AIRSYS

MOBILECOOL-SPLIT

Telecommunication Base Station Special Air Conditioner

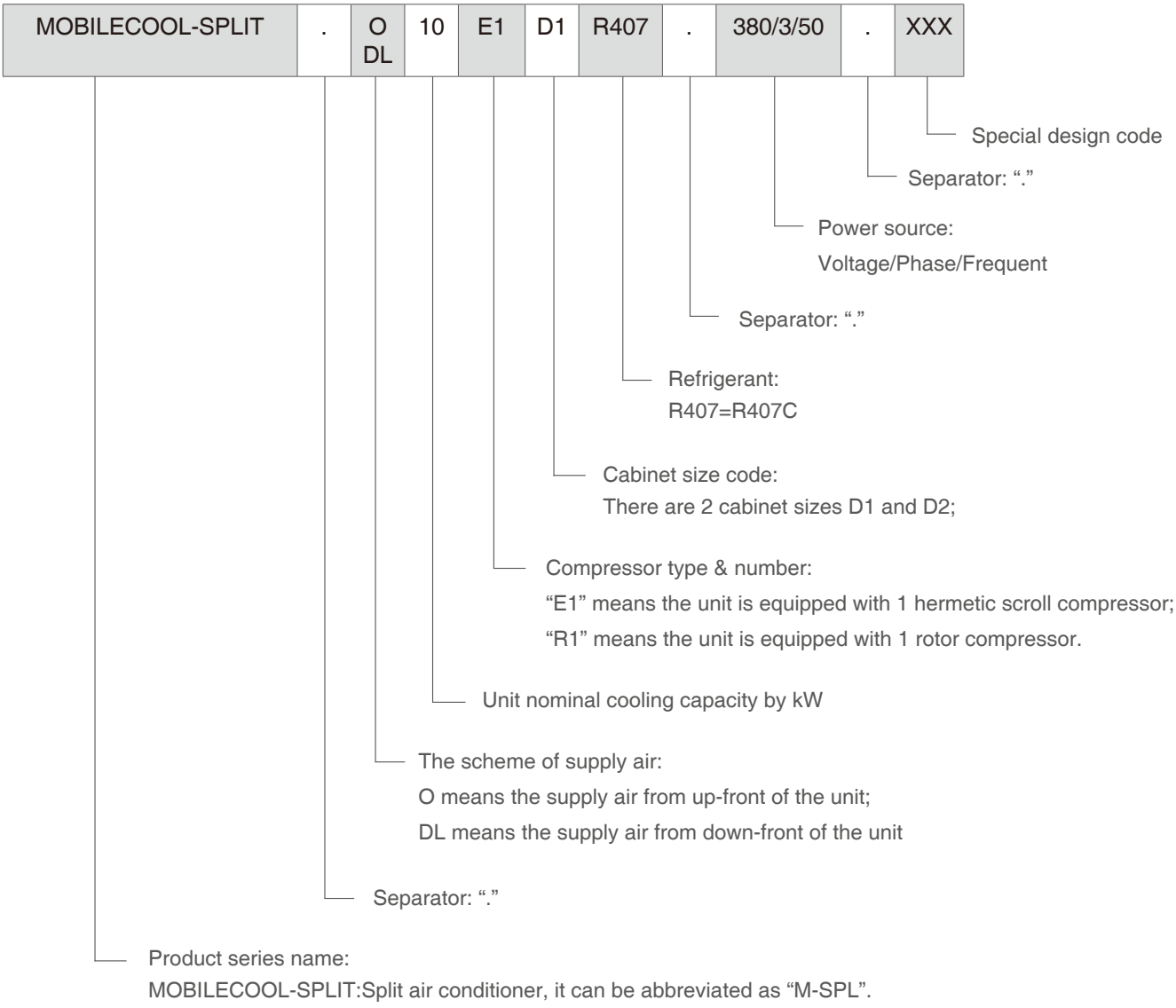
Cooling Capacity: 5.5kW~13.5kW

MOBILECOOL-SPLIT unit is one of the products of Airsys BTS air conditioner family to be suitable for high efficiency, various power supply, green refrigerant, various installation methods, wide working range and safety etc.

