ComfortStar® Orbit series™

# FULL DC INVERTER COOLING ONLY TECHNICAL MANUAL

## CC-VAC

*Cooling only 208-230V/3PH/60Hz*

## CONDENSING UNITS

Revision V 2303

AHRI CERTIFIED® www.ahridirectory.org Unitary Small AC AHRI Standard 210/240 Certification applies only when the complete system is listed with AHRI

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## Model Numbers:

**CC-VAC008-2PS1, CC-VAC010-2PS1, CC-VAC012-2PS1, CC-VAC014-2PS1, CC-VAC016-2PS1, CC-VAC018-2PS1, CC-VAC020-2PS1, CC-VAC022-2PS1, CC-VAC024-2PS1**

### Table of Contents


**Part A. General information**
**1.Full DC Inverter introduction**
**2. Outdoor units**

**Part B. Outdoor units**
**1.Specifications**
**2. Dimensions**
**3. Outdoor refrigerant circuit diagram**
**4. Outdoor unit wiring diagrams and field wiring**
**5. Operation limits**
**6. Operation sound levels**
**7. Outdoor fan performance**
**8. Functional parts and safety devices**
**9. Exploded views**


**WARNING**

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

# Content

**Part A. General information**

**Part B. Outdoor units**

# Part A. General information

1. Full DC Inverter introduction
2. Outdoor units

# 1. Introduction

1.1 Basic modules

a) 7 basic modules: 8HP, 10HP, 12HP, 14HP, 16HP, 18HP, 20HP, 22HP and 24HP..

b) Modules can be freely combined to become larger unit.


8HP/10HP/12HP 14HP/16HP/18HP 20HP/ 22HP 24HP

1.2 Several core technologies make system high efficiency

1.2.1 High Efficiency DC inverter compressor

- High pressure chamber
  - has small suction refrigerant super heat, refrigerant volume efficiency is high
  - Has large refrigerant discharge buffer volume, Low vibration and noise
- Neodymium permanent magnet rotor, has powerful magnetic force, large torque and high efficiency
- Concentrated winding, improving low frequency efficiency

1.2.2 Full DC inverter compressors technology

- All the compressors in outdoor unit are DC inverter compressors.
- Contribute to higher EER

1.2.3 High Efficiency DC motor

- Low noise and high efficiency because of high-density wire winding engineering
- Brushless with built-in sensor

1.2.4 Stepless Control

- DC fan motor can be stepless controlled by outdoor PCB according to system's operating pressure. And it is able to reduce the energy consumption and maintain the system in the best performance.

1.2.5 180˚ Sine Waveform Control

- The perfect combination of 180˚ Sine waveform rotor frequency drive control technology and excellent IPM inverters reduces the reactive loss of motor-driven, increases motor efficiency by 12%.

1.2.6 CCT Inner-grooved Tube

- CCT (Continuous Cooling Transformation) inner-grooved copper tube has high thermometric conductivity. Its inner-grooved fins break the refrigerant flow boundary layer to enhance refrigerant disturbance to increase heat-exchanging efficiency.

1.2.7 2-in-1 Refrigerant Flow Path Design

- Thanks to the 2-in-1 refrigerant flow path design, the liquid refrigerant volume proportion in the condenser outlet is highly increased, so the indoor unit's will produce more heat (or cool).

1.2.8 Super cooling Flow Path Design.

- Super cooling flow path design, separates the refrigerant inlet and outlet, increase the supercooling degree, reduce the effect of high temperature inlet gas refrigerant to low temperature outlet liquid refrigerant, therefore, the system efficiency will be greatly increased.

1.2.9 Cross Flow Fins.

- Has low air resistance and great heat transfer coefficient
- Frosting improved, frost on the heat exchanger will be well-distributed, easy for defrosting.

1.2.10 New internal structure.

- Thanks to the optimization pipeline design, 5% pressure drop is reduced.
- EER and COP increase, because of evaporating temperature increase and compressor work decrease.

1.3 Benefits for users

1.3.1 Excellent in EER and COP

- Thanks to DC devices(compressor and motor), piping optimization design and new control logic, system's EER and COP are observably increase.

1.3.2 Outstanding comfort ability

- Comfortstar system have excellent cooling & heating performance, thanks to the high efficiency DC fan motor, DC compressor and optimized refrigerant flow control logic.
- Precisely room temperature control by adopting large pulse EXV. Indoor temperature fluctuation can be maintain within 0.5 ˚C, offers outstanding comfort ability.

1.3.3 Wide operation range.

- Cooling operating temperature is up to 50˚C, suitable for the hot region.

1.3.4 7 improvements to reduce noise

- Maximum 10dB(A) decrease.
- Brushless DC motor
- Streamline air duct design
- Anti-vibration fan blade
- 180˚ Sine Waveform Control
- Circuit Silencer
- Low noise compressor
- Night time silent operation

1.3.5 Silent mode, night time noise control

- Maximum 10dB(A) decrease.

1.3.6 Anti-snow Function

- In the cold weather, outdoor fan will start to run for a while at intervals, for preventing the snow to accumulate on fan blade. Because accumulated snow will freeze and block fan blade rotating, even worse it will damage the motor.
- It only starts when temperature is lower than 0˚C.

1.3.7 All outdoor units cycle operation

- In one combination system, any outdoor unit can run as master unit.
- Balance the lifespan among outdoor units in one system.

1.3.8 Intelligent defrosting program

- Program starts only when unit needs to. Whereas conventional unit's defrosting timing & duration is fixed, causing fluctuations in temperature and personal comfort.

1.3.9 Flexible for all kinds of rooms

- 11 types & 68 models of indoor units, suitable for all kinds of rooms.

1.3.10 Environment friendly

- Refrigerant R410A(HFC), low carbon footprint, no harm to Ozone.

1.4 Benefits for installers

1.4.1 4 unit combination, capacity up to 80HP.

- When large capacity system is needed, CC-VAC system saves money on piping installation.

1.4.2 Adjustable outdoor fan external static pressure

- Thanks to DC fan motor, the external static pressure of outdoor fan is adjustable.
- Outdoor units can be installed in the service floor or facility room.
- Maximum ESP 85Pa.

1.4.3 New wired controller

- Bidirectional communication. Indoor unit's operating parameters (error code, temperature, address) can be inquired and displayed on the controller.
- Compact design
- 3" screen with white background light
- Timer function
- Electrical standard dimensions
- User can check the error code and inquiry unit status very easy, safe and convenient.

1.4.4 Addressing methods

- 2 addressing methods:
- Automatically addressing: system will distribute address to indoor unit automatically
- Manually setting by wireless remote controller
- Addressing method can be selected easily by adjusting the switch on outdoor PCB.
- Automatic addressing will reduce artificial faults by 35% and 5% manual works.
    - 54% system failure were caused by communication faults.
    - 65% communication faults were caused by address problems.
    - Most of the address problems were: address setting forgotten, wrong settings, address repeat.

1.4.5 LED display on the PCB

- LED display on the PCB, it can show system's operation status and error codes.

1.4.6 Service window on the electric control box.

- Thanks to the service window, checking outdoor unit’s status and setting is now easy, no need to remove the electric control box cover.

1.4.7 New internal structure.

- All key components are designed to close to outside, it is convenient for repair and replacement.
- Thanks to the new balance technology, gas balance pipe does no longer exist, brazing points and leaking risk are decreased.

1.4.8 Oil control technology

- Core oil control technology makes system safety & reliable.

1.4.9 Heavy duty coating

- The new application method of the anti-corrosion coating significantly improved thickness.
- Special coating can be customized to prevent rusting and spoiling.

1.4.10 3-phase power protector (Optional device)

- Protect the outdoor unit from instable voltage.

1.4.11 Easy installation

- Easy for the outdoor unit to transporting to roof floor by elevator due to its compact size.
- Communication wire length can be up to 1000m.

1.4.12 Use 2-core shielded wire as signal wire

- Saves installation cost.
- Reduces manual works.

## 2. Outdoor units

2.1External appearance

| 8HP / 10HP/12HP | 14HP / 16HP/18HP | 20HP / 22HP | 24HP |
|---|---|---|---|
|  |  |  |  |

2.2 Outdoor units combination table

| Capacity (HP) | Model | Recommend combination | | | | | | | | | Max. indoor unit quantity. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8HP | 10HP | 12HP | 14HP | 16HP | 18HP | 20HP | 22HP | 24HP | |
| 8 | CC-VAC008-2PS1 | ● | | | | | | | | | 13 |
| 10 | CC-VAC010-2PS1 | | ● | | | | | | | | 16 |
| 12 | CC-VAC012-2PS1 | | | ● | | | | | | | 19 |
| 14 | CC-VAC014-2PS1 | | | | ● | | | | | | 23 |
| 16 | CC-VAC016-2PS1 | | | | | ● | | | | | 26 |
| 18 | CC-VAC018-2PS1 | | | | | | ● | | | | 29 |
| 20 | CC-VAC020-2PS1 | | | | | | | ● | | | 33 |
| 22 | CC-VAC022-2PS1 | | | | | | | | ● | | 36 |
| 24 | CC-VAC024-2PS1 | | | | | | | | | ● | 39 |

# Part B. Outdoor units

1. Specifications
2. Dimensions
3. Outdoor refrigerant circuit diagram
4. Outdoor unit wiring diagrams and field wiring
5. Operation limits
6. Operation sound levels
7. Outdoor fan performance
8. Functional parts and safety devices
9. Exploded view

# 1. Specifications

1.1 Outdoor unit (8HP, 10HP, 12HP)

| **Model name** | | | **CC-VAC008-2PS1** | **CC-VAC010-2PS1** | **CC-VAC012-2PS1** |
|---|---|---|---|---|---|
| **Performance data** | | | 208~230V-3N-60Hz | 208~230V-3N-60Hz | 208~230V-3N-60Hz |
| Cooling | Capacity | HP | 8HP | 10HP | 12HP |
| | | kW | 25.2 | 28 | 33.5 |
| | | Btu/h | 86000 | 95500 | 114000 |
| | | RT | 7.2 | 8 | 9.5 |
| | Power input | kW | 5.82 | 6.83 | 8.57 |
| | EER | W/W | 4.33 | 4.1 | 3.91 |
| Max. input consumption | | kW | 13.50 | 14.10 | 14.20 |
| Max. current | | A | 40.0 | 42.0 | 45.0 |
| Capacity adjustment range | | | 50%~130% | 50%~130% | 50%~130% |
| **Compressor data** | | | | | |
| DC Inverter compressor | Quantity | | 1 | 1 | 1 |
| | Type | | DC /Twin-rotary | DC /Twin-rotary | DC /Twin-rotary |
| | Brand | | Mitsubishi | Mitsubishi | Mitsubishi |
| | frequency range | Hz | 10~120 | 10~120 | 10~120 |
| Compressor oil | Model | | FV50S | FV50S | FV50S |
| | Original oil volume | ml | 2300 | 2300 | 2300 |
| | Additional oil volume | ml | 2500 | 2500 | 2500 |
| **Fan data** | | | | | |
| Fan motor | Type | | DC | DC | DC |
| | Model | | DR-310-750-8-1（ZDK750-8ZHm） | DR-310-750-8-1（ZDK750-8ZHm） | DR-310-750-8-1（ZDK750-8ZHm） |
| | Quantity | | 1 | 1 | 1 |
| | Insulation class | | B | B | B |
| | Protection class | | IP44 | IP44 | IP44 |
| | Power output | W | 750 | 750 | 750 |
| Fan blade | Material | | ASG20 | ASG20 | ASG20 |
| | Type | | axial-flow | axial-flow | axial-flow |
| | Drive | | Direct-driven | Direct-driven | Direct-driven |
| | Fan Quantity | | 1 | 1 | 1 |
| | Air flow | $m^3/h$ | 10500 | 10500 | 11000 |
| **Physical data** | | | | | |
| Outdoor coil | Fin type | | hydrophilic | hydrophilic | hydrophilic |
| | Tube outside diameter | mm | 7.94 | 7.94 | 7.94 |
| | Tube type | | Inner-grooved | Inner-grooved | Inner-grooved |
| Refrigerant | Type | | R410a | R410a | R410a |
| | Volume | kg | 10 | 10 | 10 |
| Dimension (D*H*W) | Net | mm | 840*1740*990 | 840*1740*990 | 840*1740*990 |
| | Packing | mm | 910*1900*1060 | 910*1900*1060 | 910*1900*1060 |

| Model name | | | CC-VAC008-2PS1 | CC-VAC010-2PS1 | CC-VAC012-2PS1 |
|---|---|---|---|---|---|
| Weight | Net | kg | 208 | 208 | 208 |
| | Gross | kg | 218 | 218 | 218 |
| Outdoor sound level | | dB(A) | 58 | 58 | 60 |
| Maximum operating pressure | | MPa | 4.5 | 4.5 | 4.5 |
| **Piping & wiring data** | | | | | |
| Pipe size | Liquid pipe | mm | Ø12.7 | Ø12.7 | Ø12.7 |
| | Gas pipe | mm | Ø25.4 | Ø25.4 | Ø25.4 |
| Max. pipe length | Total pipe length | m | 1000 | 1000 | 1000 |
| | From OU to farthest IU(Actual length) | m | 190 | 190 | 190 |
| | From OU to farthest IU(Equivalent length) | m | 220 | 220 | 220 |
| | From 1st indoor distributor to farthest IU | m | 90 | 90 | 90 |
| Max. vertical length | Between OU & IU(OU above IU) | m | 90 | 90 | 90 |
| | Between OU & IU(OU below IU) | m | 110 | 110 | 110 |
| | Between IUs | m | 30 | 30 | 30 |
| | Between OUs | m | 0 | 0 | 0 |
| Connection wire | Power wire size | $mm^2$ | 6*4+6(L≤20m) | 6*4+6(L≤20m) | 6*4+10(L≤20m) |
| | | | 10*4+6(20m<L≤50m) | 10*4+6(20m<L≤50m) | 10*4+10(20m<L≤50m) |
| | Signal wire type | | 2-core shielded cable | 2-core shielded cable | 2-core shielded cable |
| | Signal wire size | $mm^2$ | 0.75 | 0.75 | 0.75 |
| **Operation temperature range** | | | | | |
| Cooling | Outdoor side | °C | -5~50 | -5~50 | -5~50 |
| | Indoor side | °C | 16~32 | 16~32 | 16~32 |

***Notes:***

*1).....The cooling conditions: indoor temp.: 27˚C DB (80.6˚F), 19˚C WB (60˚F) outdoor temp.: 35˚C DB (95˚F) equivalent pipe length: 5m drop length: 0m.*

*2).....The heating conditions: indoor temp.: 20˚C DB (68˚F), 15˚C WB (44.6˚F) outdoor temp.: 7˚C DB (42.8˚F) equivalent pipe length: 5m drop length: 0m.*

*3).....Sound level: Anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of 1.3 m. During actual operation, these values are normally somewhat higher as a result of ambient conditions.*

*4).....Maximum 85Pa outdoor ESP can be set on outdoor PCB.*

*5) The above data may be changed without notice for future improvement on quality and performance.*

1.2 Outdoor unit (14HP, 16HP, 18HP)

| Model name | | | CC-VAC014-2PS1 | CC-VAC016-2PS1 | CC-VAC018-2PS1 |
|---|---|---|---|---|---|
| **Performance data** | | | 208~230V-3N-60Hz | 208~230V-3N-60Hz | 208~230V-3N-60Hz |
| Cooling | Capacity | HP | 14HP | 16HP | 18HP |
| | | kW | 40 | 45 | 50 |
| | | Btu/h | 136500 | 153500 | 170600 |
| | | RT | 11.4 | 12.8 | 14.2 |
| | Power input | kW | 10.08 | 11.75 | 13.37 |
| | EER | W/W | 3.97 | 3.83 | 3.74 |
| Max. input consumption | | kW | 16.9 | 17.3 | 24 |
| Max. current | | A | 50 | 53 | 70 |
| Capacity adjustment range | | | 50%~130% | 50%~130% | 50%~130% |
| **Compressor data** | | | | | |
| DC Inverter compressor | Quantity | | 1 | 1 | 2 |
| | Type | | DC /Twin-rotary | DC /Twin-rotary | DC /Twin-rotary |
| | Brand | | Mitsubishi | Mitsubishi | Mitsubishi |
| | frequency range | Hz | 10~120 | 10~120 | 10~120 |
| Compressor oil | Model | | FV50S | FV50S | FV50S |
| | Original oil volume | ml | 2300 | 2300 | 2300 |
| | Additional oil volume | ml | 4500 | 4500 | 4000 |
| **Fan data** | | | | | |
| Fan motor | Type | | DC | DC | DC |
| | Model | | DR-310-920-8 （ZDK920-8ZFm） | DR-310-920-8 （ZDK920-8ZFm） | DR-310-920-8 （ZDK920-8ZFm） |
| | Quantity | | 1 | 1 | 1 |
| | Insulation class | | B | B | B |
| | Protection class | | IP44 | IP44 | IP44 |
| | Power output | W | 920 | 920 | 920 |
| Fan blade | Material | | ASG20 | ASG20 | ASG20 |
| | Type | | axial-flow | axial-flow | axial-flow |
| | Drive | | Direct-driven | Direct-driven | Direct-driven |
| | Fan Quantity | | 1 | 1 | 1 |
| | Air flow | $m^3/h$ | 13500 | 13500 | 13500 |
| **Physical data** | | | | | |
| Outdoor coil | Fin type | | hydrophilic | hydrophilic | hydrophilic |
| | Tube outside diameter | mm | 7.94 | 7.94 | 7.94 |
| | Tube type | | Inner-grooved | Inner-grooved | Inner-grooved |
| Refrigerant | Type | | R410a | R410a | R410a |
| | Volume | kg | 12 | 12 | 13 |
| Dimension (D*H*W) | Net | mm | 840*1740*1340 | 840*1740*1340 | 840*1740*1340 |
| | Packing | mm | 910*1900*1410 | 910*1900*1410 | 910*1900*1410 |

| Model name | | | CC-VAC014-2PS1 | CC-VAC016-2PS1 | CC-VAC018-2PS1 |
|---|---|---|---|---|---|
| Weight | Net | kg | 260 | 260 | 288 |
| | Gross | kg | 278 | 278 | 306 |
| Outdoor sound level | | dB(A) | 58 | 60 | 61 |
| Maximum operating pressure | | MPa | 4.5 | 4.5 | 4.5 |
| **Piping & wiring data** | | | | | |
| Pipe size | Liquid pipe | mm | Ø15.9 | Ø15.9 | Ø15.9 |
| | Gas pipe | mm | Ø31.8 | Ø31.8 | Ø31.8 |
| Max. pipe length | Total pipe length | m | 1000 | 1000 | 1000 |
| | From OU to farthest IU(Actual length) | m | 190 | 190 | 190 |
| | From OU to farthest IU(Equivalent length) | m | 220 | 220 | 220 |
| | From 1st indoor distributor to farthest IU | m | 90 | 90 | 90 |
| Max. vertical length | Between OU & IU(OU above IU) | m | 90 | 90 | 90 |
| | Between OU & IU(OU below IU) | m | 110 | 110 | 110 |
| | Between IUs | m | 30 | 30 | 30 |
| | Between OUs | m | 0 | 0 | 0 |
| Connection wire | Power wire size | $mm^2$ | 10*4+10(L≤20m) | 10*4+10(L≤20m) | 10*4+10(L≤20m) |
| | | | 16*4+10(20m<L≤50m) | 16*4+10(20m<L≤50m) | 16*4+10(20m<L≤50m) |
| | Signal wire type | | 2-core shielded cable | 2-core shielded cable | 2-core shielded cable |
| | Signal wire size | $mm^2$ | 0.75 | 0.75 | 0.75 |
| **Operation temperature range** | | | | | |
| Cooling | Outdoor side | °C | -5~50 | -5~50 | -5~50 |
| | Indoor side | °C | 16~32 | 16~32 | 16~32 |

