

# DATACOOL

Precision Air Conditioner For Critical Application

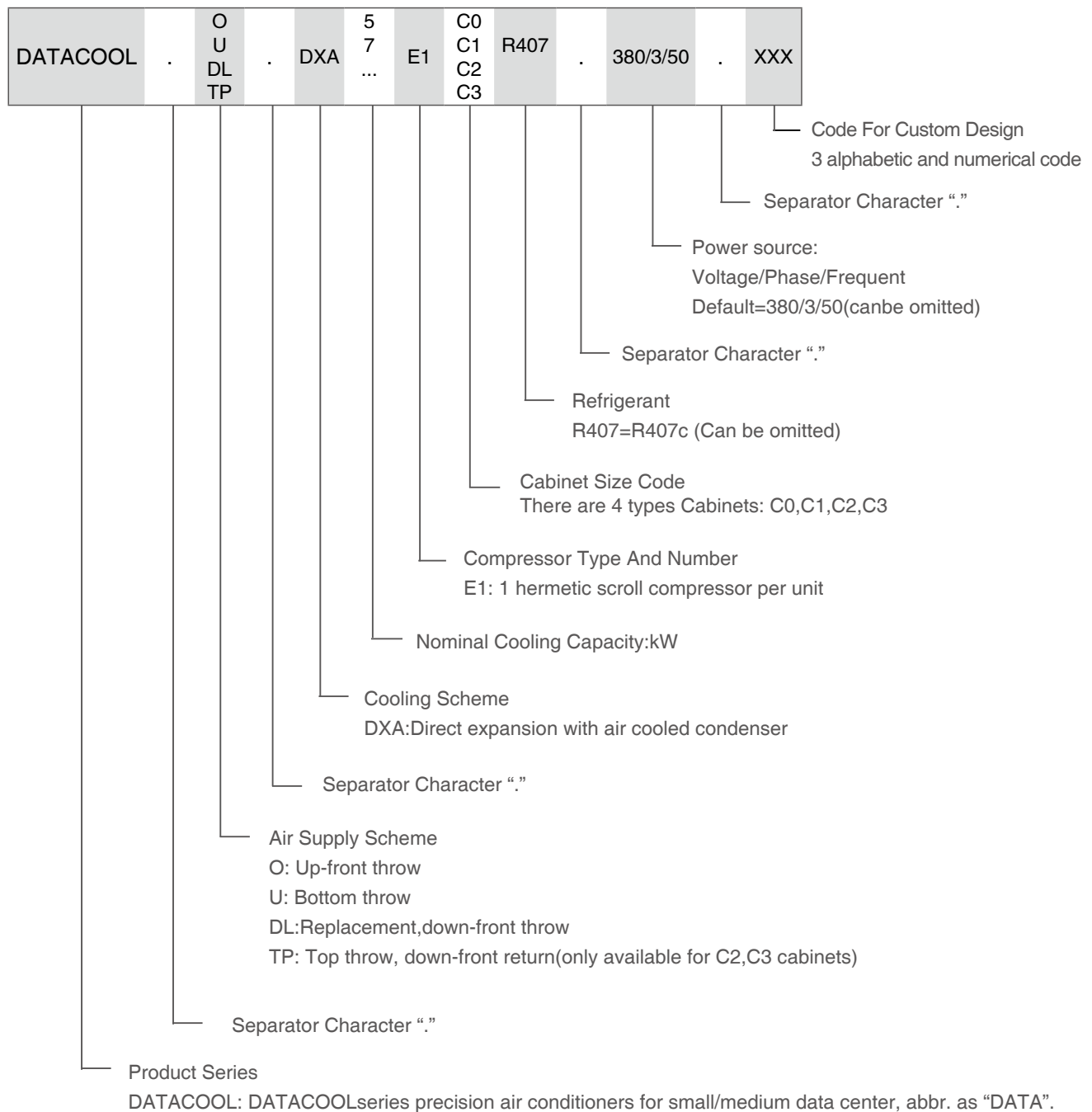
Cooling Capacity: 5.8~30.2kW



DATA COOL product series is one of many data center cooling product family members that AIRSYS offers. It is specially designed for data center cooling application. It incorporates various cutting edge-features.

DATA COOL series provides precise humidity, temperature control which is typical of medium/small data centers. The series is designed to work for wide range of -45°C~45°C and 24x7 operations. The products meet or exceed high efficiency, high reliability requirement typically seen in the marketplace.

## Unit Identification



**Example:** DATA COOL.O.DXA15E1C2. This product name suggests that it is a DATA COOL series, up-front throw air flow, direct evaporative air-cooled with a remote air-cool condenser, nominal cooling capacity of 15KW. This unit has only 1 compressor with cabinet size of C2,charged R407c refrigerant.

## Operation Range and Control Accuracy

### Operating Range

#### Ambient Temperature

-15°C~+45°C; it can operate in as low as -40°C when equipped with low-ambient enhancement option

#### Refrigeration tubing horizontal length:

The combined gas and liquid length in horizontal no more than 30 meters. (Please consult with the factory or dealer if range is over the limit.)

#### Refrigeration tubing vertical differences

Outdoor unit above the indoor unit: ≤20 meters

Outdoor unit below the indoor unit: ≤5 meters

(Please consult with the factory or dealer if range is over the limit.)

### Control Precision

Temperature range: 15~35°C; Precision: ±1°C;