The unit is integrated the newest technology and advantages in modern time, supplies a value over the desire of customer.

The product is a split unit, includes indoor unit and outdoor unit. All the components of the unit are assembled in factory. All the tests are finished and all the control parameters are factory settings as default before leaving the factory.

Unit Identification



For example:

MOBILECOOL-SPL.O10E1D2R407.380/3/50: means this is a MOBILECOOL-SPLIT unit. The nominal cooling capacity is 13 kW. Up-front supply air scheme; The unit is equipped with 1 hermetic scroll compressor. The unit dimension code is D2. R407c refrigerant and 380V/3Ph/50Hz power source.

Working range and control accuracy

Indoor side

Temperature range and accuracy: 5℃~32℃±1℃

Outdoor side

-30℃~45℃

Storage

Temperature: -40℃~70℃

Humidity: 5~95%

Applications

Various telecommunication base station

Advanced technology electronic devices switching room

Power distribution station

Industrial process control center

Unit main components

Indoor unit standard configuration

Unit base and Unit frame:

Unit base is made of folded sheet steel and welded. The surface is coated with epoxy resin powder.

Unit frame is made of folded sheet steel and is assembled by bolts or rivets.

The surface of unit frame is coated with epoxy resin powder

Unit panel:

Unit panels are made of folded sheet steel and are assembled with unit frame by bolts or rivets.

The surface of panels is coated with epoxy resin powder

Mechanical cooling system

Scroll compressor
Dry filter
Thermodynamic expansion valve
Evaporator: made of grooved copper tube with continuously enhanced aluminum fining
Auto reset type high/low pressure switch

Supply air fan

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

Air filter

G4 washable main air filter
G2 nylon filter, at external air inlet

Electric control:

All the electric components are assembled in an independent room.

Miniature circuit breaker: every load is equipped with a separate miniature circuit breaker.

Contactor: every load is equipped with a separate contactor.

Phase and over-current protector (Only for 3 phases power source)

Control transformer
Power switch: change the voltage from AC to DC, used for 24Vdc controller and damper actuator.
Micro-processer
User terminal
Return air temperature sensor
Outdoor temperature sensor
Humidity sensor

Outdoor unit standard configuration

Unit base and Unit frame:

Unit base is made of folded sheet steel and welded if necessary. The surface is coated with epoxy resin powder.

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

Aluminum panels
Condenser

Made of grooved copper tube with continuously enhanced louvered aluminum fining.

Condenser fan

Axial propellerfan with directly coupled motor with internal thermal protection and external current protection

Electric control

All the electric components are assembled in an independent room.

Miniaturecircuit breaker: every load is equipped with a separate miniature circuit breaker.

Contactor: every load is equipped with a separate contactor.

Optional components

Indoor unit standard configuration

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

Gravitational pressure relief valve (air discharge)(Only available for SPLIT units)

Rain cover at air inlet (Only for indoor installed units)

AC EC supply fan

Equipped with EC centrifugal fan

DC powered EC fan

*Note: Only for 7kW cooling capacity unit.

Electric heating elements

There are 3.0kW, 4.5kW and 6kW, three heating capacity for option, relatively matched with control components.

Crankcase heater

Equipped with crankcase heater, to make sure the compressor can work at low temperature.

Low temperature start kit

Equipped with low temperature start kit to make sure the air conditioner can start normally under lower temperature condition.

Filter clogged alarm

The filter clogged alarm will be triggered if the filter is clogged through equipped with air pressure differential switch.

Cabinet for sea air environment

Include frame made of stainless steel and panels made of aluminum alloy.

Remote communication card

RS485 or RS232 communication card with MODBUS communication protocol

PCOWEB internet communication card: remote monitor and control after equipped with IP address.

Communication protocol conversion card

Change the communication protocol from MODBUS to TCP/IP.

