

# Low Ambient Temperature Air Source Heat Pump



H.Stars (Guangzhou) Refrigerating Equipment Group Ltd.

H02



The standard "low ambient temperature" air source heat pump adopts specialized compressors, which can be divided into two categories: scroll and screw type. It adopts modular control to give options of single control or multiple modules control. It is flexible for different applications of cooling and heating at very low ambient temperature -25 ~ -35°C to produce 50°C hot water, available hot water temperature range : 35-50°C heating and cooling function.

The low ambient temperature air source heat pump,

## Designed For Extremely Cold Regions

Stable operation at -35°C ambient temperature; Two-stage compression average efficiency can reach level 1 of national standard.

## Screw Type Two-stage Compressor

Turth two-stage compression, with strong inter-stage gas supplement, the comprehensive energy efficiency of the whole heating season in the extremely cold region is 2.8,energy saving. With low temperature and strong heat technology, the heating capacity is reduced with the decrease of ambient temperature at -35 °C ~ 43 °C.

## Multiple Four-Way Valve Combination Design

Improve the traditional design, during the defrosting process, the unit can continue to work without shutdown , greatly improve the actual operating efficiency.

adopts two-stage compression technology, specially launched by H.Stars Group for central heating in cold region. It can be widely used in residential areas and commercial buildings with heating area of 2000-10000 m<sup>2</sup> , especially suitable for replacement of buyer in the old cities.The COP is high, produce 60 °C hot water during -35 °C ambient temperature, and 70 °C hot water when obtained at -25 °C ambient temperature, which is the perfect solution for boiler replacement.

## Outlet Water Temperature Range

Highest outlet water temperature up to 85 °C , Suitable for renovation project for boiler and radiator, and other special project .

## Split Type Design (Optional)

Mainframe is separated from the fin heat exchanger to meet the special requirements of environment.

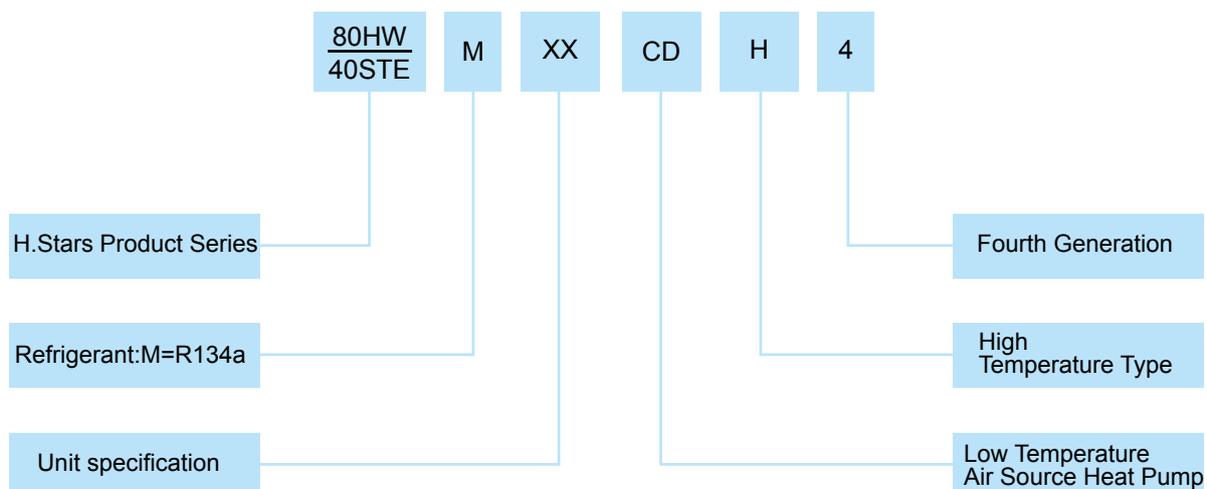
## Cloud Service (Optional)

Online real-time monitor to check operation data at anytime and anywhere.

## HFC-134a, Green to the environment

HFC-134a refrigerant, DPO is 0, no damage to ozone layer and meets the LEED green building standard.

## Model Nomenclature



## Double Stage Compressor

1. Compared with the two units system and cascade system, designed for large differential pressure and large pressure ratio, it has the advantages of small sizes of installation area and simple control. It also has the advantages of high efficiency and high reliability compared with single stage compressor.
2. Patent design of high-pressure unloading slider: High-pressure automatic unloading VI block structure. Pure mechanical structure design, no additionally parts such as solenoid valves, simple and low starting power.
3. Excellent motor cooling design ensures high efficiency of the compressor, so that the compressor can operate in a very wide range and is more adaptable.
4. Built-in economizer filter, check valve, shut-off valve, to achieve reliable protection of the compressor and simplify user system configuration.



Double Stage Compressor

## Enhanced Vapor Injection Compressor

Designed for all-season heating purpose, from  $-30^{\circ}\text{C}$  to  $43^{\circ}\text{C}$ . Innovative “scroll heating” technology is adopted to heating in cold winter with hot water temperature up to  $60^{\circ}\text{C}$ . It increases the heating capacity by 40% compared with traditional heat pump technology.



Enhanced Vapor Injection Compressor

## Low Ambient Temperature Heat Pump Compressor

1. Designed for cold areas, the cooling and heating dual function compressor has a minimum suction saturation temperature is  $-40^{\circ}\text{C}$  and a maximum suction saturation temperature is  $15^{\circ}\text{C}$ .
2. Large heating capacity, suitable for central cooling and heating projects, reduce the initial investment and minimize the installation space.
3. With high efficiency oil separator to reduce the oil concentration of the system to increase the efficiency.
4. Double electronic expansion valve is adopted to control the unit body temperature to ensure the safety and the efficiency, low-temperature heating efficiency of is higher than the small compressor unit.
5. No need external oil cooling device, system is simple and reliable.



Low Ambient Temperature Heat Pump Compressor

## Fin Type Heat Exchanger

1. Special design for low temperature, effectively extend the heating life cycle of the equipment.
2. Stainless steel frame design, good anti-corrosive performance, strong and durable.
3. Special coated aluminum sheet, durable and difficult to frost.