Relative Humidity range: 35%~80%, precision: ±5%

## Application

ICT applications

Small/Medium MCS

Call centers or text message process centers

Micro-wave or satellite base stations

Mobile telecom-equipment room

Small/Medium data centers or computer rooms

Network operation centers

PUS and battery housing

Hot spots or regions within large data centers

CT and MRI computer/electronic rooms

Medical clinic facilities

Industry production or processing plants

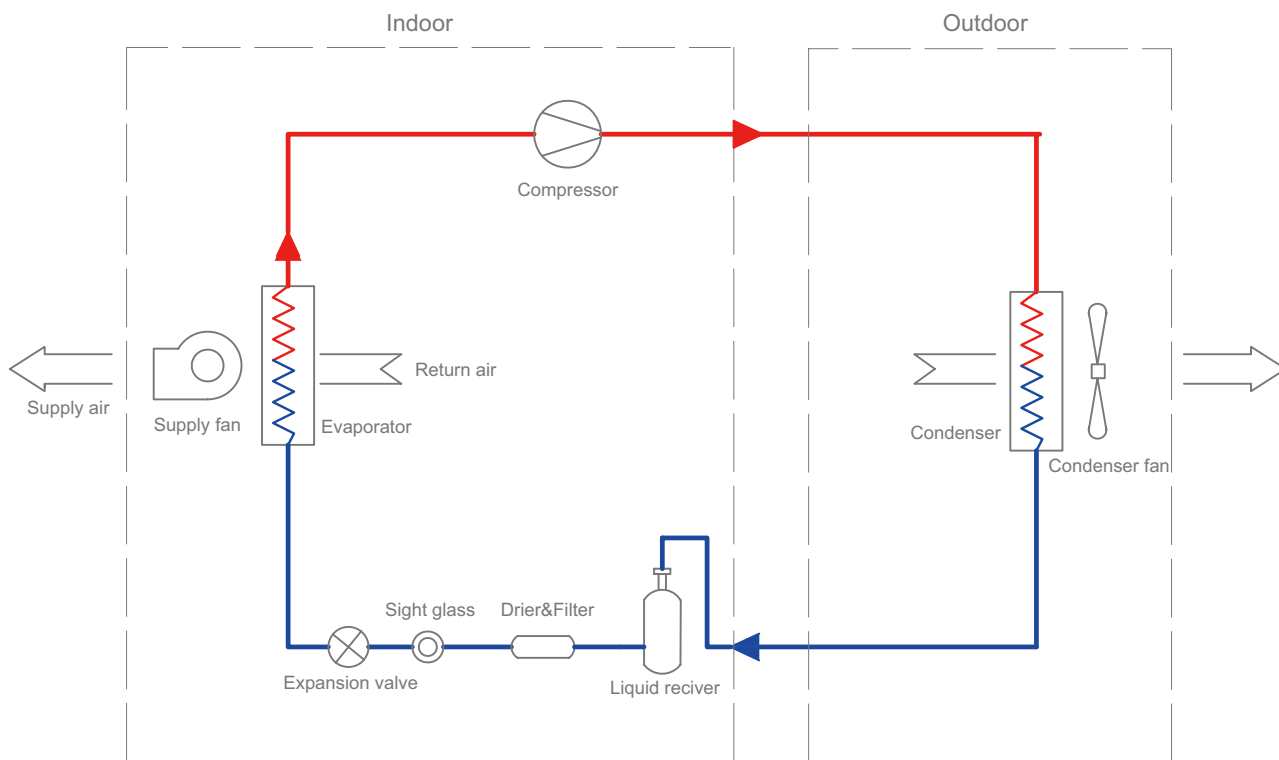
Precision control environment or labs

Standard or calibration chambers

Precision machine shops

Museum and records keeping environment

## System Schematic



## Product Features

### High Efficiency

DATACOOL product series was designed with high energy efficiency in mind. The product adopts high-efficiency components (such as compressors and fan motors) and efficient structure design to achieve system EER above 2.9.

### Energy-efficient Running Modes

This product series offers two running modes: standard and energy-saving mode. When application requires very accurate Temperature or HR control accuracy, standard mode can be chosen; otherwise energy-saving mode is chosen and can deliver 10% or energy saving.

### Condenser Fan Speed Control

Controlling the condenser fan speed will not only reduce the fan motor's energy but also the whole refrigeration systems.

### Efficient Air Distribution

DATACOOL series offers 4 flow patterns: (up-front throw, bottom throw, replacement and top throw). Clients can pick the most suitable to match their data centers. Up-front throw (return at the lower) mode does not raised floor, is the least demanding installation, and widely accepted in small electronic housing; since hot air tends to go and stay at top and cold stays at bottom, this mode delivers worse energy efficiency comparing with the other 2 modes by 2~5%. See charts below.

Bottom throw requires raised-up floor. Comparing with up-front throw, it offers easy air distribution of hot passage and cold aisle. This distribution results higher energy saving benefits, also higher infrastructure cost. See charts below.

Replacement flow allows air temperature and distribution close to its natural tendency as shown below. It reduces cooling capacity loss as hot cold air mix and doesn't require raised-up floor. It usually delivers better energy saving results. Don't put any obstacles in front of the supply ducts otherwise "air short circuit" may occur.

Top throw standard static pressure at the outlet is 50 Pa, it usually apply to the site that need connect air duct, to achieve better temperature distribution and more flexible unit placement.

### Filter

DATACOOL series uses washable synthetic fiber filters with G4 rating, i.e. it can filter out 80% of 5μ large particles, 20% of 1μ, should meet conventional data center requirements.

### Styles

DATACOOL series main body frames and base are typically in black, follow mainstream industry standards in terms dimensions and styles.

It offers compact structures, small foot-print, light weight and easy of moving and handling within confined spaces.

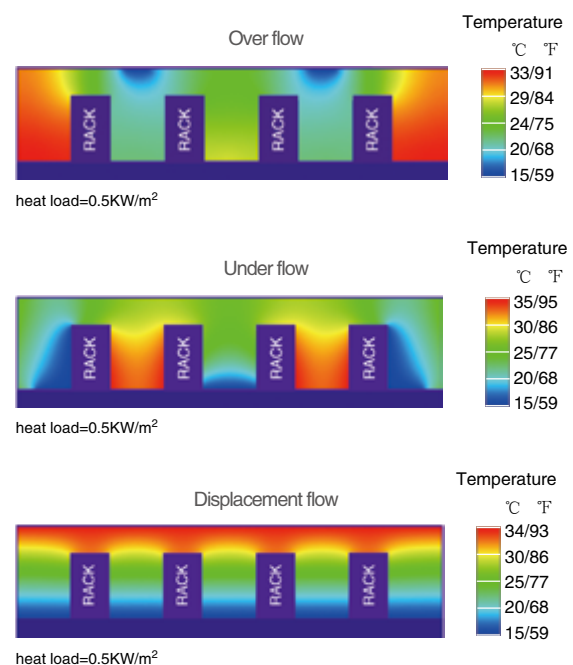
### Reliability

DATACOOL series uses only top quality parts and best brands for its compressors, fan motors, expansion valves, controllers to ensure system high availability and reliability.

Unit Systems are designed three levels of access control to reduce risks by human errors or workmanship.

Units are also configured with various protection and alarm systems to reduce down-time, such high/low pressure, compressor over-heat, humidifier, heater-over current, fan motor over-drive, high- & low-temp protections and filter clogging etc.

Temperature profile of the room



## Product Configurations

### Standard Configuration

Steel frames, base & top power-painted in black

Steel front panel, heat and sound plates

Scroll compressor

Backward curve, centrifugal fan with 3 phase AC powered electronic commuted motor

Copper tube aluminum finned evaporator

Thermal expansion valve

Sight glass

Dry filter

Liquid receiver

Electrode humidifier, available with multi-stage humidifier

Stainless steel fin electrical heater, available with multiple capacities

G4 air filter

Return air and HR sensor

Pressure switch/protection

Micro-controllersystem

Phase protection (only application for 3-phase Unit)

Continuous control system for condensing pressure

Micro PC control system

Electrical Panel for

- Compressor, fan motor, heater, humidifier Circuitry
- Compressor, fan motor, heater, humidifier etc. connectors
- Transformer(s) for auxiliary circuitry and microcontroller