Clock card

Provide calendar function, convenient for operation and management

Wall mounting kits

The unit is designed to be installed hanging on the shelter wall and is enclosed with related mounting accessories such as: angle brackets, through wall bolts, sealing tape and grill etc.

Supply air temperature sensor

Assembled the sensor in the mixture air box, used for control the position of air damper.

Various power source

As customer requirement, the below power sources are available.

50Hz:

220VAC/1Ph/50Hz;

380~420VAC/1Ph/50Hz

60Hz:

208~230VAC/1Ph/60Hz;

208~230VAC/3Ph/60Hz;

460VAC/3Ph/60Hz

Outdoor unit standard configuration

AC EC supply fan

Equipped with EC centrifugal fan

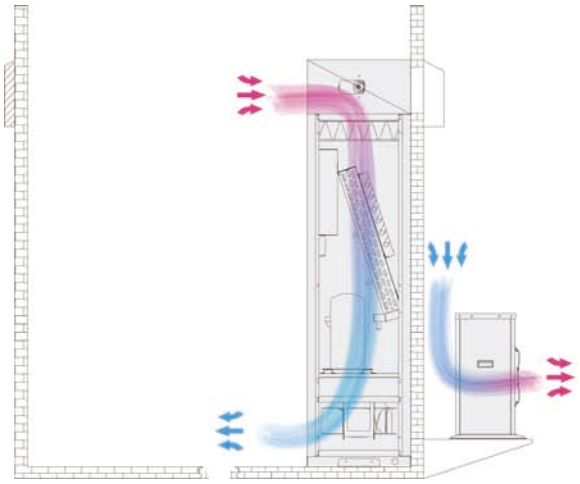
Special condenser

Condenser coil coated with phenolic anti-corrosion resin;

The material of the fin is copper.

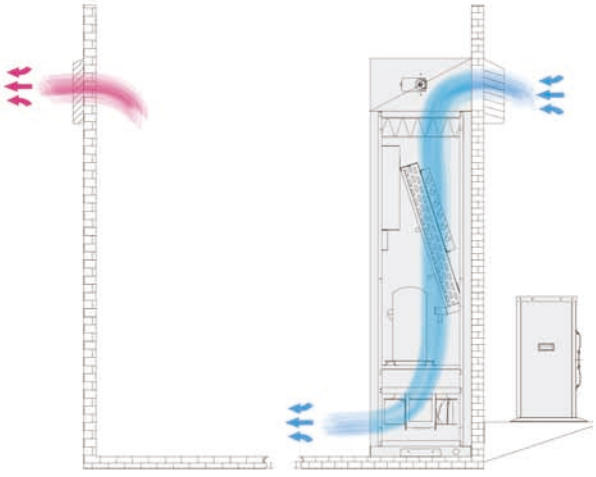
Working Principle

MOBILECOOL INDOOR Working Principle Diagram



Mechanical cooling mode

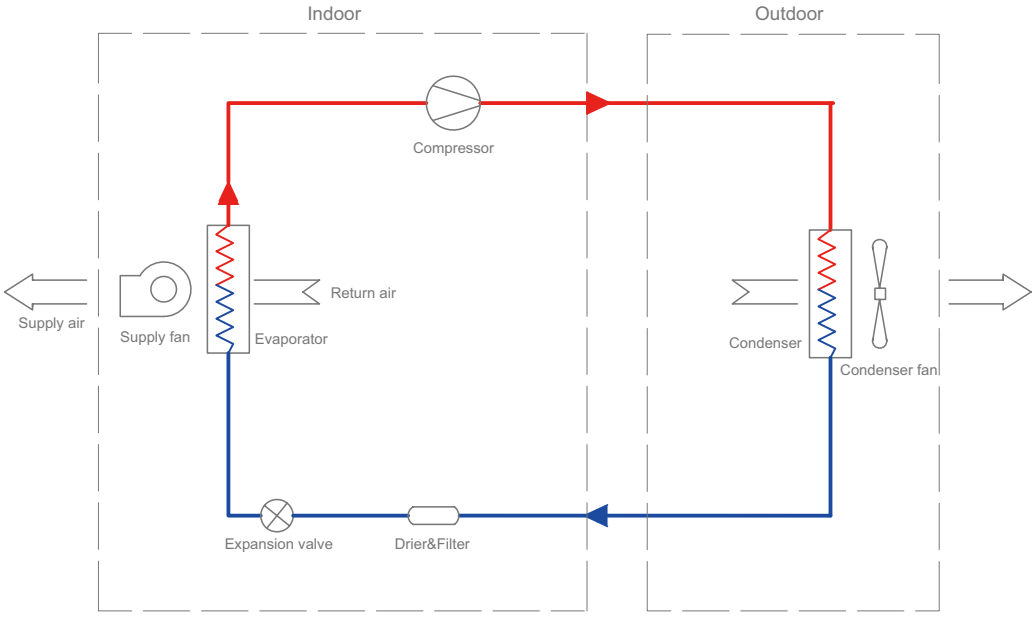
Air returned directly from the room, no external air entering the room.