Anti-corrosion Fin Heat Exchanger(Self-manufactured)

## Shell And Tube Condenser

1. Water through tube, easy to maintain and easy to apply for mechanically clean.
2. Adopt 1.1mm enhanced copper tube, self-developed core components to ensure the production process.
3. Qualified pressure vessel design and production.



Self-manufactured Shell and Tube Condenser

## Product Features And Functions

The HMI directly displays the fault content to cooperate with the simple operation interface to timely feedback various maintenance information.

The control system can be connected to the user's central control system (BMS) to monitor the chiller running situation freely.

Protection control on the external power supply system with Over-voltage, under-voltage, three-phase unbalance, and lack-phase protection.

And the chiller has built in more than 30 protection functions to provide comprehensive protection for the safe operation of the unit.

User connection points is reserved to provide cloud services.

## Control center

With plastic shell and installed standard mounting.

Integrated electronic expansion valve with module drive into one control system.

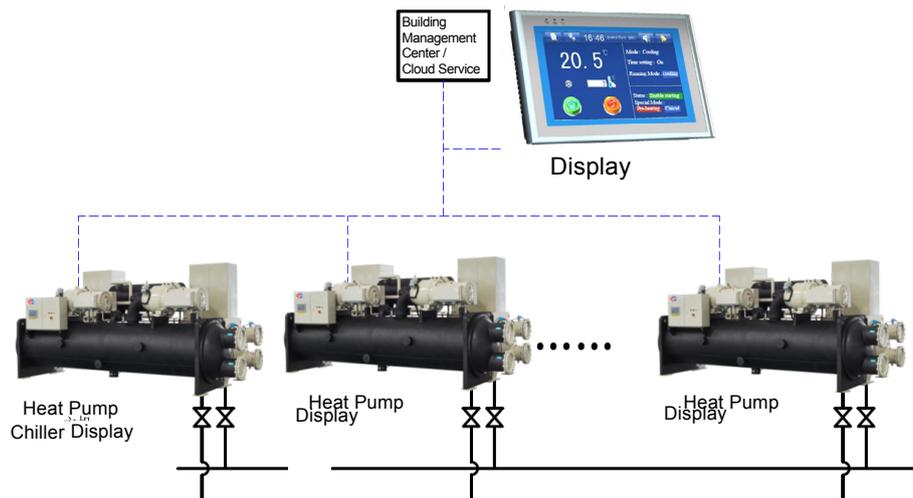
Three-phase voltage and current are displayed timely and highly integrated with the controller.

Mainboard can be networked, group control and single control free switching.



Integrated controller

## Network of multiple units (module systems)



With phase sequence protector to better protect the unit. Save cost and high integration of external phase sequence protector. High reliability and saving after-sales cost.

The simulation accurately detects the running current and voltage of the compressor to protect the compressor in time, improve the service life of the compressor and reduce the after-sales service cost.

Standard MODBUS interface, zero cost access to building management control system to meet engineering requirements.

An innovative device LAN interface connects local devices into a network at zero cost to optimize equipment operation, save energy and improve equipment lifespan.

Integrated expert electronic expansion valve drive, more stable control. Saving space and assembly labor cost.

Analog quantity pressure detection, accurate pressure protection.

Muti-language display, convenient for unit debugging, maintenance. Easy to use, direct display unit operation condition, failure conditions, built-in operating instructions.

The control equipment makes different operation strategies

according to the detected information, and has perfect protection function to ensure the stable operation of the unit under bad working conditions. In low or high ambient temperature and other bad conditions, the unit can still ensure stable operation.

Digital power supply and motor protection device, digital display three-phase voltage and three-phase motor current.

Advanced electronic expansion valve control system, refrigerant system is more stable.

Intelligent sense if the contactor is normal, to avoid abnormal damage to the compressor.

Integrated electronic expansion valve drive and control algorithm, no expansion.

Integrated MODBUS communication protocol, convenient extension, easy access to the cloud server.

Intelligent pre-protection with detection data, intelligent unloading while it reaches critical value.

Classified alarm, according to the fault level, intelligent Shut Down, corresponding to the compressor, only alarm and other protective actions, comprehensive protect unit safe operation.

## Function Content (Standard Control)

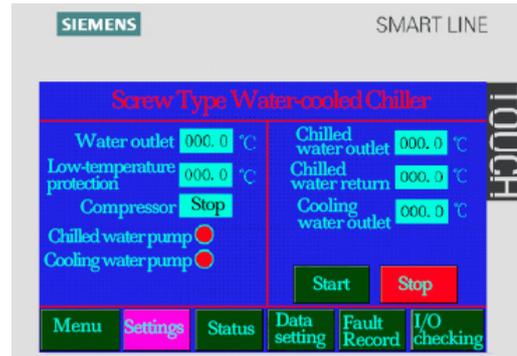
1. Support USB flash drive upgrade and USB flash drive download history operation data and fault content.
2. Support English and other language switching.
3. Support the timing setting.
4. Support MODBUS RTU communication protocol.
5. Support Cloud service, can control the unit by website or APP.



## Function Content (PLC Control)

1. Support OPC and MODBUS RTU protocols.
2. Support USB flash drive /Micro SD upgrade and USB flash drive history data and fault content download.

3. Support English and other language.
4. Customized screen display can be modified according to different request.



## Main Components of Electrical Cabinet

- |                                |                                 |                                    |
|--------------------------------|---------------------------------|------------------------------------|
| 1. Color touch screen          | 5. Controller fuse protection   | 8. Power supply connector          |
| 2. Emergency stop button       | 6. Unit control processor       | 9. Compressor contactor            |
| 3. Control circuit transformer | 7. Control signal I/O connector | 10. Compressor current transformer |
| 4. Switch power of controller  |                                 |                                    |



## Standard Control Section

### Function Display (Part)

Parameter	Setting
Setting Model	Heating
Setting Temperature of Heating	50.0°C
* Loading Deviation of Heating Temperature	2.0°C
Unloading Deviation of Heating Temperature	2.0°C
1#Compressor Operation Setting	Enable
2#Compressor Operation Setting	Disable
Timing Setting	Disable
Cooling and Heating Switch(Remote Control)	/