***Notes:***

*1).....The cooling conditions: indoor temp.: 27˚C DB (80.6˚F), 19˚C WB (60˚F) outdoor temp.: 35˚C DB (95˚F) equivalent pipe length: 5m drop length: 0m.*

*2).....The heating conditions: indoor temp.: 20˚C DB (68˚F), 15˚C WB (44.6˚F) outdoor temp.: 7˚C DB (42.8˚F) equivalent pipe length: 5m drop length: 0m.*

*3).....Sound level: Anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of 1.3 m. During actual operation, these values are normally somewhat higher as a result of ambient conditions.*

*4).....Maximum 85Pa outdoor ESP can be set on outdoor PCB.*

*5) The above data may be changed without notice for future improvement on quality and performance.*

1.3 Outdoor unit (20HP, 22HP, 24HP)

| **Model name** | | | **CC-VAC020-2PS1** | **CC-VAC022-2PS1** | **CC-VAC024-2PS1** |
|---|---|---|---|---|---|
| **Performance data** | | | 208~230V-3N-60Hz | 208~230V-3N-60Hz | 208~230V-3N-60Hz |
| Cooling | Capacity | HP | 20HP | 22HP | 24HP |
| | | kW | 56 | 61.5 | 67 |
| | | Btu/h | 191000 | 209800 | 228600 |
| | | RT | 16 | 17.5 | 19 |
| | Power input | kW | 15.73 | 18.25 | 19.59 |
| | EER | W/W | 3.56 | 3.37 | 3.42 |
| Max. input consumption | | kW | 26.50 | 27.00 | 27.00 |
| Max. current | | A | 78.0 | 80.0 | 80.0 |
| Capacity adjustment range | | | 50%~130% | 50%~130% | 50%~130% |
| **Compressor data** | | | | | |
| DC Inverter compressor | Quantity | | 2 | 2 | 2 |
| | Type | | DC /Twin-rotary | DC /Twin-rotary | DC /Twin-rotary |
| | Brand | | Mitsubishi | Mitsubishi | Mitsubishi |
| | frequency range | Hz | 10~120 | 10~120 | 10~120 |
| Compressor oil | Model | | FV50S | FV50S | FV50S |
| | Original oil volume | ml | 2300*2 | 2300*2 | 2300*2 |
| | Additional oil volume | ml | 4000 | 4000 | 4000 |
| **Fan data** | | | | | |
| Fan motor | Type | | DC | DC | DC |
| | Model | | DR-310-560-8-1 （ZDK560-8ZFm） | DR-310-560-8-1 （ZDK560-8ZFm） | DR-310-560-8-1 （ZDK560-8ZFm） |
| | Quantity | | 2 | 2 | 2 |
| | Insulation class | | B | B | B |
| | Protection class | | IP44 | IP44 | IP44 |
| | Power output | W | 560 | 560 | 560 |
| Fan blade | Material | | ASG20 | ASG20 | ASG20 |
| | Type | | axial-flow | axial-flow | axial-flow |
| | Drive | | Direct-driven | Direct-driven | Direct-driven |
| | Fan Quantity | | 2 | 2 | 2 |
| | Air flow | $m^3/h$ | 16500 | 16500 | 16500 |
| **Physical data** | | | | | |
| Outdoor coil | Fin type | | hydrophilic | hydrophilic | hydrophilic |
| | Tube outside diameter | mm | 7.94 | 7.94 | 7.94 |
| | Tube type | | Inner-grooved | Inner-grooved | Inner-grooved |
| Refrigerant | Type | | R410a | R410a | R410a |
| | Volume | kg | 14 | 14 | 15 |
| Dimension (D*H*W) | Net | mm | 840*1740*1340 | 840*1740*1340 | 840*1740*1340 |
| | Packing | mm | 910*1900*1410 | 910*1900*1410 | 910*1900*1410 |

| Model name | | | CC-VAC020-2PS1 | CC-VAC022-2PS1 | CC-VAC024-2PS1 |
|---|---|---|---|---|---|
| Weight | Net | kg | 296 | 296 | 306 |
| | Gross | kg | 314 | 314 | 324 |
| Outdoor sound level | | dB(A) | 58 | 63 | 63 |
| Maximum operating pressure | | MPa | 4.5 | 4.5 | 4.5 |
| **Piping & wiring data** | | | | | |
| Pipe size | Liquid pipe | mm | Ø15.9 | Ø15.9 | Ø15.9 |
| | Gas pipe | mm | Ø31.8 | Ø31.8 | Ø31.8 |
| Max. pipe length | Total pipe length | m | 1000 | 1000 | 1000 |
| | From OU to farthest IU(Actual length) | m | 190 | 190 | 190 |
| | From OU to farthest IU(Equivalent length) | m | 220 | 220 | 220 |
| | From 1st indoor distributor to farthest IU | m | 90 | 90 | 90 |
| Max. vertical length | Between OU & IU(OU above IU) | m | 90 | 90 | 90 |
| | Between OU & IU(OU below IU) | m | 110 | 110 | 110 |
| | Between IUs | m | 30 | 30 | 30 |
| | Between OUs | m | 0 | 0 | 0 |
| Connection wire | Power wire size | $mm^2$ | 10*4+10(L≤20m) | 10*4+10(L≤20m) | 10*4+10(L≤20m) |
| | | | 16*4+10(20m<L≤50m) | 16*4+10(20m<L≤50m) | 16*4+10(20m<L≤50m) |
| | Signal wire type | | 2-core shielded cable | 2-core shielded cable | 2-core shielded cable |
| | Signal wire size | $mm^2$ | 0.75 | 0.75 | 0.75 |
| **Operation temperature range** | | | | | |
| Cooling | Outdoor side | °C | -5~50 | -5~50 | -5~50 |
| | Indoor side | °C | 16~32 | 16~32 | 16~32 |

***Notes:***

*6).....The cooling conditions: indoor temp.: 27˚C DB (80.6˚F), 19˚C WB (60˚F) outdoor temp.: 35˚C DB (95˚F) equivalent pipe length: 5m drop length: 0m.*

*7).....The heating conditions: indoor temp.: 20˚C DB (68˚F), 15˚C WB (44.6˚F) outdoor temp.: 7˚C DB (42.8˚F) equivalent pipe length: 5m drop length: 0m.*

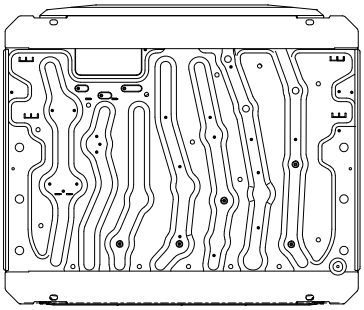
*8).....Sound level: Anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of 1.3 m. During actual operation, these values are normally somewhat higher as a result of ambient conditions.*

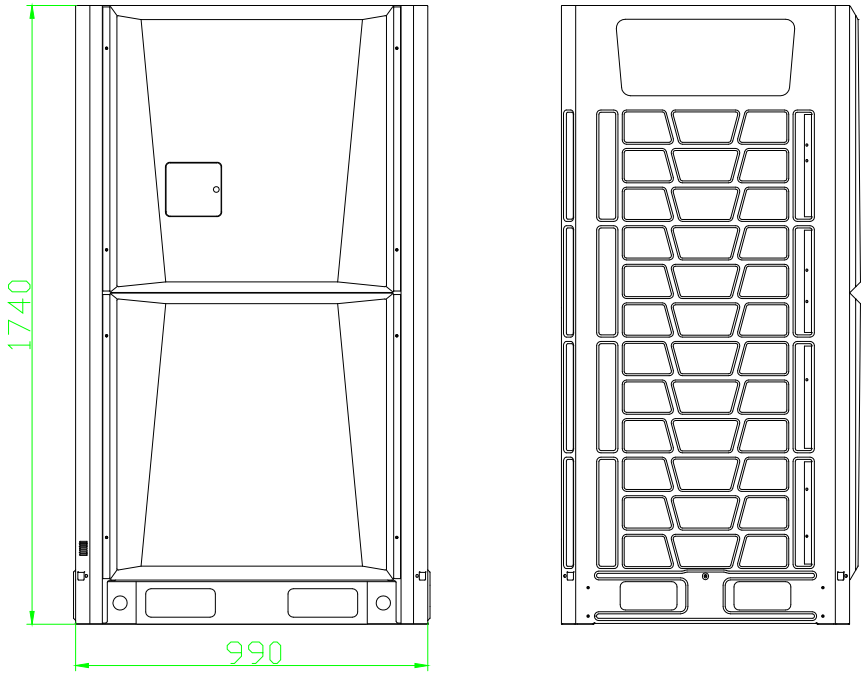
*9).....Maximum 85Pa outdoor ESP can be set on outdoor PCB.*

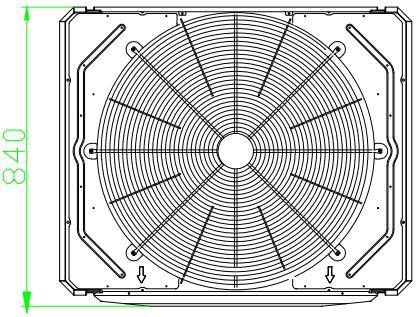
*10) The above data may be changed without notice for future improvement on quality and performance.*

