AIRSYS

Optima – HD

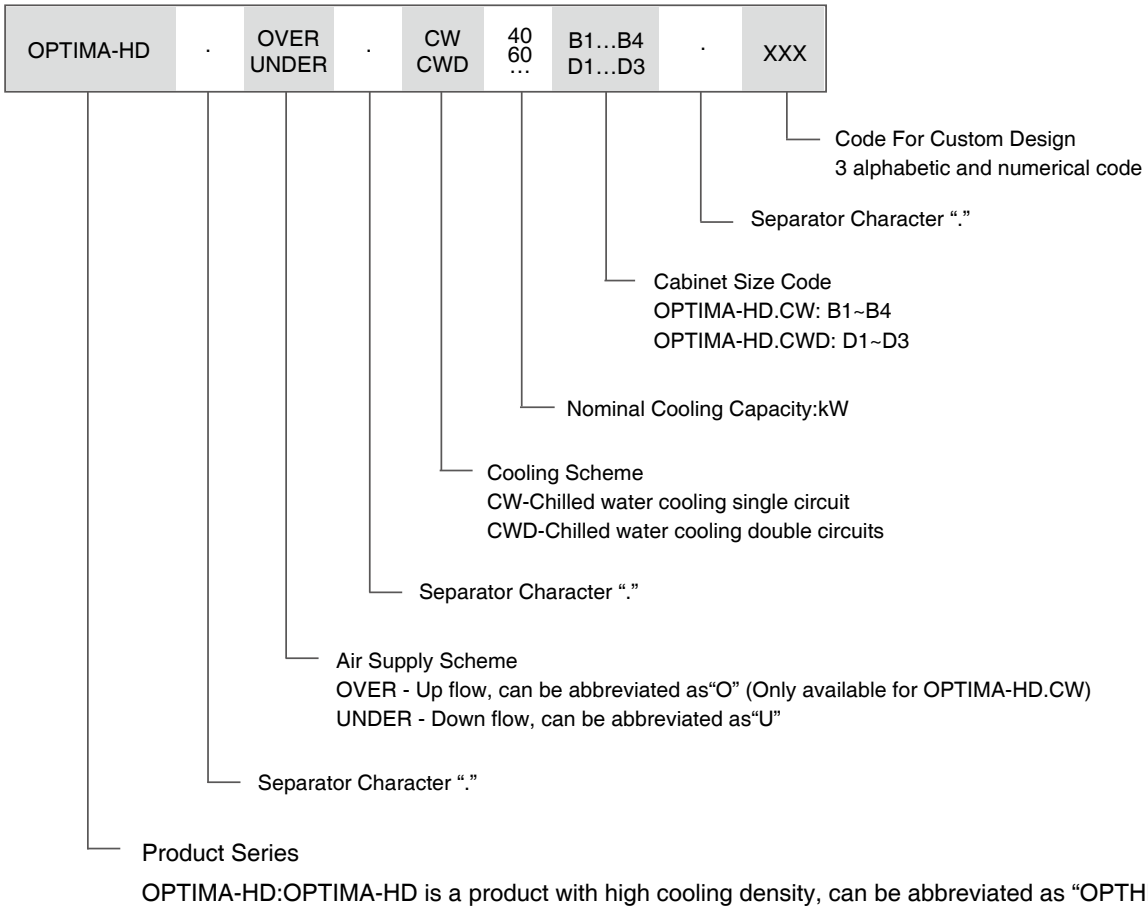
Chilled Water Precision Air Conditioner for Critical Application

Cooling Capacity: 42.1kW~180.9kW

OPTIMA product family is designed for medium to large data center. OPTIMA provide precise temperature and humidity control, outstanding reliability and energy efficiency, 24*7 operation.

OPTIMA-HD is a product with high cooling density, using chilled water from central chiller plant or free cooling water. It does not require any compressors and outdoor condensers which can save the capital investment.The whole system is more energy-efficient and reliable.
OPTIMA-HD has two versions:
OPTIMA-HD.CW: Single chilled water circuit
OPTIMA-HD.CWD: Double chilled water circuits

Unit Identification



Working Range and Control Accuracy

Operating Range

Water pressure: higher than overall system pressure drop, lower than 1,250KPa.

Control Accuracy

Temperature Range And Accuracy:

Range: 15~35℃, Accuracy: ±1℃;

Humidity Range And Accuracy:

Range: 35~80%, Accuracy: ±5%

Application

Middle and high telecommunication exchange room

Middle and big data center and computer room

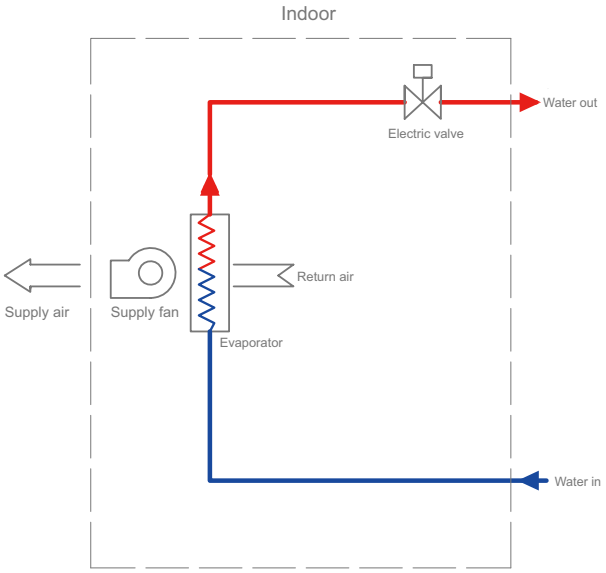
Museum and library

Precision machining equipment center

Working Principle

OPTIMA-HD.CW working mode:

OPTIMA-HD.CW, without mechanical cooling components, use chilled water as cooling resource. Chilled water enters into the cooling coil and exchanges the heat with the return air to lower the room temperature. The whole system is moreenergy efficient and highly reliable.