### Fault Display (Part)

Fault name	Testing condition	Alarm action	Touble clearing
External alarm	Power on detection	Shut Down	Check“External alarm” Signal
Overload of Chilled Water Pump, Fan, Compressor	Power on detection	Shut Down	Check“Overload”Signal
Lack of Water	Power on detection	Shut Down	Check“Water Flow Switch”Signal
System Power Failure	Power on detection	Shut Down	Check“System power failure”Signal
Temperature/Pressure Sensor Failure	Power on detection	Shut Down	Check the “Senor”
System Outlet Temperature/Pressure too High/Low	Power on detection	Shut Down	Check whether the “Sensor reading” is in normal range

## PLC Control

### Function Display (Part)

Parameter	Setting
Setting Model	Cooling
Setting Temperature of Heating	50.0°C
Target Outlet Temperature/Return Water Selection	Outlet
1#Compressor Operation Setting	Enable
2#Compressor Operation Setting	Disable
Timing Setting	Disable
IP Address Parameter Setting(1)	Customized
Parameter Setting(2)	Customized

(1)&(2)Only one term is available at a time

### Fault Display (Part)

Fault name	Testing condition	Alarm action	Touble clearing
External alarm	Power on detection	Shut Down	Check“External alarm” Signal
Overload of Chilled Water Pump, Fan, Compressor	Power on detection	Shut Down	Check“Overload”Signal
Lack of Water	Power on detection	Shut Down	Check“Water Flow Switch”Signal
Phase Sequence Protection	Power on detection	Shut Down	Check“Phase Sequence Protection”Signal
Oil level, Anti-freeze, expansion valve, compressor internal protection	Power on detection	Shut Down	Check the “Switching Valve” Signal
System Outlet Temperature/Pressure too High/Low	Power on detection	Shut Down	Check whether the “Sensor reading” is in normal range
Temperature/Pressure Sensor Failure	Power on detection	Shut Down	Check the “Senor”

## Protection System

### Power Motor Protection

Reversed-phase Protection, Lack-phase Protection, Over-high/Over-low voltage Protection, Over-current Protection, Three-phase current stable protection, three-phase voltage balance protection.

### System Pressure Protection

Over-high/Over-low refrigerant pressure protection.

### Pump Protection

Check the waterflow when the pump is running; protect the pump from overload and overcurrent.

Water flow switch wiring is reserved.

### Frost Protection

After the unit turns off, the unit will automatically start up when system water temperature is so low that forecasting will reach icing. And it will stop automatically when the system water temperature is back to the safety zone.

### Over-high/Over-low Refrigerant Circuit Pressure Protection

Detecting excessive compressor motor temperature and excessive motor current protection.

### System Temperature Protection

Over-high/Over-low temperature of system refrigerant circuit Protection, and Over-high/Over-low temperature of system water flow protection.



## Emergency and maintenance testing

### Standard use requirements

The unit needs to be powered on all the time throughout the heating season.

The entire heating season needs to ensure that the water flow of the unit is continuous.

### Power Failure

When the environment is below 0°C, it is necessary to empty the water in the pipeline in time to prevent the icing of the pipeline and the risk of freezing the pipe.

### Fault Shutdown

Please contact the factory after-sales technicians in time;

If the unit cannot be used, the water in the pipeline should be drained in time when the ambient temperature is below 0°C.

### Out Of Service

Timely draining the water from the pipeline to prevent icing;

Before using it again, power on the preheating compressor's refrigeration oil 12 hours in advance.

### Emergency Drainage

When an emergency situation requires power failure maintenance, please open the system-specific drain valve, and return to the power-on state after the repair is completed.

### Auxiliary Heating

When the temperature condition cannot be increased due to the extreme working condition or failure, the auxiliary electric heating is temporarily started, and the auxiliary electric heating is turned off when the normal state is restored.

## Air Source Single-compressor Two-stage Unit Technical Parameters R134a (Heating)

Refrigerant: R134a Power supply: 380V-3Ph-50Hz

Model	Rated Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Power	Running noise dB(A)	Shipping weight kg	Running weight kg
	KW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m3/h				
80HW-M250CDH4	211	60	98	10	80	3"	36	1	50	8	124000	10	75	4500	4700
80HW-M300CDH4	239	68	108	50	100	4"	41	1	52	8	160800	16	75	5000	5200
80HW-M350CDH4	307	87	148	0	120	4"	53	1	52	8	160800	16	75	5500	5700
80HW-M450CDH4	369	105	177	75	150	4"	64	1	54	8	160800	16	75	6000	6200

### Note

- Design conditions: Environmental DB/WB temperature -12 ° C / -14 ° C, hot water inlet / outlet temperature 60 ° C / 65 ° C; fouling factor 0.088 m<sup>2</sup> · °C / KW;
- Hot water temperature range: 55°C ~ 85°C ;
- Ambient temperature range:-30°C ~ 30°C ;
- Specifications and dimensions will be subject to improvement without notice.

## Air Source Single-compressor Two-stage Unit Technical Parameters R22 (Heating)

Refrigerant: R22 Power supply: 380V-3Ph-50Hz

Model	Rated Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Power	Running noise dB(A)	Shipping weight kg	Running weight kg
	kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m3/h				
80HW-250CDH4	329	94	126	10	80	3"	57	1	52	8	160800	16	75	5500	5700
80HW-300CDH4	368	105	139	50	100	4"	63	1	52	8	160800	16	77	6500	8700
80HW-350CDH4	478	136	180	0	120	5"	82	1	52	12	241200	24	78	8500	8700
80HW-450CDH4	605	172	226	75	150	5"	104	1	52	16	321600	32	80	12000	12400

### Note

- Design conditions: Environmental DB/WB temperature -12 ° C / -14 ° C, hot water inlet / outlet temperature 50 ° C / 55 ° C; fouling factor 0.088 m<sup>2</sup> · °C / KW;
- Hot water temperature range: 45°C ~ 60°C ;
- Ambient temperature range:-30°C ~ 30°C ;
- Specifications and dimensions will be subject to improvement without notice.