## 2. Dimensions

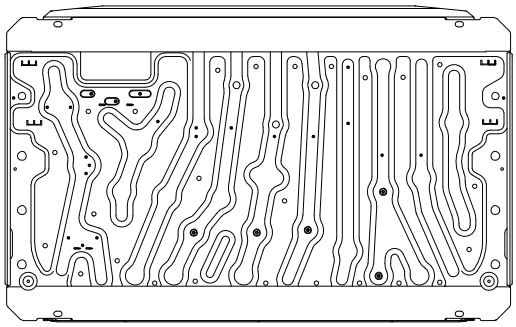
2.1 8HP, 10HP ,12HP units dimension

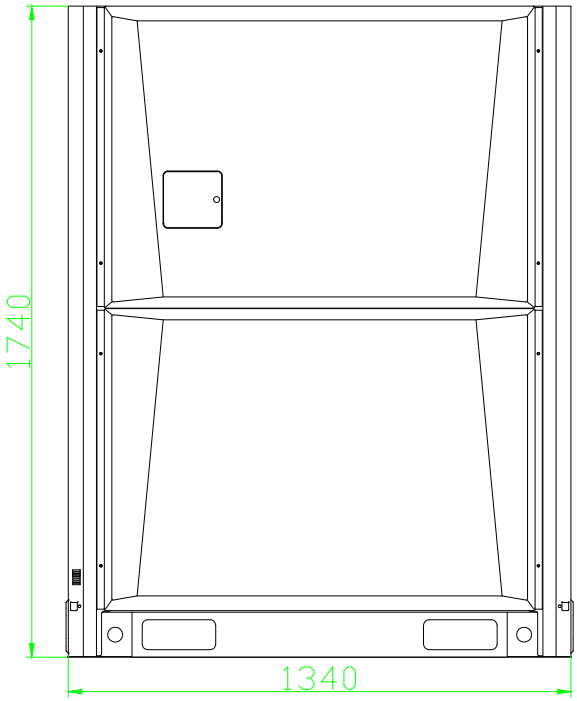


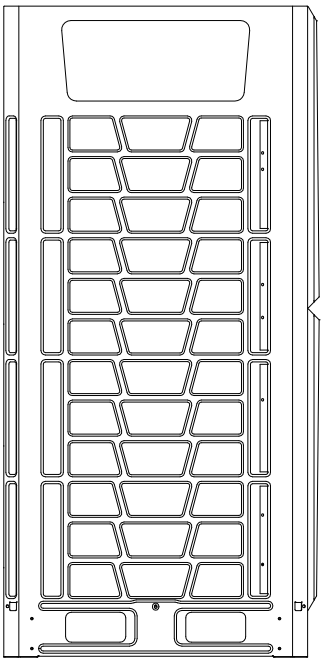


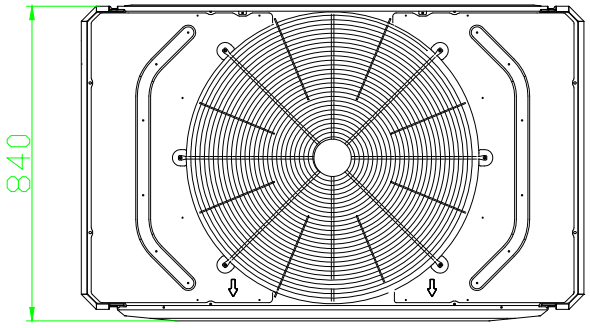



## 2.2 14HP, 16HP, 18HP units dimension

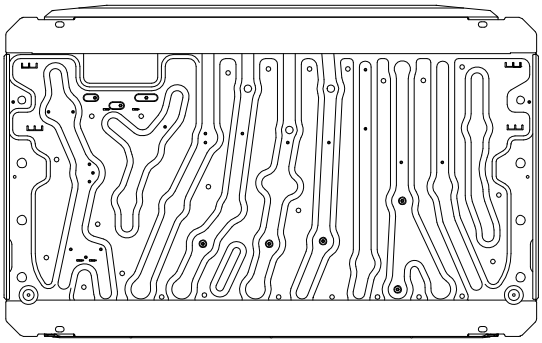


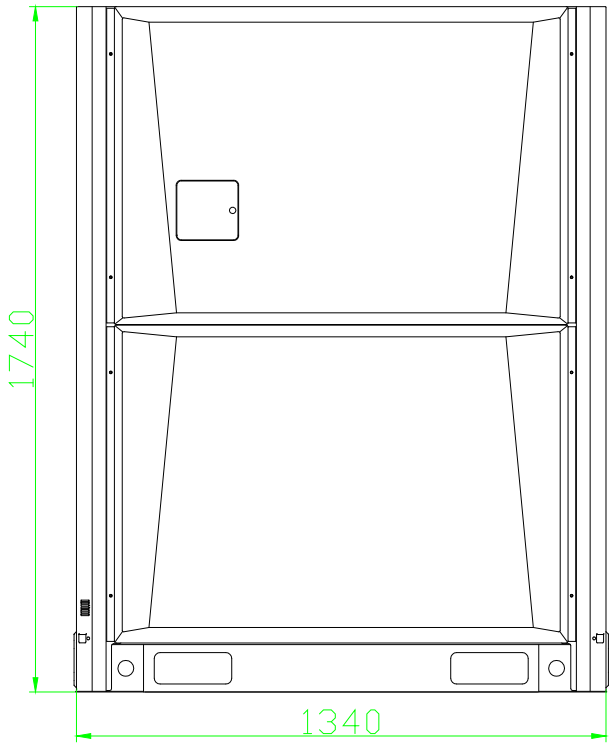


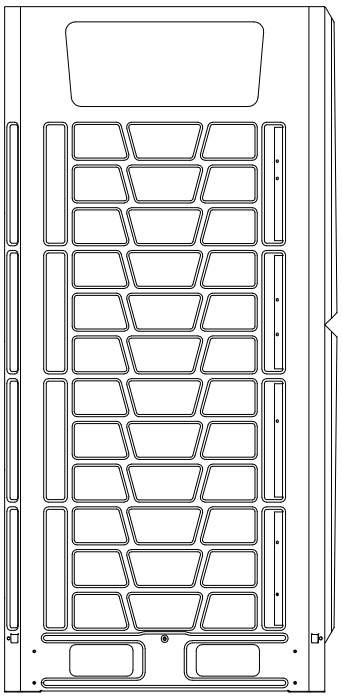



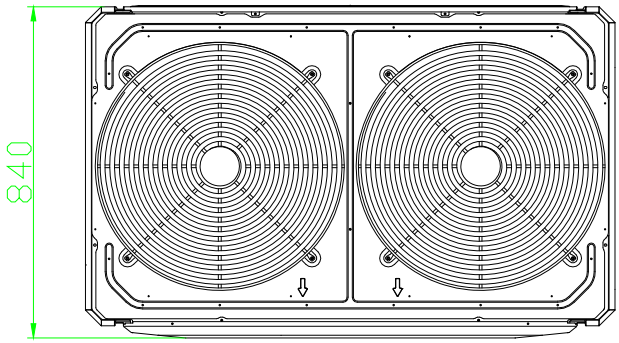


2.3 20HP ,22 HP units dimension

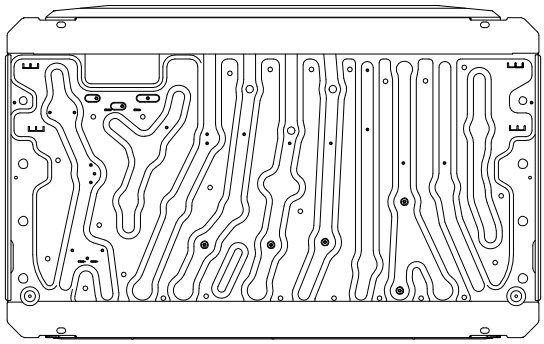


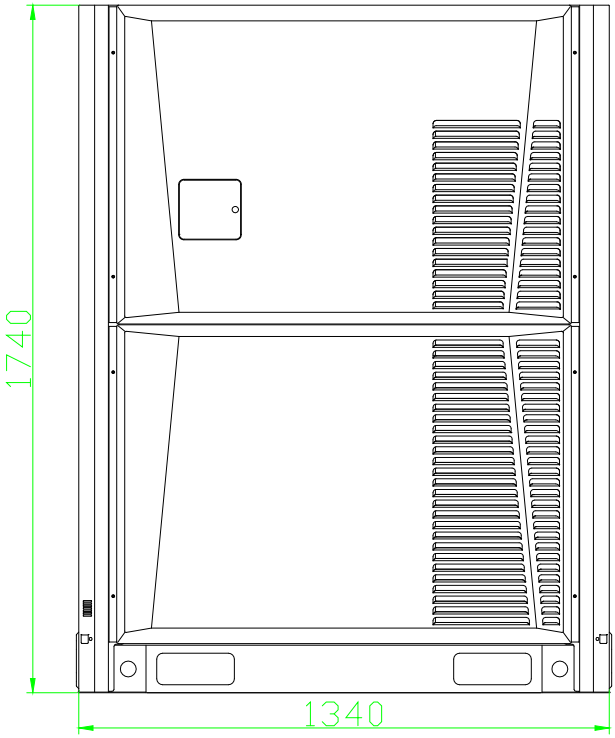


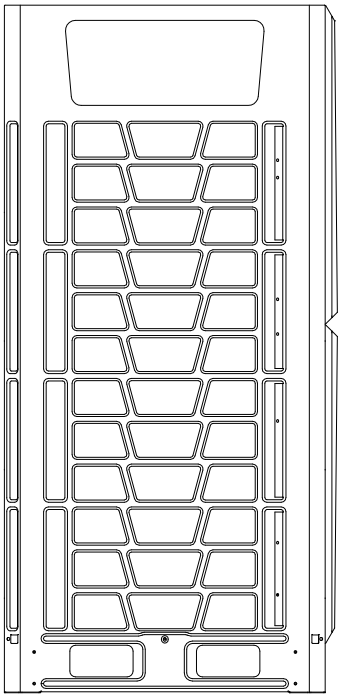



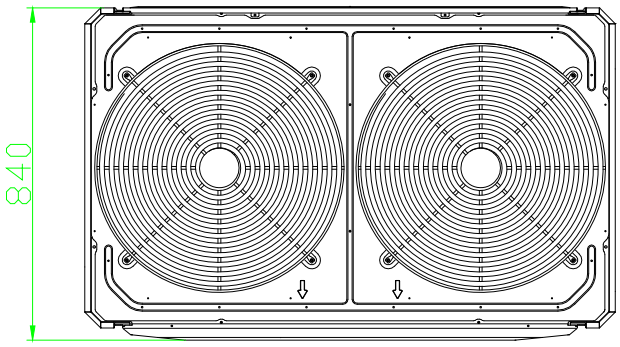


## 2.4 24HP units dimension

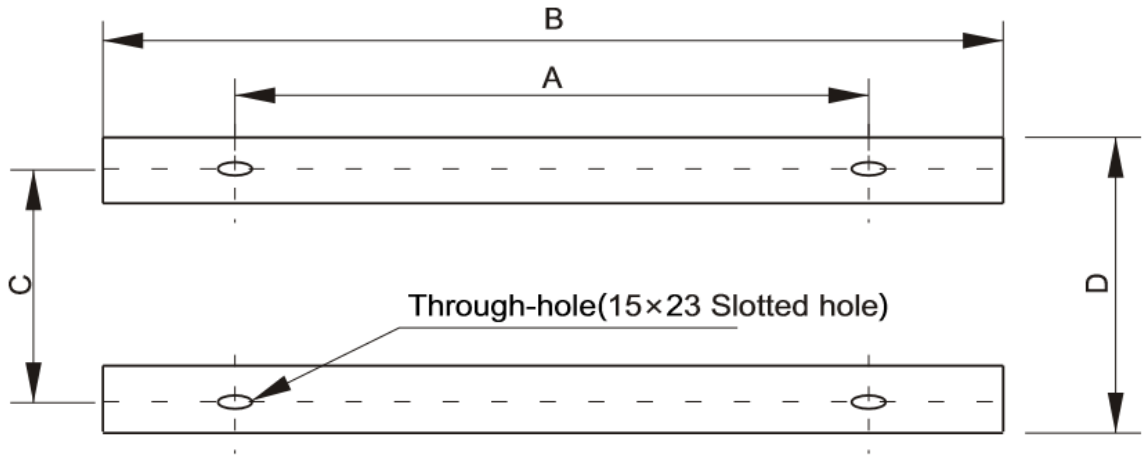




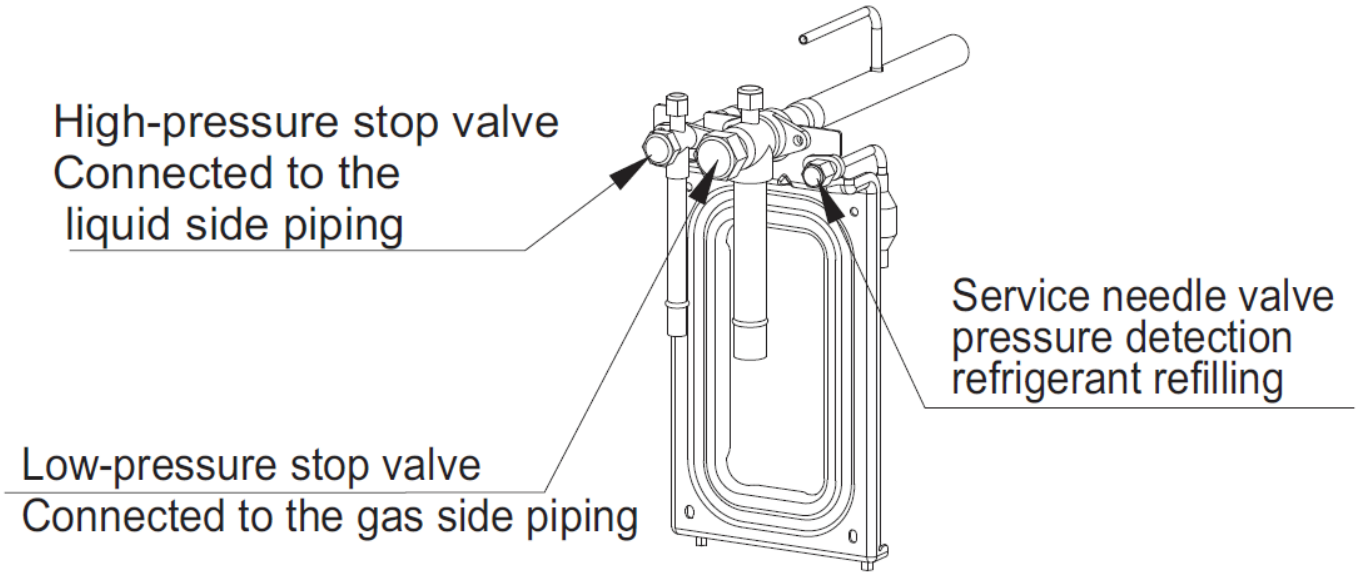


2.5 Installation base dimension



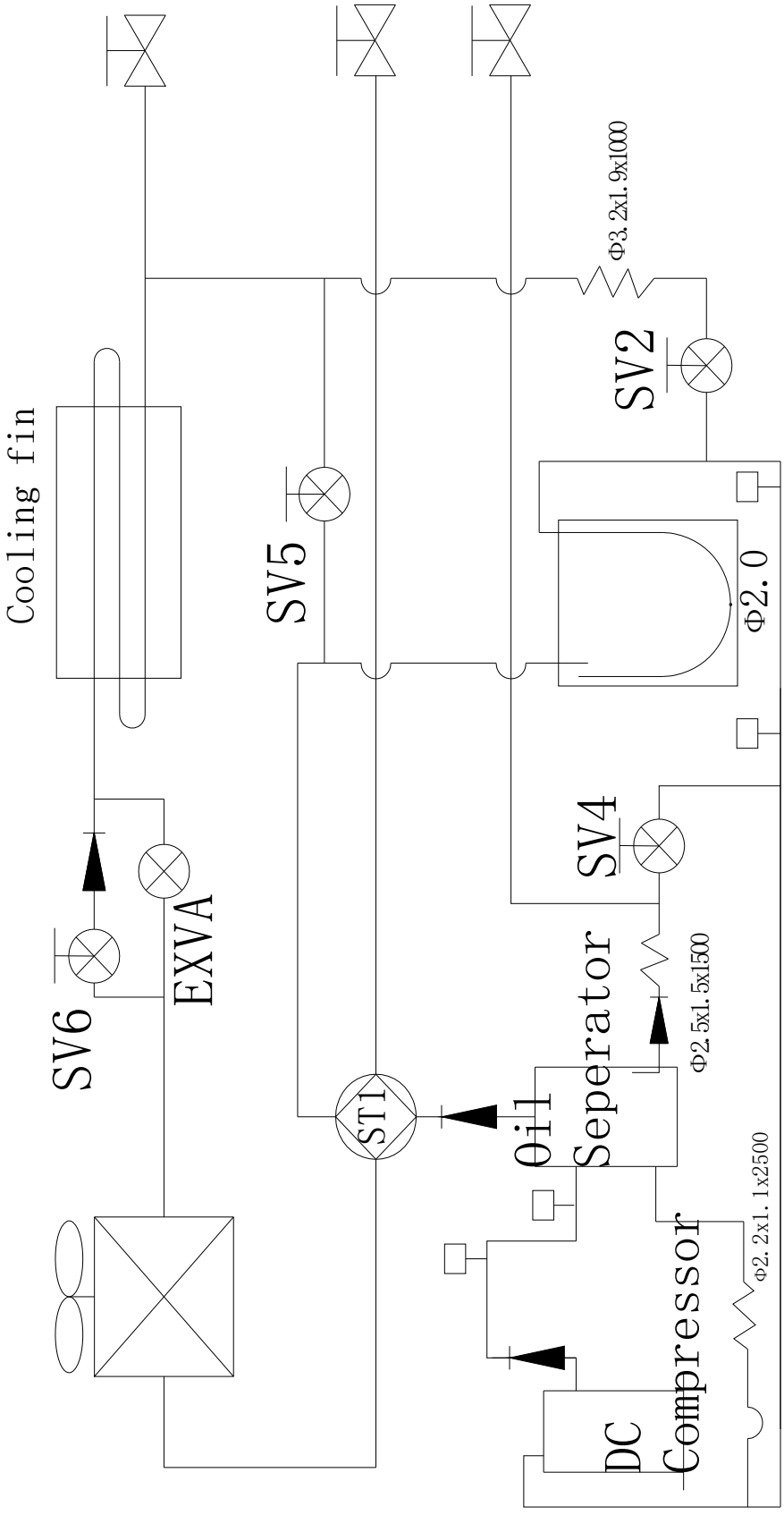

| Model | Capacity | A(mm) | B(mm) | C (mm) | D (mm) |
|---|---|---|---|---|---|
| CC-VAC008-2PS1 | 8 HP | 720 | 1040 | 774 | 850 |
| CC-VAC010-2PS1 | 10 HP | | | | |
| CC-VAC012-2PS1 | 12 HP | | | | |
| CC-VAC014-2PS1 | 14 HP | 1070 | 1390 | 774 | 850 |
| CC-VAC016-2PS1 | 16 HP | | | | |
| CC-VAC018-2PS1 | 18 HP | | | | |
| CC-VAC020-2PS1 | 20 HP | | | | |
| CC-VAC022-2PS1 | 22 HP | | | | |
| CC-VAC024-2PS1 | 24 HP | | | | |

2.6 Valve explanation

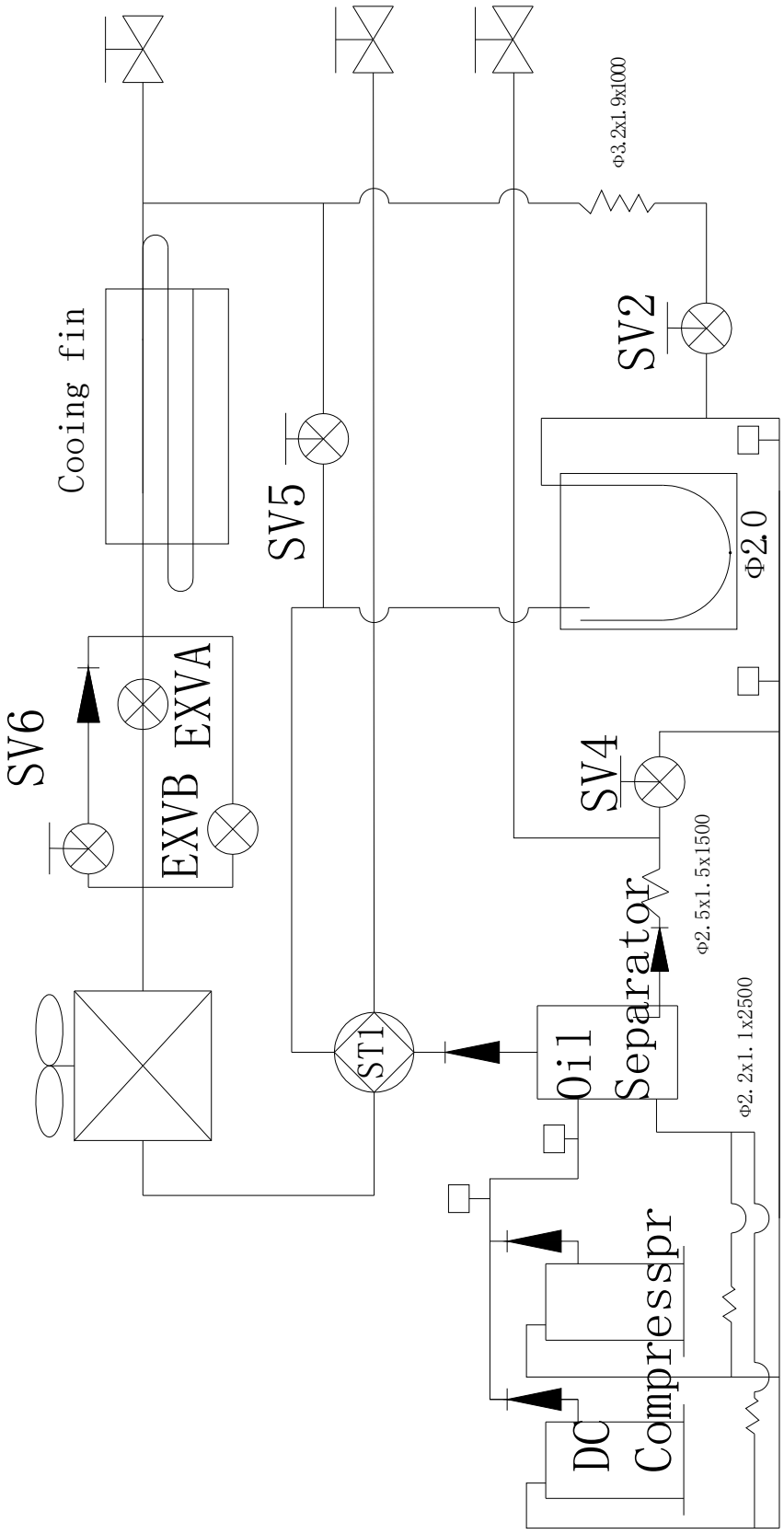


## 3. Outdoor refrigerant circuit diagram

3.1 8HP, 10HP, 12HP



3.2 14HP, 16HP, 18HP,20HP



3.3 Key parts

3.3.1 Oil Separator

It is used to separate oil from high pressure & temperature gas refrigerant that is pumped out from compressor.

3.3.2 Liquid accumulator

It is used to store the overmuch liquid refrigerant, and guarantee the refrigerant from the outdoor to indoor unit is in liquid status.

3.3.3 Gas-liquid separator

It is used to store the liquid refrigerant and oil, it can protect the compressor from liquid hammer.

3.3.4 Four-way valve (ST)

Closes in cooling mode and opens in heating mode

3.3.5 EXV (Electromagnetic expansion valve)

a) Max. Open degree is 480 pulses.
b) Generally when system is electrified the EXV closes 700pulse first, then opens to 350 pulse and stand by. Then the unit is started, it opens to the right pulse.
c) When the running outdoor unit receives OFF signal, the EXV of auxiliary unit will stop while main unit is running and auxiliary unit is stopped at the same time. If all outdoor units are stopped, the EXV will close first, and then open to the pulse of stand-by.

3.3.6 SV2

It is for spraying a little liquid refrigerant to cool compressor down. Open when any compressor discharge temperature is higher than 100˚C.

3.3.7 SV4:

a) Oil return valve.
b) Opens after the DC inverter compressor has been run for 5 minutes and then closes 15 minutes later. (For the system has only one outdoor unit).
c) Every 20 minutes, SV4 of each outdoor unit opens for 3 minutes. (For the system has more than one outdoor unit)

3.3.8 SV5

a) It is used for defrosting.
b) In defrosting mode, the opening of SV5 can cut the refrigerant flowing circle, so the defrosting process will takes less time.
c) In cooling mode, it is always off.

3.3.9 SV6

a) By-pass valve.
b) It closes when the unit is standby and the system is running in heating mode.
c) It opens when the discharge temperature is over-high in cooling mode, and closes when the unit is standby or system is running in heating mode.

3.3.10 Hi pressure sensor

To detect the discharge pressure of the compressor and to control the DC fan speed.

3.4 Key functions

3.4.1 Oil return program

a) When system start up for 140 minutes, oil return program will run. After that, every 8 hours continued operating this program will run.

b) The program will last for 3 minutes.

c) All the outdoor EXV open to 480 pulse and SV6 is on.

d) Action of indoor Fan and EXV.

| | | Running indoor unit | Stop or standby indoor unit | Fan only indoor unit |
|---|---|---|---|---|
| Cooling mode | EXV | Keep degree unchanged | 300 pulse | 300pulse |
| | Fan | Keep on | Keep off | Keep on |
| Heating mode | EXV | Keep degree unchanged | 300 pulse | / |
| | Fan | Anti-cold wind | Keep off | / |

3.4.2 All outdoor units cycle operation

a) Balance the lifespan among outdoor units in one system.

b) In cooling mode, outdoor units will change the start order when

i. Room temperature gets to the set point or

ii. After oil return program.

c) In heating mode, outdoor units will change the start order when

i. Room temperature gets to the set point, or

ii. After oil return program, or

iii. After defrost program.

3.4.3 Forced cooling program

a) After pressing it once, all indoor units and outdoor units will start cooling, no matter what mode they are running on, no matter whether they are ON or OFF.

b) The forced cooling function is available for master unit only.

c) During forced cooling mode.

i. All indoor EXVs open to 300 pulses.

ii. All indoor fans are in high speed.

iii. All compressors are ON.

iv. All outdoor fan motors are OFF

v. Outdoor EXVs opens to 480 pulses

vi. SV6 is ON

d) When program starts:

i. All the compressors are on

ii. Indoor fan is running at high speed

e) When the process is last for 1h or the button is pressed again, program will quit.

3.5 Electric characteristics

| Model | Outdoor Unit | | | | Fan Motor. |
|---|---|---|---|---|---|
| | Hz | Voltage | Min. | Max. | Output |
| CC-VAC008-2PS1 | 60 | 208~230 | 187 | 253 | 0.75 |
| CC-VAC010-2PS1 | 60 | 208~230 | 187 | 253 | 0.75 |
| CC-VAC012-2PS1 | 60 | 208~230 | 187 | 253 | 0.75 |
| CC-VAC014-2PS1 | 60 | 208~230 | 187 | 253 | 0.92 |
| CC-VAC016-2PS1 | 60 | 208~230 | 187 | 253 | 0.92 |
| CC-VAC018-2PS1 | 60 | 208~230 | 187 | 253 | 0.92 |
| CC-VAC020-2PS1 | 60 | 208~230 | 187 | 253 | 2×0.56 |
| CC-VAC022-2PS1 | 60 | 208~230 | 187 | 253 | 2×0.56 |
| CC-VAC024-2PS1 | 60 | 208~230 | 187 | 253 | 2×0.56 |

***Remark:***

- *Min.: Permitted minimum operating voltage, lower than this value may damage the system*
- *Max.: Permitted maximum operating voltage, higher than this value may damage the system*
- *Output: Fan motor rated power Output (kW)*

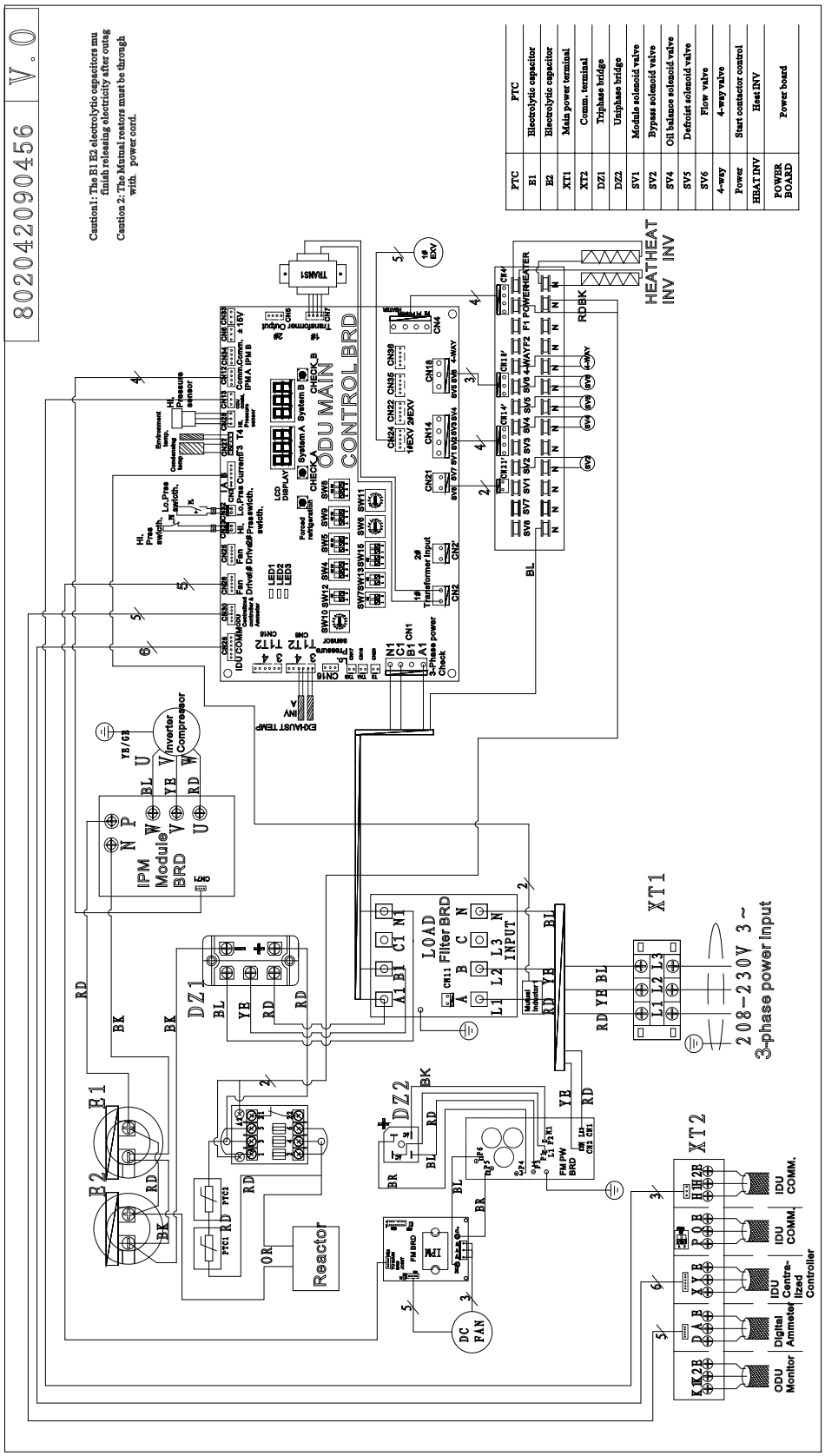
***Notes:***

- *RLC is based on the following conditions, indoor temperature 27˚C DB/19˚C WB, outdoor temperature 35˚C DB*
- *TOC means the total value of each Over-Current set.*
- *MSC means the Maximum current during the starting of compressor.*
- *Maximum allowable voltage variation between phases is 2%*
- *Selection wire size based on the larger value of MC or TOC*
- *MFC is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).*

