

DATACOOL-PACKAGE

Packaged Precision Air Conditioner with Built-in Fresh Air Free Cooling

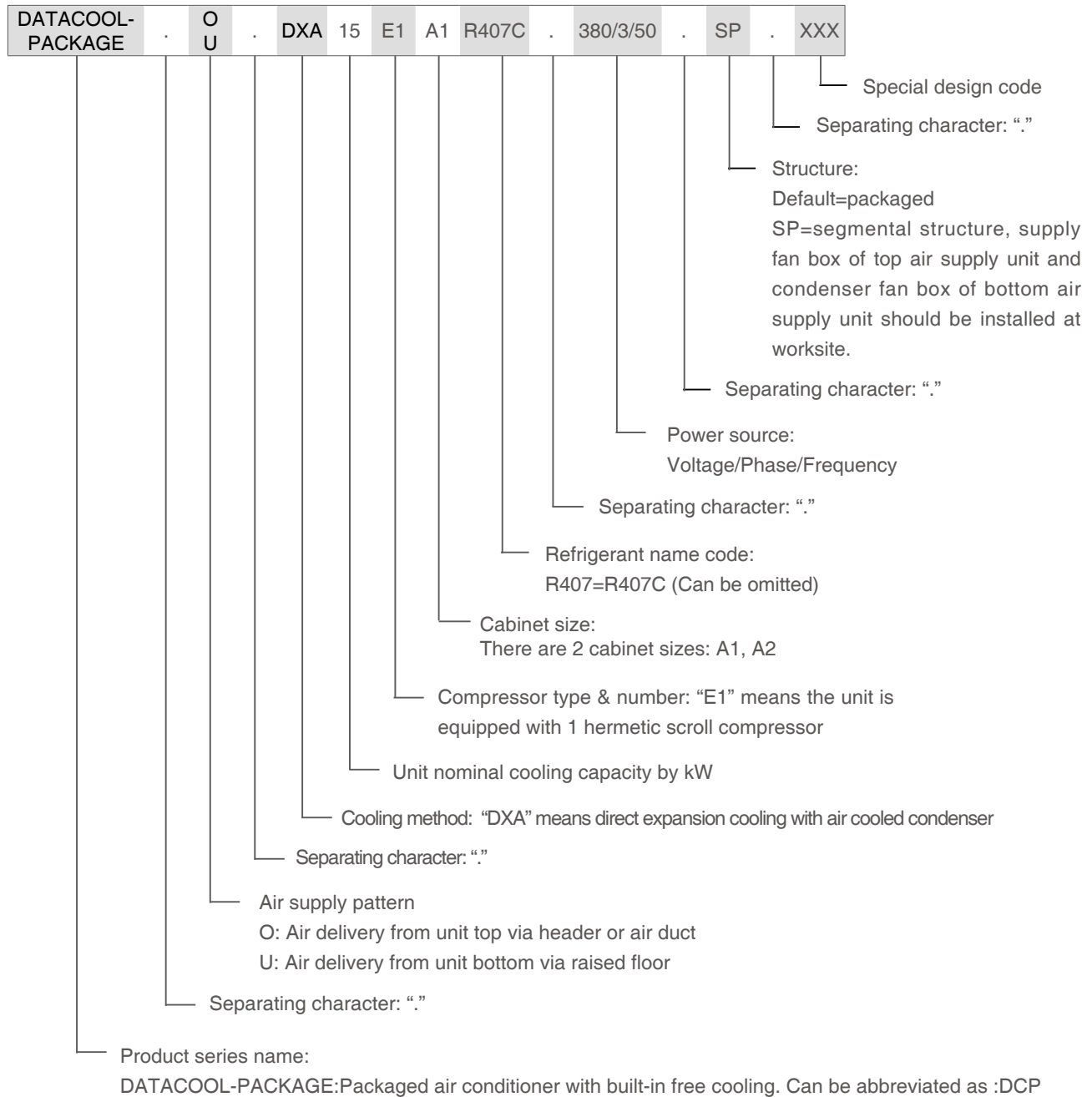
Cooling Capacity:9.1~48.6kW



DATA COOL-PACKAGE is a series of precision air conditioners with numerous merits and new technologies, which offer maximum value for critical environment consumers.

DATA COOL-PACKAGE is a self-contained air conditioning unit with built-in compressor type mechanical cooling system and fresh air free cooling system integrated into the unit, which saves lot installation and operation cost.

Unit Identification



For example:

DCP.O.DXA15E1A1R407.380/3/50: stand for DATA COOL-PACKAGE unit with top air supply and direct expansion cooling. The nominal cooling capacity is 15 kW, cabinet size is A1,1 hermetic scroll compressor; charged with R407c refrigerant; The power supply is 380V/3Ph/50HZ.

Working Range And Control Accuracy

Indoor side

Temperature range and accuracy: 18°C~30°C±1°C

Outdoor side:

Standard unit: -30°C~45°C

Unit Configuration

Standard Components

Unit base and frame

Unit base is made of folded sheet steel coated with black epoxy resin powder.

Unit frame is made of folded sheet steel and assembled by bolts or rivets. The surface of unit frame is coated with black epoxy resin powder.

Unit panel

Unit panels are made of folded sheet steel and assembled with unit frame by bolts or rivets. The surface of panels is coated black epoxy resin powder.

Mechanical refrigeration system

Scroll compressor with crank case electric heater

Liquid receiver

Sight glass

Filter & drier

Thermal expansion valve

Evaporator: made of high efficiency heat exchanging copper tube with continuously enhanced aluminum fining.

Condenser: made of high efficiency heat exchanging copper tube with continuously enhanced louvered aluminum fining.

Auto reset type of high/low pressure switch

Supply air fan

Backward curved, single inlet, EC centrifugal fan with directly coupled motor

Condenser fan

Backward curved, single inlet, EC centrifugal fan with directly coupled motor

Air Filter

G4 main air filter, disposable pleated type

G2 nylon pre-filter

Free cooling system

Air damper

Include: damper blade by galvanized steel, with jamb and head seals to prevent leakage when closed.

Damper blade is covered with insulated material to have a good sealing performance

Damper actuator:

With 24VAC power supply and maximum 90S open or close time and with spring return to close upon unit shutdown

Application

Small to mid-size switching room for telecommunication

Small to mid-size data center and computer room

UPS and battery room

Industrial process control center

Electrical Box

All the electrical components are fitted in a separated box, including:

MCB

Contactor

Phase sequence/lose and current overload protection

Transformer for controller

Rectifier

Damper actuator

Microprocessor

Controller display

Return air temperature sensor

Supply air temperature sensor

Outdoor air temperature sensor

Clock card

Optional Components

Electric heater

Capacity 4.5kW, 6kW ,and related control components.