## Air Source Screw Type Heat Pump Technical Parameters(Cooling & Heating)

Refrigerant: R22 Power supply: 380V-3Ph-50Hz

Model	Nominal Cooling Capacity		Compressor Input Power KW	Nominal heating capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Operating sound level dB(A)	Shipping weight kg	Operating weight kg	
	kW	USRT		kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Condenser Water pressure drop KPa	Quantity	Air flow m3/h				Power
40STE-110CDHS4	113	32	37	79	22	29	0 66 100	30	2-1/2"	20	1	28	4	57600	5	68	1550	1660
40STE-160CDHS4	160	45	52	110	31	40	0 50 75 100	42	3"	28	1	33	4	80400	8	68	1960	2140
40STE-210CDHS4	214	61	67	146	42	53		56	3"	37	1	48	6	86400	7	68	2940	3160
40STE-240CDHS4	252	72	76	170	48	60		68	3"	43	1	55	6	120600	12	68	3120	3340
40STE-280CDHS4	297	84	88	199	57	69		78	4"	51	1	61	8	160800	16	72	3300	3550
40STE-310CDHS4	319	91	95	215	61	75		84	4"	55	1	64	8	160800	16	72	3480	3730
40STE-340CDHS4	347	99	105	235	67	83		93	4"	60	1	66	8	160800	16	72	3660	3980

Note

- 1.Nominal cooling capacity reference: Environmental DB/WB temperature 35°C /24°C , chilled water inlet / outlet temperature 12°C /7°C ; fouling factor 0.088m<sup>2</sup>.°C / KW;
- 2.Nominal heating capacity reference: Environmental DB/WB temperature -12°C /-14°C , Hot water inlet / outlet temperature 39°C /41°C ;
- 3.Chilled water temperature range: 5-20°C ;
- 4.Hot water temperature range: 35-45°C ;
- 5.In cooling working condition,ambient temperature range:20 ~ 43°C ; In heating working condition,ambient temperature range: -25 ~43°C ;
- 6.Specifications and dimensions will be subject to improvement without notice.

## Air Source Heat Pump Unit Technical Parameters (Heating)

Refrigerant: R22 Power supply: 380V-3Ph-50Hz

Model	Nominal Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Operating sound level dB(A)	Shipping weight kg	Operating weight kg	
	kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air flow m3/h				Power
80HW-15CDSM4	12.5	3.6	4.8	0 100	5	1-1/4"	2.1	1	32	1	8100	0.52	75	270	290
80HW-30CDSM4	20.1	5.7	8		6	1-1/4"	3.5	1	36	1	8100	0.52	75	310	330
80HW-60CDDM4	40.2	11.4	16	0 50 100	12	1-1/2"	6.9	1	40	2	16200	1.04	75	680	720
80HW-80CDDM4	48.2	13.7	19.3		15	1-1/2"	8.3	1	45	2	25600	1.56	75	810	850

Note

- 1.Nominal cooling capacity reference: Environmental DB/WB temperature -12°C /-14°C ,hot water inlet / outlet temperature 50°C /55°C ; fouling factor 0.088m<sup>2</sup>.°C / KW;
- 2.Ambient temperature range:-25°C -35°C ;
- 3.Specifications and dimensions will be subject to improvement without notice.

## Air Source Single-compressor Two-stage Unit Technical Parameters R134a (Heating)

Refrigerant: R134a Power supply: 460V-3Ph-60Hz

Model	Rated Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Running noise dB(A)	Shipping weight kg	Running weight kg	
	KW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m3/h				Power
80HW-M250CDH4	253	72	117	10 50 100	80	3"	44	1	50	8	148800	12	75	4950	5170
80HW-M300CDH4	287	82	129	0 50 100	100	4"	49	1	52	8	192960	19	75	5500	5720
80HW-M350CDH4	368	105	178	0 50 75 100	120	4"	63	1	52	8	192960	19	75	6050	6270
80HW-M450CDH4	442	126	213		150	4"	76	1	54	8	192960	19	75	6600	6820

### Note

- Design conditions: Environmental DB/WB temperature -12 ° C / -14 ° C, hot water inlet / outlet temperature 60 ° C / 65 ° C; fouling factor 0.088 m<sup>2</sup> · °C / KW;
- Hot water temperature range: 55°C ~ 85°C ;
- Ambient temperature range:-30°C ~ 30°C ;
- Specifications and dimensions will be subject to improvement without notice.

## Air Source Single-compressor Two-stage Unit Technical Parameters R22 (Heating)

Refrigerant: R22 Power supply: 460V-3Ph-60Hz

Model	Rated Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Running noise dB(A)	Shipping weight kg	Running weight kg	
	kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m3/h				Power
80HW-250CDH4	394.8	112	151.2	10 50 100	80	3"	68	1	52	8	192960	19.2	75	6050	6270
80HW-300CDH4	441.6	126	166.8	0 50 75 100	100	4"	76	1	52	8	192960	19.2	77	7150	7370
80HW-350CDH4	573.6	163	216		120	5"	99	1	52	12	289440	28.8	78	9350	9570
80HW-450CDH4	726	206	271.2		150	5"	125	1	52	16	385920	38.4	80	13200	13640

### Note

- Design conditions: Environmental DB/WB temperature -12 ° C / -14 ° C, hot water inlet / outlet temperature 50 ° C / 55 ° C; fouling factor 0.088 m<sup>2</sup> · °C / KW;
- Hot water temperature range: 45°C ~ 60°C ;
- Ambient temperature range:-30°C ~ 30°C ;
- Specifications and dimensions will be subject to improvement without notice.