### Options

Backward curve, centrifugal fan with 3Phase, EC powered motor

407C refrigeration type Unit

Low-Ambient Startup kit for -20°C or lower

Filter clogging alarm

Supply air temperature sensor

Supply air pressure sensor

Install stands with adjustable legs

Floor water sensor/alarm kit

R232 com card

RS485 com card

Pcoweb card

Clock card

Com protocol converter

Note: Above configurations is only available for C1~C3 cabinets

Heater/Humidifier Configuration Table

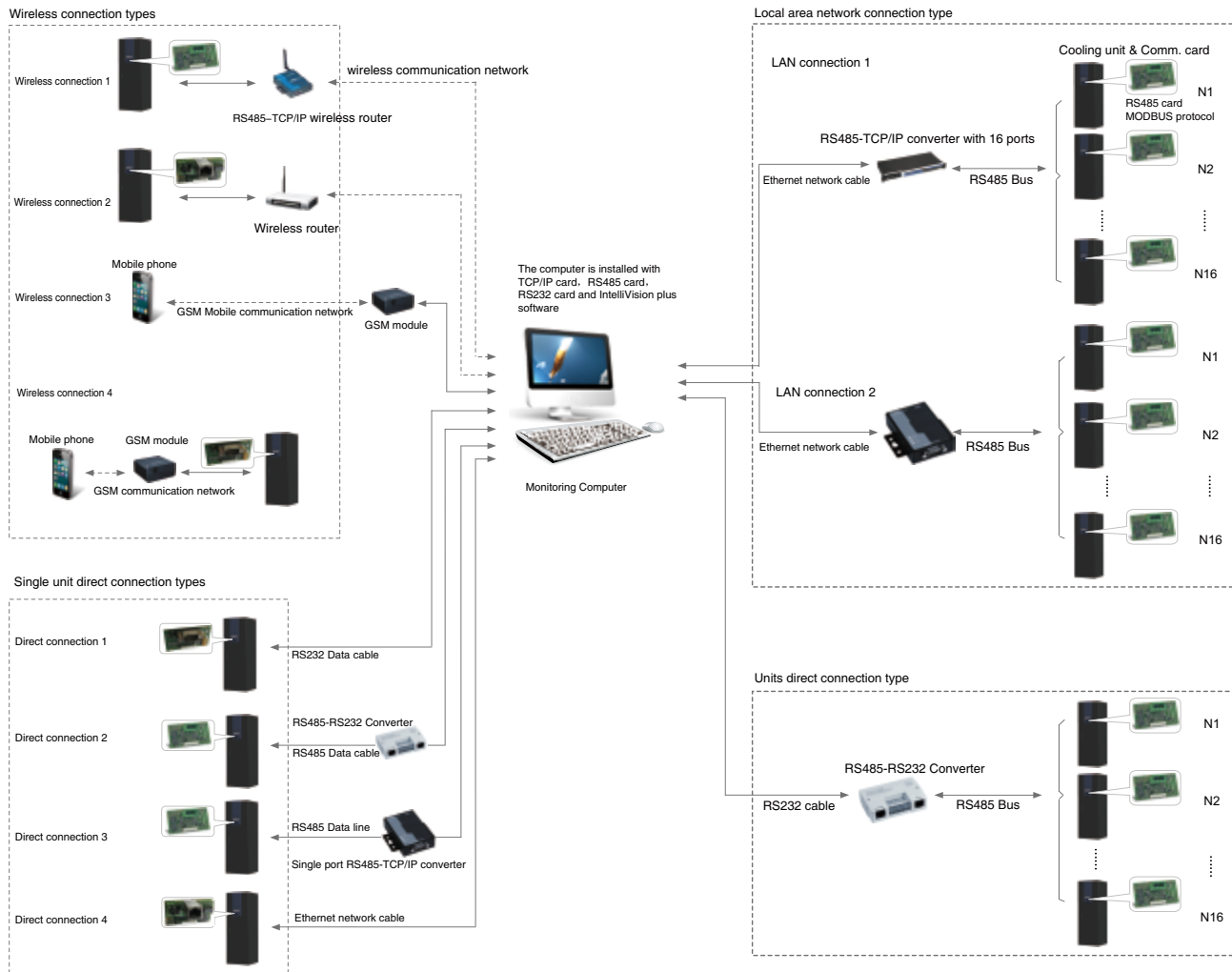
|                            |      | 5E1C0 | 7E1C0 | 13E1C0 | 7E1C1 | 10E1C1 | 13E1C1 | 15E1C2 | 18E1C2 | 22E1C3 | 25E1C3 | 30E1C3 |
|----------------------------|------|-------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|
| Heater capacity (kW)       | 2.3  | ●     | ●     | —      | ●     | —      | —      | —      | —      | —      | —      | —      |
|                            | 4.5  | —     | —     | ●      | ○     | ●      | ●      | —      | —      | —      | —      | —      |
|                            | 6    | —     | —     | —      | —     | ○      | ○      | ●      | ●      | —      | —      | —      |
|                            | 9    | —     | —     | —      | —     | —      | ○      | ○      | ○      | ●      | ●      | ●      |
|                            | 12   | —     | —     | —      | —     | —      | —      | —      | —      | ○      | ○      | ○      |
|                            | 13.5 | —     | —     | —      | —     | —      | —      | —      | —      | ○      | ○      | ○      |
| Humidifier capacity (kg/h) | 3    | ●     | ●     | ●      | ●     | ●      | ●      | —      | —      | —      | —      | —      |
|                            | 5    | —     | —     | —      | —     | —      | —      | ●      | ●      | ●      | —      | —      |
|                            | 8    | —     | —     | —      | —     | —      | —      | ○      | ○      | ○      | ●      | ●      |
|                            | 10   | —     | —     | —      | —     | —      | —      | —      | —      | ○      | ○      | ○      |
|                            | 13   | —     | —     | —      | —     | —      | —      | —      | —      | ○      | ○      | ○      |
|                            | 15   | —     | —     | —      | —     | —      | —      | —      | —      | ○      | ○      | ○      |

Note: “●” standard configuration, “○” option available, “—”no option available.

## Remote Control And Monitoring Network

The unit can be remote controlled or monitored by many kinds of methods as follows:

- 3 kinds of local direct cable connection
- 3 kinds of LAN network connection
- 4 kinds of wireless network connection