Filter clogged alarm

Air pressure switch to send the alarm

Special Condenser

Condenser coil coated with phenolic anti-corrosion resin.

RS485

communication card with MODBUS communication protocol

Web server

Provide IP address for remote monitoring through internet.

Protocol converter

Convert the protocol from MODBUS to TCP/IP

Additional temperature sensors

can be located at different places in the room

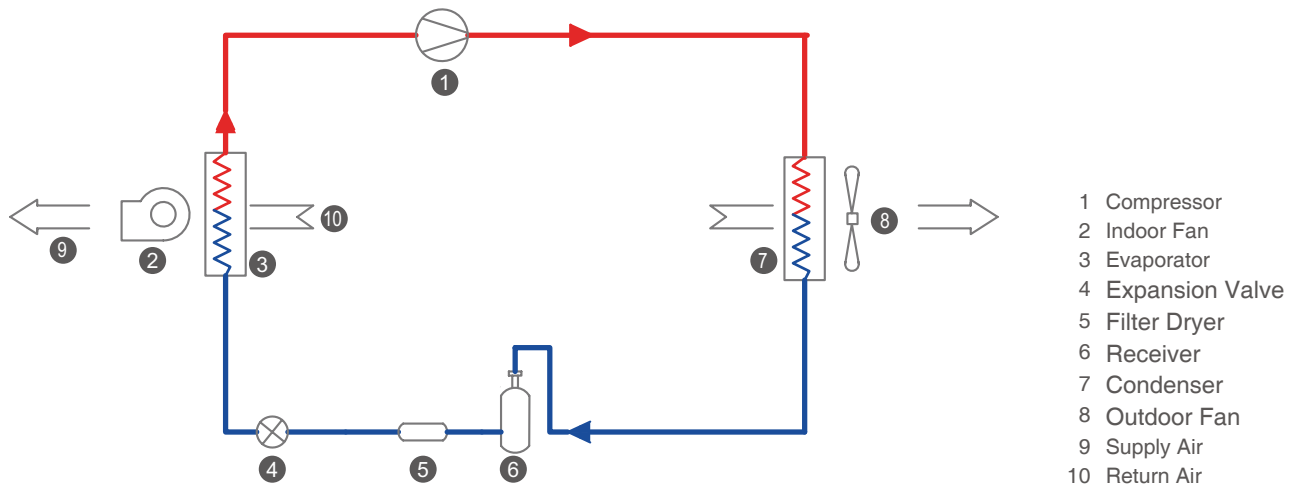
Alternative power supply

Following power source would be available:

220/1/50	208~230/1/60
380~420/3/50	208~230/3/60
	460/3/60

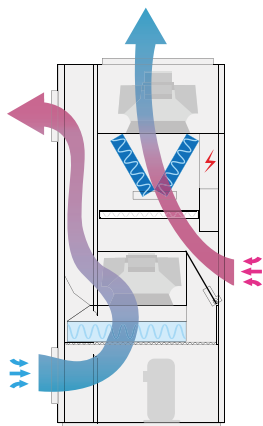
Working Principle

Mechanical Cooling

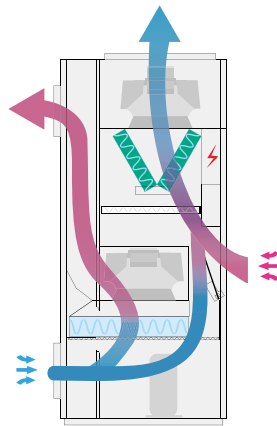


Free Cooling

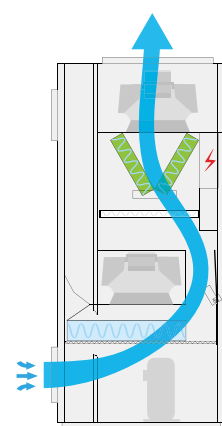
Air flow circuit of up flow units



Only mechanical cooling

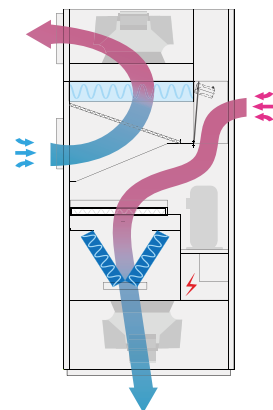


Mechanical cooling + Free cooling

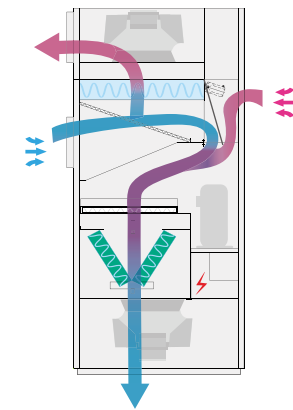


Only free cooling

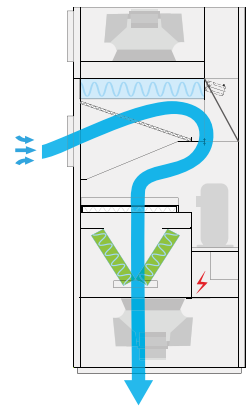
Air flow circuit of down flow units



Only mechanical cooling



Mechanical cooling + Free cooling



Only free cooling

Advantage

Energy Saving

When the outdoor temperature is lower than that of the room, the built-in free cooling system will bring the fresh air into the room to avoid the compressor working, which reduces the power consumption.

When the temperature difference between indoor and outdoor is higher than 10°C, the free cooling system can supply 100% of the cooling capacity, saving 90% energy.

Good structure design and easy maintenance

The main components such as: compressors, fans, motor, dampers and other related components can be accessed and maintained in front of the unit.

The weight of each panel is less than 10kg.

Offer two structure types: packaged and segmental structure. Packaged structure facilitates the installation, segmental structure includes main unit and fan box, fan box should be assembled with main unit at worksite, but it is easier for transport. Customers can freely choose structure whichever is more suitable.

Corrosion-proof

The unit frame and panels are coated with the corrosion proof epoxy powder which can last for more than 15 years for indoor installation.

High sensible heat ratio

The Sensible heat ratio of all the units are higher than 0.9.

Wide working range

The unit can work at minimum -30°C, maximum 45°C ambient temperature continuously and reliably.

High efficiency fan

EC technology, super high efficiency and variable speed control fan. The fan will deliver more than 90% of the designed air flow even when the pressure drop of the filter reaches 250Pa.