## Air Source Screw Type Heat Pump Technical Parameters(Cooling & Heating)

Refrigerant: R22

Power supply: 460V-3Ph-60Hz

Model	Nominal Cooling Capacity		Compressor Input Power KW	Nominal heating capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Operating sound level dB(A)	Shipping weight kg	Operating weight kg	
	KW	USRT		KW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Condenser Water pressure drop KPa	Quantity	Air flow m3/h				Power
40STE-110CDHS4	136	39	45	94	27	35	0 66 100	30	2-1/2"	23	1	28	4	69120	6	68	1705	1826
40STE-160CDHS4	192	54	62	132	38	48	0 50 75 100	42	3"	33	1	33	4	96480	10	68	2156	2354
40STE-210CDHS4	256	73	81	176	50	63		56	3"	44	1	48	6	103680	9	68	3234	3476
40STE-240CDHS4	302	86	91	204	58	72		68	3"	52	1	55	6	144720	14	68	3432	3674
40STE-280CDHS4	356	101	105	239	68	83		78	4"	61	1	61	8	192960	19	72	3630	3905
40STE-310CDHS4	383	109	114	258	73	90		84	4"	66	1	64	8	192960	19	72	3828	4103
40STE-340CDHS4	417	118	126	282	80	99		93	4"	72	1	66	8	192960	19	72	4026	4378

Note

- 1.Nominal cooling capacity reference: Environmental DB/WB temperature 35°C /24°C , chilled water inlet / outlet temperature 12°C /7°C ; fouling factor 0.088m<sup>2</sup>.°C / KW;
- 2.Nominal heating capacity reference: Environmental DB/WB temperature -12°C /-14°C , Hot water inlet / outlet temperature 39°C /41°C ;
- 3.Chilled water temperature range: 5-20°C ;
- 4.Hot water temperature range: 35-45°C ;
- 5.In cooling working condition,ambient temperature range:20 ~ 43°C ; In heating working condition,ambient temperature range: -25 ~43°C ;
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## Air Source Heat Pump Unit Technical Parameters (Heating)

Refrigerant: R22

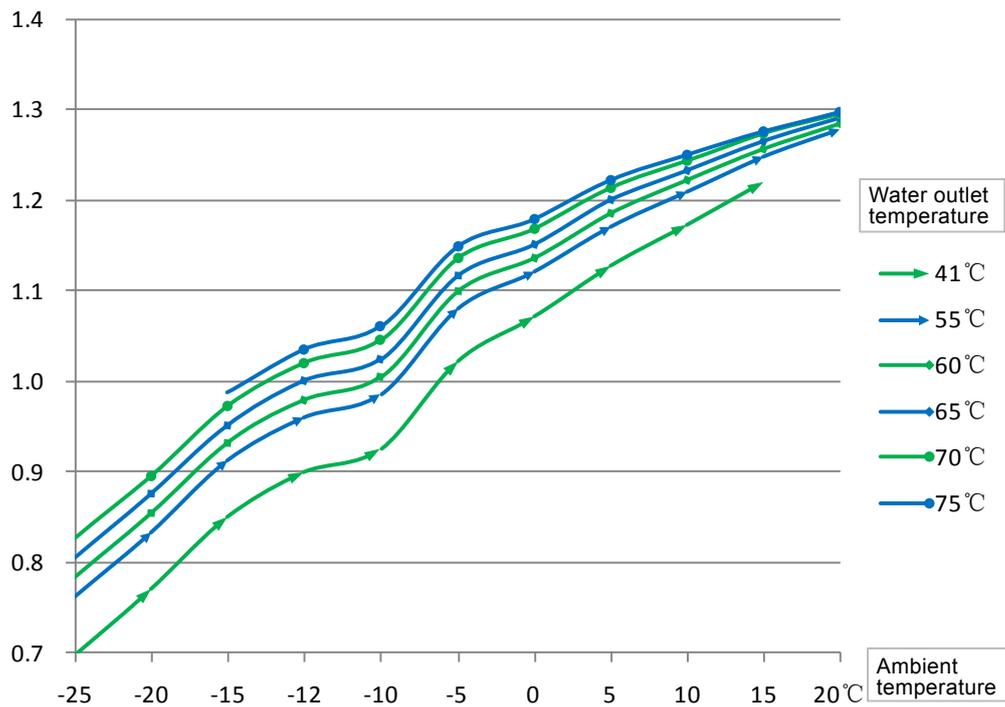
Power supply: 460V-3Ph-60Hz

Model	Nominal Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/Fan		Operating sound level dB(A)	Shipping weight kg	Operating weight kg	
	KW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm3/h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air flow m3/h				Power
80HW-15CDSM4	15	4	6	0 100	5	1-1/4"	3	1	32	1	9720	1	75	297	290
80HW-30CDSM4	24	7	10		6	1-1/4"	4	1	36	1	9720	1	75	341	330
80HW-60CDDM4	48	14	19	0 50 100	12	1-1/2"	8	1	40	2	19440	1	75	748	720
80HW-80CDDM4	58	16	23		15	1-1/2"	10	1	45	2	30720	2	75	891	850