## Technical Parameters

### Indoor Units

| Unit Model                            |      | 5E1C0                        | 7E1C0           | 13E1C0 | 7E1C1  | 10E1C1    | 13E1C1 | 15E1C2 | 18E1C2             | 22E1C3 | 25E1C3  | 30E1C3  |
|---------------------------------------|------|------------------------------|-----------------|--------|--------|-----------|--------|--------|--------------------|--------|---------|---------|
| Supply air scheme(1)                  |      | O                            |                 |        |        | O/U/DL/TP |        |        |                    |        |         |         |
| Cooling capacity                      |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Total (2)                             | kW   | 5.8                          | 7.4             | 13.2   | 7.6    | 10.7      | 13.6   | 15.4   | 18.3               | 22.2   | 25.4    | 30.2    |
| Sensible (2)                          | kW   | 5.2                          | 6.6             | 11.7   | 6.9    | 9.8       | 12.5   | 14.2   | 16.8               | 20.4   | 23.4    | 27.8    |
| Total (3)                             | kW   | 6.1                          | 7.6             | 13.4   | 8.1    | 11.5      | 14.2   | 16.0   | 18.7               | 22.6   | 25.9    | 30.6    |
| Sensible (3)                          | kW   | 5.5                          | 6.8             | 12.1   | 7.8    | 10.8      | 13.3   | 15.0   | 17.4               | 21.0   | 24.1    | 28.5    |
| Compressor                            |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Type                                  |      | Rotor                        | Hermetic scroll |        |        |           |        |        |                    |        |         |         |
| Power input                           | kW   | 1.6                          | 1.9             | 3.6    | 1.9    | 2.7       | 3.5    | 3.7    | 4.6                | 5.2    | 5.9     | 6.9     |
| Current                               | A    | 7.2                          | 3.6             | 6.1    | 3.4    | 4.9       | 5.6    | 6.5    | 8.0                | 9.7    | 11.2    | 12.7    |
| Power input                           | kW   | 1.7                          | 2.0             | 3.7    | 1.9    | 2.9       | 3.6    | 3.8    | 4.8                | 5.3    | 6.0     | 7.1     |
| Current                               | A    | 7.4                          | 3.8             | 6.3    | 3.5    | 5.1       | 5.7    | 6.7    | 8.2                | 9.9    | 11.5    | 12.9    |
| Fan                                   |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Qty. of fan                           | n.   | 1                            | 1               | 1      | 1      | 1         | 1      | 1      | 1                  | 2      | 2       | 2       |
| Air volume                            | m³/h | 1650                         | 1650            | 2630   | 2450   | 2450      | 2950   | 3450   | 3450               | 5100   | 6500    | 6500    |
| External Static pressure(ESP)         | Pa   | 0                            | 0               | 0      | 30     | 30        | 30     | 30     | 30                 | 50     | 50      | 50      |
| Power input                           | kW   | 0.35                         | 0.35            | 0.6    | 0.4    | 0.4       | 0.5    | 0.5    | 0.5                | 0.8    | 1.2     | 1.2     |
| Current                               | A    | 1.7                          | 1.7             | 2.7    | 0.6    | 0.6       | 0.9    | 0.9    | 0.9                | 1.3    | 2.1     | 2.1     |
| Heater (4)                            |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Type                                  |      | Finned stainless tube        |                 |        |        |           |        |        |                    |        |         |         |
| Heating capacity                      | kW   | 2.3                          | 2.3             | 4.5    | 2.3    | 4.5       | 4.5    | 6.0    | 6.0                | 9.0    | 9.0     | 9.0     |
| Working steps                         | n.   | 1                            | 1               | 1      | 1      | 1         | 1      | 2      | 2                  | 2      | 2       | 2       |
| Humidifier (4)                        |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Type                                  |      | Electrode                    |                 |        |        |           |        |        |                    |        |         |         |
| Capacity                              | kg/h | 3                            | 3               | 3      | 3      | 3         | 3      | 5      | 5                  | 5      | 8       | 8       |
| Power input                           | kW   | 2.3                          | 2.3             | 2.3    | 2.3    | 2.3       | 2.3    | 3.8    | 3.8                | 3.8    | 6.0     | 6.0     |
| OD Model*Qty (5)                      |      |                              |                 |        |        |           |        |        |                    |        |         |         |
|                                       |      | CMD3x1                       | CMD4x1          | CMD5x1 | CMD4x1 | CMD4x1    | CMD5x1 | CME5x1 | CME8x1             | CME8x1 | CME10x1 | CME10x1 |
| Power supply                          |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Power source                          |      | 380V/3Ph/50Hz                |                 |        |        |           |        |        |                    |        |         |         |
| Unit max. operating power input (6)   | kW   | 4.9                          | 5.0             | 9.7    | 5.3    | 8.5       | 9.7    | 11.8   | 12.9               | 16.9   | 18.2    | 19.5    |
| Unit max. operating current input (6) | A    | 15.6                         | 10.5            | 18.0   | 9.8    | 15.0      | 16.4   | 21.1   | 23.0               | 30.0   | 32.7    | 34.6    |
| Unit piping connection                |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Condensing water drainage             | in   | 3/4"                         | 3/4"            | 3/4"   | 3/4"   | 3/4"      | 3/4"   | 3/4"   | 3/4"               | 3/4"   | 3/4"    | 3/4"    |
| Humidifier water supply               | in   | 1/2"                         | 1/2"            | 1/2"   | 1/2"   | 1/2"      | 1/2"   | 1/2"   | 1/2"               | 1/2"   | 1/2"    | 1/2"    |
| Ref. connecting type                  |      | Bell mouth thread connection |                 |        |        |           |        |        | Welding connection |        |         |         |
| Refrigerant gas                       | in   | 5/8"                         | 5/8"            | 5/8"   | 5/8"   | 5/8"      | 5/8"   | 3/4"   | 3/4"               | 3/4"   | 7/8"    | 7/8"    |
| Refrigerant liquid                    | in   | 1/2"                         | 1/2"            | 1/2"   | 1/2"   | 1/2"      | 1/2"   | 1/2"   | 1/2"               | 1/2"   | 5/8"    | 5/8"    |
| Unit external dimensions and Weight   |      |                              |                 |        |        |           |        |        |                    |        |         |         |
| Length                                | mm   | 650                          | 650             | 650    | 650    | 650       | 650    | 900    | 900                | 1300   | 1300    | 1300    |
| Width                                 | mm   | 580                          | 580             | 580    | 650    | 650       | 650    | 750    | 750                | 750    | 750     | 750     |
| Height                                | mm   | 1910                         | 1910            | 1910   | 1910   | 1910      | 1910   | 1910   | 1910               | 1910   | 1910    | 1910    |
| Weight                                | kg   | 120                          | 135             | 155    | 142    | 165       | 180    | 255    | 290                | 370    | 460     | 490     |

Note:

- (1) O: up-front throw (supplier coming out of up-front louver); D: Bottom Throw; DL: Replacement; TP: top throw, only available for C2, C3 cabinets;
- (2) Return Air temperature dry bulb 24°C, humidity at 50%, outdoor dry bulb temperature 35°C;
- (3) Return Air temperature dry bulb 28°C, humidity at 40%, outdoor dry bulb temperature 35°C;
- (4) In this table, only showing the default heater/humidifier default capacities; please refer to "Heater/humidifier Configuration Table" for other options available for each model if you wish;
- (5) More detailed parameters can be found in air-cooled condenser catalogue. CMD condenser only offers vertical installation;
- (6) Max operating power and current: parameters are derived for in the extreme condition when ambient temperature at 45°C and unit's electrical heater running at its full capacity to de-humidify.

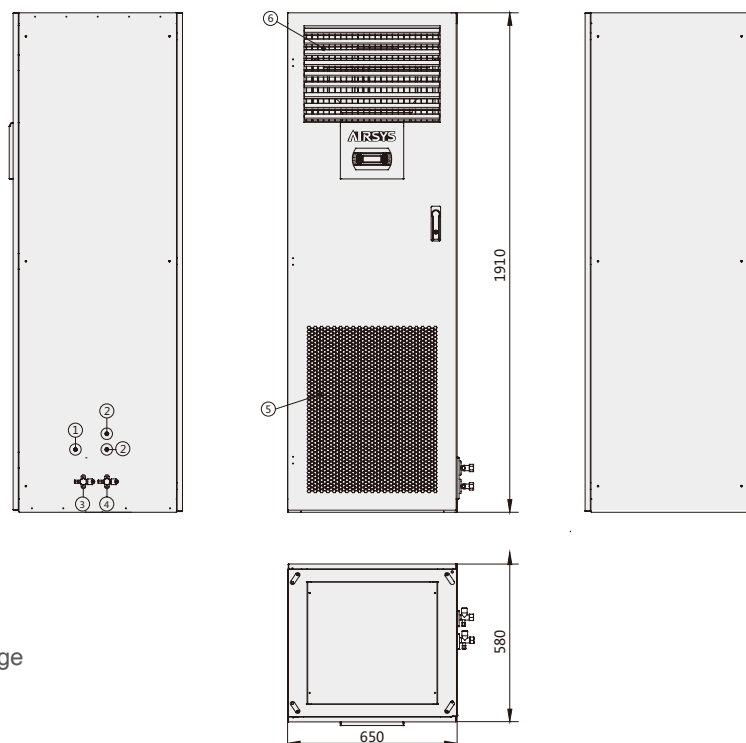
## Outdoor Unit

| Unit Model                                            |                   | CMD3 | CMD4 | CMD5 | CME5 | CME8  | CME10 |
|-------------------------------------------------------|-------------------|------|------|------|------|-------|-------|
| <b>Capacity</b>                                       | kW                | 9.3  | 13.7 | 20.4 | 20.5 | 29.6  | 35.4  |
| Qty. of fan                                           | n                 | 1    | 1    | 1    | 1    | 1     | 1     |
| Air volume                                            | m <sup>3</sup> /h | 4400 | 4100 | 5600 | 5600 | 10100 | 9700  |
| Power input                                           | kW                | 0.28 | 0.28 | 0.37 | 0.37 | 0.63  | 0.63  |
| Current input                                         | A                 | 1.3  | 1.3  | 1.7  | 1.7  | 3.0   | 3.0   |
| <b>Unit piping connection</b>                         |                   |      |      |      |      |       |       |
| Refrigerant gas                                       | in/mm             | 5/8" | 5/8" | 5/8" | 19   | 22    | 22    |
| Refrigerant liquid                                    | in/mm             | 1/2" | 1/2" | 1/2" | 12   | 16    | 16    |
| <b>Unit external dimensions and Weight dimensions</b> |                   |      |      |      |      |       |       |
| Length                                                | mm                | 808  | 808  | 1004 | 1140 | 1340  | 1340  |
| Width                                                 | mm                | 509  | 509  | 509  | 475  | 620   | 620   |
| Height                                                | mm                | 789  | 789  | 930  | 770  | 1070  | 1070  |
| Weight                                                | kg                | 29   | 35   | 43   | 47   | 95    | 110   |

(1) Industrial standard operating condition: inlet temperature=35°C, condenser temperature= 50°C.