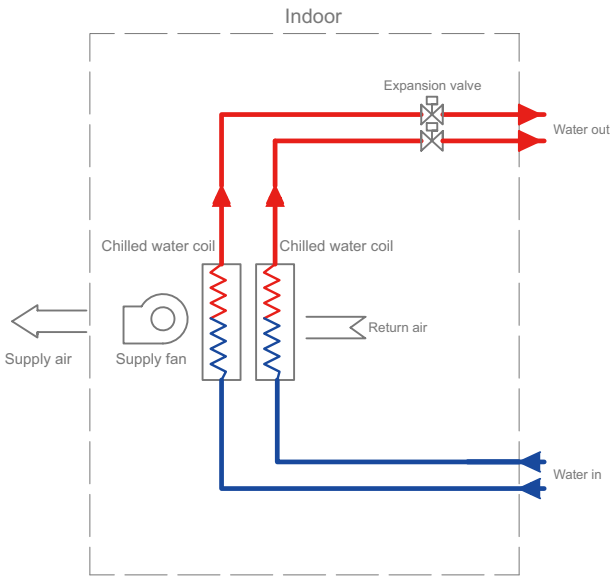
OPTIMA-HD.CW Working Diagram

OPTIMA-HD.CWD working mode:

1. Energy-saving Mode:Circuit Ⅰ uses chilled water from central chiller plant, while circuit Ⅱ uses chilled water from free cooling sources. According to different climate conditions, the system will decide which circuit to be used.

In summer time, only circuit Ⅰ will be used. In winter time, only circuit Ⅱ will be used.In other time,by regulating 2 electronic two-way valves, circuit Ⅱ is used as the priority cooling and circuit Ⅰ is used as compensation cooling.

The system is more energy efficient due to the maximum usage of free cooling.



OPTIMA-HD.CWD Working Diagram

2. Reliability Mode: both the circuits use chilled water from central chiller plant, one working one standby.When one circuit cannot supply enough cooling capacity, the other circuit will work as compensation.

Highlights

Compact, High Cooling Density, High Air Volume

OPTIMA-HD is designed withthe highly compact structure to achieve the high cooling density and the high air volume at the same time. It will save the precious space for the customers, the maximum cooling density= 80KW/ m^2 (two circuits working at the same time).

Precise Control

The control accuracy for temperature is ±1℃ and for relative humidity is ±5%.

High Efficiency

OPTIMA-HD is equipped with EC supply fans. In addition, by increasing the return water temperature, the EER of the chiller will be optimized. By using the free cooling circuits, more energy will be saved.

Various Air Supply Schemes Available

CW: up flow with duct, front under flow, under flow with the under floor fan section.

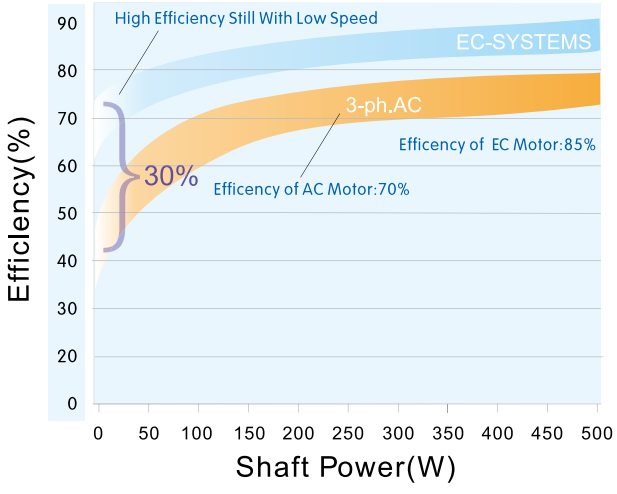
CWD: front under flow, under flow with the under floor fan section.

EC fan

EC motor with external rotor is highly efficient, reliable and compact. Taking advantage of its speed variation ability, the unit can achieve:

1 Energy-saving by reducing the fan speed when necessary.

2 Adjusting external static pressure and air volume according to the external static pressure change.



Electric Heater

It is stainless steel pipe twisted with fins around the pipe and it works with a reduced superficial temperature eliminating ionization, thus avoiding peculiar smell.

Self-diagnosis

All the components connected to microprocessor are continuously monitored and controlled and, in case of malfunction, the unit is shut up and the failure is shown on the display.

Isolated Control Panel

All the electrical and control components are installed on an isolated control panel with orderly wiring and clear labeling, meeting the IEC norm.

Easy Maintenance

Technical compartment recessed from the air flow, housing compressor, humidifier, control and safety devices for ordinary service and preventive maintenance during operation.

Unit Configuration

Standard Configuration

Standard Configuration	OPTIMA-HD.CW	OPTIMA-HD.CWD
Powder painted steel frame	●	●
Powder painted steel panel with inside thermal and acoustic insulation	●	●
Backward curve, single inlet, centrifugal fan with 3 phase EC powered Electronic Commuted motor	●	●
One V type copper tube aluminum fin coil	●	—
Two copper tube aluminum fin coils	—	●
Condensing water tray	●	●
Proportional controlled electrode type humidifier, various capacity available	●	●
Stainless steel electric heater, various capacity available		
G4 class air filter	●	●
Motorized 2-way valve	●	●
Temperature and RH sensor at return air inlet	●	●
Air pressure switch for supply fan protection	●	●
Return air plenum for up flow unit(mandatory for up flow unit)	●	—
Supply air plenum for down flow unit(mandatory for down flow unit)	●	●
Microprocessor control	●	●
Electrical control panel	●	●

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

Option

Option	OPTIMA-HD.CW	OPTIMA-HD.CWD
Backward curve, single inlet, centrifugal fan with 3 phase, AC powered motor.	○	○
Motorized 3-way valve	○	○
Air pressure switch for clogged filter alarm.	○	○
Supply air plenum for up flow unit	○	—
Supply air temperature sensor	○	○
Supply air pressure sensor	○	○
Installation support stand with adjustable legs	○	○
Floor water leakage alarm kit	○	○
Colored touch screen graphical user interface	○	○
RS232 communication card	○	○
RS485 communication card	○	○
PcoWeb card serve as web based server	○	○
Clock card	○	○
Communication protocol converter	○	○
Phase sequence protection relay for power supply	○	○

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

Electric heater/Humidifier selection sheet

Cabinet Size		B1	B2	B3	B4	D1	D2	D3
Heat capacity (kW)	9	●	—	—	—	●	—	—
	13.5	○	●	—	—	○	●	—
	18	—	○	●	●	—	○	●
	27	—	—	○	○	—	—	○
Humidification capacity (kg/h)	8	●	●	●	●	●	●	●
	10	○	○	○	○	○	○	○
	13	○	○	○	○	○	○	○
	15	○	○	○	○	○	○	○

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

Supply Air Plenum (Option) Dimensions And Weight

Cabinet Size		B1	B2	B3	B4
Width	mm	900	1750	2490	2905
Depth	mm	470	470	470	470
Height	mm	900	900	900	900
Weight	kg	46	63	86	97

Microprocessor Control System

Indicative Parameters for Unit Working Status

Temperature And Humidity

Return air temperature

Return air relative humidity

Working Status

Supply fans

Humidifier water filling and drain valves

2 stages electric heater

Automatic or manual status

Working Hours of Every Main Component

Supply fans

humidifier

Heaters working hours

Alarm Display

Display effective alarms, store and track up to 100 historical alarms (including alarm code, date, time and alarm description)

Other Control Functions

Self-diagnosis

The microprocessor will continuously monitor its own circuit and shut off automatically in case of malfunction.