High torque and low leakage air damper

The air damper is equipped with a high torque actuator to assure the reliability and low leakage. The on/off cycle is less than 90 seconds.

The Air Leakage across dampers is less than 5% of the air passing through the unit when under pressure of 125 Pa.

Fully automatic control

The unit is equipped with a full automatic control system. All the control, protection and alarm are automatic with auto restart.

Auto changeover of working mode

The unit automatically selects the working mode: mechanic cooling or free cooling according to the temperature of indoor side and outdoor side. In the event of either electrical or mechanical failure affecting the refrigeration system, the unit will be capable of automatic reversion to the fresh air cooling mode.

Random restart when power recovered

When the power is recovered after a power failure, the unit will restarts automatically with a random time delay between 1 to 60 seconds to avoid many components starting at the same time.

Automatic self-diagnosis

All the components connected to microprocessor are continuously tested. In case of malfunction, the failure is shown on the display with information accordingly.

The attend mode function

When service people is working in base station, he can simply press 2 buttons on the controller interface, then the control temperature of the air conditioner will be set as 24°C (settable) automatically. Half an hour later (settable) the control temperature of air conditioner will be returned to original set point.

4 levels password protection

There are 4 levels password protection for the control system, which is:

Read only: suitable for normally operation people

Read/write: Suitable for maintenance people

Maintenance and commissioning: Suitable for commissioning engineer

OEM: Suitable for the engineer from manufacturer.

Voltage protection

There is a voltage relay for protection. When the supply voltage exceeds the permitted range, the unit will be stopped. For 3 phase unit, if there is phase unbalance or phase absence, the unit will also be stopped for protection.

Alarms

There are a lot of alarms for the complete protection to the unit

Automatic maintenance test

A maintenance test facility is provided to enable an engineer to press/select one button that will activate a self-test routine.

The self-test routine will check for the satisfactory operation of the fresh air damper and the compressor refrigerant circuits.

This is achieved by applying a dummy return air temperature signal, slowly ramping up from a point below the system set point to a high temperature level thereby testing the damper operation (via changes in the supply temperature).

The system stops the supply fan for a controlled period, to simulate the low pressure of refrigeration system and to check if the low pressure protection working normally.

The system stops the condenser fan for a controlled period, to simulate the high pressure of refrigeration system and to check if the high pressure protection working normally.

Running data logging

The controller has a memory of 1M for data logging.

If the interval of data logging is less than 5 minutes, the controller can store at least 48 hours working data.

Data output

A facility for a connection RS485 of a computer lead to enable automatic downloading of logs and parameters into either a CSV file or Excel file to allow for automatic data entry into database.

Web server monitoring

The unit can be equipped with a Web Server card with TCP/IP protocol and Ethernet network to realized remote control and monitoring. Each computer can be connected to the web server by Ethernet network and understand the working status and control the unit in time everywhere.

Auto-changeover

Upon failure of Lead unit, Lag unit operates

Auto-sequencing: equalize runtime of all units

If there are 2 units installed in a site, the controller will change the working unit automatically according to the total working time of the unit to balance the working time of the 2 units.

Functions of microprocessor control system

Main parameters display

Current control temperature set

Return air temperature

Outside air humidity

Outside air temperature

Supply air temperature

Software version

Attend mode

Working status display

Main fan speed

Main fan hours run

Main fan minimum speed hours run

Condenser fan low speed

Condenser fan low speed hours run

Condenser fan high speed

Condenser fan high speed hours run

Compressor working status

Compressor hours run

Compressor startup times

Compressor total startup times within latest 48 hours

Heater working status

Heater working hours

Heater startup times

Free cooling working status

Free cooling working hours

Free cooling startup times.

Alarm display

Unit general failure alarm

Controller fail alarm

High pressure

Low pressure

Supply fan failure

Condenser fan failure

Filter clogged

Free cooling system failure

Low temperature

High temperature

Fire or smoke

Temperature sensor failure

Remote control and monitoring

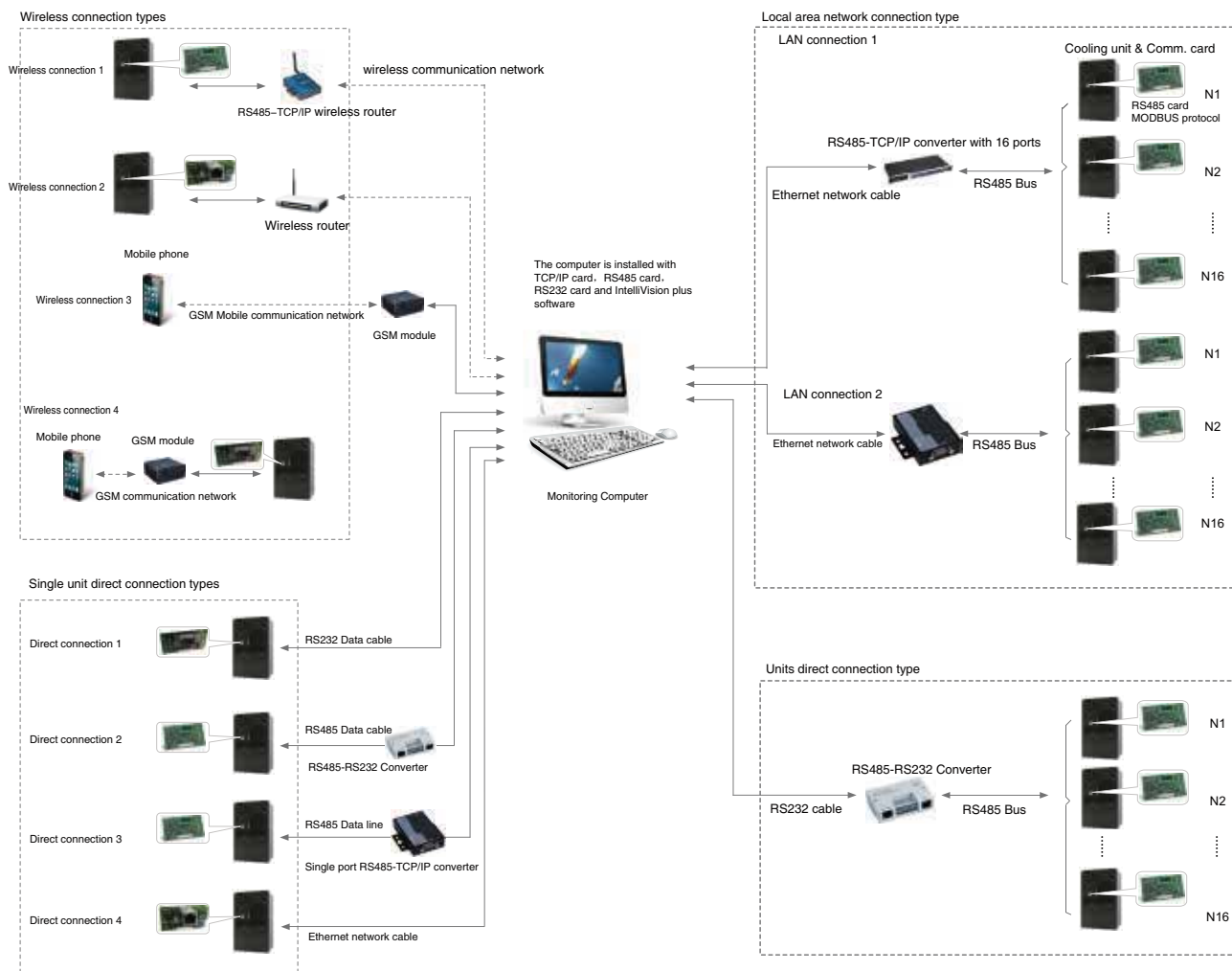
The remote monitoring and control system can be easily connected with the units to realize remote real time monitoring and control and save the running data.