# 4. Outdoor unit wiring diagrams and field wiring

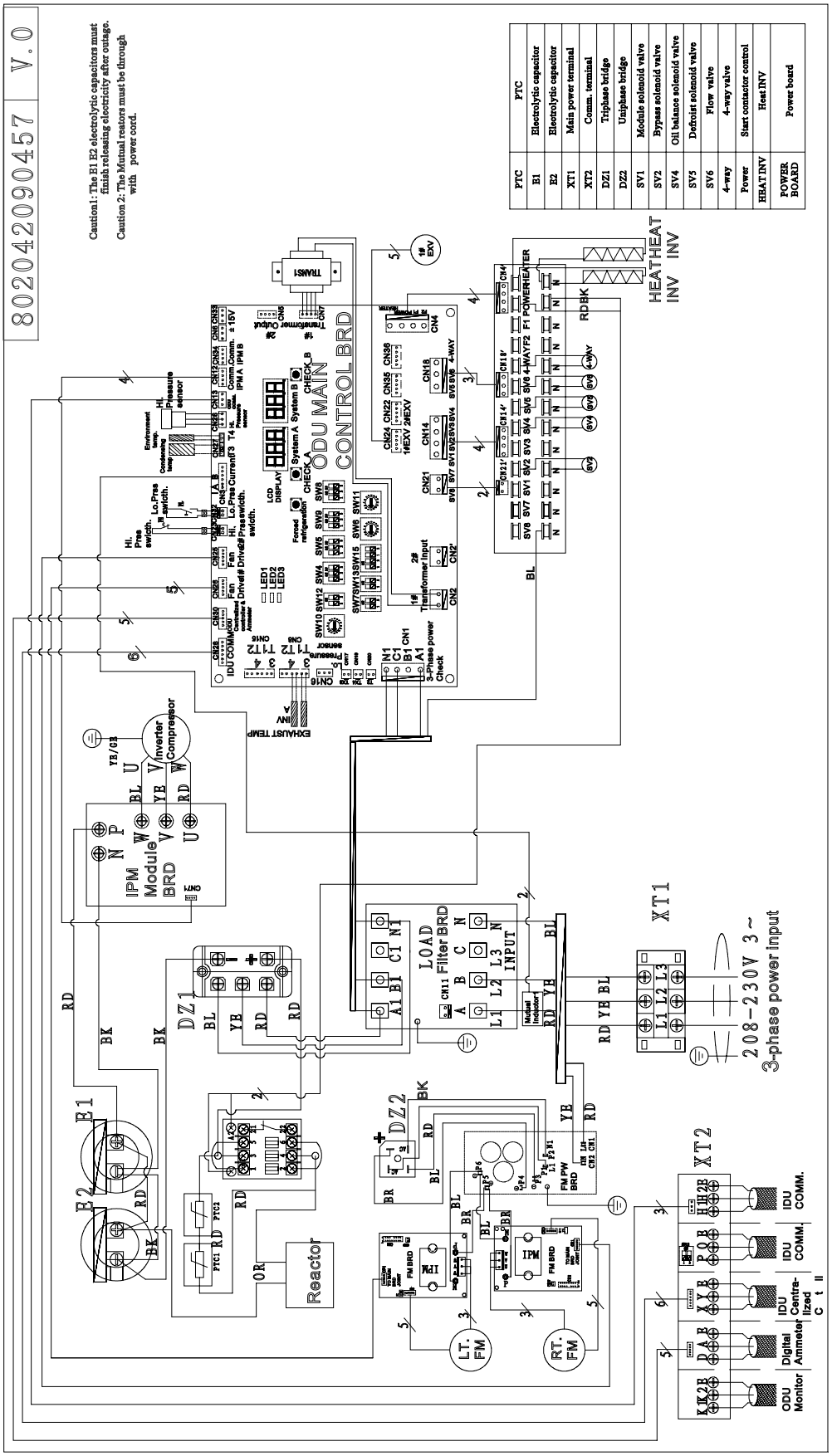
4.1 Wiring diagram

4.1.1 8HP and 10HP



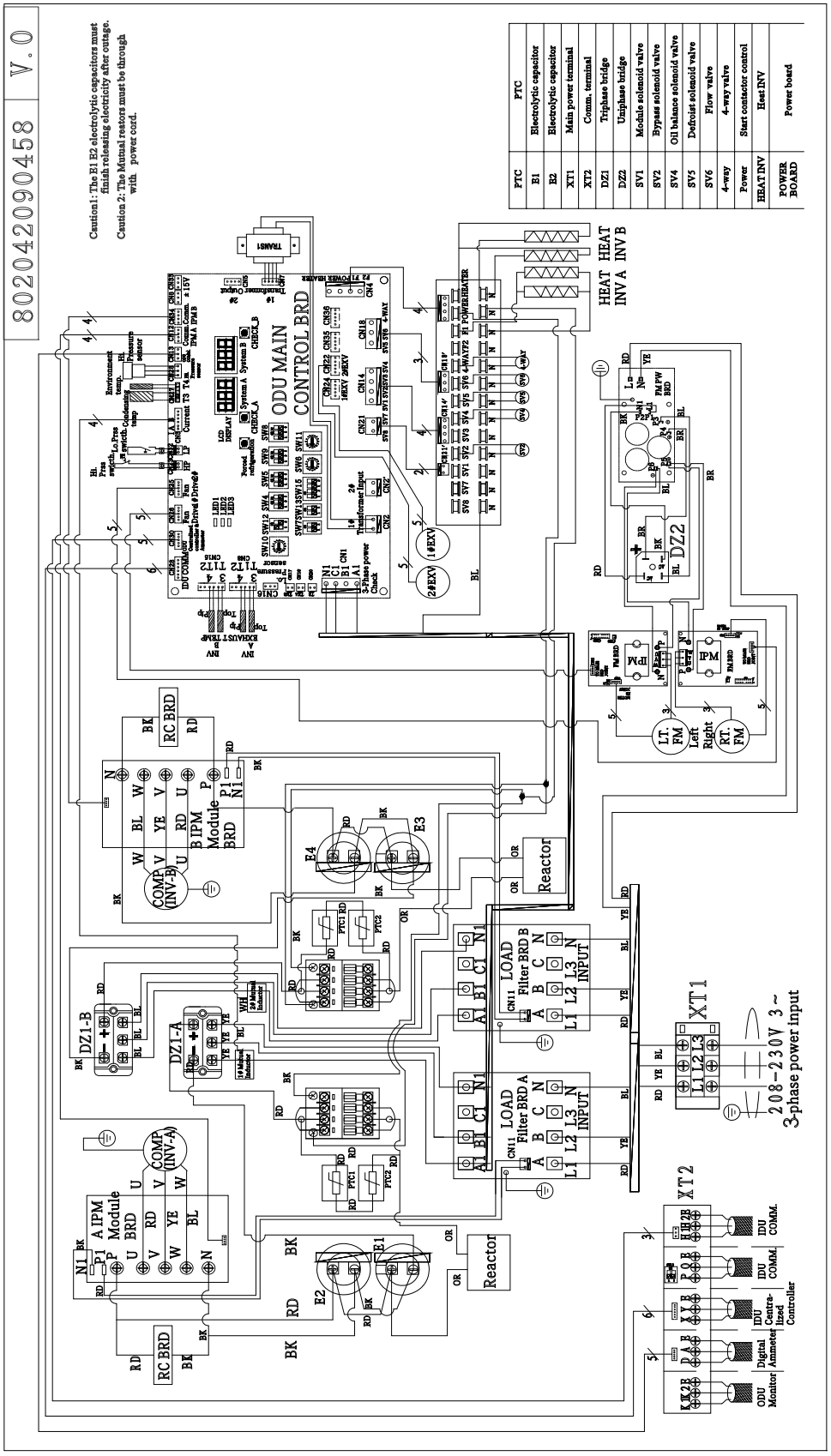

***Caution:*** *The E1 E2 electrolytic capacitors must finish releasing electricity after outage.*

4.1.2 12HP



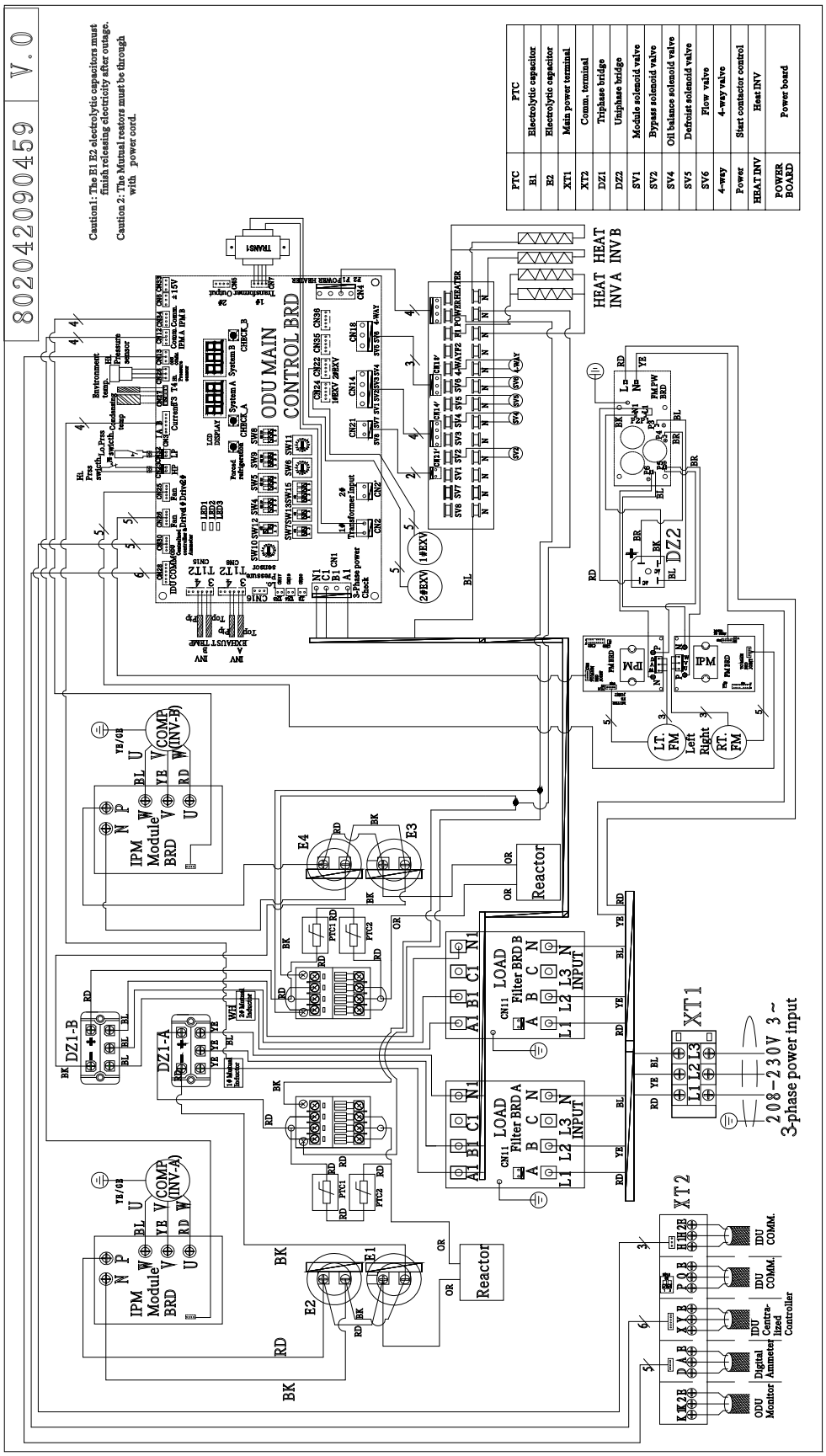

***Caution:*** *The E1 E2 electrolytic capacitors must finish releasing electricity after outage.*

4.1.3 14HP and 16HP



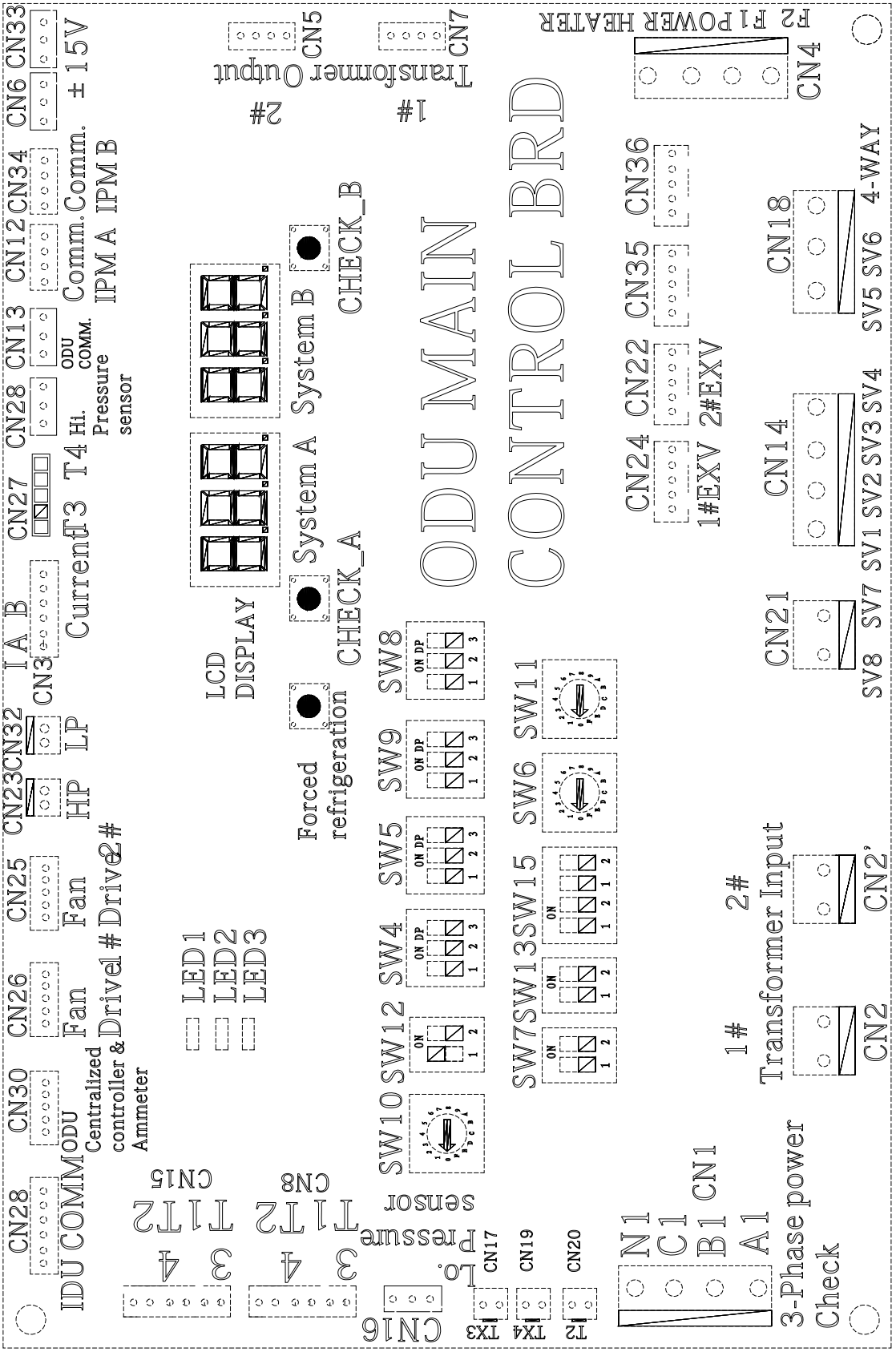

***Caution:*** *The E1 E2 electrolytic capacitors must finish releasing electricity after outage.*

4.1.4 18HP and 20HP



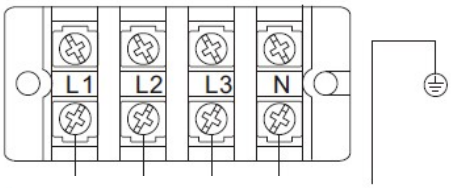

***Caution:*** *The E1 E2 electrolytic capacitors must finish releasing electricity after outage.*

4.1.5 Main PCB


ODU MAIN CONTROL BRD
CN28 IDU COMM
CN30 ODU Centralized controller & Ammeter
CN26 Fan Drive1 #
CN25 Fan Drive2 #
CN23 HP
CN32 LP
CN3 I A B Current
CN27 T3 T4
CN28 Hi. Pressure sensor
CN13 ODU COMM.
CN12 Comm. IPM A
CN34 Comm. IPM B
CN6 CN33 ± 15V
CN5 2# Transformer Output
CN7 1# Transformer
CN4 F2 F1 POWER HEATER
CN24 CN22 CN35 CN36 1#EXV 2#EXV
CN18 4-WAY SV5 SV6
CN14 SV1 SV2 SV3 SV4
CN21 SV8 SV7
LCD DISPLAY
System A
System B
CHECK_A
CHECK_B
Forced refrigeration
LED1
LED2
LED3
SW10 SW12 SW4 SW5 SW9 SW8
SW7 SW13 SW15 SW6 SW11
ON DP
CN16 T3 T4 T1 T2 CN15
CN8 T3 T4 T1 T2 Pressure sensor
CN17 CN19 CN20 TX3 TX4 T2
N1 C1 B1 A1 CN1 3-Phase power Check
1# Transformer Input 2#
CN2 CN2'