Free cooling mode(option)

External air intake for the free-cooling cycle through motorized controldamper.

Mechanical cooling working principle



Free cooling

When outdoor temperature is 2℃ or more lower than indoor temperature, the free cooling function will work.

When the cooling capacity provided by free cooling is not enough, the compressor will be turned on, work with free cooling, this function is Called free cooling.

Unit main features

Energy-saving operating

Integrated with Free Cooling system (Option) will be used when outdoor temperature lower than indoor temperature, minimize the run time of mechanical cooling, lower the power consumption.

When ΔT reaches to 10°C, the free cooling can supply a great cooling capacity which is equivalent to 100% mechanical cooling capacity, the total energy-saving up to 90% in a whole year.

Good structure design and easy maintenance

There are some necessary clearances between components; every component can be easily dismantled from the unit.

The weight of each the panel is controlled less than 10 kg.

The unit is designed to be installed universally. It is not needed to make a distinction between left and right hand installation when it is to be adjacent installed at the end of shelter base station.

The main components such as: compressor, fan, damper and other related components can be accessed in front and two sides of the unit and can be field replaced without removing the units when installed side-by-side on the same end of shelter.

Strong structure

The unit passed a transportation test to confirm the structure is strong enough to be able to transport on low grade ways.

Dual cooling source

Each unit is equipped with both mechanical cooling system and free cooling system as standard. standard. The fresh air free cooling is designed to be the primary source of cooling.

Anti corrosion

The unit framework is provided with corrosion protection treatment.The treatment is sufficient to provide protection for 15 years life cycle for inland installation.

If necessary, the treatment for sea air environment can be supplied as optional.

High sensible heat ratio

The Sensible heat ratio of all the units are high than 0.8

Wide working range

The unit can work at minimum -30°C, maximum 53°C ambient temperature continuously and reliably.

High capacity air filter

When the pressure drop of the filter reached 250Pa end resistance, the unit air flow will not be low than 90% of air flow at standard condition.

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, if the unit is equipped with free cooling function, itcan be capable of automatic reversion to the fresh air cooling mode.

Unit restart when prime power goes back

The unit will restart automatically with a random delay time from 1s to 60s when prime power goes back after a

power failure to avoid several equipment restart at the same time.

Controller 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(Optional)

When service people is working in base station, the comfortable mode is available, just press 2 buttons on the user terminal, then the control temperature of the air conditioner will be set ascomfort mode set point(settable) automatically. An hour later the control temperature of air conditioner will be return 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 & 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 is over 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.

Alarm

There are a lot of alarms provided to protect the unit.

Humidity limitation

The control function can be enabled or disabled on site.

If it is enabled, when the humidity is higher than set point, free cooling will be turned off in order to keep humidity in normal range. When the humidity is decrease to normal range, the free cooling will restart.

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.

Web server monitoring

The unit can be equipped with a Web Server card with TCP/IP protocol and Ethernet work 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, balance 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, so the operation life will be enlarged.