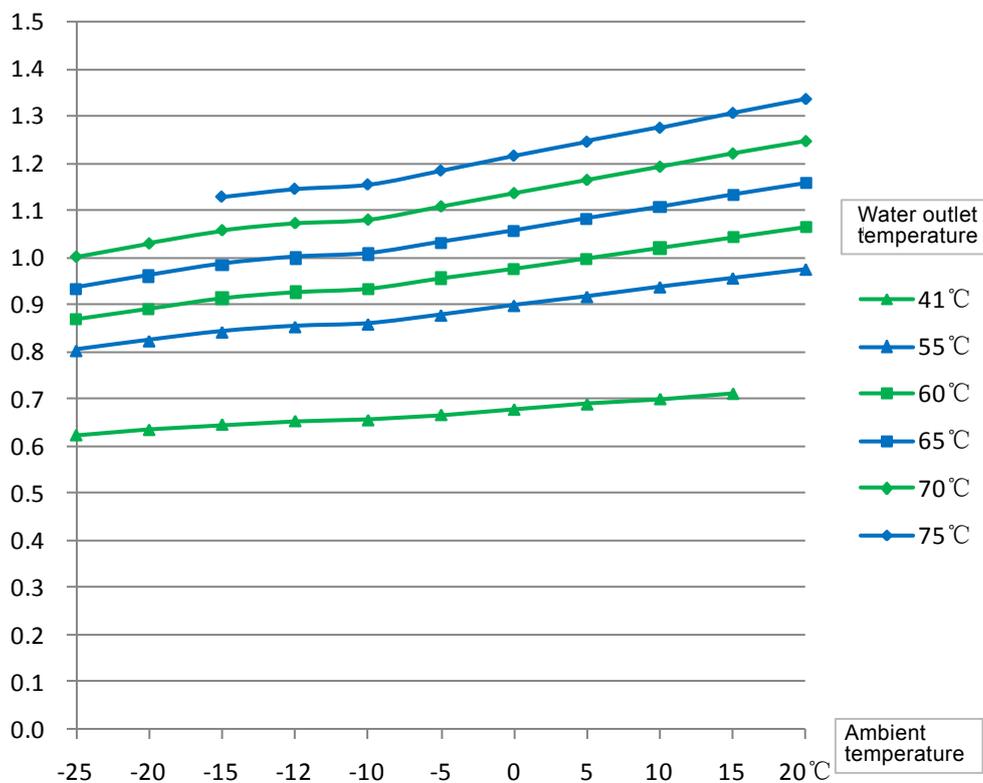
Note

- 1.Nominal cooling capacity reference: Environmental DB/WB temperature -12°C /-14°C ,hot water inlet / outlet temperature 50°C /55°C ; fouling factor 0.088m<sup>2</sup>.°C / KW;
- 2.Ambient temperature range:-25°C -35°C ;
- 3.Specifications and dimensions will be subject to improvement without notice.