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

4 kinds of wireless network connection with computer

3 kinds of local direct connection with computer

3 kinds of LAN network connection with computer



Monitoring and control method	Related network configuration	Farthest distance
Wireless network connection		
Wireless connection 1:Wireless communication without unit server	RS485-TCP/IP converter; wireless router	No limitation
Wireless connection 2:Unit server based Wireless communication	Web server card; wireless router	No limitation
Wireless connection 3:Communication with remote computer by GSM mobile phone	GSM communication module	No limitation
Wireless connection 4:Communication with air conditioner directly by GSM mobile phone	GSM communication module; RS232 card	No limitation
Direct cable connection		
Direct connection 1:Direct connection by RS232 data line	RS232 communication card	1.5m
Direct connection 2:Direct connection by RS485 data line	RS485 communication card	1500m
Direct connection 3:Direct connection by Ethernet network line	Web server card	Can be extended by hub.
LAN network connection		
LAN connection 1:LAN net work by multi port protocol converter	RS485 communication card; Multi port RS485-TCP/IP protocol converter	Can be extended by hub.
LAN connection 2:LAN net work by single port protocol converter	RS485 communication card;Single port RS485-TCP/IP protocol converter	1500m
LAN connection 3:LAN net work by RS485-RS232 protocol converter	RS485 communication card;Single port RS232/RS485 protocol converter	1500m

Unit Specification

Unit Model		8E1A1	15E1A1	22E1A2	30E2A2	45E2A3
Supply air scheme(1)		O/U				
Cooling capacity						
Total (2)	kW	9.1	16.5	23.9	33.0	48.6
Sensible(2)	kW	8.6	15.3	22.2	30.7	45.2
Free cooling capacity(3)	kW	13.1	18.5	25.0	27.5	50.0
Compressor						
Type		Hermetic scroll				
Power input(2)	kW	2.8	4.5	6.2	9.0	12.4
Current(2)	A	4.9	8.1	12.0	16.2	24
Supply fan						
Type		Caseless backward centrifugal fan				
Qty. of fan		1	1	1	1	2
Air volume	m³/h	4350	6150	8320	9150	16640
External static pressure(ESP) (4)		75Pa, Can be adjusted				
Power input	kW	1.0	1.6	1.9	2.3	3.8
Current	A	1.7	2.7	3.0	3.5	6.0
Condenser fan						
Type		Caseless backward centrifugal fan				
Qty. of fan		1	1	1	2	4
Air volume	m³/h	4200	5100	5800	10200	14400
Power input	kW	0.41	0.7	0.9	1.2	3
Current	A	0.8	1.2	1.5	2.4	5.2
Main air filter		G4 Plate				
Fresh air filter		G2 nylon pre-filter				
Electric heater(5)						
Type		Stainless steel electric heater				
Heating capacity	kW	4.5	4.5	4.5	6	9
Working steps	n.	2	2	2	2	4
Power supply						
Power source		380V/3Ph/50Hz				
Unit max. operating power input(6)	kW	4.6	7.7	9.9	14.5	23.8
Unit max. operating current(6)	A	8.1	13.5	18.3	25.1	38.8
External dimensions and weight of packaged unit						
Width	mm	1160	1160	1460	1460	2920
Depth	mm	1050	1050	1100	1100	1100
Height	mm	2350	2350	2350	2350	2350
Weight	kg	450	520	610	660	1280
External dimensions and weight of split unit(7)						
Width	mm	1160	1160	1460	1460	2920
Depth	mm	1050	1050	1100	1100	1100
Height	mm	2450	2450	2450	2450	2450
Weight	kg	500	570	680	730	1420

(1) O:Up flow U:Down flow;

(2) Return air dry bulb temperature 24℃,RH50%,Outdoor dry bulb temperature35℃;

(3) Indoor temperature and outdoor temperature difference (ΔT) is 10℃;