## Unit Dimensions

C0 Up-front throw (air) unit dimensions

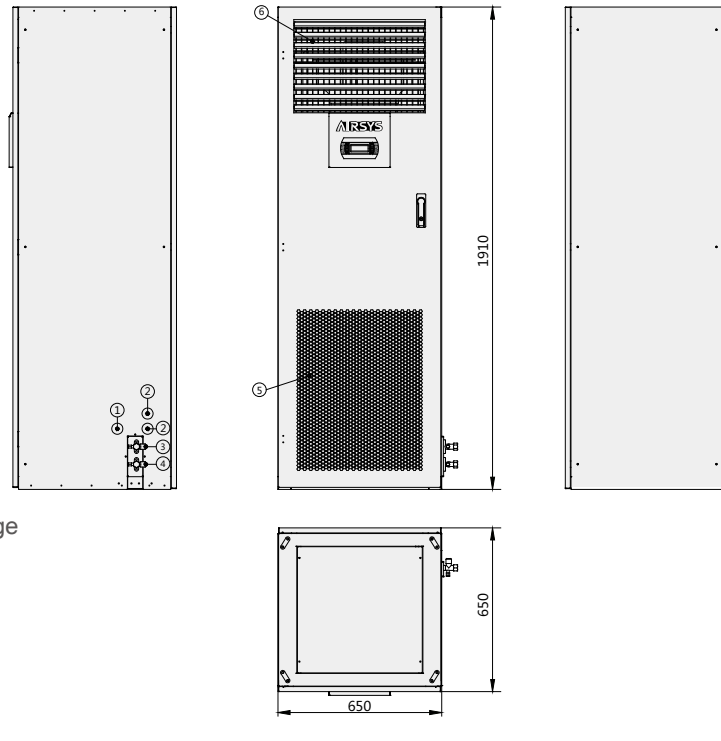


1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet



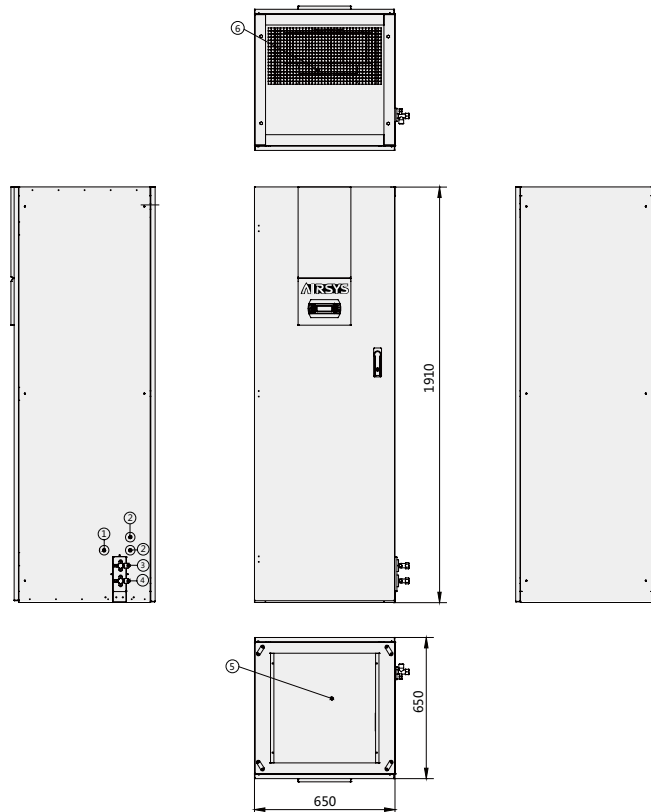
## Unit Dimensions

### C1 Up-front throw (air) unit dimensions



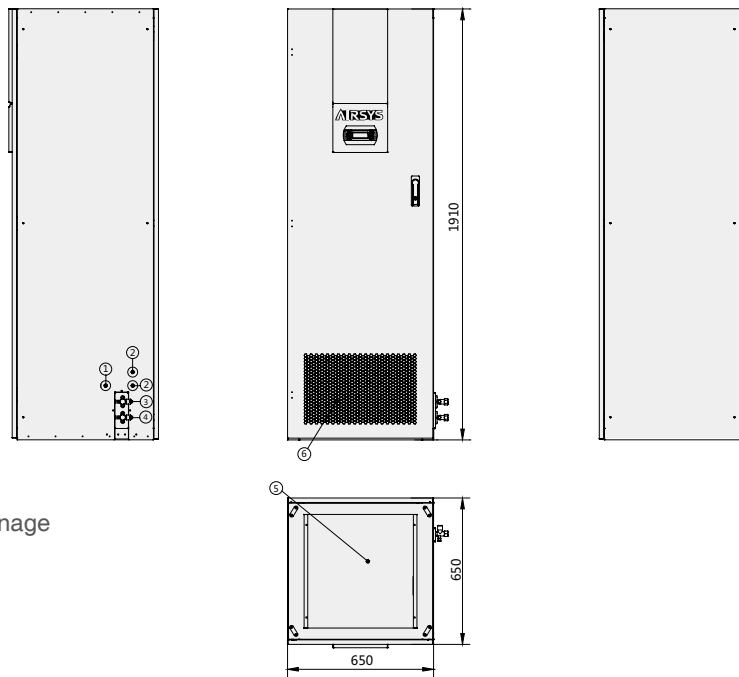
- 1. Condensing water drainage
- 2. Cable holes
- 3. Gas pipe
- 4. Liquid pipe
- 5. Return air intake
- 6. Supply air outlet

### C1 Bottom throw (air) unit dimensions



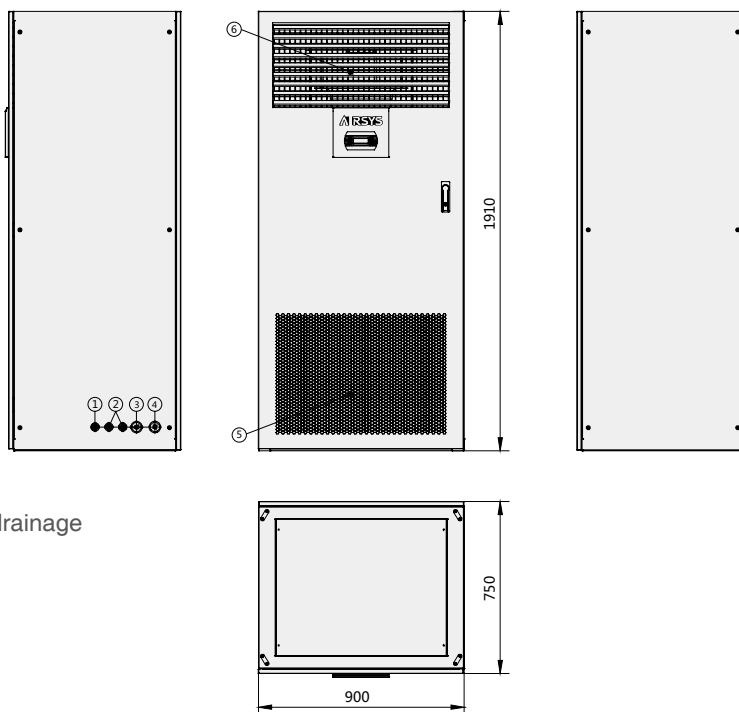
- 1. Condensing water drainage
- 2. Cable holes
- 3. Gas pipe
- 4. Liquid pipe
- 5. Return air intake
- 6. Supply air outlet