The control functions

Parameters display

Current control temperature set
Return Air Temperature
Outside air humidity
Outside Air Temperature
Supply Air Temperature
Damper Position
Software Version
Attend Mode

Working status display

Supply 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
Filter clogged
Free cooling system failure
Low temperature
High temperature
Fire/smoke alarm
Temperature sensor defective

Remote control and monitoring

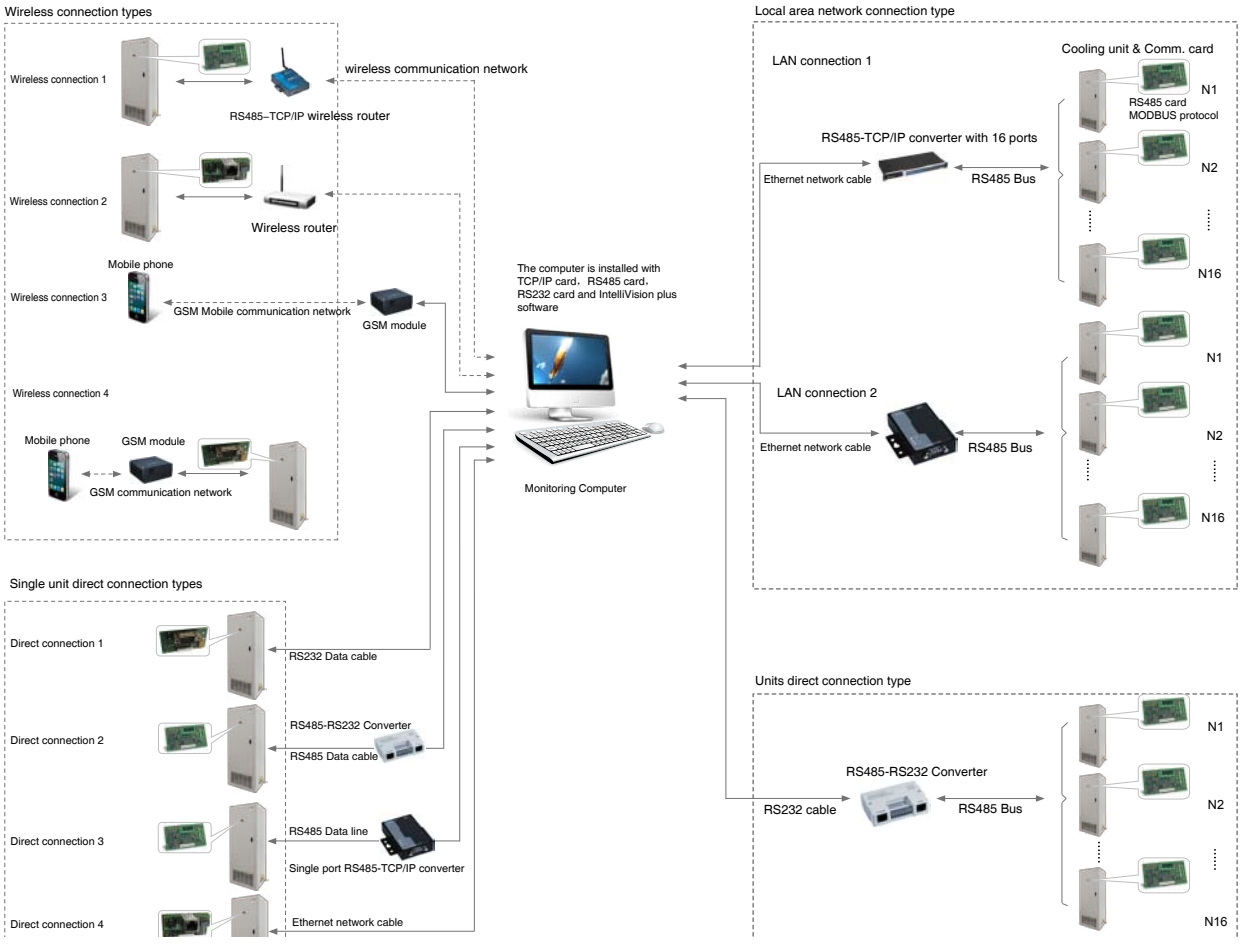
The remote monitoring and control system can be easily connected with the units to realize remote real time monitoring and control and save the running data.