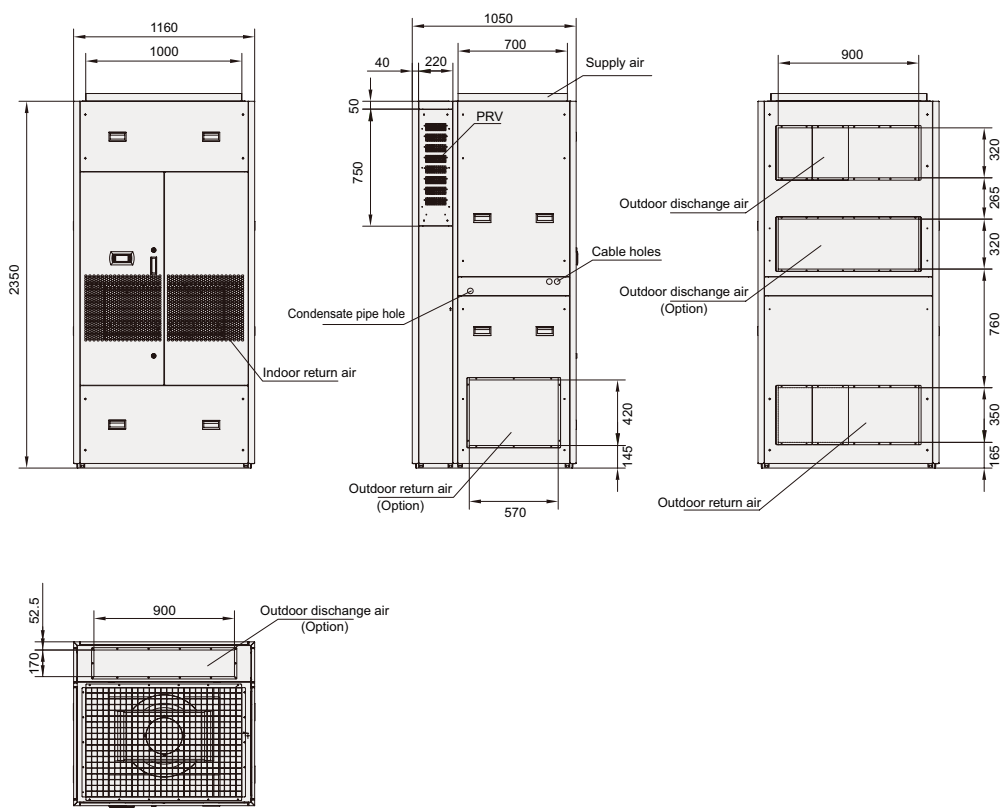
(4) For ESP over 300 Pa, Contact manufacturer;

(5) Option,the default capacity;

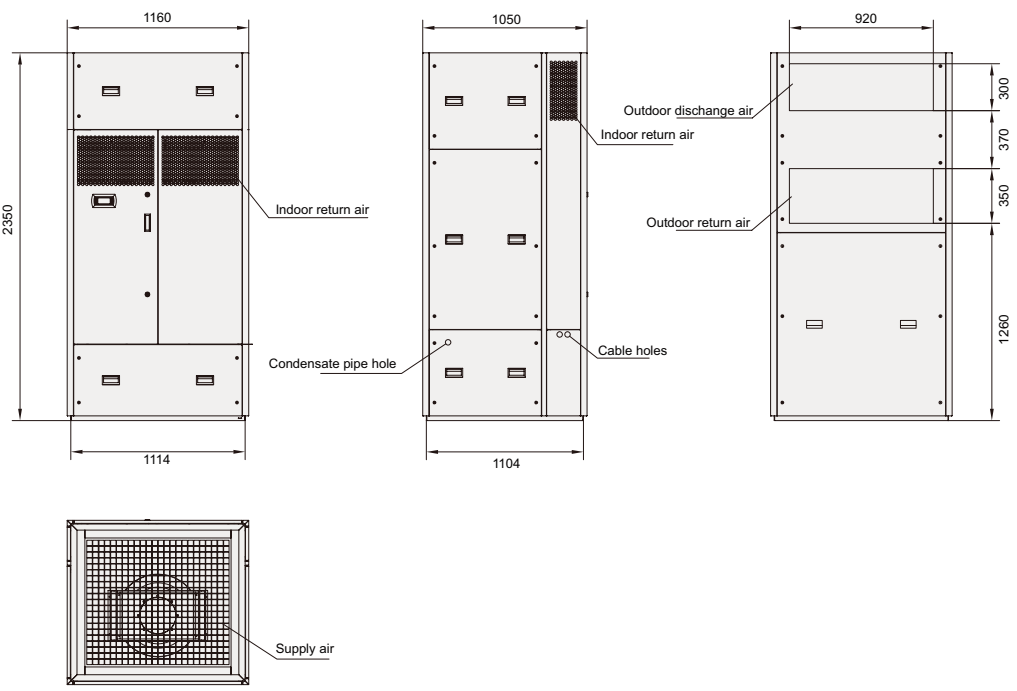
(6) Max. operating power input: as above spec sheet, outdoor temperature at 45℃, unit works at full-load;

(7) Totally dimensions and weight, included fan section.

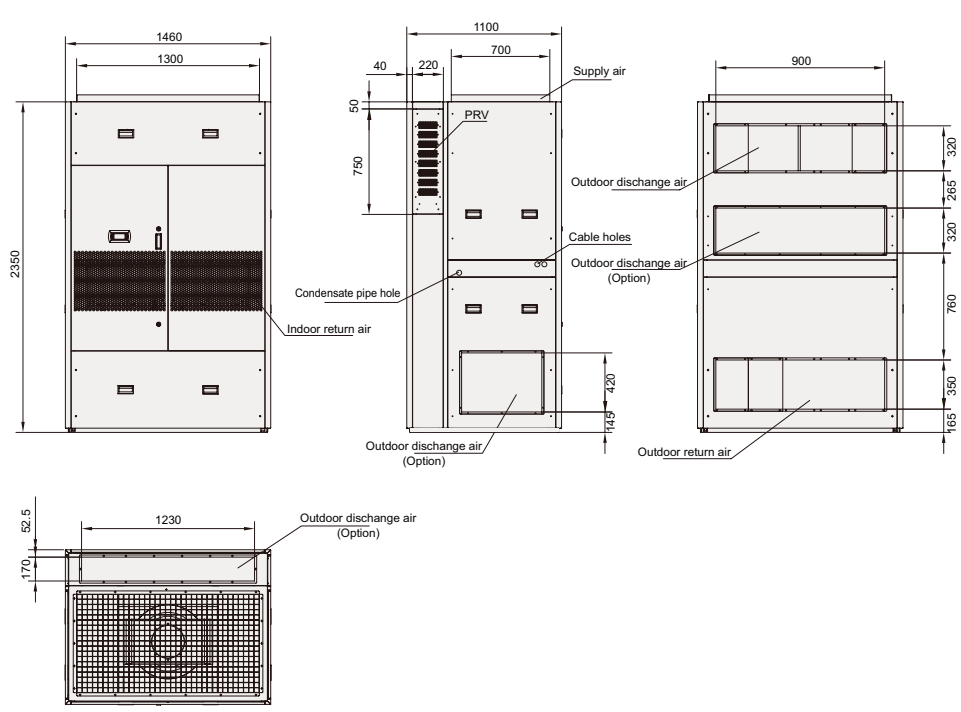
Dimensions drawing
 DATACOOOL-PACKAGE OVER A1