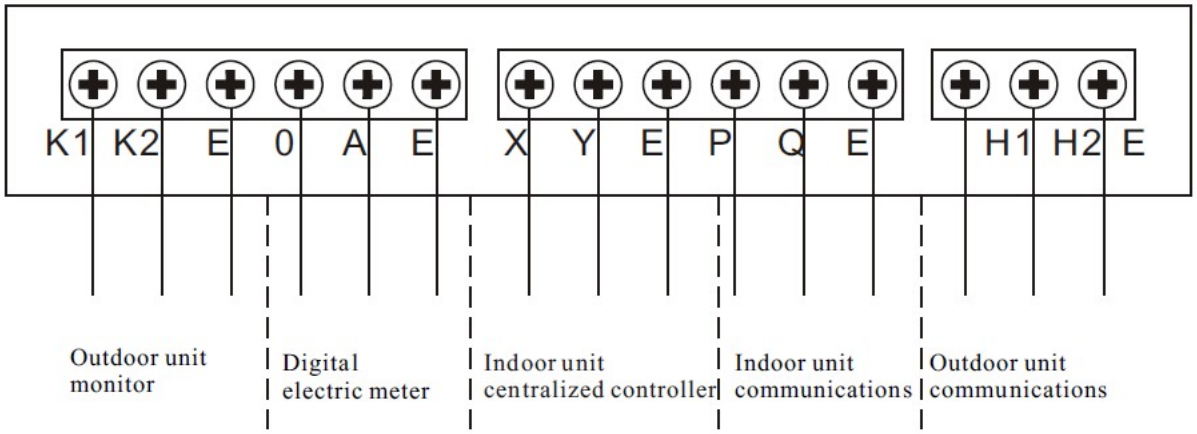
4.2 Field wiring

1) Power supply terminals

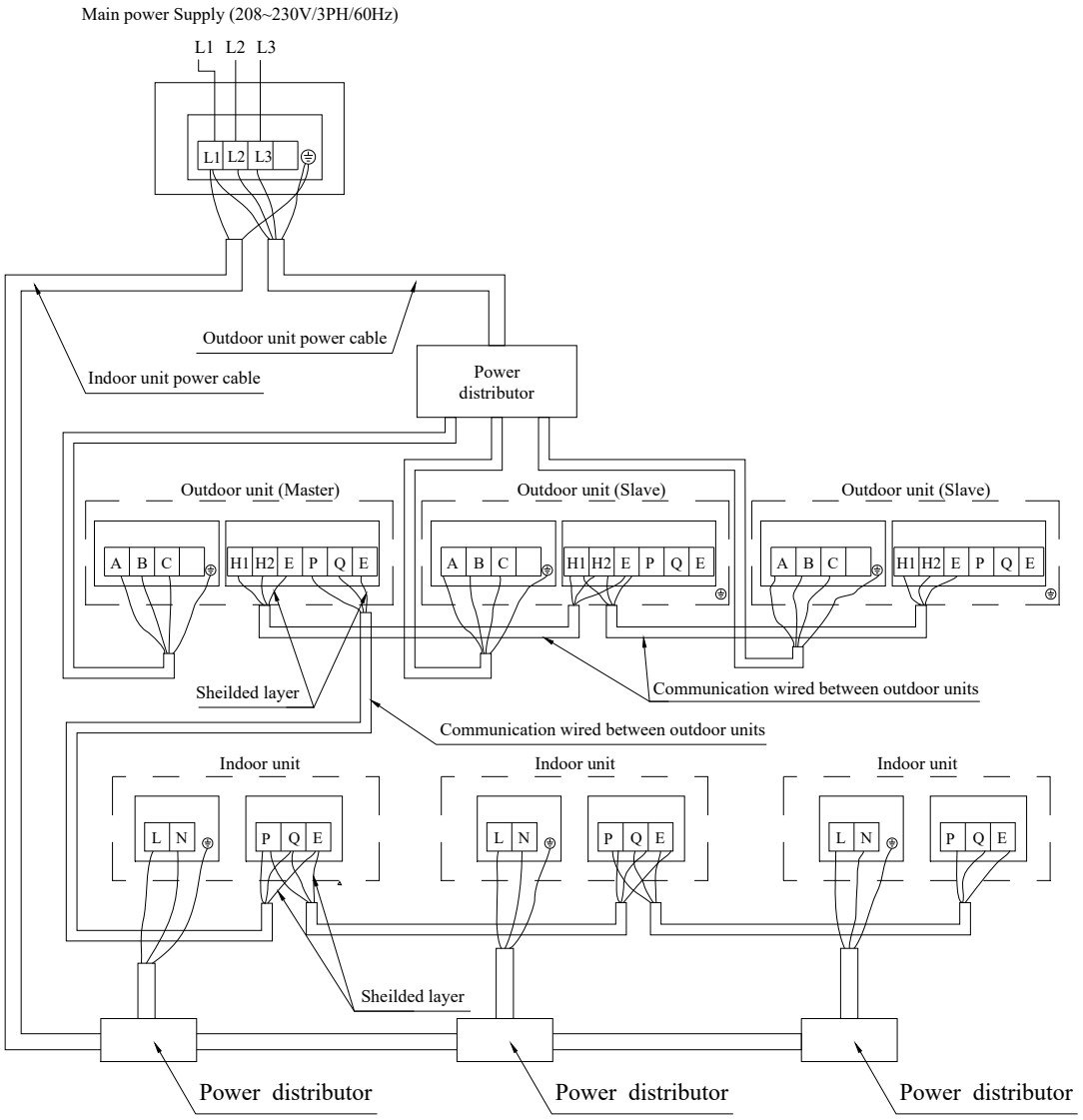



208~230V, 60Hz, 3ph

2) Communication terminals



3) Wiring between indoor and outdoor unit




***Note:***

*a) The signal connecting line between outdoor units, indoor and outdoor units and indoor units has polarity. When connecting, be careful to prevent error connection.*

*b) Signal line shall adopt three-core shielded wire with an area above 0.75 $mm^2$.*

*c) Do not bind signal line and copper pipe together with belting.*

*d) Make sure that the shield metal layer should be grounded well indoor control box in order to prevent interference.*

*e) it's forbidden to connect 200V or above high-volt live wire to the communication terminal.*

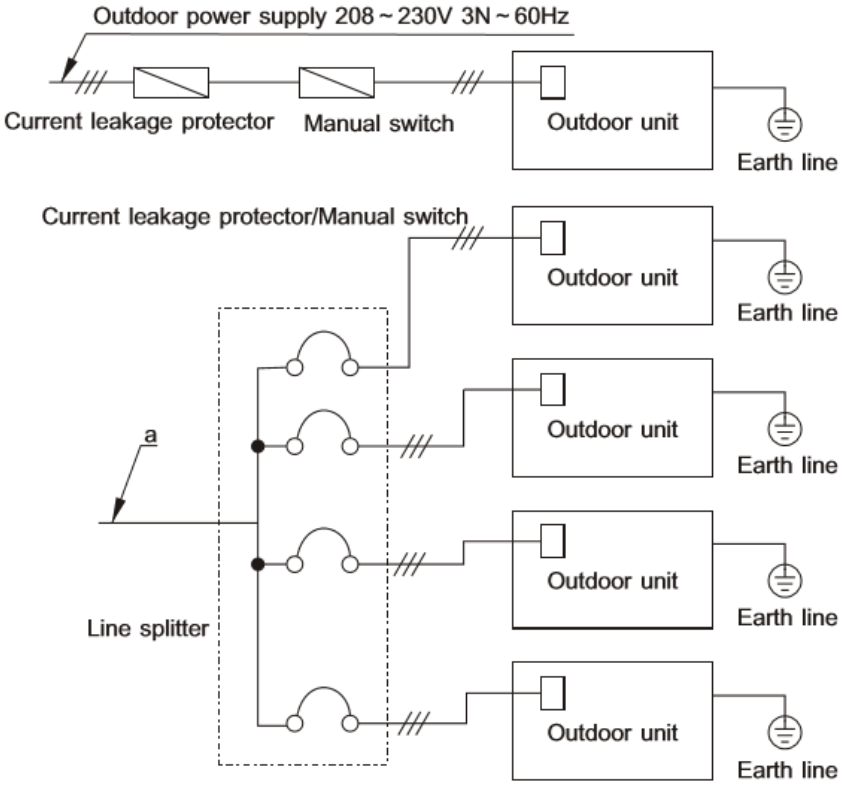
4.3 Outdoor unit power wiring

4.3.1 Separately power supply (without power facility)

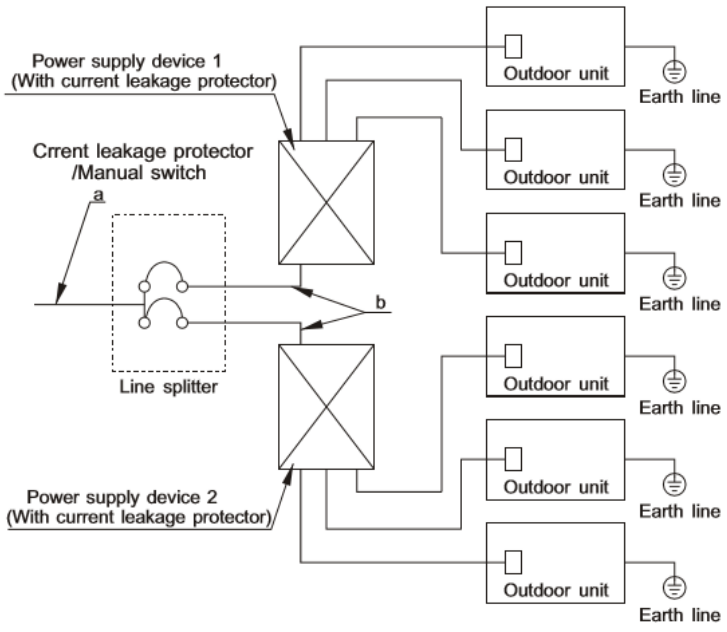
| Model name | Power supply | Minimum power cable diameter (L is cable length) | | Manual switch | | Circuit breaker |
|---|---|---|---|---|---|---|
| | | Size ($mm^2$) | Ground wire ($mm^2$) | Capacity (A) | Fuse (A) | |
| CC-VAC008-2PS1 | 208V~230V 3 phase 60Hz | 3×16 (L≤20m) 3×25(20<L≤50m) | 16 | 63 | 60 | 100mA <0.1sec |
| CC-VAC010-2PS1 | | | | | | |
| CC-VAC012-2PS1 | | | | | | |
| CC-VAC014-2PS1 | | 3×25 (L≤20m) 3×35(20<L≤50m) | 16 | 100 | 100 | |
| CC-VAC016-2PS1 | | | | | | |
| CC-VAC018-2PS1 | | 3×35 (L≤20m) 3×50(20<L≤50m) | | 150 | 120 | |
| CC-VAC020-2PS1 | | | | | | |

4.3.2 With power facilities:

a) Case 1:




b) Case 2:




***Note:***

- *Select power wire for these five models separately according to relevant standard.*
- *The wiring diameter and the length in the table indicate the condition that the voltage dropping range is within 2%. If the length exceeds the above figure, please select the wire diameter according to relevant standard.*

4.3.3 Reference table of the cable size for each capacity

| Total capacity (HP) | Minimum wire diameter ($mm^2$ ) | |
|---|---|---|
| | Wire length ≤ 20m | 20m<Wire length≤ 50m |
| 8 | 16 | 25 |
| 10 | 16 | 25 |
| 12 | 16 | 25 |
| 14 | 25 | 35 |
| 16 | 25 | 35 |
| 18 | 25 | 35 |
| 20 | 25 | 35 |

- *The above selection is for reference.*
- *For an actual electrical project, it should be considered that the cable layout, space between cable and surroundings, etc.*

4.3.4 Power wire selection

Power wiring includes the **main wire(a)** connecting to branch box and the **wire (b)** between branch box and power facilities.

Please select the wire diameter according to the following requirement.

a) Diameter of **main wire (a)**: depends on the total horse power (HP) of outdoor unit (See 5.3.3).

Example:

In system: (8HP×1 unit+8HP×1 unit+10HP×1 unit)

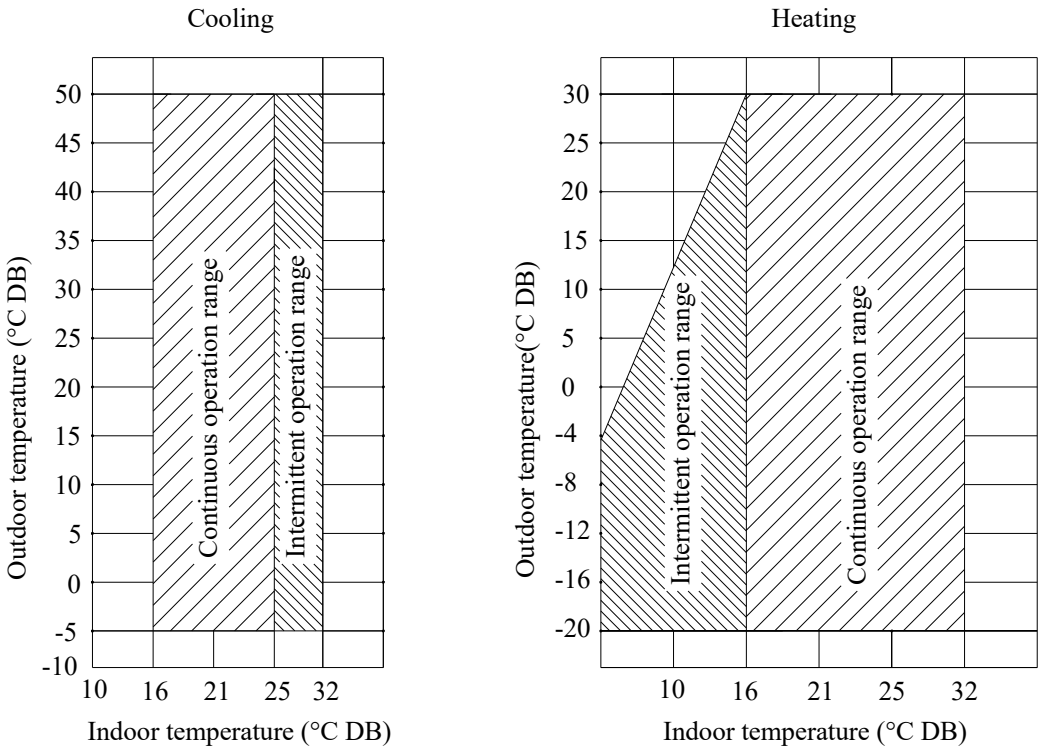
So totally 26HP → **See 5.3.3** → size of wire is 35$mm^2$ (within 20m)

b) Diameter of **wire (b):** depends on the number of combined outdoor unit.

If outdoor unit quantity ≤ 5, the **wire (b)** diameter selection is same as **main wire (a)** selection (See 5.3.3).

If outdoor unit quantity > 5, there will be 2 electric control boxes, the **wire (b)** diameter selection depends on the total horse power (HP) of outdoor units connecting to each electric control box (See 5.3.3).

## 5. Operation limits



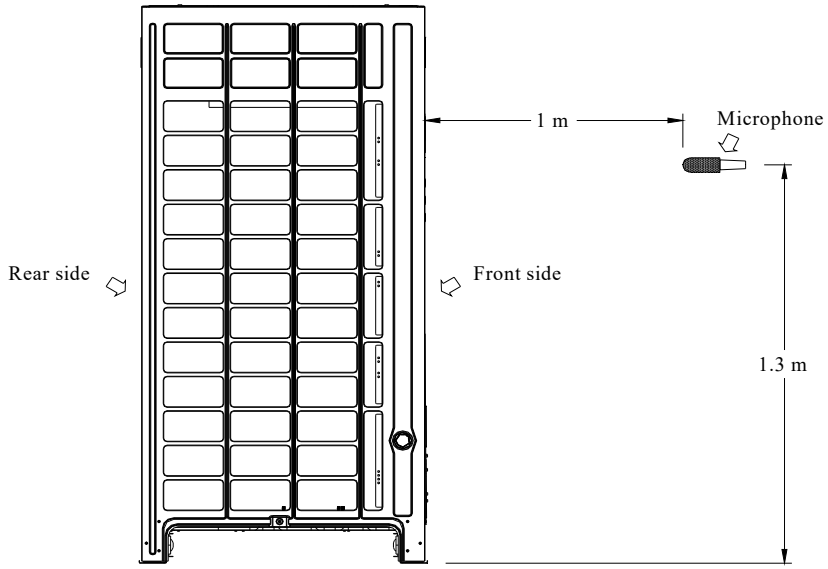

| Operation mode | Outdoor temperature | Indoor temperature |
|---|---|---|
| Cooling | -5°C ~ 50C | 16°C ~ 32°C |
| Heating | -20°C ~ 30°C | 16°C ~32°C |

***Notes:***

- *If the unit is operating beyond above condition, protection device will be activated; even then the units will abnormality run.*
- *These figures base on the operation conditions between indoor units and outdoor units: equivalent pipe length is 5m, and height difference is 0m.*
- ***Precaution**: the indoor relative humidity should be lower than 80%. If the air conditioner works in an environment with a relative humidity higher than mentioned above, the surface of the air conditioner may condensate. In this case, it is recommended to set the air speed of the indoor unit to high.*

## 6. Operation sound Levels

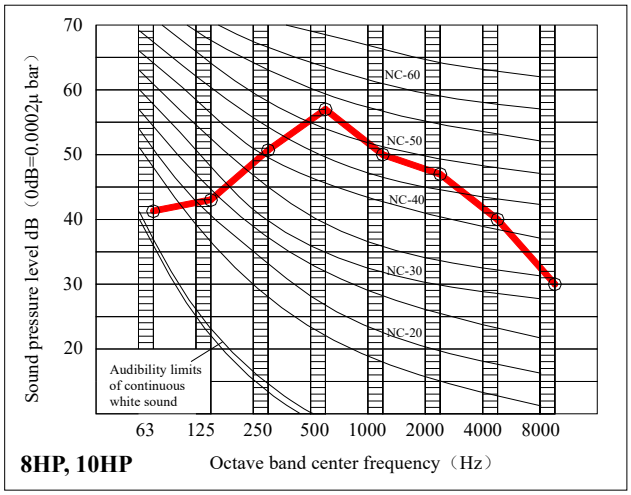
6.1 Testing method and sound levels



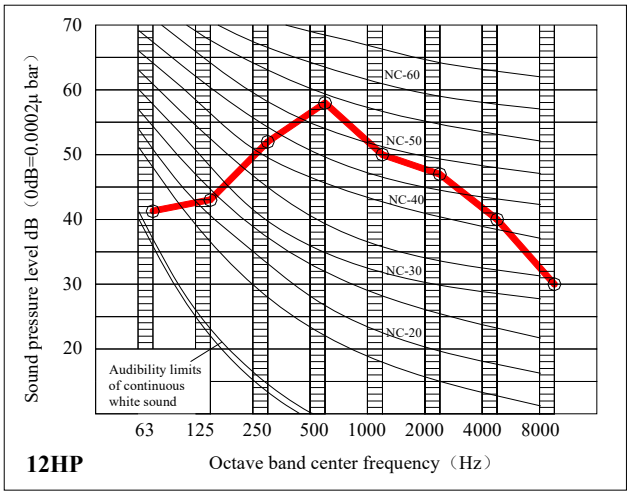

**Test value**

| Outdoor unit | Sound level dB(A) |
|---|---|
| 8 HP | 58 |
| 10 HP | 58 |
| 12 HP | 58 |
| 14 HP | 60 |
| 16 HP | 60 |
| 18 HP | 60 |
| 20HP | 63 |