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

Model		5R1D1	7R1D1	10E1D2	13E1D2	15E1D2
Air delivery				O/DL		
Cooling capacity						
Mechanical cooling(1)	kW	5.5	7.6	10.4	13.3	14.9
Free cooling(2)	kW	5.9	5.9	7.4	11.6	11.6
Compressor						
Power input	kW	1.6	2.3	2.7	3.5	4.0
Current	A	7.3	3.8	5.0	6.9	7.6
Supply Fan						
Type				caseless centrifugal AC motor		
Power input	kW	0.17	0.17	0.30	0.52	0.52
Air flow	m^3/h	1800	1800	2250	3500	3500
Electric heater						
Heating capacity	kW	1.5	2.25	3	4.5	4.5
Working steps	n.	1	1	1	1	1
Pipe connection						
Gas line	mm	16	16	16	16	16
Liquid line	mm	12	12	12	12	12
Power supply						
Power source		220V/1Ph/50Hz		380V/3Ph/50Hz		
Max. operating power	kW	2.4	3.5	4.3	5.3	5.8
Max. current	A	10.1	6.3	9.7	11.1	12.4
Dim. of indoor unit						
Length	mm	600	600	750	750	750
Width	mm	500	500	500	500	500
Height	mm	1700	1700	1700	1700	1700
Weight	kg	70	80	150	160	165
Air cooled condenser						
Model x Qty.		CMD3x1	CMD4 x1	CMD4 x1	CMD5 x1	CMD6 x1
Power input	kW	0.29	0.29	0.49	0.49	0.49
Air flow rate	m^3/h	4600	4600	6600	6600	6600
Dimensions						
Length	mm	808	808	808	1004	1250
Width	mm	509	509	509	509	509
Height	mm	789	789	789	930	930
weight	kg	52	65	65	75	95

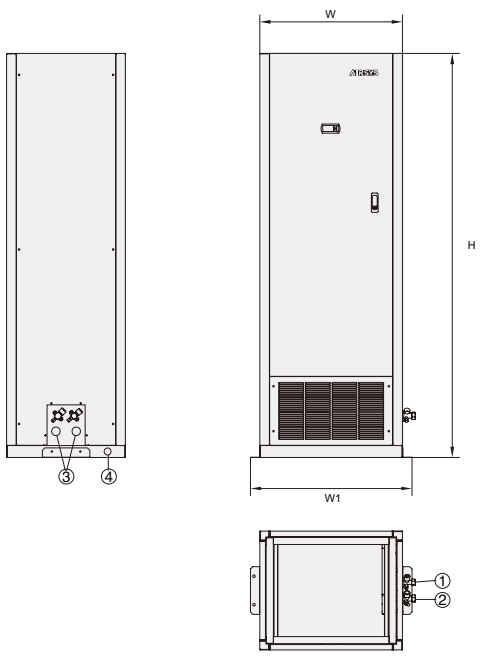
(1) Dry bulb temperature of air return 24℃,relative humidity 50%,external dry bulb temperature 35℃

(2) Option available for DL air supply scheme units, the temperature difference between indoor and outdoor is 10℃. Not available for up-front air supply scheme unit.

(3) Option.

