost care while considering these factors minimizes the noise and vibration significantly.
- If the equivalent length exceeds 20m, or the vertical height difference between the indoor unit and the outdoor unit exceeds the value shown in Table 2-1, please consult the manufacturer before installation to confirm whether additional pipeline extension components are needed.

Table 2-1 Vertical height difference between indoor unit and condensing unit

relative position	Value
The outdoor unit is higher than the indoor unit	Max：15m
The outdoor unit is lower than the indoor unit	Max：5m

The Table 2-2 prescribes the equivalent length of the piping to be considered in the liquid line piping for the bends and the elbows connector devices.

Table 2-2 Equivalent length for bends and elbows

Liquid pipe OD (mm (inch))	Equivalent length (m (ft.))		
	90° elbow	45° elbow	T-type three way
9.52 (3/8)	0.21	0.10	0.74

	(0.69)	(0.33)	(2.43)
12.7 (1/2)	0.24 (0.79)	0.12 (0.39)	0.76 (2.49)

Standard connecting pipe 5m: 6.5kW air conditioner adopts air pipe diameter 1/2 inch and liquid pipe diameter 3/8 inch.

The longest connecting pipe is 30m.

6.5kW air conditioner, within 10m of connecting pipe, the diameter of the air pipe is 1/2 inch, and the diameter of the liquid pipe is 3/8 inch. The connecting pipe is 10-30m, the diameter of the gas pipe is 5/8 inch, and the diameter of the liquid pipe is 1/2 inch.

2．Installation Notes of the connector

Both top as well as the bottom piping method are compatible with the unit. The connectors of the unit are located on the indoor unit and condensing unit. Utmost care must be taken while connecting the quick thread connector.

Read the following steps thoroughly before making the connection:

- Remove the dust-proof caps.
- Wipe the coupling seats and threaded surface with a clean cloth carefully.
- Lubricate the male thread with refrigerant oil.
- Thread the coupling halves together manually (by hand) to ensure that the threads mate properly.
- Tighten the coupling body's hexagon nut and union valve until a definite resistance is felt.6）
- Use a marker to draw a longitudinal line from the connecting nut to the end of the pipe; then use two wrenches to tighten the nut a quarter turn to ensure air tightness. The misalignment of the line indicates that it is tightly connected. During the installation process, two wrenches must be used together. The operation of one wrench can easily damage the connecting copper pipe of the valve.

Refer to Table 2-3 for recommended tightening torque values.

Table 2-3 Recommended torque value of quick connector

Coupling size (mm (inch))	Torque value (N.m)
9.52 (3/8)	7～8
12.7 (1/2)	8～9

3． Pipes to be connected

The refrigerant pipeline (gas side pipe and liquid side pipe) between the indoor unit and the outdoor unit is shown in Figure 2-4

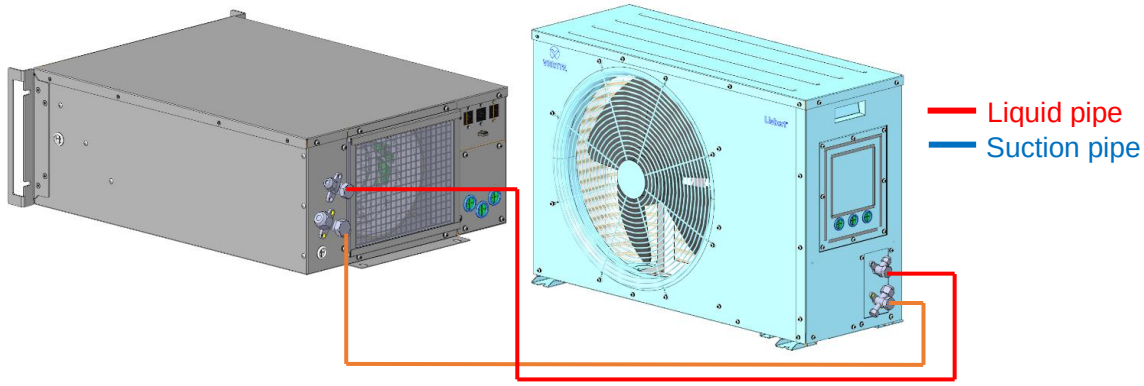


Figure 2-4 Schematic diagram of pipeline connection

1）The length of the copper pipe provided by the manufacturer is 5m. If you need a longer pipe, please contact Vertiv or its sales agent.