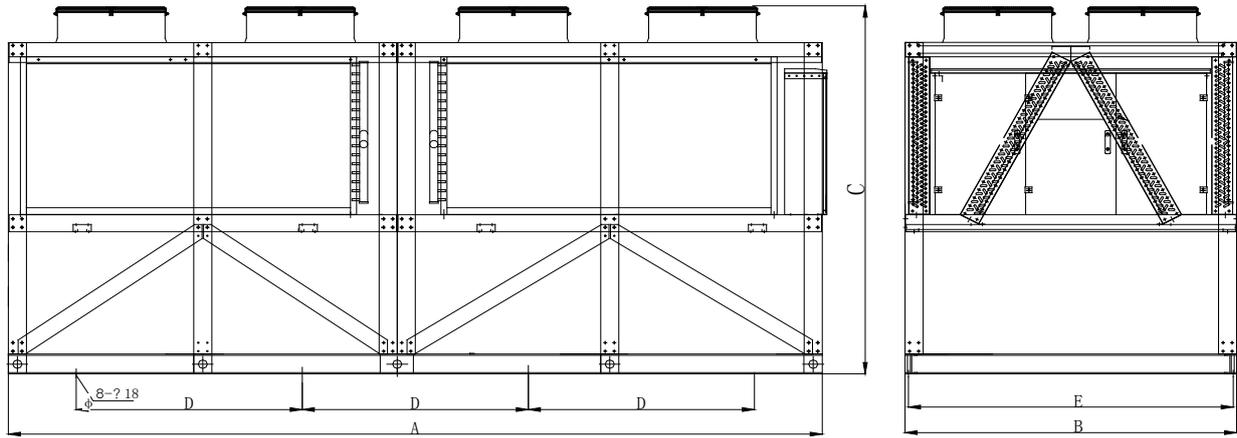
## Heating Capacity Curve



## Variable Power Curve

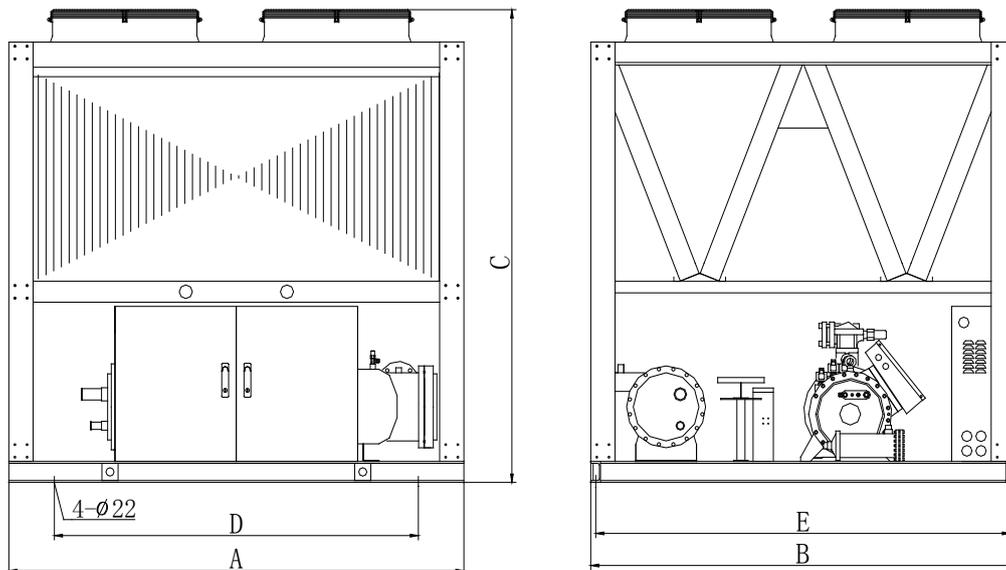


### Unit Dimensions(Single Compressor Two-stages)



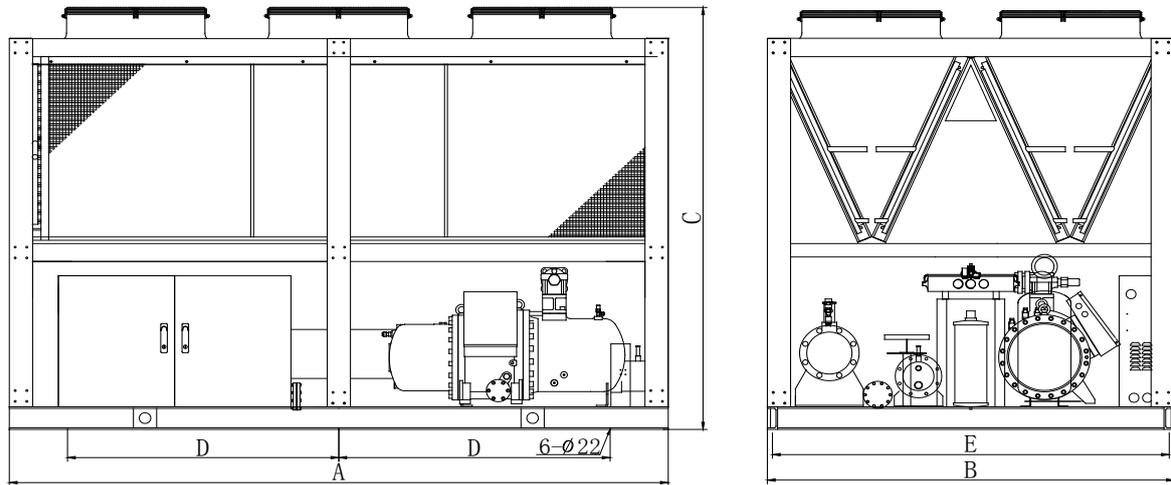
Model	A	B	C	D	E
80HW-M250CDH4	4500	2200	2500	1500	2155
80HW-M300CDH4	5000	2200	2500	1500	2155
80HW-M350CDH4	5000	2200	2600	1500	2155
80HW-M450CDH4	5400	2200	2600	1500	2155