## C1 Replacement (air) unit dimensions



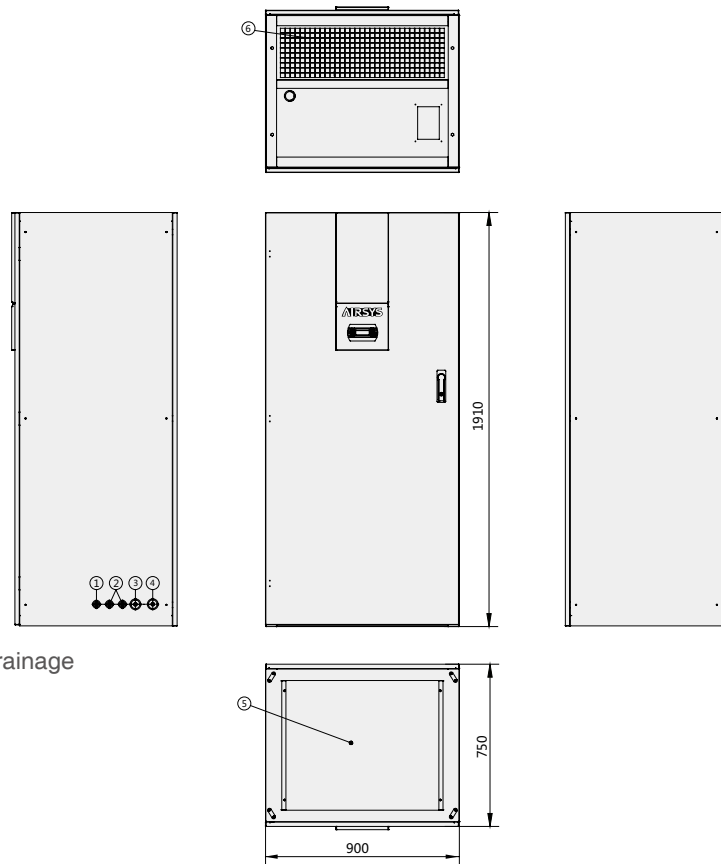
- 1. Condensing water drainage
- 2. Cable holes
- 3. Gas pipe
- 4. Liquid pipe
- 5. Return air intake
- 6. Supply air outlet

## C2 Up-front throw (air) unit dimensions



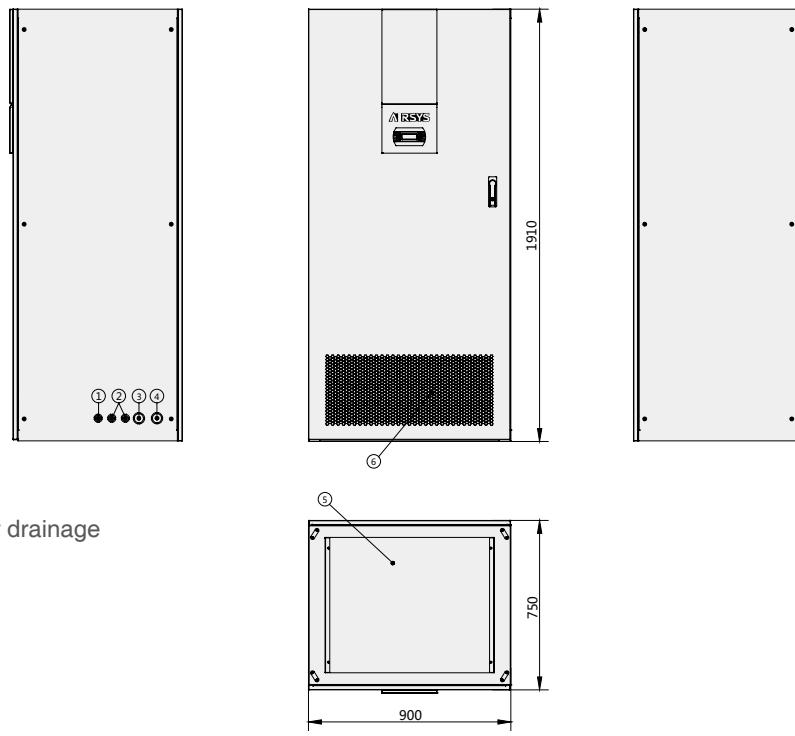
- 1. Condensing water drainage
- 2. Cable holes
- 3. Gas pipe
- 4. Liquid pipe
- 5. Return air intake
- 6. Supply air outlet

## C2 Bottom throw (air) unit dimensions



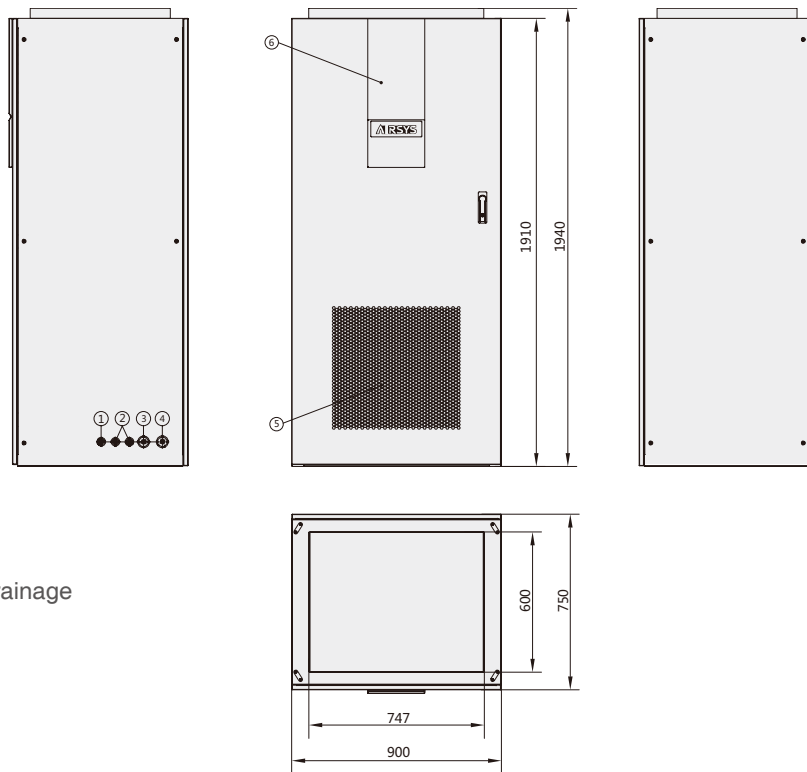
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