Motor Overload Alarm for Supply fan and Electric heater

prevent damages of component motor from voltage unbalance, low voltage and phase loss.

Sensor Failure Alarm

The microprocessor will shut down the unit and send out alarm signal in case of any failure of temperature sensor and pressure transducer.

Power Supply Failure Alarm

The microprocessor will shut down the unit and send out alarm signal in case of any failure of the power supply such as phase loss, phase sequence mistake, and voltage out of range.

Unit Random Insertion

The units can start-up automatically after the power recovery. The microprocessor has 2-60 seconds of random insertion to avoid current shock caused by multiple unit start-up at the same time.

Floor Water Leakage Alarm

When detecting the water on the floor with the water leakage alarm kit, the microprocessor will send out an alarm.

Humidification System Alarm

Microprocessor provides various alarms to the humidification system, such as high/low current, high/low water level, cylinder life, high/low conductivity, to assure the reliability and to prolong the life of the humidifier.

Manual Control

It is able to manually switch on/off all the major components during the commissioning and service of the unit.

Operating Scheduling

This function allows the user to set daily or weekly operating schedule.

Multi-unit Group Control

When multiple units are installed in one room, the operating strategy such as rotation, standby, can be achieved by group networking.

Acoustic and Optical Alarm Signaling

The room temperature, humidity and working status of all the components are displayed on the controller. When a failure occurs, acoustic buzzer is energized and the failure message is displayed on the controller display.

4 Levels of Password

Unit has 4 password dedicated to different operation and maintenance jobs, this will prevent the unit from wrong or unauthorized operation.

Modifiable Parameters

Basic Running Parameter

Basic Running Parameters can be modified by customers according to the customer need, for example: temperature and humidity setting.

General Parameters

The default parameters can be modified by service engineer during routine maintenance, for example:temperature and humidity range, precision range adjustment, temperature and humidity dead zone setting, highest and lowest temperature and humidity setting, high pressure alarm setting, start and stop schedule setting, etc.

Advanced Parameter

For example:alarm delay adjustment, backup rotation setting, condensing fan working point setting, the compressor minimum start interval setting

The unit can be initializedifnecessary

Note: more details, please refer to the User Manual.