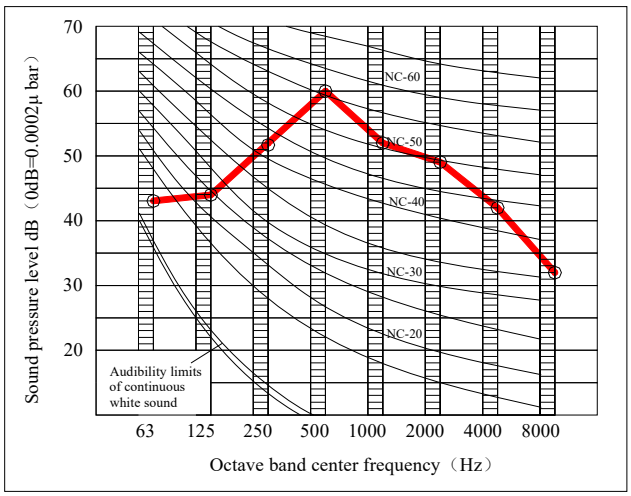
6.2 NC curve




**8HP, 10HP**



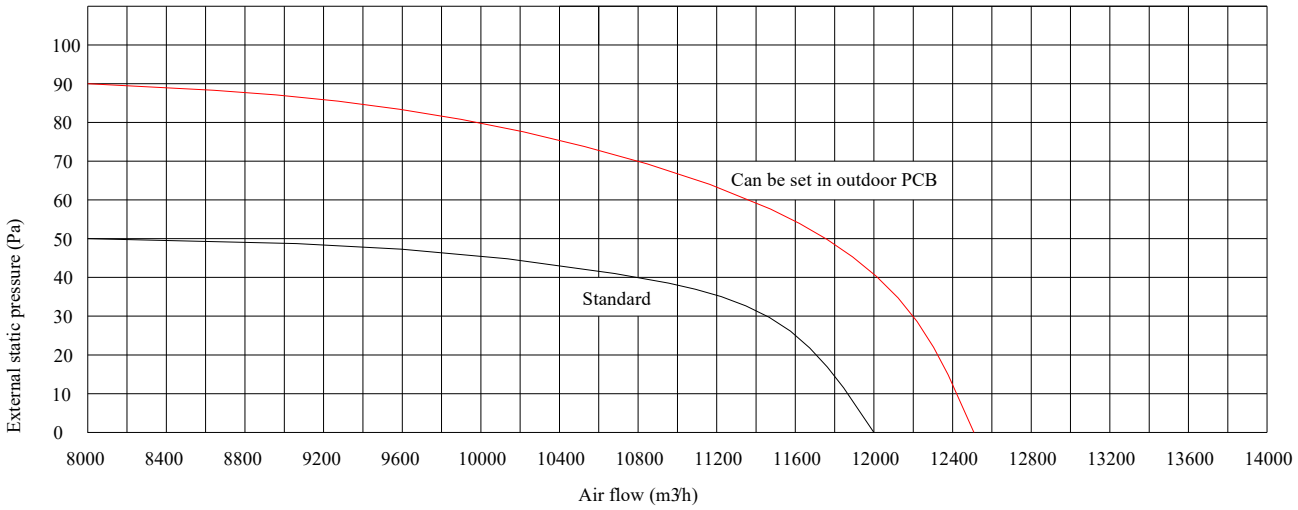

**12HP**



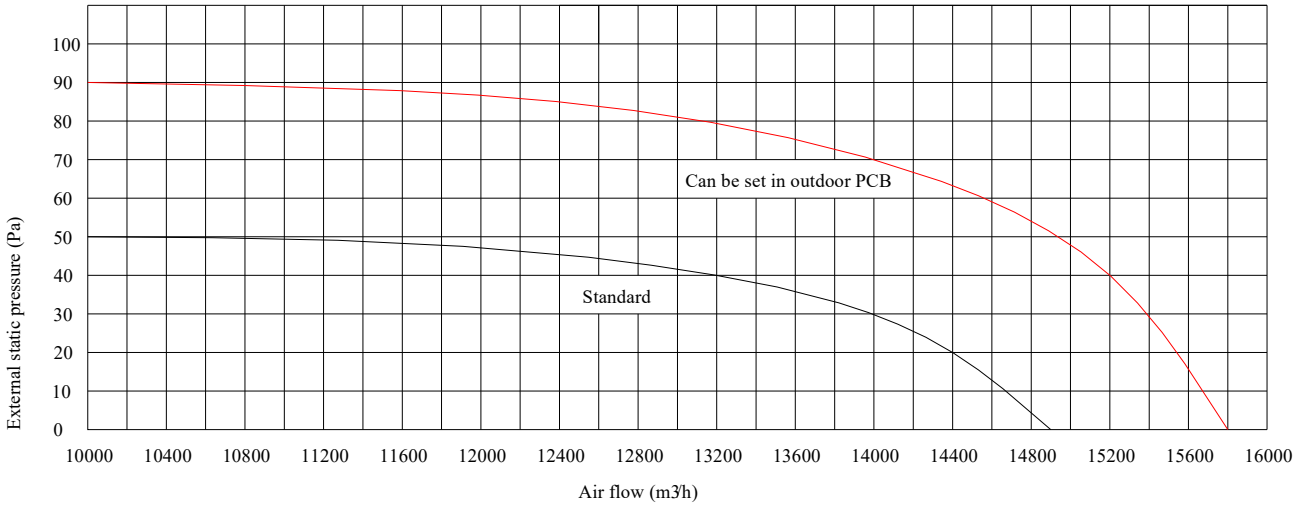

**14HP, 16HP, 18HP,20HP**

# 7. Outdoor fan performance

7.1 8HP, 10HP's air-flow-external-static-pressure curve




7.2 12HP, 14HP,16HP,18HP,20HP's air-flow-external-static-pressure curve



## 8. Functional parts and safety devices

Table 1.

| Item | Symbol | Name | | CC-VAC008-2PS1 | CC-VAC010-2PS1 | CC-VAC012-2PS1 |
|---|---|---|---|---|---|---|
| Compressor | Inverter | Inverter compressor | | E655DHD-65A2YG | E655DHD-65A2YG | E655DHD-65A2YG |
| | CCH | Crank case heater | | 2×40w | | |
| Motor and security devices | Motor | Fan motor | Model | DR-310-750-8 | DR-310-750-8 | 2×DR-310-560-8 |
| | | | Output power | 750W | 750W | 2×560W |
| | | Safety thermostat | On | 115°C | | |
| | | | Off | / | | |
| | HP | High pressure switch | | OFF:45(±1)kg/cm$^2$<br>ON:35(±1)kg/cm$^2$ | | |
| | LP | Low pressure switch | | OFF:0.5(±1)kg/cm$^2$<br>ON:1.5(±1)kg/cm$^2$ | | |
| Temperature sensor | T3,T4 | Temperature sensor (condenser outlet/ambient temperature) | | 25°C=5KΩ | | |
| | Discharge thermostat | Thermostat (Inverter/Fixed discharge) | | BW120°C ON:120°C OFF:90°C | | |
| Pressure sensor | HPSH | High pressure sensor (discharge) | | Model: 2HMP6-9<br>Character: Vout=0.870*P+0.5(MPa) | | |
| Functional parts | PMV | Electronic expansion valve | | UKV-32D210 ( Foshan Hualu) | | |
| | 4-W/V | 4-way valve | | -V280WM6A/M+4.0.ZLT.7-5(Foshan Hualu) | | |
| | SV | Solenoid valve | | FDF6A-088-RK (Zhejiang Sanhua) | | |

Table 2.

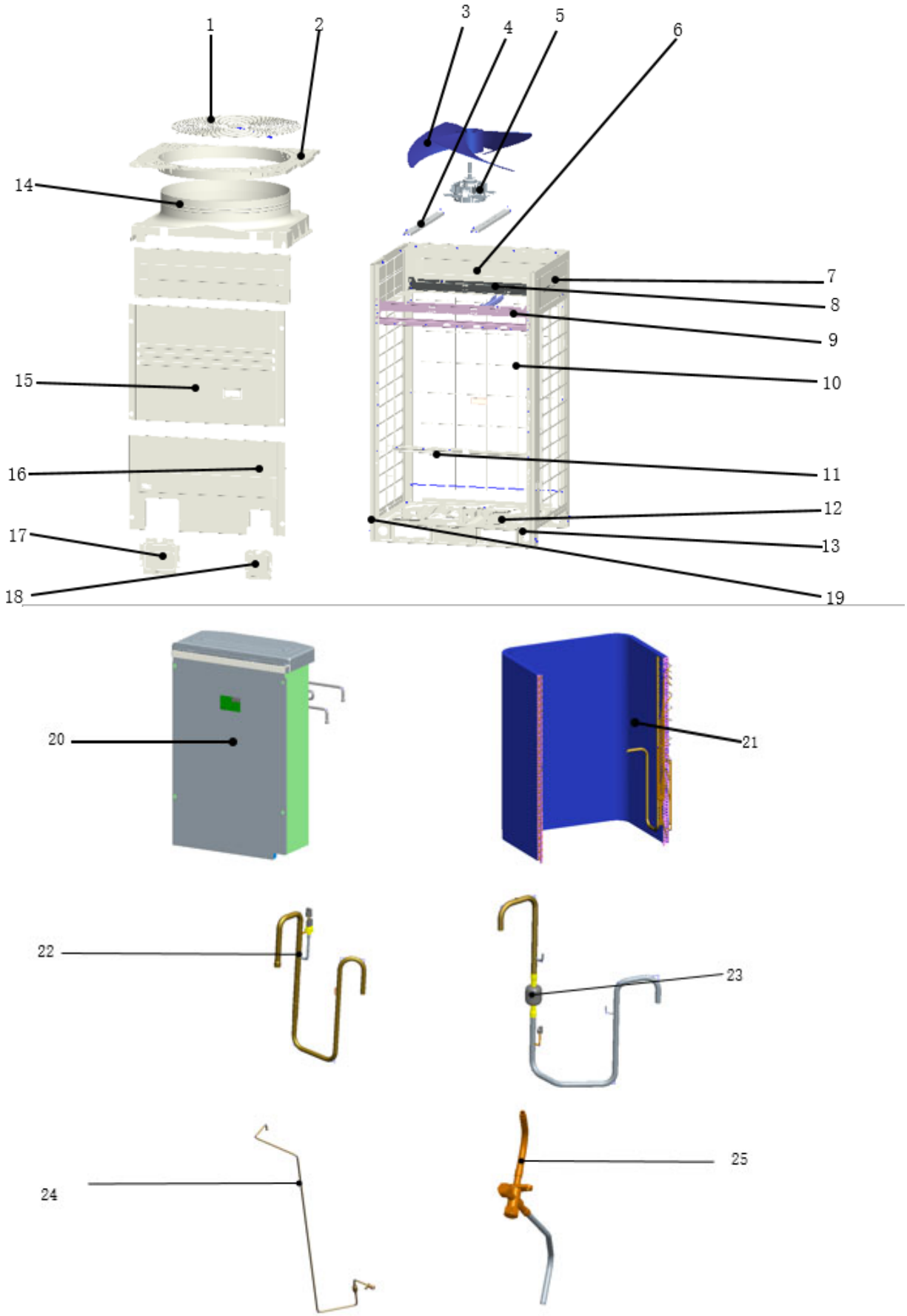
| Item | Symbol | Name | | CC-VAC014-2PS1 | CC-VAC016-2PS | CC-VAC018-2PS1 |
|---|---|---|---|---|---|---|
| Compressor | Inverter Compressor *2 | Inverter compressor | | E405DHD-42A2YG | E405DHD-42A2YG | E655DHD-65A2YG |
| | CCH | Crank case heater | | 4×40w | | |
| Motor and security devices | Motor | Fan motor | Model | 2×DR-310-560-8 | | |
| | | | Output power | 2×560W | | |
| | | Safety thermostat | On | 115°C | | |
| | | | Off | / | | |
| | HP | High pressure switch | | OFF:45(±1)kg/cm$^2$<br>ON:35(±1)kg/cm$^2$ | | |
| | LP | Low pressure switch | | OFF:0.5(±1)kg/cm$^2$<br>ON:1.5(±1)kg/cm$^2$ | | |
| Temperature sensor | T3,T4 | Temperature sensor (condenser outlet/ambient temperature) | | 25°C=5KΩ | | |
| | Discharge thermostat | Thermostat (Inverter/Fixed discharge) | | BW120°C ON:120°C OFF:90°C | | |
| Pressure sensor | HPSH | High pressure sensor (discharge) | | Model: 2HMP6-9<br>Character: Vout=0.870*P+0.5(MPa) | | |
| Functional parts | PMV | Electronic expansion valve | | UKV-32D210 (Foshan Hualu) | | |
| | 4-W/V | 4-way valve | | -V280WM6A/M+4.0.ZLT.7-5 (Foshan Hualu) | | |
| | SV | Solenoid valve | | FDF6A-088-RK. (Zhejiang Sanhua) | | |

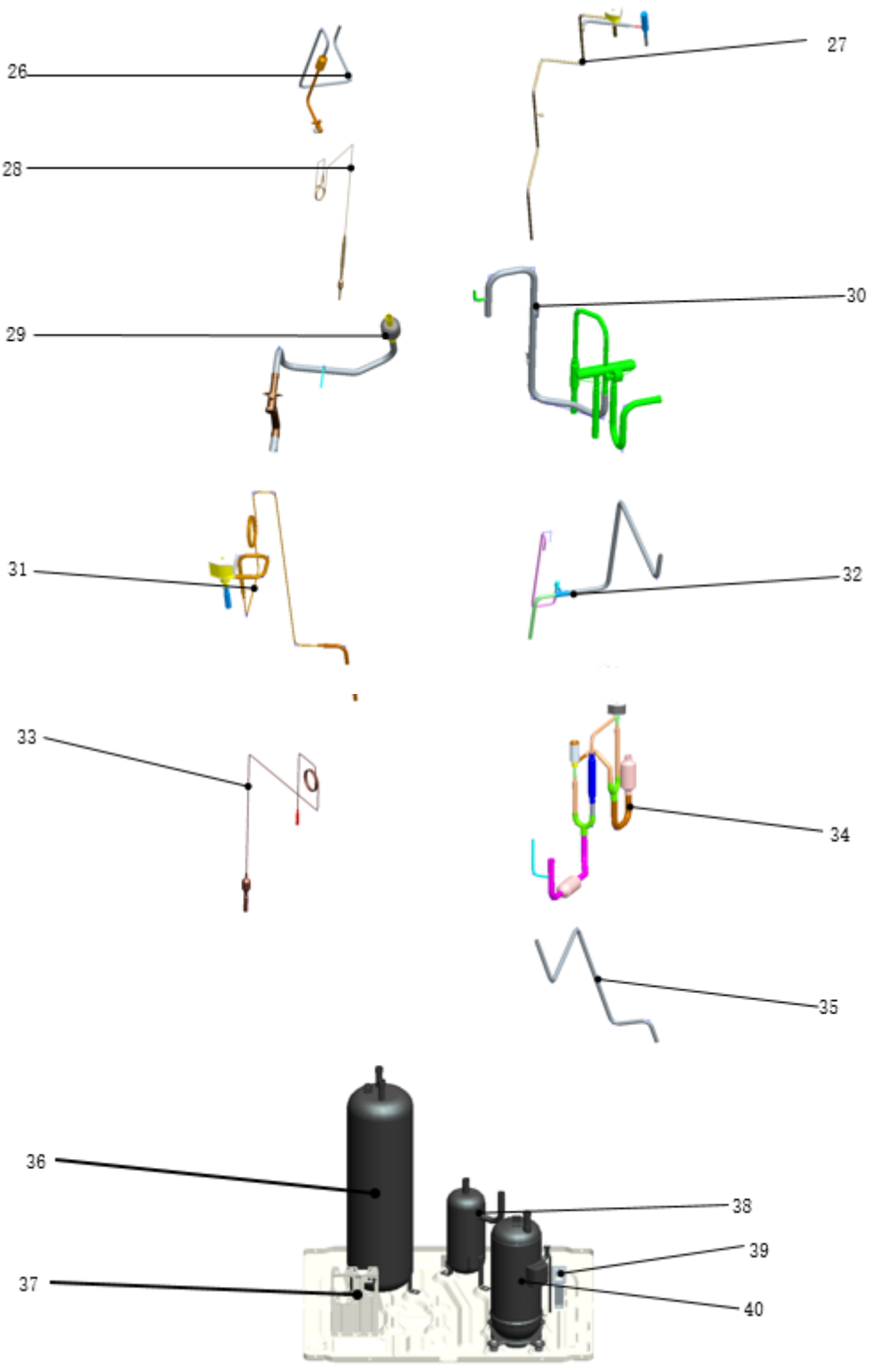
Table 3.

| Item | Symbol | Name | | CC-VAC020-2PS1 |
|---|---|---|---|---|
| Compressor | Inverter Compressor *2 | Inverter compressor | | E655DHD-65A2YG |
| | CCH | Crank case heater | | 4×40w |
| Motor and security devices | Motor | Fan motor | Model | 2×DR-310-560-8 |
| | | | Output power | 2×560W |
| | | Safety thermostat | On | 115°C |
| | | | Off | / |
| | HP | High pressure switch | | OFF:45(±1)kg/cm$^2$<br>ON:35(±1)kg/cm$^2$ |
| | LP | Low pressure switch | | OFF:0.5(±1)kg/cm$^2$<br>ON:1.5(±1)kg/cm$^2$ |
| Temperature sensor | T3,T4 | Temperature sensor (condenser outlet/ambient temperature) | | 25°C=5KΩ |
| | Discharge thermostat | Thermostat (Inverter/Fixed discharge) | | BW120°C ON:120°C OFF:90°C |
| Pressure sensor | HPSH | High pressure sensor (discharge) | | Model: 2HMP6-9<br>Character: Vout=0.870*P+0.5(MPa) |
| Functional parts | PMV | Electronic expansion valve | | UKV-32D210 (Foshan Hualu) |
| | 4-W/V | 4-way valve | | -V280WM6A/M+4.0.ZLT.7-5 (Foshan Hualu) |
| | SV | Solenoid valve | | FDF6A-088-RK. (Zhejiang Sanhua) |