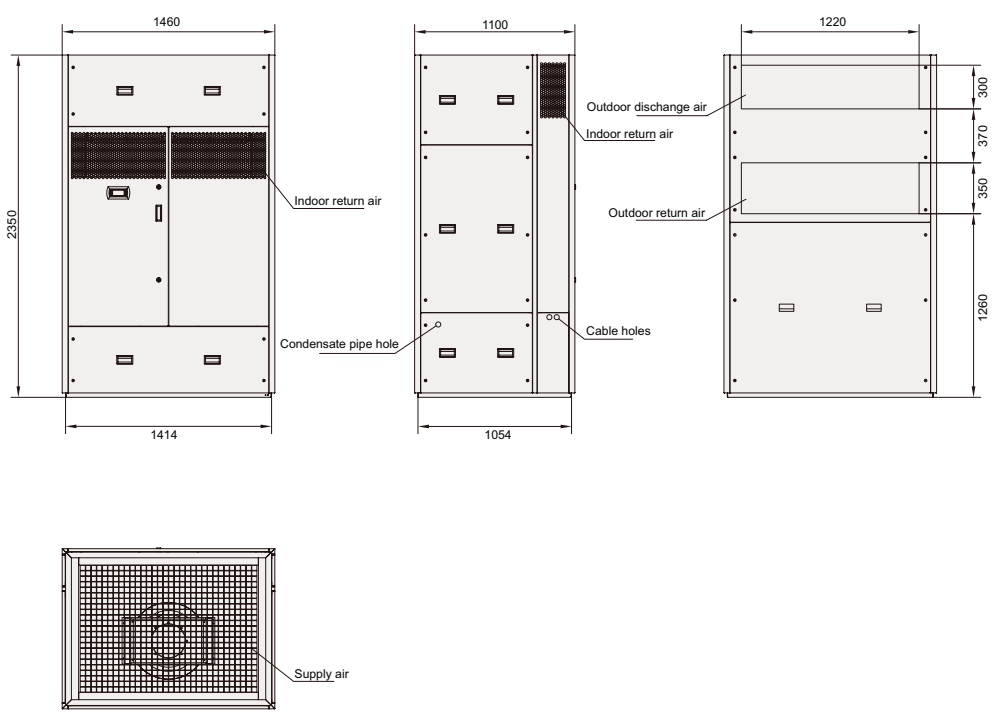
DATACOOOL-PACKAGE UNDER A1



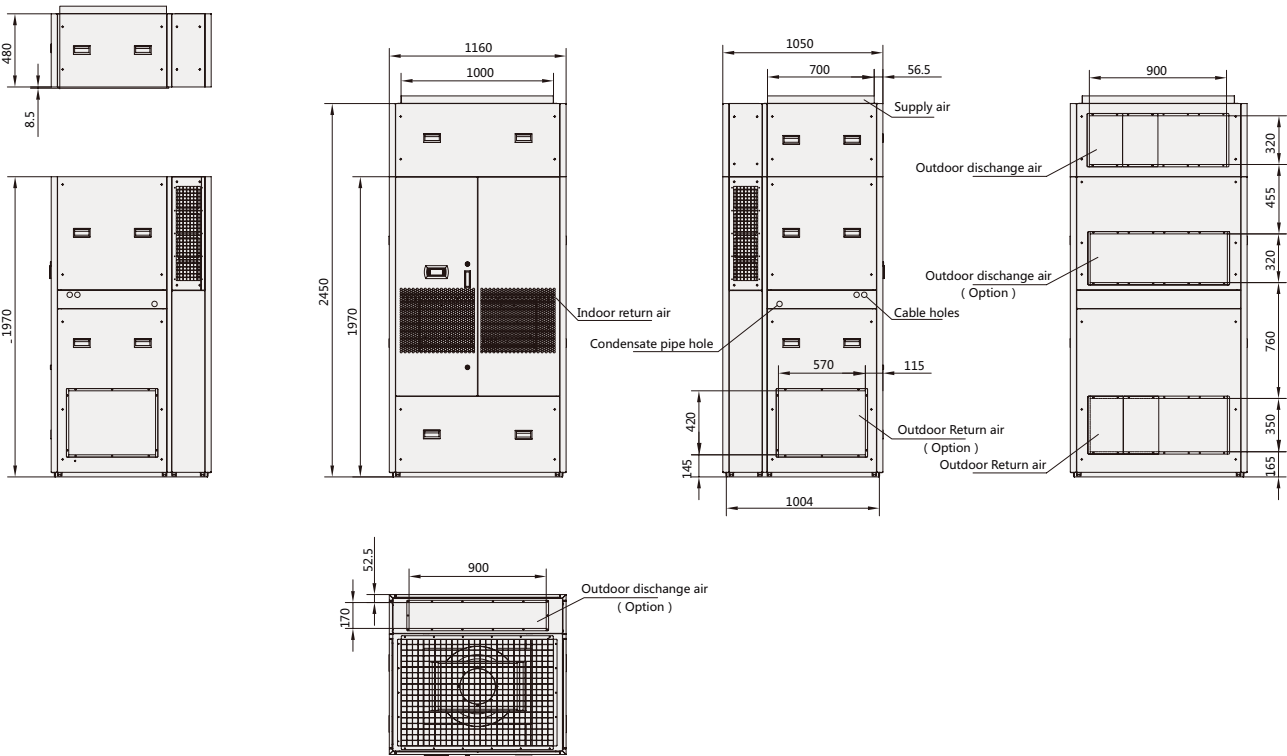
DATA-COOL-PACKAGE OVER A2



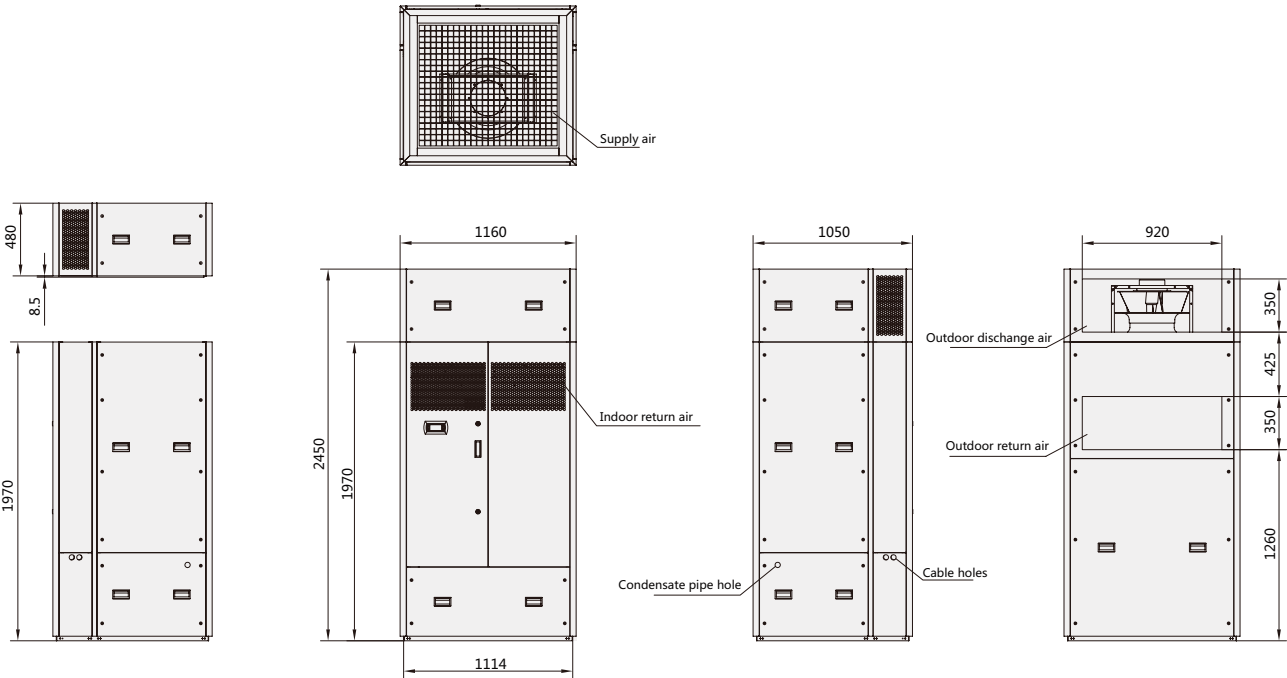
DATA-COOL-PACKAGE UNDER A2