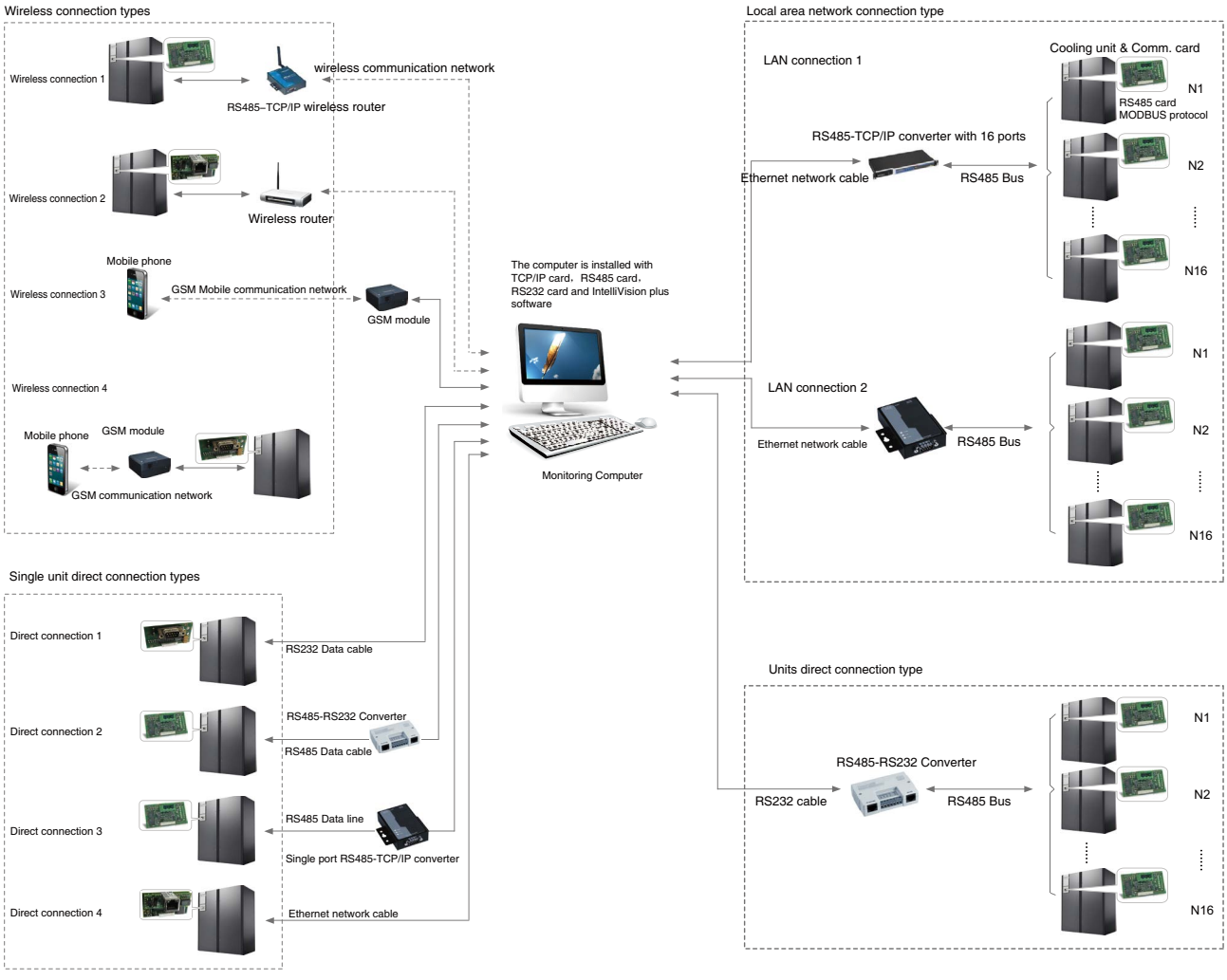
Remote Control And Monitoring Network

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

OPTIMA-HD.CW

Unit Model		40B1	60B1	80B2	100B2	120B3	140B3	160B4	180B4
Supply air scheme(1)					O/U				
Cooling capacity									
Total cooling capacity(2)	kW	42.1	60.7	83.6	101.6	123.3	145.2	160.5	180.9
Sensible cooling capacity(2)	kW	37.5	53.4	73.6	90.4	111.0	129.2	142.8	159.2
Total cooling capacity(3)	kW	33.7	48.6	69.3	84.3	105.6	127.3	137.2	154.1
Sensible cooling capacity(3)	kW	30.3	43.3	61.7	75.0	97.2	117.1	126.2	141.8
Cooling coil									
Water flow(2)	m^3/h	7.2	9.6	14.2	17.3	19.5	24.7	26.3	28.4
Wate pressure drop(coil+valve)(2)	kPa	95.0	97.0	86.0	94.0	93.6	91.2	98.6	83.9
Water flow(3)	m^3/h	5.9	8.1	12.9	14.6	17.4	20.3	22.8	26.3
Wate pressure drop(coil+valve)(3)	kPa	71.2	75.0	73.0	65.5	89.6	82.7	83.9	62.4
Supply fan									
Type					Caseless backward centrifugal fan				
Qty. of fan	n.	1	1	2	2	3	3	3	3
Air volume	m^3/h	11700	12600	22600	23600	31800	32600	37200	37200
External static pressure (ESP)	Pa				Standard ESP is 75Pa, adjustment range is 50~300Pa				
Power input	kW	1.9	2.3	2×2.6	2×2.8	3×1.9	3×2.1	3×2.4	3×2.6
Current input	A	2.8	3.5	2×3.8	2×4.4	3×2.8	3×3.3	3×3.6	3×4.0
Power input(4)	kW	3.5	3.5	2×3.5	2×3.5	3×3.5	3×3.5	3×3.5	3×3.5
Current input(4)	A	6.4	6.4	2×6.4	2×6.4	3×6.4	3×6.4	3×6.4	3×6.4
Eletric heater(5)									
Type					Stainless steel electric heater				
Heating capacity	kW	9	9	13.5	13.5	18	18	18	18
Current input	A	13.3	13.3	20.3	20.3	27.3	27.3	27.3	27.3
Working steps	n.	2	2	2	2	2	2	2	2
Humidifier(5)									
Type					Electrode				
Humidification capacity	kg/h	8	8	8	8	8	8	8	8
Power input	kW	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Current input	A	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Unit power supply									
Power source					380V/3Ph/50Hz				
Unit max. operating power input(6)	kW	16.9	17.3	24.7	25.1	29.7	30.3	31.2	31.8
Unit max. operating current(6)	A	25.3	26	37.1	38.3	44.9	46.4	47.3	48.5
Unit piping connection									
Condensing water drainage	in	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″
Chilled water inlet/outlet	in	1 1/2″	1 1/2″	2″	2″	2″	2″	2 1/2″	2 1/2″
Unit external dimensions and Weight									
Width	mm	900	900	1750	1750	2490	2490	2905	2905
Depth	mm	900	900	900	900	900	900	900	900
Height(7)(O/U)	mm	1960/1730	1960/1730	1960/1730	1960/1730	1960/1730	1960/1730	1960/1730	1960/1730
Return air plenum height(8)	mm	400	400	400	400	400	400	400	400
Supply air plenum height(9)	mm	550	550	550	550	550	550	550	550
Weight	kg	375	405	525	560	670	750	840	910

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

(2) Return air dry bulb temperature 24℃,RH50%,inlet/outlet chilled water temperature: 7℃/12℃;

(3) Return air dry bulb temperature 28℃,RH40%,inlet/outlet chilled water temperature: 10℃/15℃;

(4) Option, AC fan;

(5) The default capacity, please refer to "electric heater/ humidifier selection sheet" for other capacity;

(6) Max. operating power input/current: as above spec sheet, unit under the condition of dehumidification plus 100% electric reheat;

(7) Excluding the height of return air plenum of up flow unit and supply air plenum of down flow unit;

(8) Up flow unit is required and to be installed at the bottom, the total height is up to 2340mm. Please select OPTIMA.CW series if the maximum product total height is less than 2000mm;

(9) Down flow unit is required and may sink underneath floor to supply air or be installed on the floor to supplier air along the surface of the floor.

Technical parameters

OPTIMA-HD.CWD

Unit model		50D1	60D1	80D2	100D2	120D3	140D3
Supply air scheme(1)				U			
Cooling capacity(2)							
Total cooling capacity(3)	kW	50.4	61.1	81.0	100.7	120.5	143.2
Sensible cooling capacity(4)	kW	44.8	55.0	73.7	90.6	109.7	131.7
Total cooling capacity(4)	kW	40.0	49.3	59.6	75.4	95.8	112.8
Sensible cooling capacity(4)	kW	35.6	43.4	53.6	67.8	87.2	104.9
Cooling coil							
Water flow(3)	m³/h	7.7	9.6	12.7	14.8	17.9	22.0
wate flow(4)	m³/h	6.1	7.9	9.8	11.8	15.0	18.5
water pressure drop(coil+valve)(3)	kPa	101.1	123.1	83.1	83.2	184.6	156.6
water pressure drop(coil+valve)(4)	kPa	87.7	92.1	56.7	50.8	127.8	113.8
Supply fan							
Type				Caseless backward centrifugal fan			
Qty. of fan	n.	1	1	2	2	3	3
Air volume	m³/h	11600	12300	23600	22800	31200	33600
External static pressure (ESP)	Pa			Standard ESP is 75Pa, adjustment range is 50~300Pa			
Power input	kW	2.6	2.9	2×2.5	2×2.9	3×2.3	3×2.8
Current input	A	3.3	4.7	2×3.9	2×4.7	3×3.2	3×4.5
Power input(5)	kW	3.5	3.5	2×3.5	2×3.5	3×3.5	3×3.5
Current input(5)	A	6.4	6.4	2×6.4	2×6.4	3×6.4	3×6.4
Eletric heater(6)							
Type				Stainless steel electric heater			
Heating capacity	kW	9	9	13.5	13.5	13.5	13.5
Current input	A	13.3	13.3	20.4	20.4	20.4	20.4
Working steps	n.	2	2	2	2	2	2
Humidifier(6)							
Type				Electrode			
Capacity	kg/h	8	8	8	8	8	8
Power input	kW	6.0	6.0	6.0	6.0	6.0	6.0
Current input	A	9.2	9.2	9.2	9.2	9.2	9.2
Power source				380V/3Ph/50Hz			
Unit max. operating power input (7)	kW	17.4	17.9	24.5	25.3	26.4	27.9
Unit max. operating current(7)	A	25.8	27.2	37.4	39.0	39.2	43.1
Unit piping connection							
Condensing water drainage	in	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″
Chilled water inlet/outlet	in	1 1/2″	1 1/2″	2″	2″	2 1/2″	2 1/2″
Unit external dimensions and Weight							
Width	mm	1250	1250	1750	1750	2560	2560
Depth	mm	900	900	900	900	900	900
Height	mm	1900	1900	1900	1900	1900	1900
Supply air plenum height(8)	mm	550	550	550	550	550	550
Weight	kg	380	405	465	490	580	640