## 9. Exploded view

9.1 8HP,10HP

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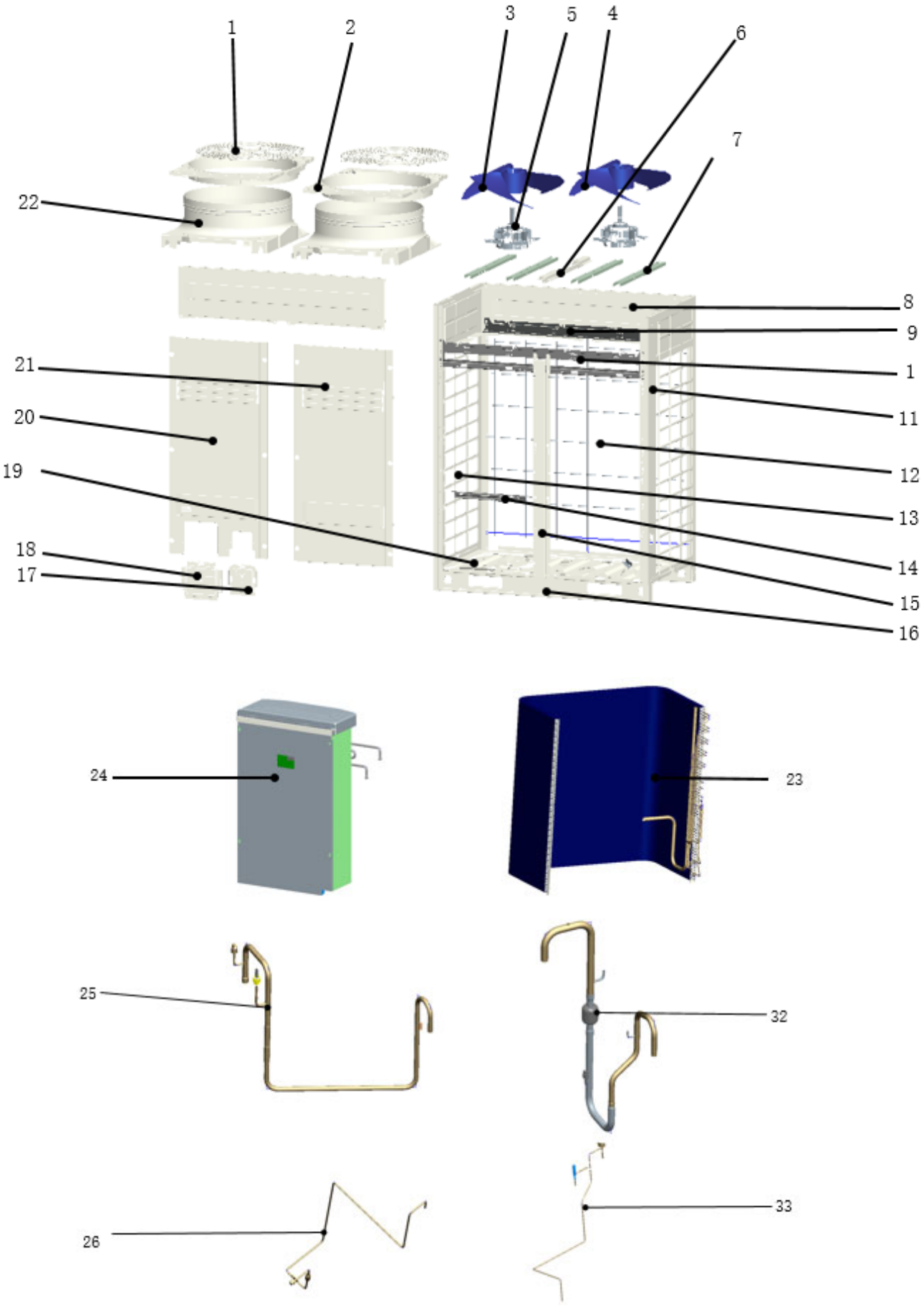
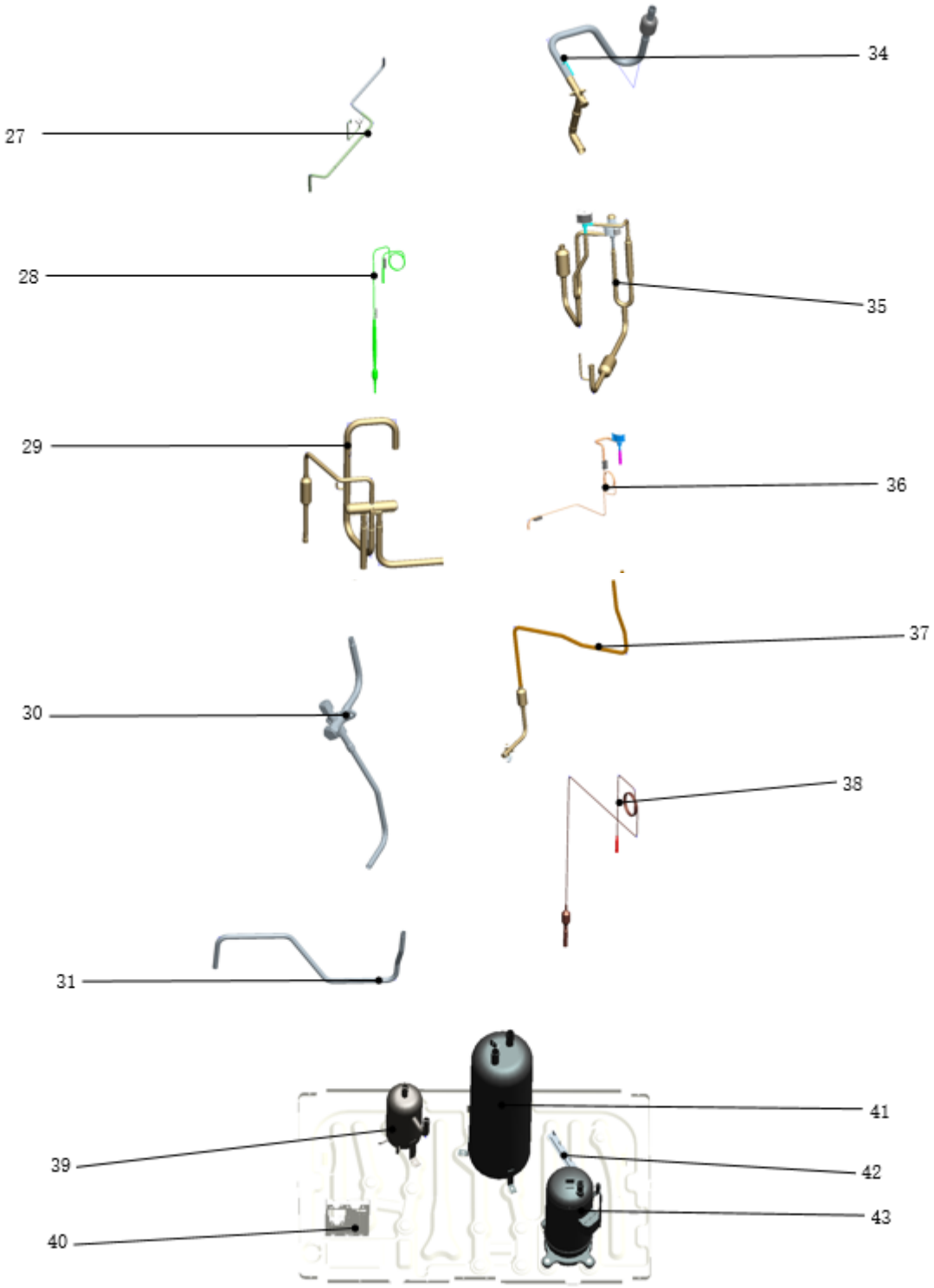
| No. | Part name | Quantity | No. | Part name | Quantity |
|---|---|---|---|---|---|
| 1 | Top net | 1 | 21 | condenser assy | 1 |
| 2 | Cover | 1 | 22 | Exhaust the total component | 1 |
| 3 | Propeller fan | 1 | 23 | Press inspiratory tube components | 1 |
| 4 | Holder for fan motor | 2 | 24 | Low-Voltage Detect needle valve components | 1 |
| 5 | Single shaft outdoor motor | 1 | 25 | Oil balance the cut-off valve components | 1 |
| 6 | Top panel components | 2 | 26 | High pressure cut-off assembly | 1 |
| 7 | Right cover | 1 | 27 | SV4 Solenoid ralve components | 1 |
| 8 | Back beam | 1 | 28 | Oil balance capillary components | 1 |
| 9 | Front top beam | 1 | 29 | Low Pressure cut-off assembly | 1 |
| 10 | Back net | 1 | 30 | 4-Ways valve assy | 1 |
| 11 | Front down beam | 1 | 31 | SV2 Solenoid ralve components | 1 |
| 12 | base assy | 1 | 32 | SV5 Solenoid ralve components | 1 |
| 13 | Machine feet | 2 | 33 | Oil return capillary components | 1 |
| 14 | Inlet cone components | 1 | 34 | The high-pressure tube of component | 1 |
| 15 | middle clapboard | 1 | 35 | The inlet of Refrigerant heat dissipation | 1 |
| 16 | underside clapboard | 1 | 36 | Vapour separator | 1 |
| 17 | The pipe cover1 | 1 | 37 | Seat board | 1 |
| 18 | The pipe cover2 | 1 | 38 | Oil separator | 1 |
| 19 | Left cover | 1 | 39 | strengthen fixed frame components | 1 |
| 20 | E-parts, assy | 1 | 40 | Variable speed compressor | 1 |

9.2 12HP

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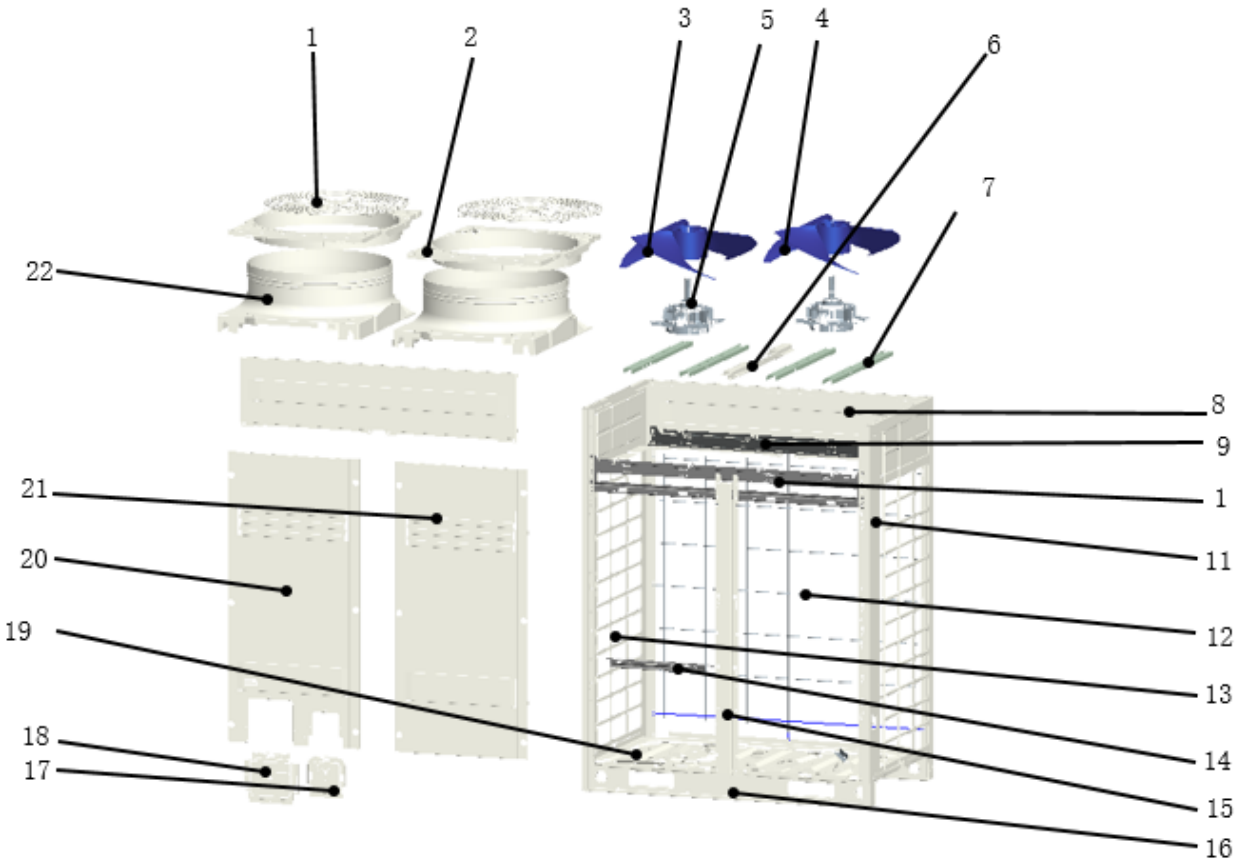
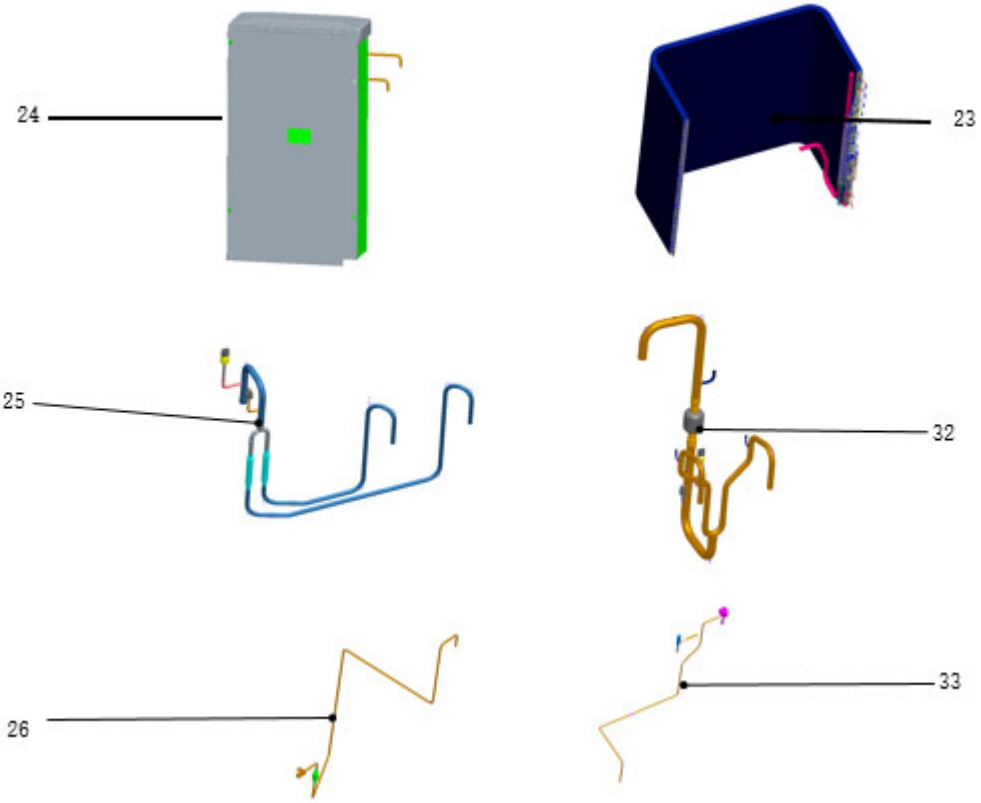
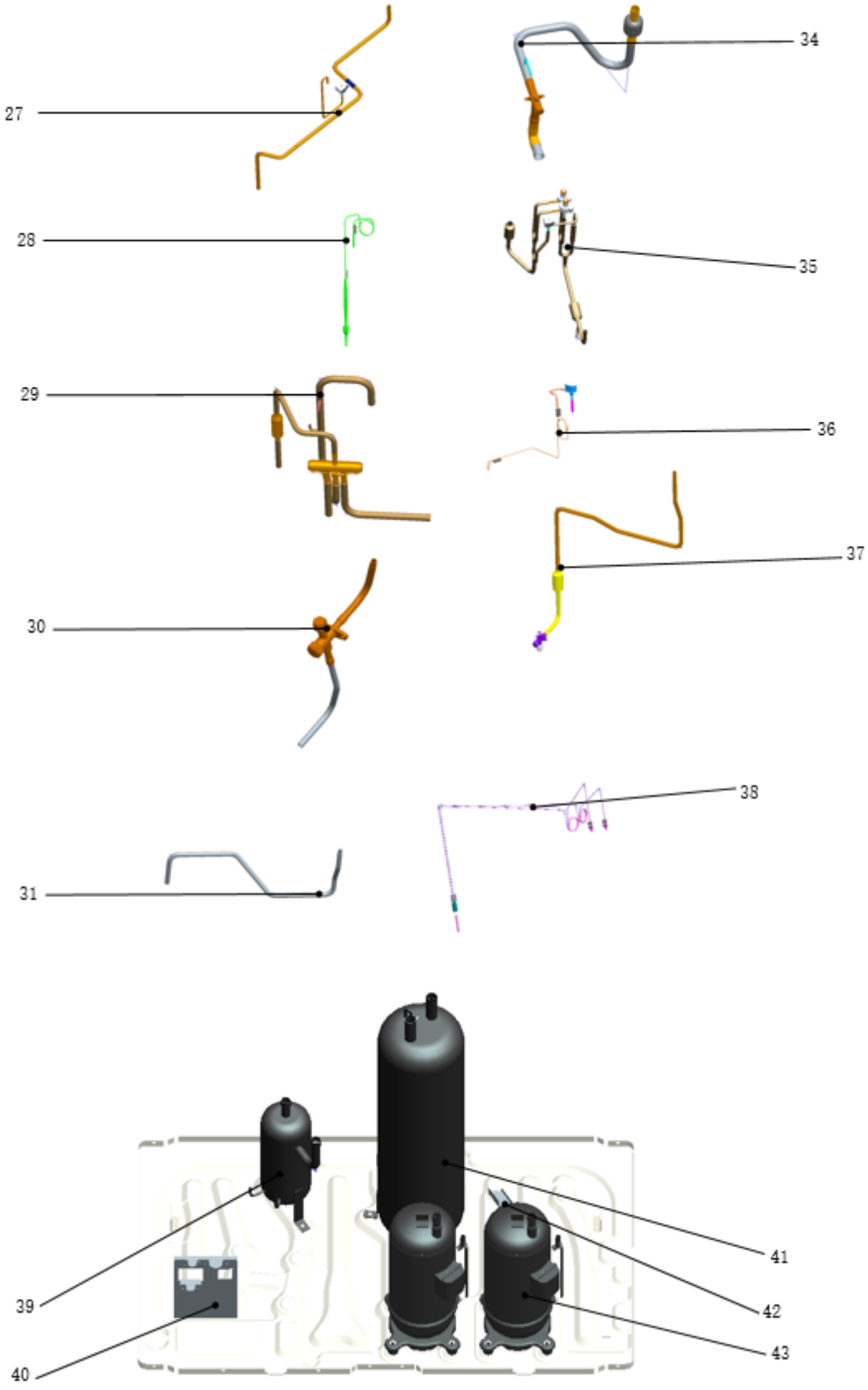
| No. | Part name | Quantity | No. | Part name | Quantity |
|---|---|---|---|---|---|
| 1 | Top net | 2 | 23 | condenser assy | 1 |
| 2 | Cover | 2 | 24 | E-parts, assy | 1 |
| 3 | Propeller fan（left） | 1 | 25 | Exhaust the total component | 1 |
| 4 | Propeller fan（right） | 1 | 26 | Low-Voltage Detect needle valve components | 1 |
| 5 | Fan motor | 2 | 27 | SV5 Solenoid ralve components | 1 |
| 6 | Top beam component | 1 | 28 | Oil balance capillary components | 1 |
| 7 | Holder for fan motor | 4 | 29 | 4-Ways valve assy | 1 |
| 8 | Top panel components | 2 | 30 | Oil balance the cut-off valve components | 1 |
| 9 | Back beam | 1 | 31 | The inlet of Refrigerant heat dissipation | 1 |
| 10 | Front top beam | 1 | 32 | Press inspiratory tube components | 1 |
| 11 | Right cover | 1 | 33 | SV4 Solenoid ralve components | 1 |
| 12 | Back net | 1 | 34 | Low Pressure cut-off assembly | 1 |
| 13 | Left cover | 1 | 35 | The high-pressure tube of component | 1 |
| 14 | Front down beam | 1 | 36 | SV2 Solenoid ralve components | 1 |
| 15 | Column components | 1 | 37 | High pressure cut-off assembly | 1 |
| 16 | Machine feet | 2 | 38 | Oil return capillary component | 1 |
| 17 | The pipe cover2 | 1 | 39 | Oil separator | 1 |
| 18 | The pipe cover1 | 1 | 40 | Seat board | 1 |
| 19 | base assy | 1 | 41 | Vapour separator | 1 |
| 20 | Left clapboard | 1 | 42 | fixed frame components | 1 |
| 21 | Right clapboard | 1 | 43 | Variable speed compressor | 1 |
| 22 | Inlet cone components | 2 | | | |