2）The liquid side pipeline is the outlet refrigerant liquid pipeline of the condensing unit. The liquid side tube should be selected with a reasonable diameter and length to ensure that the pressure drop caused by the refrigerant liquid flowing through the liquid side tube when the unit is running does not exceed 40kPa (5psi～6psi) .

3）Install and remove the connecting pipeline carefully so that the pipeline is not twisted or damaged. Pipeline bending machine should be used to bend the pipe and then connect with pipe joints.

4）If all refrigeration circuit pipelines need to be connected by welding, they should be brazed and welded with silver electrodes.

5）Before use, the connecting pipe needs to be supported, leak tested, pressurized, and vacuumed, and separated from the building with a vibration isolation frame.

6）In order not to damage the pipeline and reduce vibration when perforating the wall, it is necessary to wrap some flexible soft materials around the pipeline.

7）This unit adopts quick connection mode.

8）Long connecting pipe system adds refrigerant: The series air conditioners have been filled with a certain amount of refrigerant and lubricating oil according to the design when they leave the factory. In the engineering installation, if the connecting pipeline between the indoor and condensing units exceeds 10m, it is necessary to add refrigerant and lubricating oil to make the system operate normally. The amount of refrigerant and lubricant Refrigerant and refrigerant oil must be added in accordance with the following formula:

Refrigerant and refrigerant oil amount to be added (kg (lbs.)) = Adding refrigerant and refrigerant oil amount per meter of the liquid pipe (kg/m. (lbs./ft)) × total length of the extended liquid pipe (m. (ft))

Table2-4 Additional refrigerant and refrigerant oil

Adding refrigerant amount per meter kg/m	Adding refrigerant oil (FV50S) amount per meter ml/m (ml/ft.)
0.1	11

note

1、Must be use the specific type of refrigerant and lubricating oil directly issued by the company must be used, otherwise the compressor may be damaged. When adding refrigerant and lubricating oil to the refrigeration system, please contact Vertiv technical customer service.

2、 Adding inferior refrigerants or lubricating oil, or adding incorrect refrigerants or lubricating oils will damage the system, and the quality problems caused by this will not be covered by the warranty.

2.3 Pipeline connection inspection

Pipe inspection: focus on checking whether there is any leakage in the connecting pipes. The copper pipes and valves of the internal machine need to be inspected with full insulation cotton as shown in Figure 2-5.

Figure 2-5 Copper pipe connection inspection

3. Electrical Installation

This series of air conditioners need to be installed in accordance with national wiring regulations.

3.1 Task introduction

Lines to be connected at the installation site:

1. Indoor unit power cable:：1P3W power cable（1×L＋N＋PE）, specification 1.5mm^2.
2. Condensing unit power cable:1P3W power cable（1×L＋N＋PE）, specification 0.75mm^2.
3. Condensing unit compressor power cable：1P3W power cable（1×L＋N＋PE）, specification 1.5mm^2.
4. Compressor Telecommunication Cable: standard twisted pair.

3.2 Precautions

This air conditioner is a professional equipment, used in industrial, commercial or other professional occasions, and is not sold to the general public. Its total rated power is greater than 1kW and conforms to the IEC61000-3-12 standard. It is necessary to provide an interface between the user's power supply and the grid with a short-circuit ratio greater than or equal to 250. The user needs to obtain permission from the power supply department to ensure that the air conditioner is connected to the short-circuit ratio greater than or equal to 250 power supply.