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

(2) Single cooling coil offers. Under the standard condition, the total cooling capacity will increase by 45% when two coils work together;

(3) Return air dry bulb temperature 24℃,RH50%,inlet/outlet chilled water temperature: 7℃/12℃;

(4) Return air dry bulb temperature 28℃,RH40%,inlet/outlet chilled water temperature: 10℃/15℃;

(5) Option, AC fan;

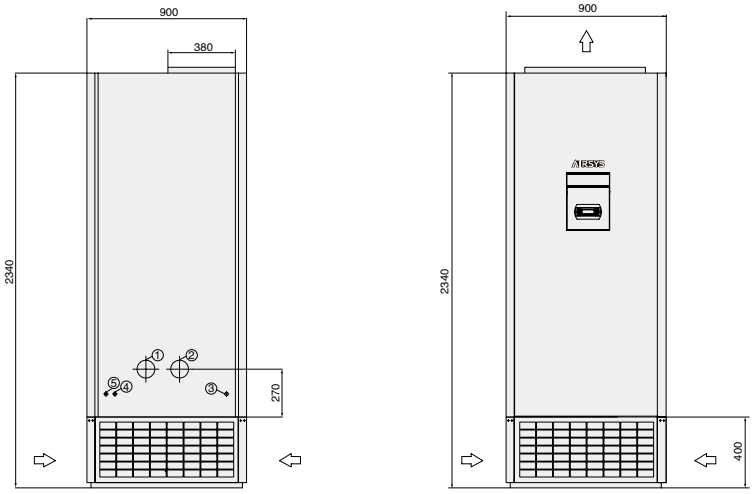
(6) The default capacity, please refer to "electric heater/ humidifier selection sheet" for other capacity;

(7) Max. operating power input/current: as above spec sheet, unit under the condition of dehumidification plus 100% electric reheat;

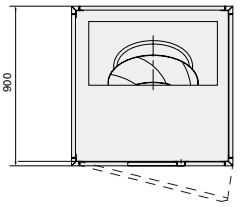
(8) Down flow unit is required and may sink underneath floor to supply air or be installed on the floor to supplier air along the surface of the floor. Please select OPTIMA.CWD series if required up flow unit.

Unit Dimension Drawing

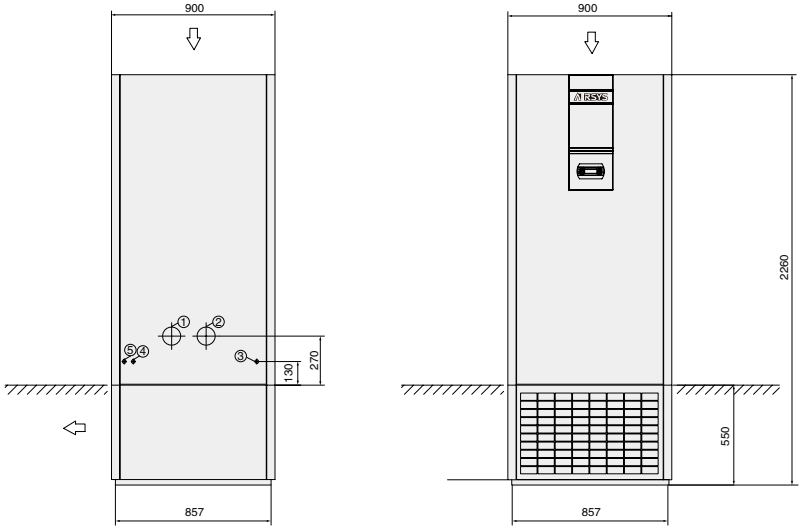
B1 Unit Cabinet Dimension Drawing for Up Flow Unit



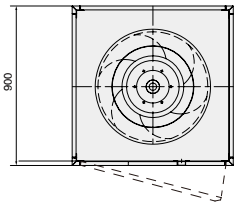
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes



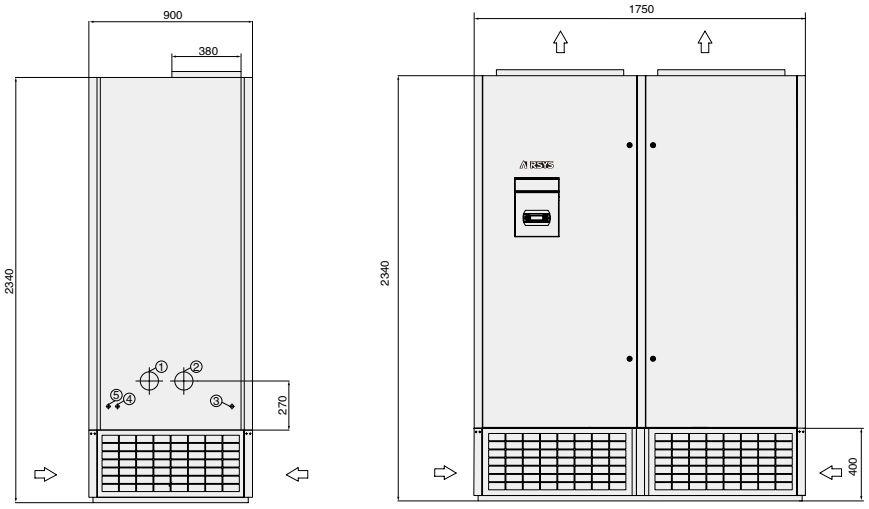
B1 Unit Cabinet Dimension Drawing for Down Flow Unit