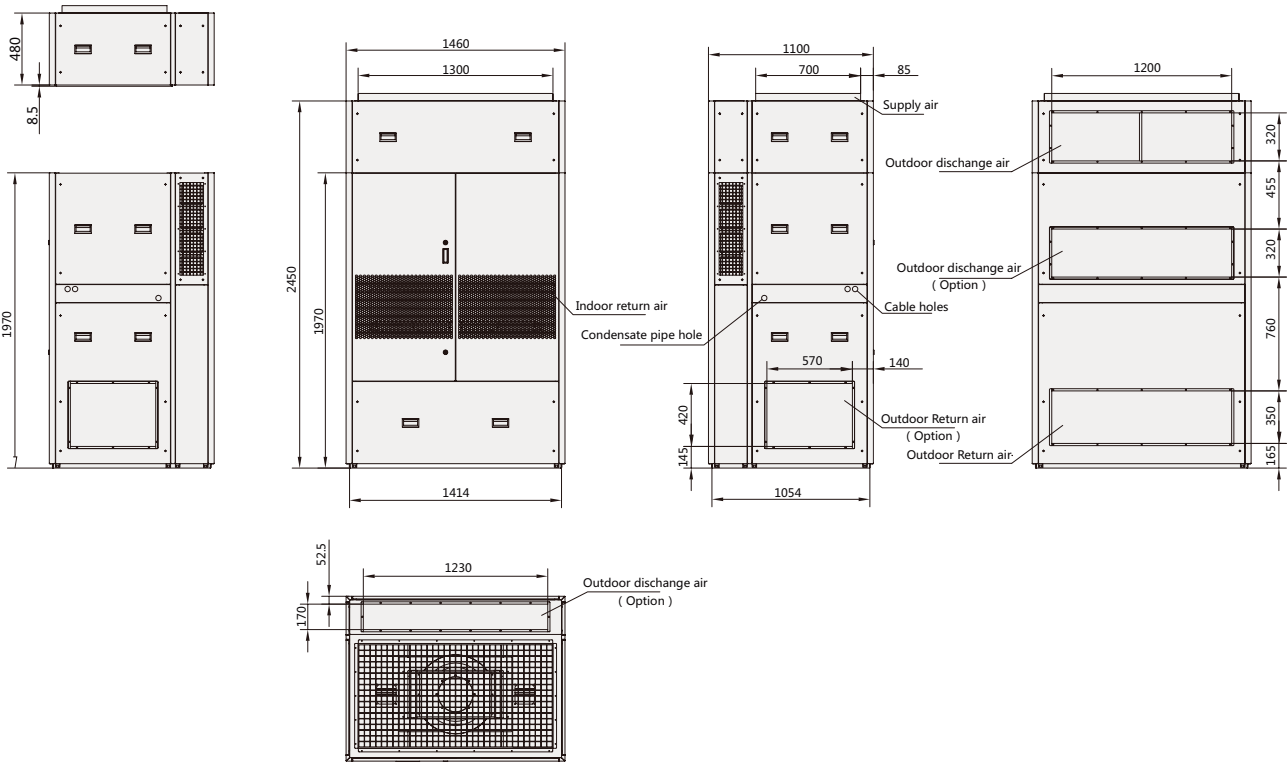
DATA COOL-PACKAGE SP OVER A1



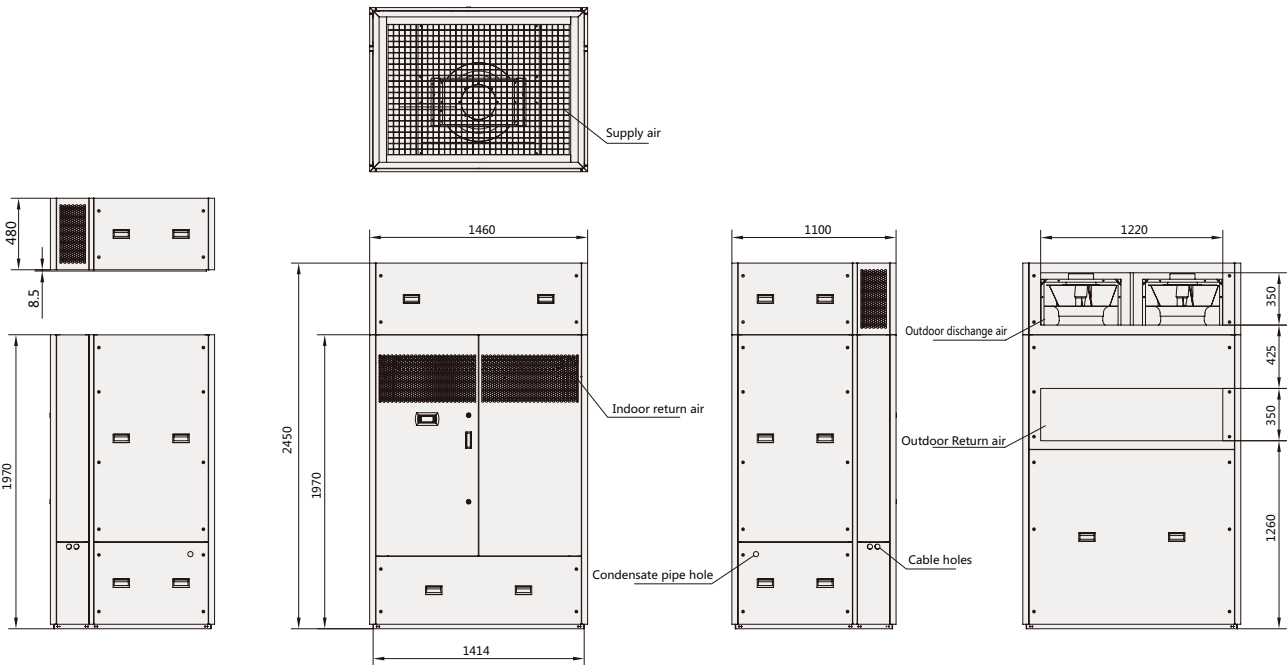
DATA COOL-PACKAGE SP UNDER A1



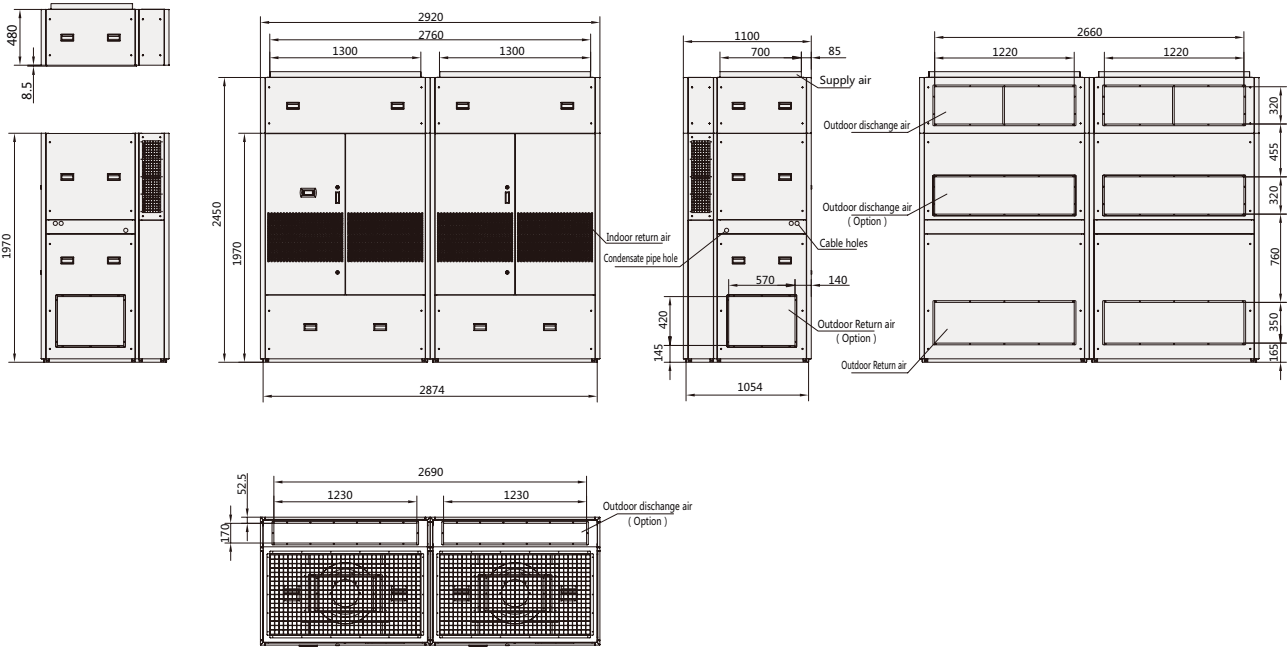
DATA-COOL-PACKAGE SP OVER A2