1. All power and control wiring and ground connections must be in accordance with the national and local electrician regulations.
2. See the equipment nameplate for the full load current. The cable sizes should meet the local wiring standards and regulations.
3. Requirements for the main power supply：1P3W（220~240Vac，50Hz，1×L＋N＋PE）。
4. The electrical installation and maintenance must be performed by authorized professional installation personnel.
5. Before performing any electrical works, use a voltmeter to measure the power supply voltage and make sure that the power supply has been switched off.
6. A proper rated circuit breaker should be installed so that the unit can be easily disconnected from power supply .
7. If the power cord is damaged, it must be replaced by a professional maintenance person.
8. The input power supply needs to comply with national and local standards, and the compressor power supply and fan power cords need to comply with national and local outdoor use standards.

3.3 Cable Connection

The cable connections for the indoor unit are done through the cover panel at the back-side of the unit as shown in Figure 3-1.

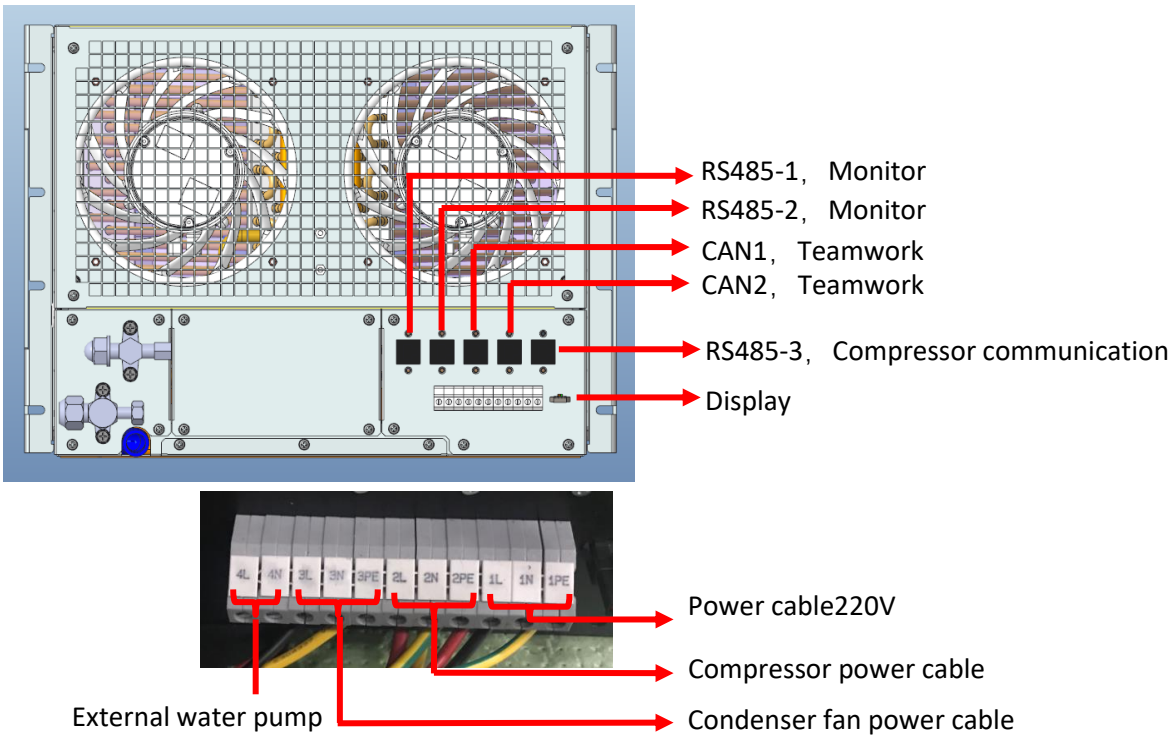


Figure 3-1 Schematic diagram of indoor unit cable connection

The cables of the condensing units are depicted in Figure 3-2.