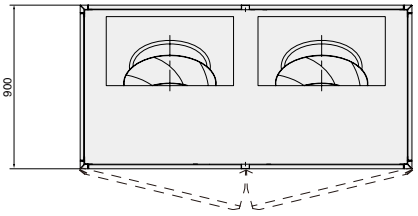
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes



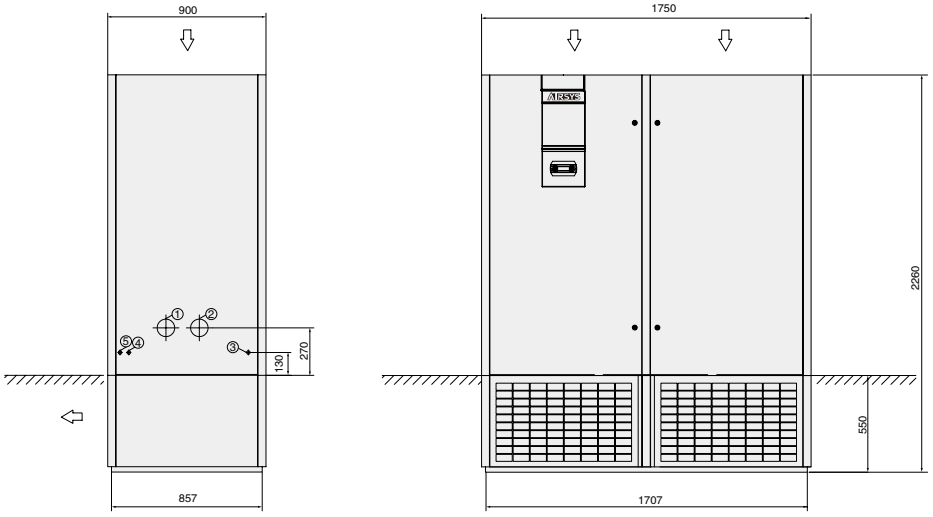
B2 Unit Cabinet Dimension Drawing for Up Flow Unit



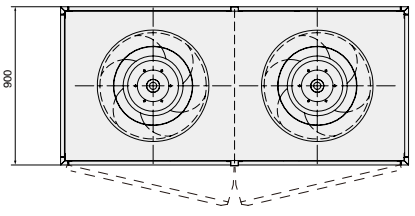
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes



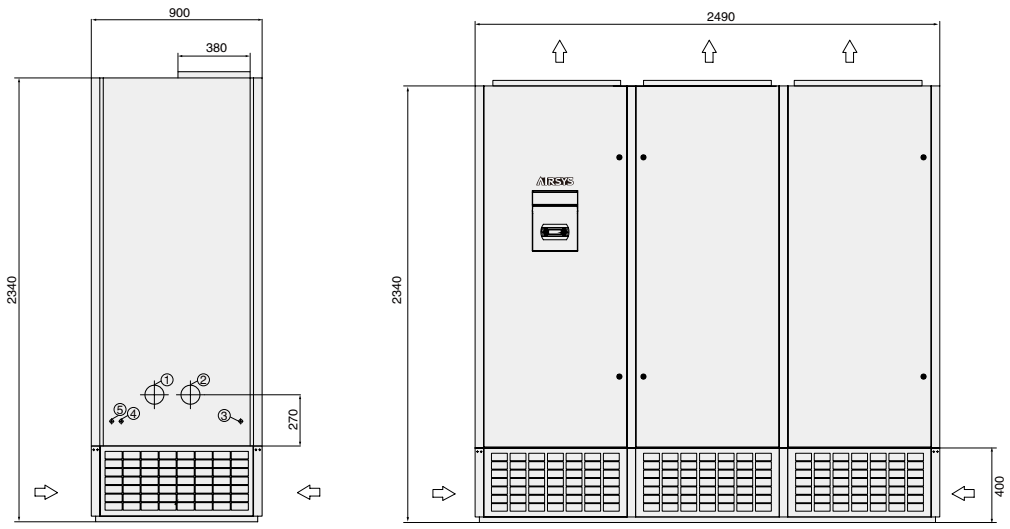
B2 Unit Cabinet Dimension Drawing for DownFlow Unit



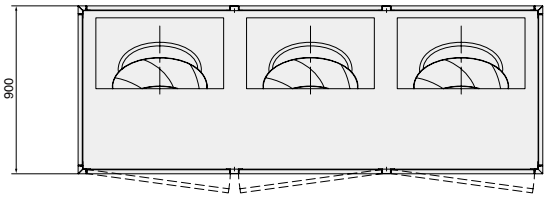
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes



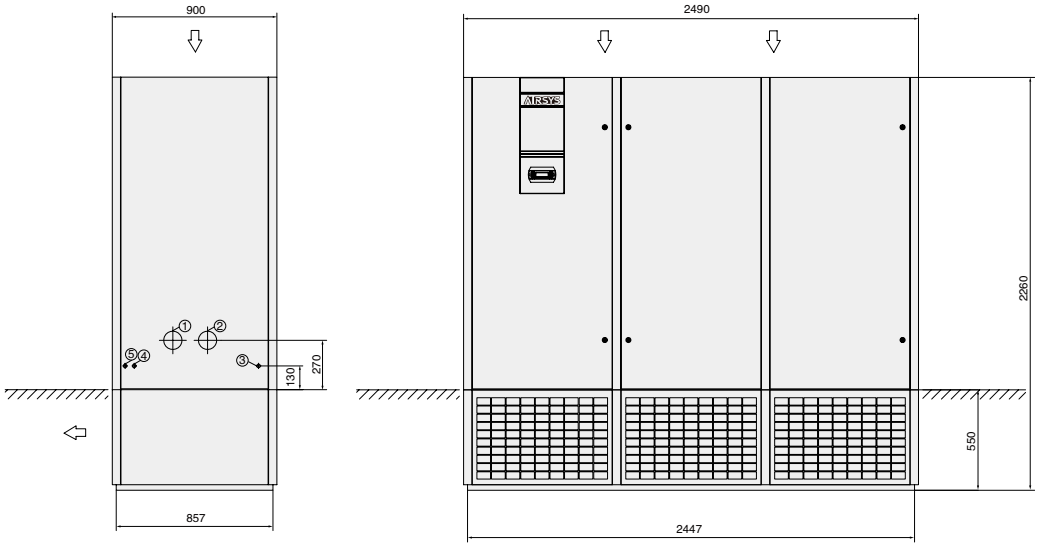
B3 Unit Cabinet Dimension Drawing for Up Flow Unit