9.3 14HP,16HP

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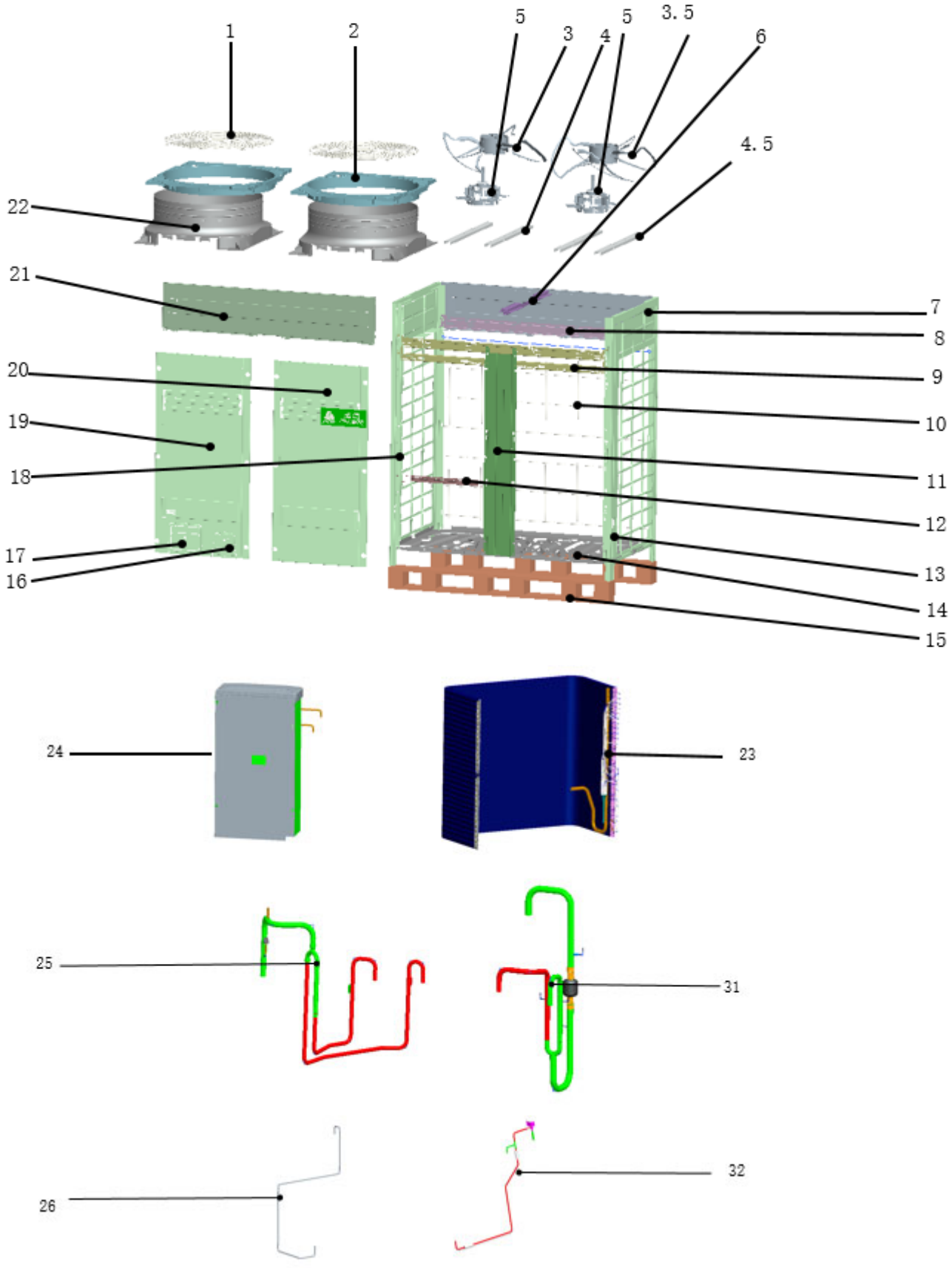
| No. | Part name | Quantity | No. | Part name | Quantity |
|---|---|---|---|---|---|
| 1 | Top net | 2 | 23 | condenser assy | 1 |
| 2 | Cover | 2 | 24 | E-parts, assy | 1 |
| 3 | Propeller fan（left） | 1 | 25 | Exhaust the total component | 1 |
| 4 | Propeller fan（right） | 1 | 26 | Low-Voltage Detect needle valve components | 1 |
| 5 | Fan motor | 2 | 27 | SV5 Solenoid ralve components | 1 |
| 6 | Top beam component | 1 | 28 | Oil balance capillary components | 1 |
| 7 | Holder for fan motor | 4 | 29 | 4-Ways valve assy | 1 |
| 8 | Top panel components | 2 | 30 | Oil balance the cut-off valve components | 1 |
| 9 | Back beam | 1 | 31 | The inlet of Refrigerant heat dissipation | 1 |
| 10 | Front top beam | 1 | 32 | Press inspiratory tube components | 1 |
| 11 | Right cover | 1 | 33 | SV4 Solenoid ralve components | 1 |
| 12 | Back net | 1 | 34 | Low Pressure cut-off assembly | 1 |
| 13 | Left cover | 1 | 35 | The high-pressure tube of component | 1 |
| 14 | Front down beam | 1 | 36 | SV2 Solenoid ralve components | 1 |
| 15 | Column components | 1 | 37 | High pressure cut-off assembly | 1 |
| 16 | Machine feet | 2 | 38 | Oil return capillary component | 1 |
| 17 | The pipe cover2 | 1 | 39 | Oil separator | 1 |
| 18 | The pipe cover1 | 1 | 40 | Seat board | 1 |
| 19 | base assy | 1 | 41 | Vapour separator | 1 |
| 20 | Left clapboard | 1 | 42 | fixed frame components | 1 |
| 21 | Right clapboard | 1 | 43 | Variable speed compressor | 2 |
| 22 | Inlet cone components | 2 | | | |

9.4 18HP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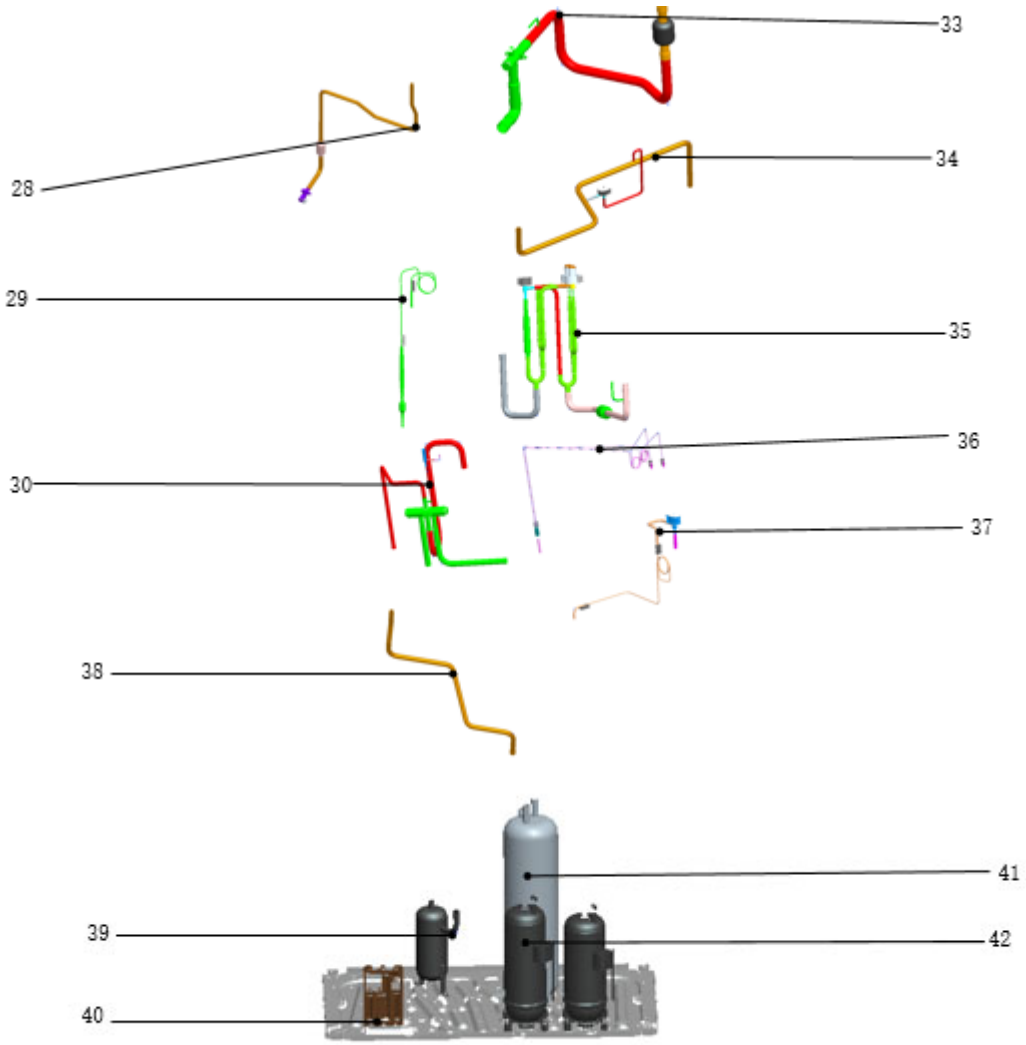


| No. | Part name | Quantity | No. | Part name | Quantity |
|---|---|---|---|---|---|
| 1 | Top net | 2 | 21 | Right clapboard | 2 |
| 2 | Cover | 2 | 22 | Inlet cone components | 2 |
| 3 | Propeller fan（left） | 1 | 23 | condenser assy | 1 |
| 3.5 | Propeller fan（left） | 1 | 24 | E-parts assy | 1 |
| 4 | Holder for fan motor（left） | 2 | 25 | Exhaust the total component | 1 |
| 4.5 | Holder for fan motor（right） | 2 | 26 | Low-Voltage Detect needle valve components | 1 |
| 5 | Fan motor | 2 | 27 | High pressure cut-off assembly | 1 |
| 6 | Top beam component | 1 | 28 | Oil balance capillary components | 1 |
| 7 | Right cover | 1 | 29 | 4-Ways valve assy | 1 |
| 8 | Back beam | 1 | 30 | Press inspiratory tube components | 1 |
| 9 | Front top beam | 1 | 31 | SV4 Solenoid ralve components | 1 |
| 10 | Back net | 1 | 32 | Low Pressure cut-off assembly | 1 |
| 11 | Column components | 1 | 33 | SV5 Solenoid ralve components | 1 |
| 12 | Column components | 1 | 34 | The high-pressure tube of component | 1 |
| 13 | The lead cover | 2 | 35 | Oil return capillary component | 1 |

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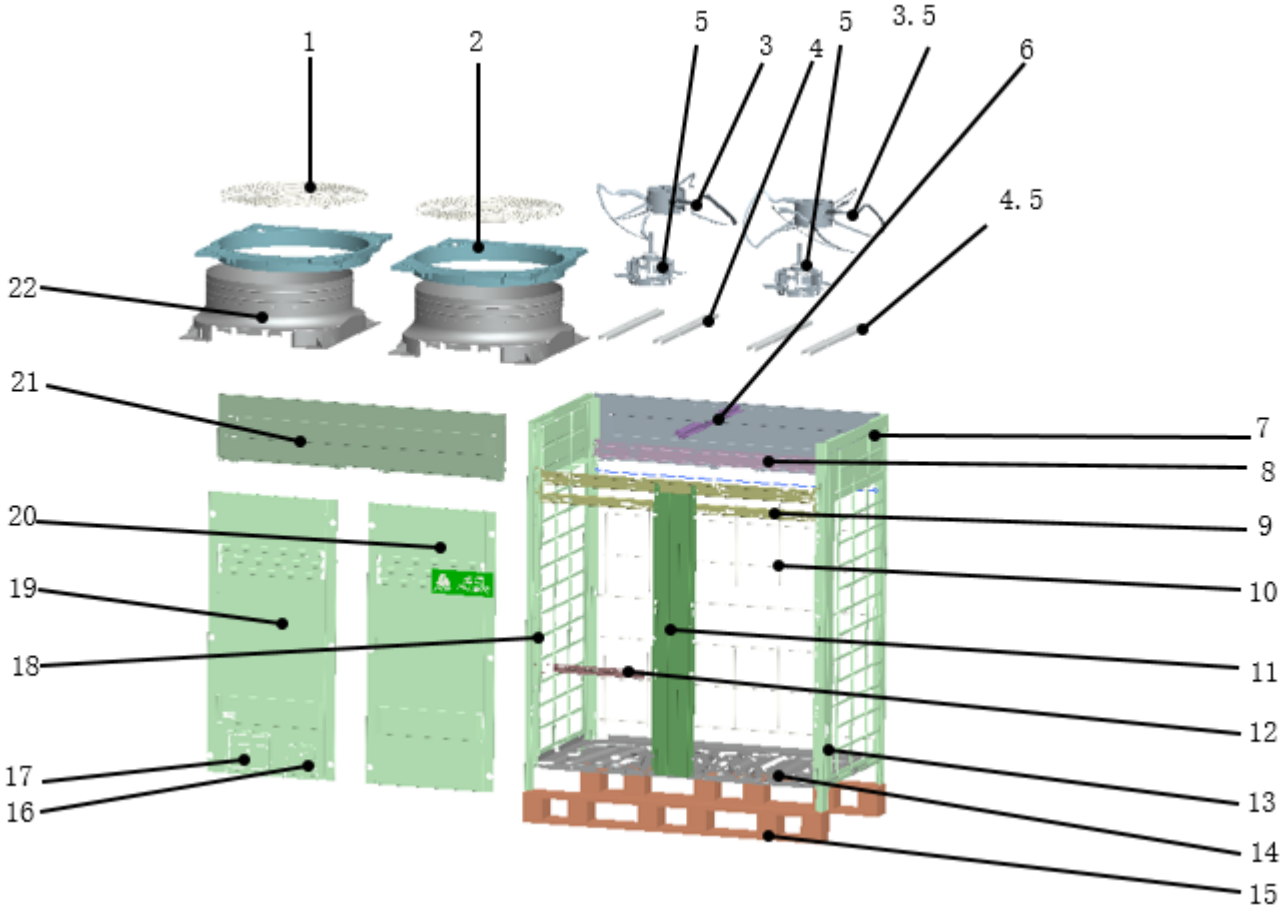
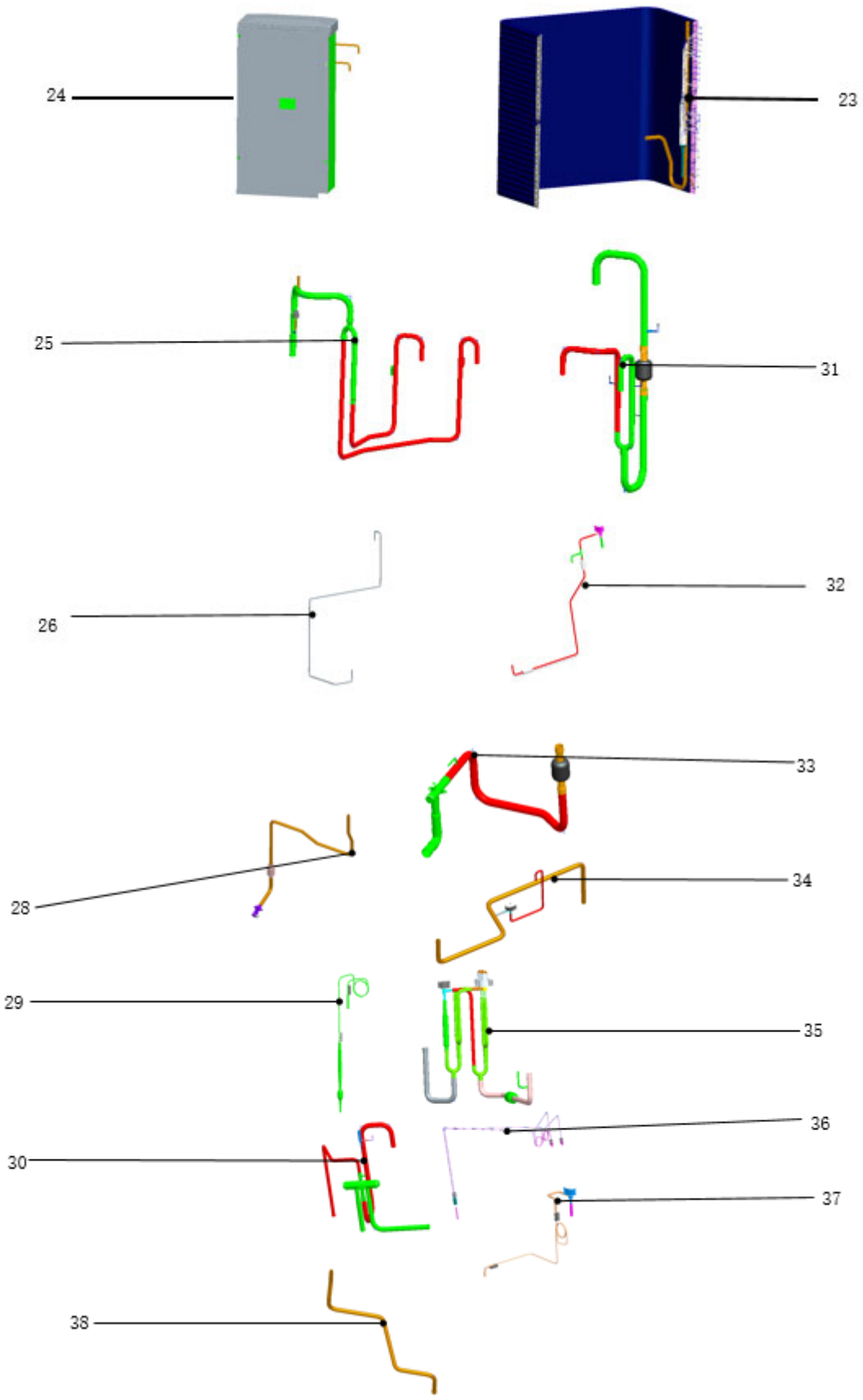
|---|---|---|---|---|---|
| 14 | base assy | 1 | 36 | SV2 Solenoid ralve components | 1 |
| 15 | Machine feet | 2 | 37 | The inlet of Refrigerant heat dissipation | 1 |
| 16 | The pipe cover2 | 1 | 38 | Oil separator | 1 |
| 17 | The pipe cover1 | 1 | 39 | Seat board | 1 |
| 18 | Left cover | 1 | 40 | Vapour separator | 1 |
| 19 | Left clapboard | 1 | 41 | Variable speed compressor | 2 |
| 20 | Right clapboard | 1 | | | |

9.5 20HP

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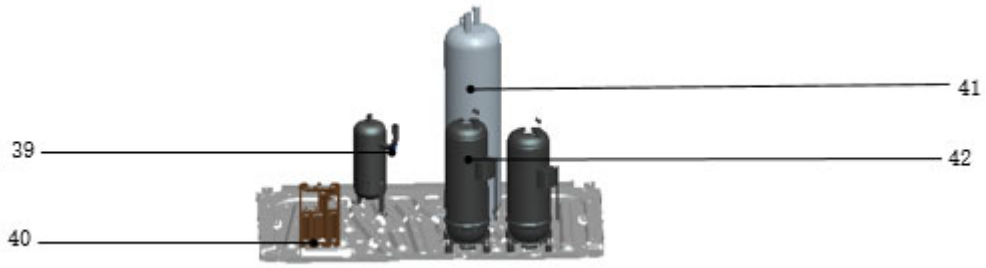


| No. | Part name | Quantity | No. | Part name | Quantity |
|---|---|---|---|---|---|
| 1 | Top net | 2 | 21 | Right clapboard | 2 |
| 2 | Cover | 2 | 22 | Inlet cone components | 2 |
| 3 | Propeller fan（left） | 1 | 23 | condenser assy | 1 |
| 3.5 | Propeller fan（left） | 1 | 24 | E-parts assy | 1 |
| 4 | Holder for fan motor（left） | 2 | 25 | Exhaust the total component | 1 |
| 4.5 | Holder for fan motor（right） | 2 | 26 | Low-Voltage Detect needle valve components | 1 |
| 5 | Fan motor | 2 | 27 | High pressure cut-off assembly | 1 |
| 6 | Top beam component | 1 | 28 | Oil balance capillary components | 1 |
| 7 | Right cover | 1 | 29 | 4-Ways valve assy | 1 |
| 8 | Back beam | 1 | 30 | Press inspiratory tube components | 1 |
| 9 | Front top beam | 1 | 31 | SV4 Solenoid ralve components | 1 |
| 10 | Back net | 1 | 32 | Low Pressure cut-off assembly | 1 |
| 11 | Column components | 1 | 33 | SV5 Solenoid ralve components | 1 |
| 12 | Column components | 1 | 34 | The high-pressure tube of component | 1 |
| 13 | The lead cover | 2 | 35 | Oil return capillary component | 1 |
| 14 | base assy | 1 | 36 | SV2 Solenoid ralve components | 1 |
| 15 | Machine feet | 2 | 37 | The inlet of Refrigerant heat dissipation | 1 |
| 16 | The pipe cover2 | 1 | 38 | Oil separator | 1 |
| 17 | The pipe cover1 | 1 | 39 | Seat board | 1 |
| 18 | Left cover | 1 | 40 | Vapour separator | 1 |
| 19 | Left clapboard | 1 | 41 | Variable speed compressor | 2 |
| 20 | Right clapboard | 1 | | | |