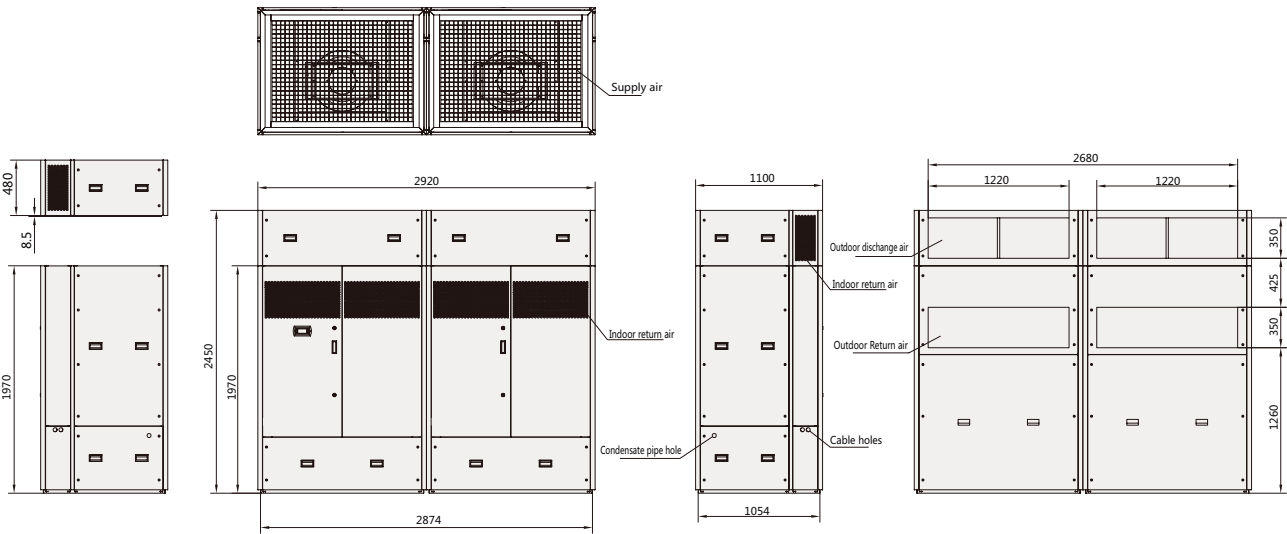
DATA-COOL-PACKAGE SP UNDER A2



DATA COOL-PACKAGE SP OVER A3



DATA COOL-PACKAGE SP UNDER A3





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