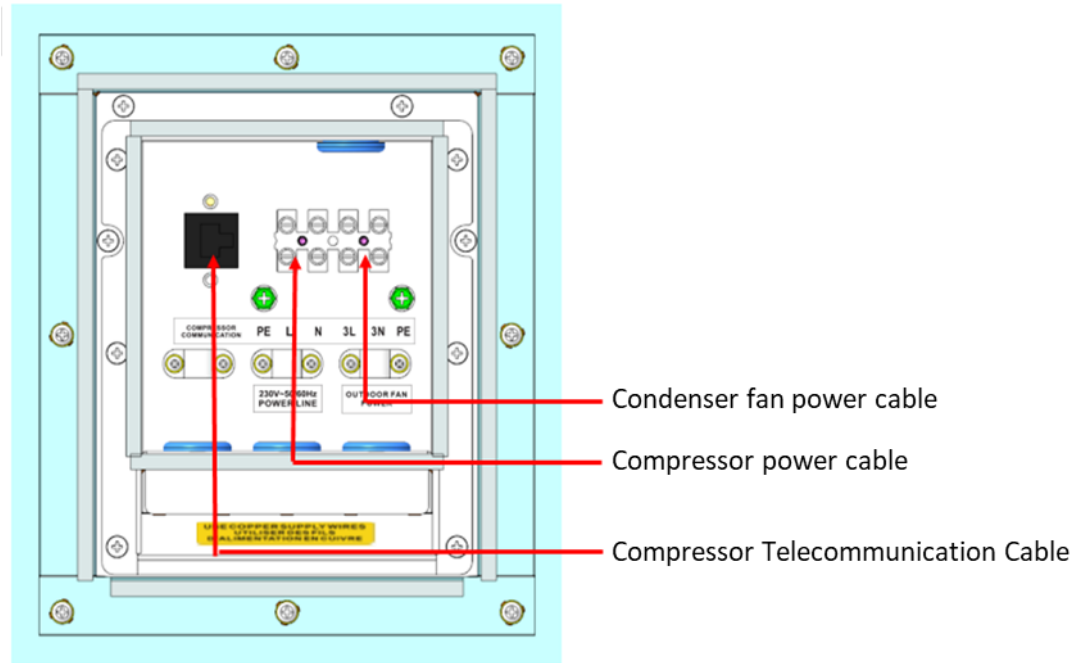


Figure 3-2 Condensing unit cable connection

The cables of the indoor and the condensing units are depicted in Figure 3-3

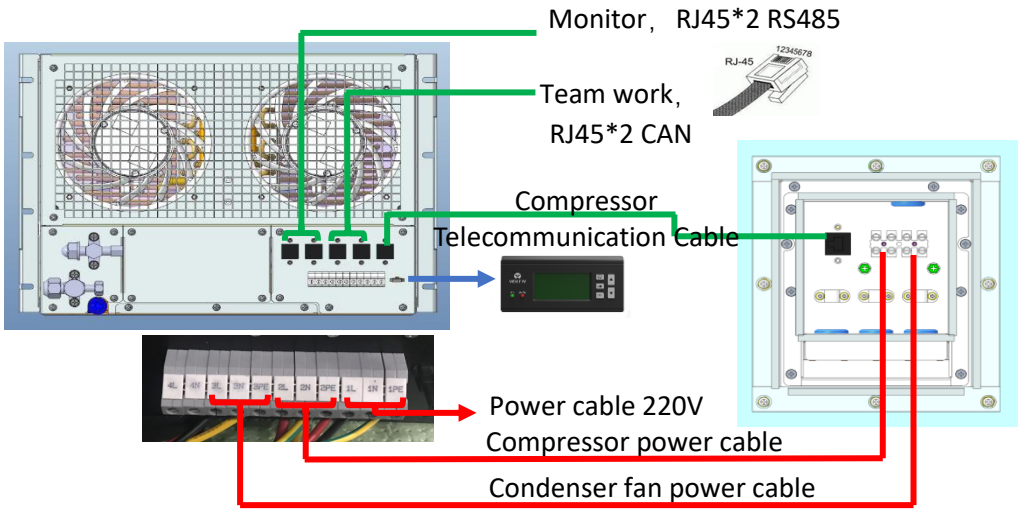


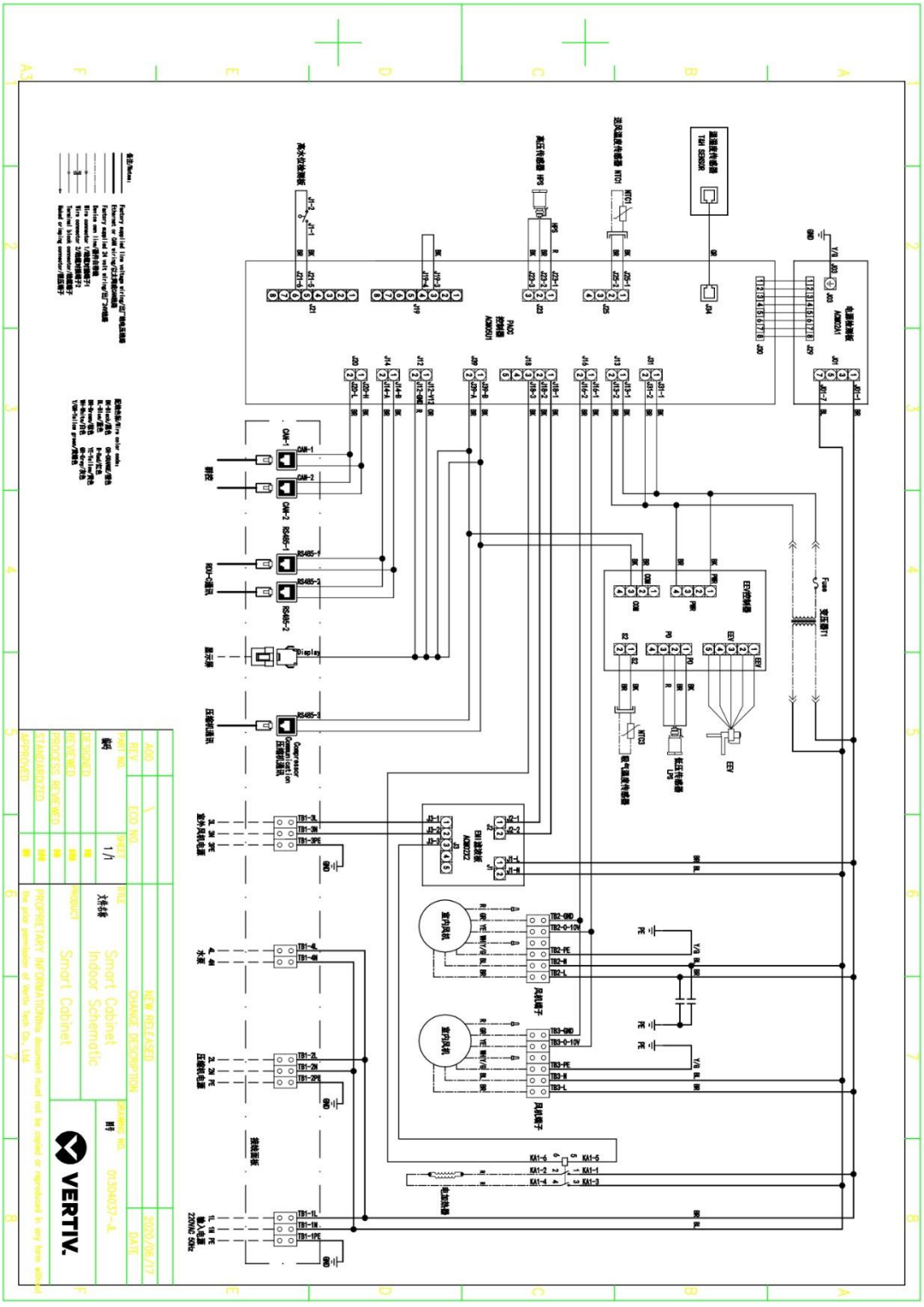
Figure 3-3 Overview of the cabling connections

3.4 Connection check

Whether all external cable is corresponding, fastened, and the cable is fixed in the wire clamp. Check whether the power cable corresponds. The connection cables of the indoor and condensing machines should be checked for correct connection, as shown in Figure 3-4。

Figure 3-4 Check the connection cable

Appendix I：Indoor Unit Wiring Diagram



Appendix II：Condensing Unit Wiring Diagram