## C2 Replacement (air) unit dimensions



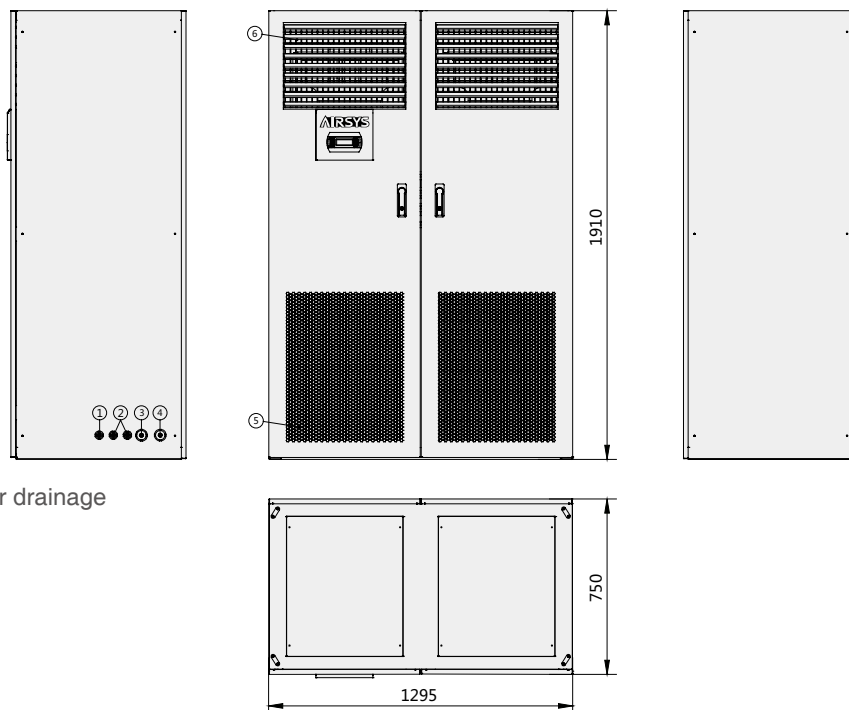
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

## C2 Top throw (air) unit dimensions



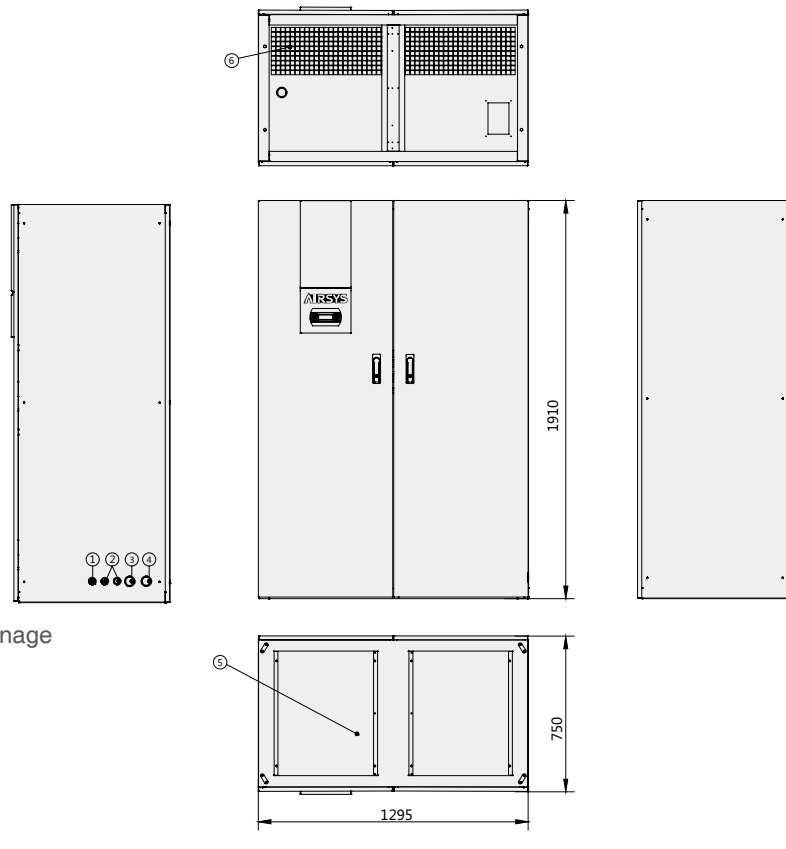
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

## C3 Up-front throw (air) unit dimensions



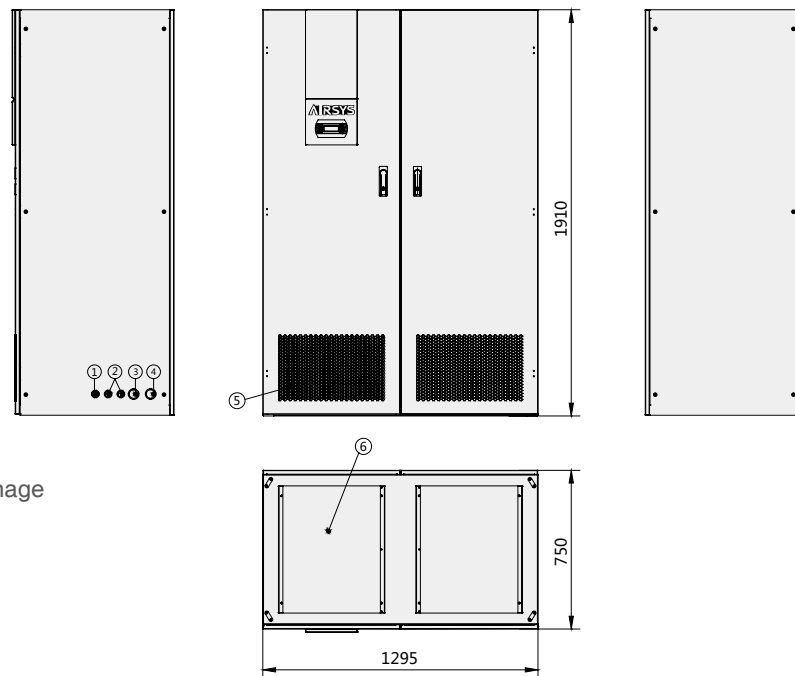
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

### C3 Bottom throw (air) unit dimensions



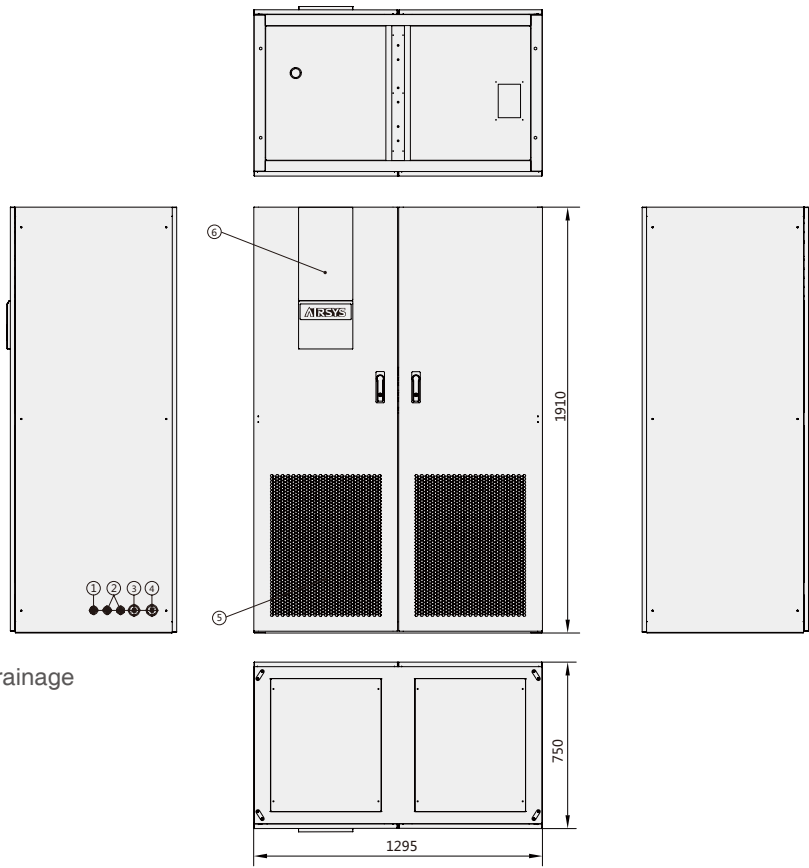
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