Dimensions Drawing

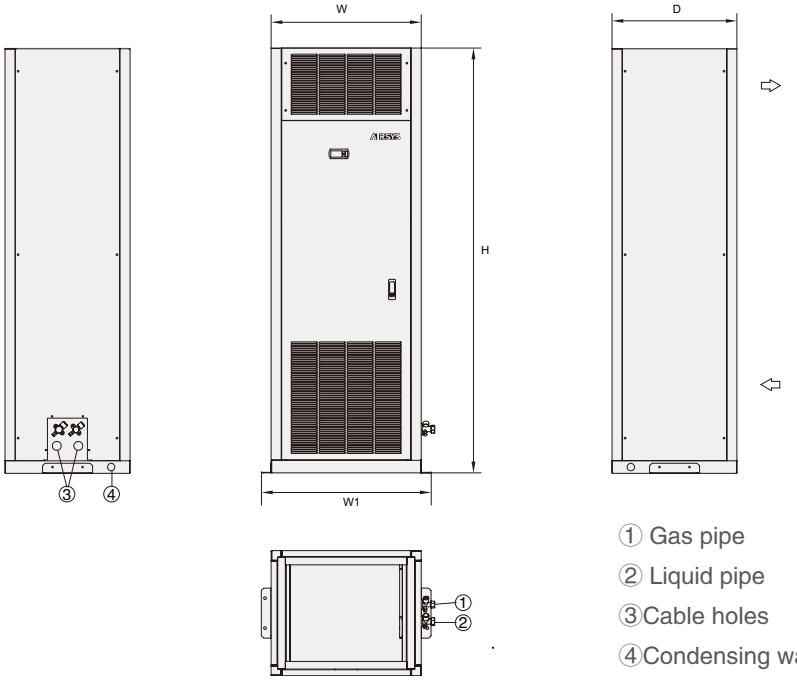
Dimensions for 50Hz



① Gas pipe
② Liquid pipe
③Cable holes
④Condensing water drainage

Cabinet Code/ Dimensions	width (A)	width (A1)	Height (B)	Depth (C)
D1 (mm)	600	680	1700	500
D2 (mm)	750	830	1700	500

Up-front supply air unitsexternal dimensions



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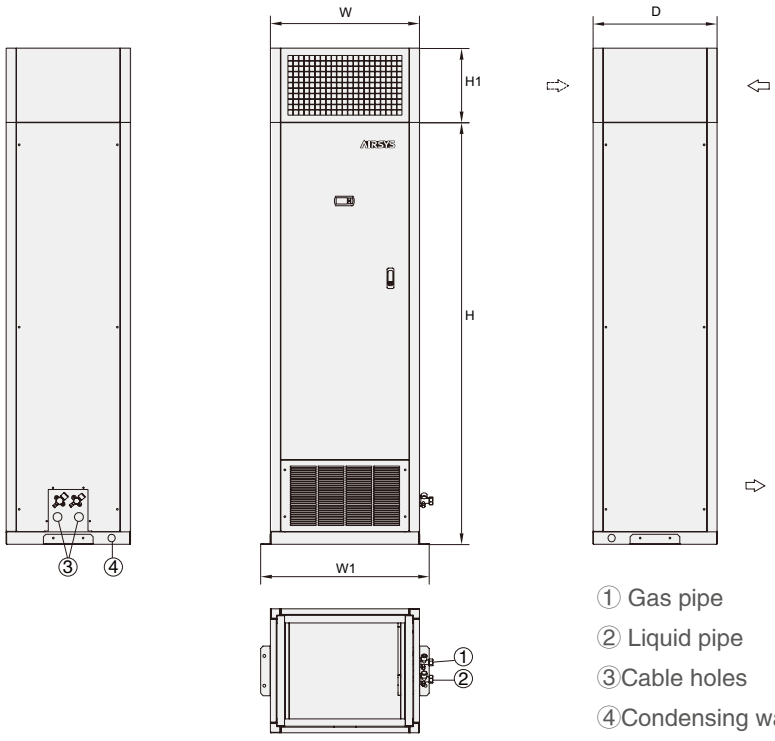
D1 (mm)	600	680	1700	500
D2 (mm)	750	830	1700	500

Displacement flow units with free cooling external dimensions



① Gas pipe
② Liquid pipe
③Cable holes
④Condensing water drainage

Cabinet Code/ Dimensions	width (W)	Depth (D)	Height(H)	Height(H1)
D1 (mm)	600	500	1700	300
D2 (mm)	750	500	1700	300

AIRSYS

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.

Add: No.28, LuGuDong Str., Shijingshan District, Beijing, China Post code: 100040
Tel:+86–10–6865 6161 Fax:+86–10–6865 2453
Callcenter :+86-400-820-5515
www.air-sys.com