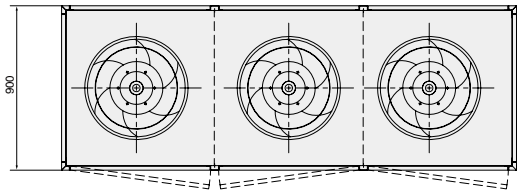
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes



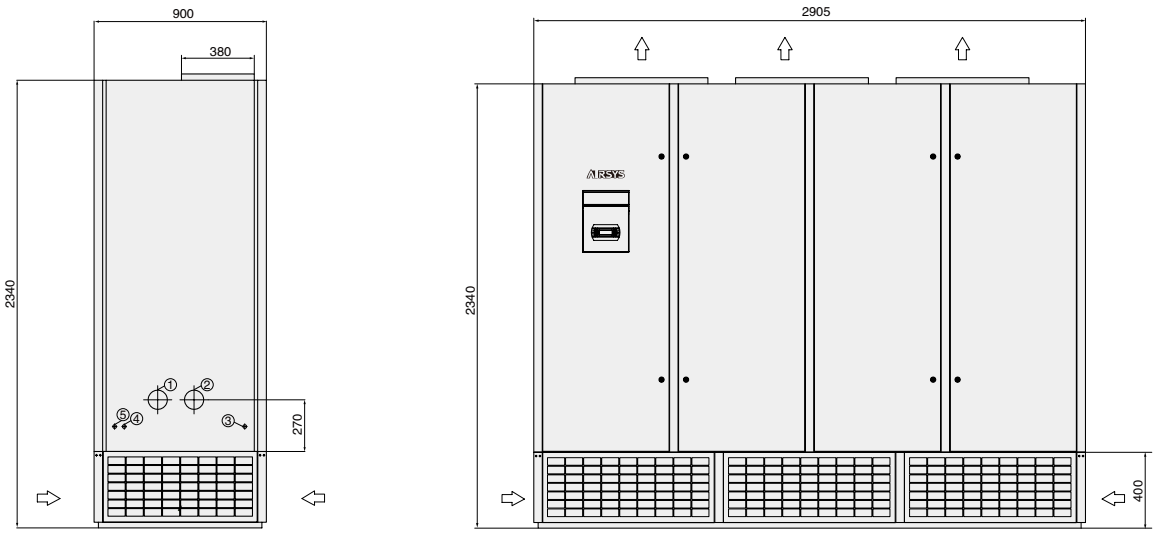
B3 Unit Cabinet Dimension Drawing For Down Flow Unit