### C3 Replacement (air) unit dimensions



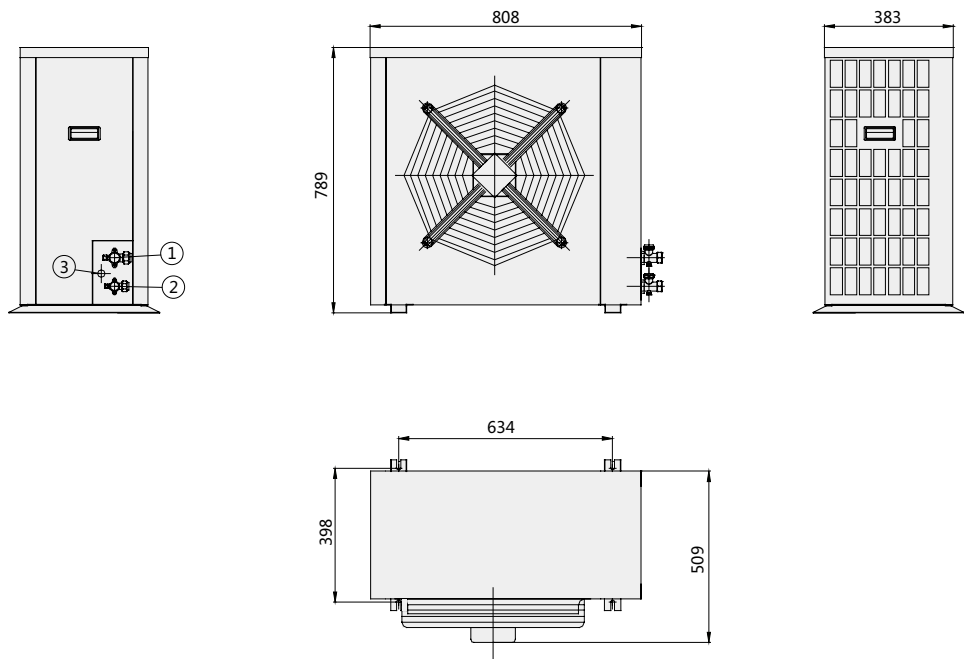
1. Condensing water drainage
2. Cable holes
3. Gas pipe
4. Liquid pipe
5. Return air intake
6. Supply air outlet

C3 Top throw (air) unit dimensions



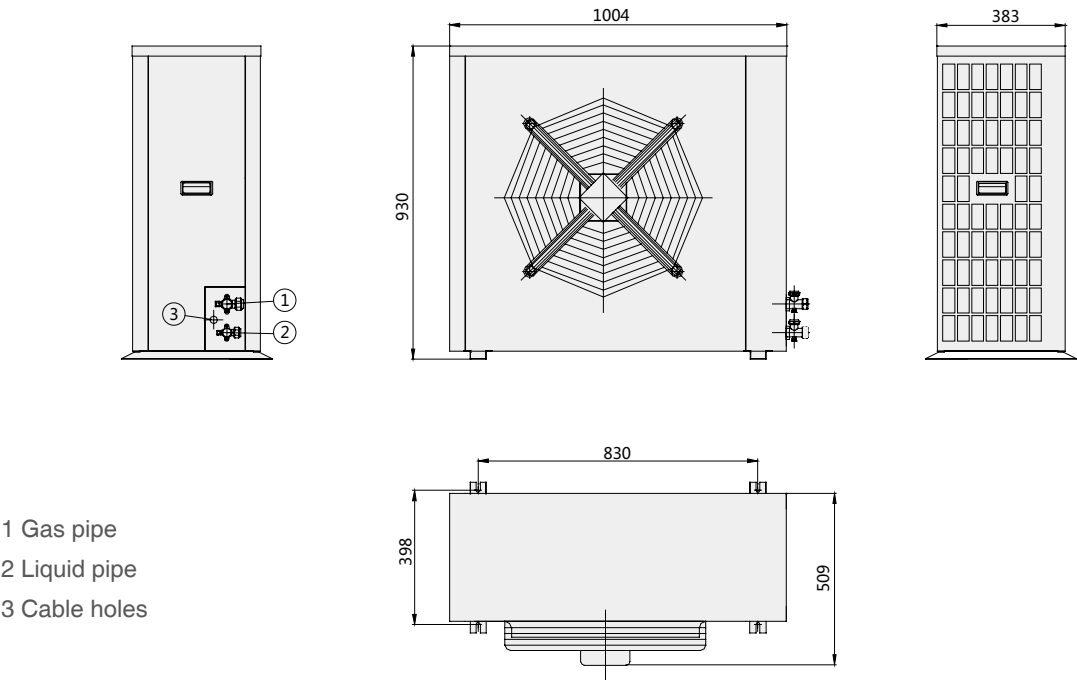
- 1. Condensing water drainage
- 2. Cable holes
- 3. Gas pipe
- 4. Liquid pipe
- 5. Return air intake
- 6. Supply air outlet

CMD4 dimensions

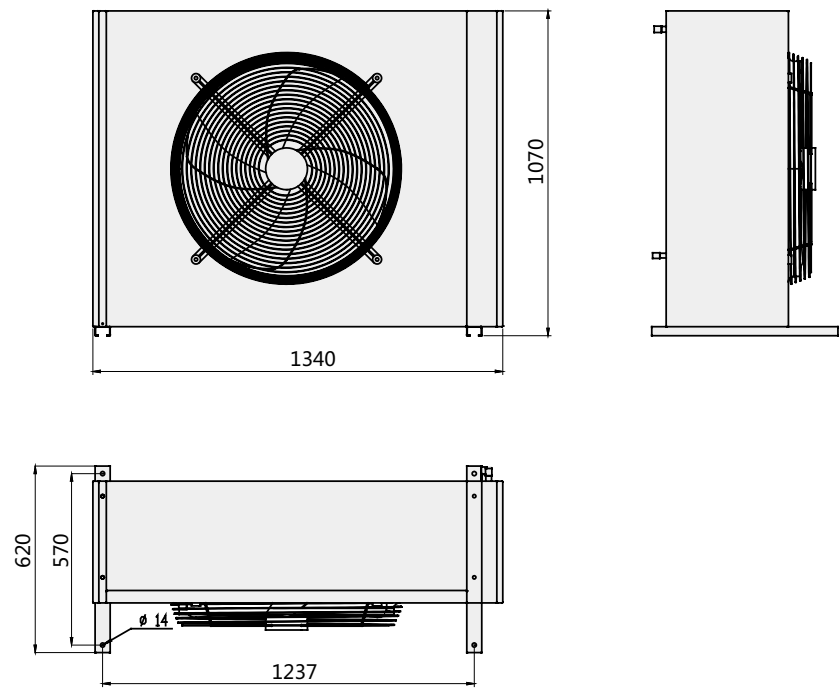


- 1 Gas pipe
- 2 Liquid pipe
- 3 Cable holes

CMD5 dimensions



CME8 / CME10 dimensions



AIRSYS is a cooling product and solution provider for ICT (Information & Communication Technology) industry.

The products include:

- Air conditioner and Chiller for IT room and large data center
- Intelligent Control system (BAS) for IT room and data center
- Air conditioning equipments for telecom shelters
- Intelligent control system for shelter cooling.

Air conditioner and heat exchanger for telecom cabinets.

The solution include:

- Cooling system design
- System integration
- Installation and Commissioning
- Operation and Maintenance

AIRSYS is also a global leader in providing cooling solution for Medical Imaging System.

**AIRSYS Refrigeration Engineering Technology (Beijing) Co. Ltd.**

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