1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes

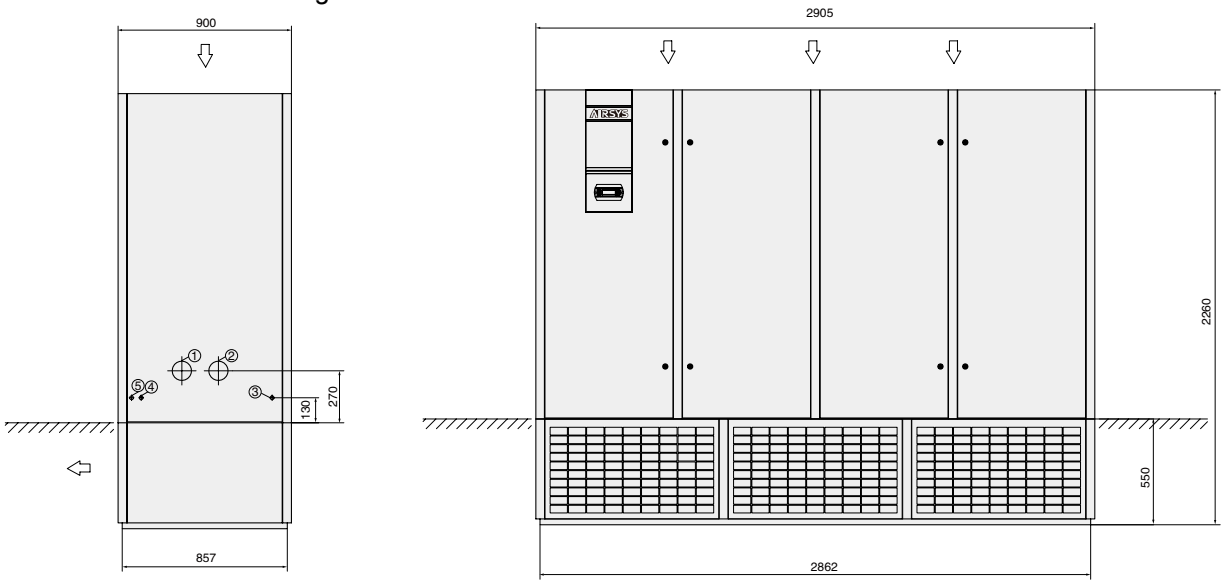


B4 Unit Cabinet Dimension Drawing for Up Flow Unit



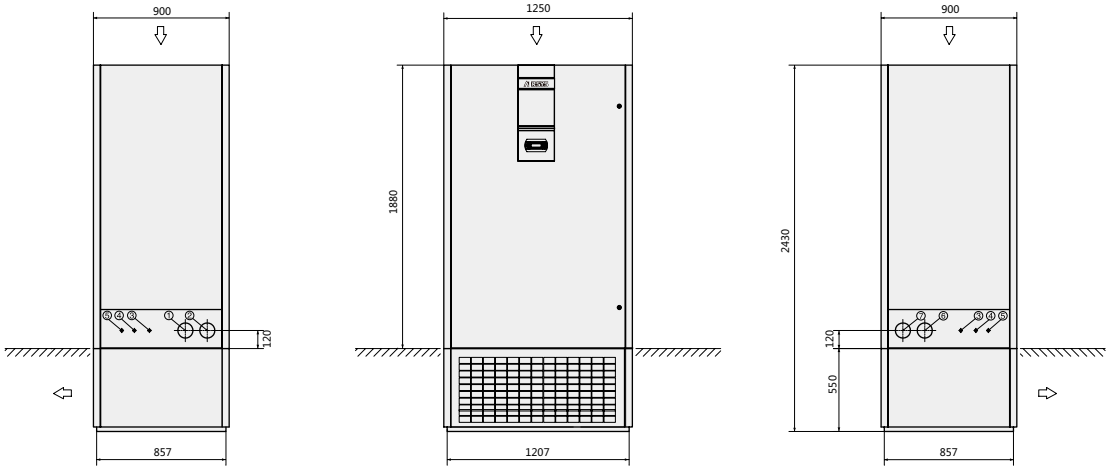
1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes

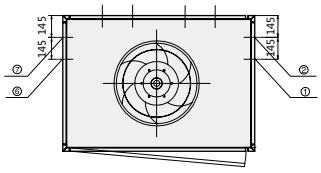
B4 Unit Cabinet Dimension Drawing For Down Flow Unit



1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes

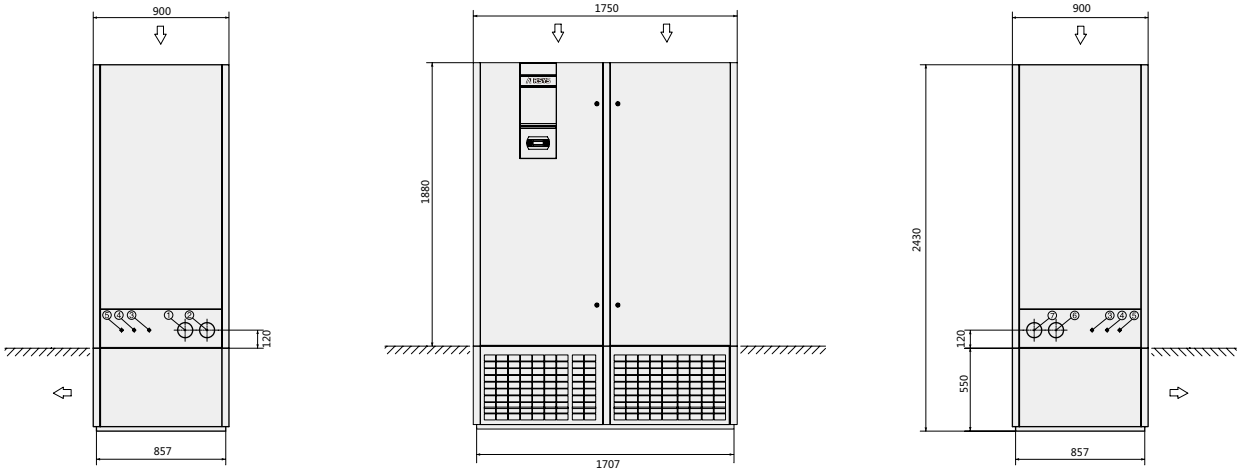
D1 Unit Cabinet Dimension Drawing

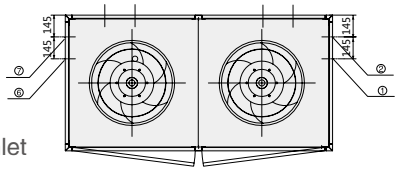




1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes
6. The cooling tower (dry and wet device) water inlet
7. The cooling tower (dry and wet device) water outlet

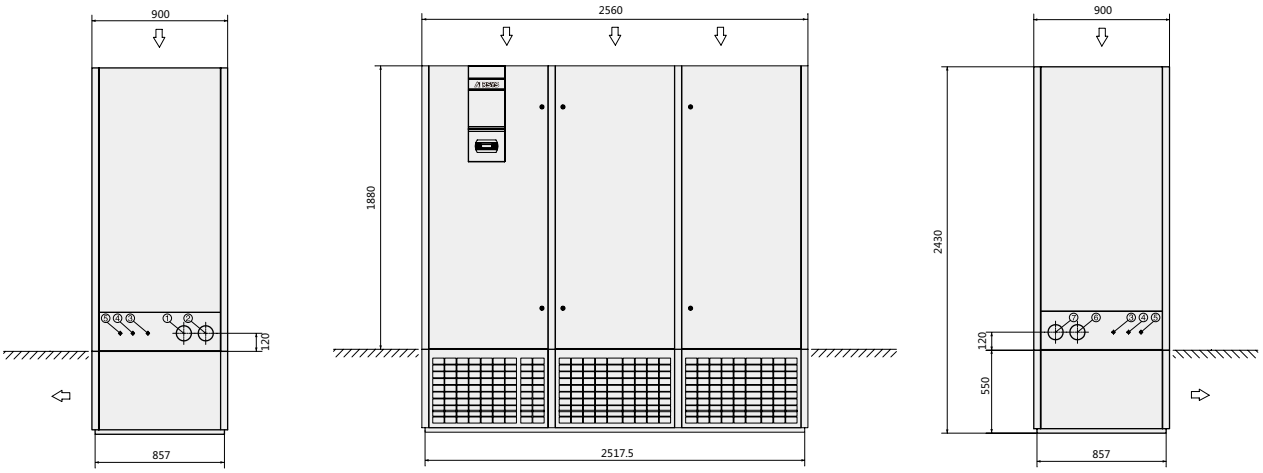
D2 Unit Cabinet Dimension Drawing

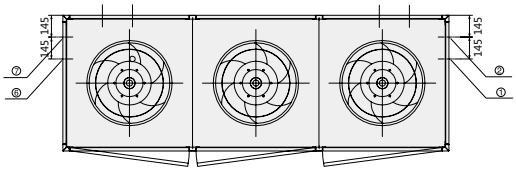




1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes
6. The cooling tower (dry and wet device) water inlet
7. The cooling tower (dry and wet device) water outlet

D3 Unit Cabinet Dimension Drawing





1. Chilled water outlet
2. Chilled water inlet
3. Condensing water drainage
4. Humidifier water supply
5. Cable holes
6. The cooling tower (dry and wet device) water inlet
7. The cooling tower (dry and wet device) water outlet

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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
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