### Unit Dimensions(Screw Type Unit)

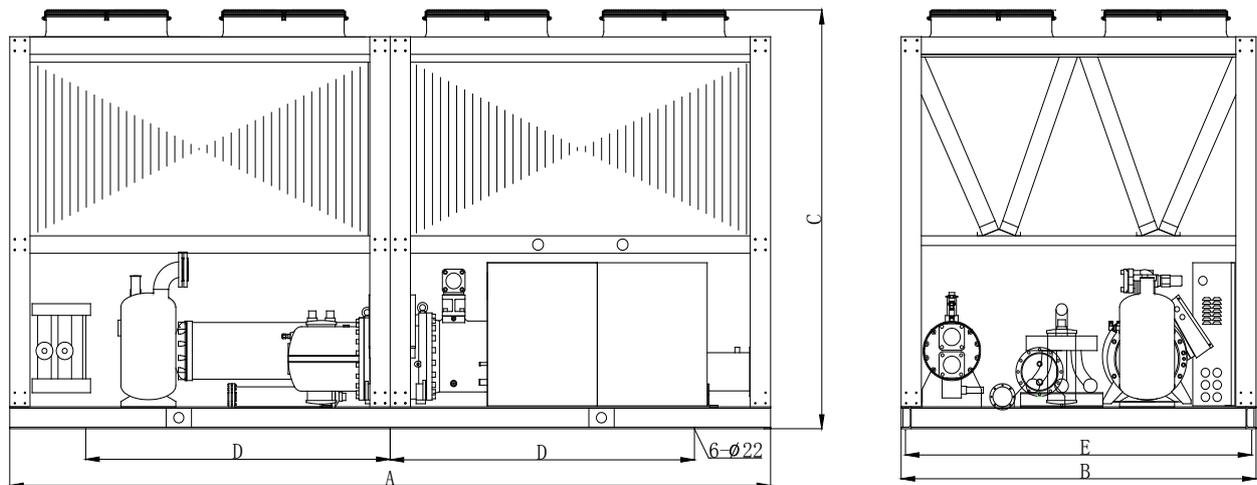


Model	A	B	C	D	E
40STE-110CDHS4	2250	2100	2400	1800	2050
40STE-160CDHS4	2250	2100	2400	1800	2050

### Unit Dimensions(Screw Type Unit)

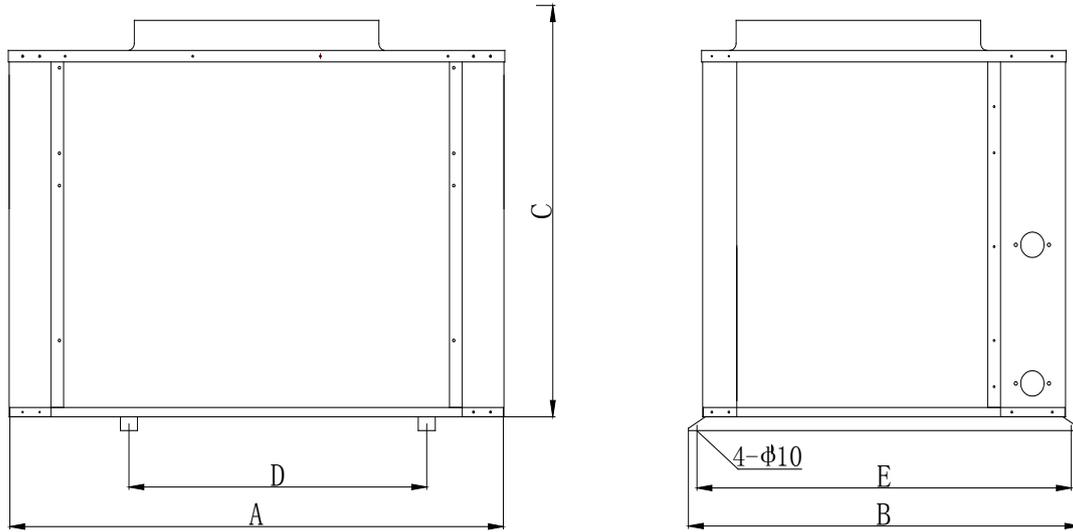


Model	A	B	C	D	E
40STE-210CDHS4	3400	2100	2400	1400	2050
40STE-240CDHS4	3400	2100	2400	1400	2050

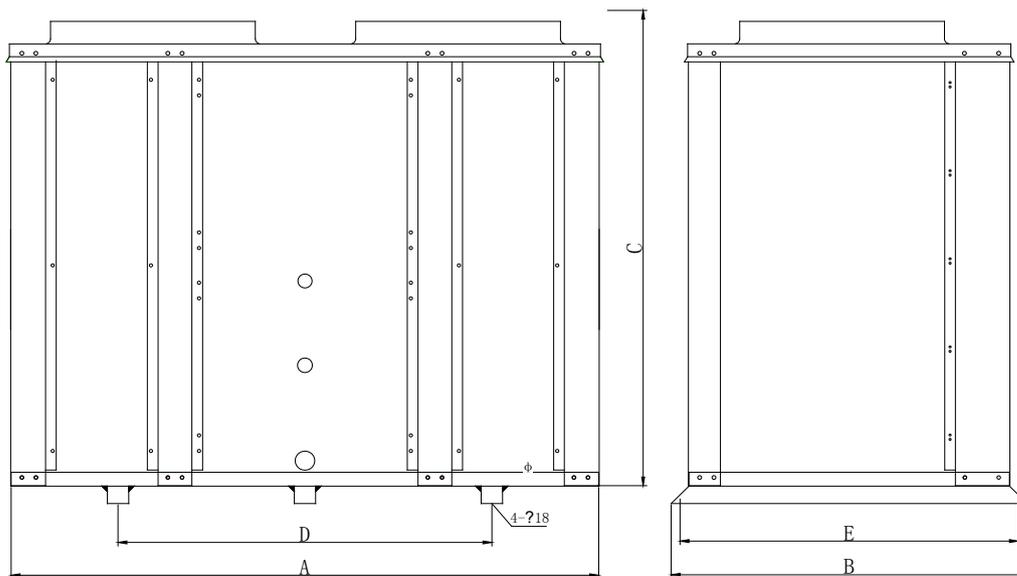


Model	A	B	C	D	E
40STE-280CDHS4	4500	2100	2400	1800	2050
40STE-310CDHS4	4500	2100	2400	1800	2050
40STE-340CDHS4	4500	2100	2400	1800	2050

## Unit Dimensions(Scroll Type Unit)



Model	A	B	C	D	E
80HW-15CDSM4	835	800	905	520	760
80HW-30CDSM4	1160	920	890	700	880



Model	A	B	C	D	E
80HW-60CDDM4	1650	1000	1370	1050	950
80HW-80CDDM4	2050	1100	1550	1450	1050

### Split Unit

Refrigerant: R134a Power supply: 380V-3Ph-50Hz

Model	Nominal Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/ Fan		Operating sound level dB(A)	Shipping weight kg	Operating weight kg	
	kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm <sup>3</sup> /h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m <sup>3</sup> /h				Power
80HW-M250CDH4	210.8	59.9	97.7	10 50	80	3"	36.3	1	50	8	124000	9.6	75	4500	4700
80HW-M300CDH4	238.9	67.9	107.6	100	100	4"	41.2	1	52	8	160800	16	75	5000	5200
80HW-M350CDH4	306.6	87.2	148.2	0 50	120	4"	52.8	1	52	8	160800	16	75	5500	5700
80HW-M450CDH4	368.6	104.8	177.2	75 100	150	4"	63.5	1	54	8	160800	16	75	6000	6200

Note:

1. Design conditions: air dry / wet bulb temperature -12°C / -14°C, hot water in/outlet water temperature 60°C / 65°C, fouling factor 0.088 m<sup>2</sup> • °C / kW;
2. Hot water temperature range: 55°C~ 85°C;
3. Ambient temperature range: -30°C ~ 30 °C;
4. Specifications and dimensions will be subject to improvement without notice.

Refrigerant: R22 Power supply: 380V-3Ph-50Hz

Model	Nominal Heating Capacity		Compressor Input Power KW	Capacity control %	Refrigerant charge kg	Condenser				Evaporator/ Fan		Operating sound dB(A)	Shipping weight kg	Operating weight kg	
	kW	USRT				Condenser Inlet outlet pipe diameter in	Cooling Water flowm <sup>3</sup> /h	Water Side Max. Pressure Mpa	Water pressure drop KPa	Quantity	Air volume m <sup>3</sup> /h				Power
80HW-250CDH4	329	94	126	10 50	80	3"	57	1	52	8	160800	16	75	5500	5700
80HW-300CDH4	368	105	139	100	100	4"	63	1	52	8	160800	16	77	6500	8700
80HW-350CDH4	478	136	180	0 50	120	5"	82	1	52	12	241200	24	78	8500	8700
80HW-450CDH4	605	172	226	75 100	150	5"	104	1	52	16	321600	32	80	12000	12400

Note:

1. Design conditions: air dry / wet bulb temperature -12°C / -14°C, hot water in/outlet water temperature 50°C / 55°C, fouling factor 0.088 m<sup>2</sup> • °C / kW;
2. Hot water temperature range: 45°C~ 60 °C;
3. Ambient temperature range: -30°C ~ 30 °C;
4. Specifications and dimensions will be subject to improvement without notice.

### Indoor Unit

Main components including compressor, condenser, four-way valve and control box are installed in the machine room, which is more convenient for operation and maintenance.



### Outdoor Unit

Fin type heat exchangers, fans and other components as outdoor units. The exterior is more compact than the integrated one. The installation is more flexible, and it can install on the roof, outdoor and other places.



## VFD Heat Pump

VFD Heat Pump adopts a variable frequency driver motor to achieve variable frequency operation of the compressor. Significantly improves the energy efficiency of the chiller at partial load.

The unit can reach a higher full load coefficient of performance (COP) and integrated part load value (IPLV).

### Energy Efficient

Adopt international brand variable frequency drive technology, integrated part load value(IPLV) up to 8.

### Stable And Reliable

The VFD heat pump unit adopts the motor speed to control the output load to achieve true stepless control to improve compressor reliability.

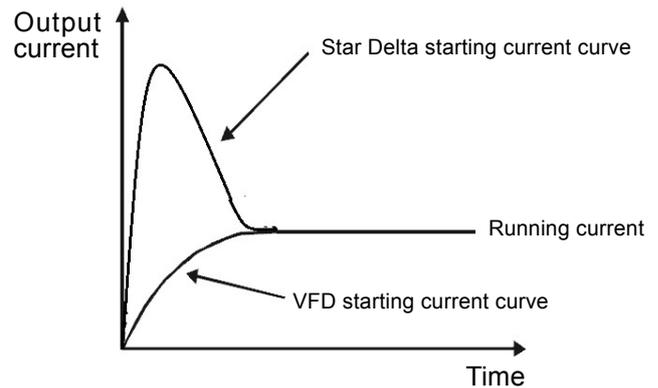
Independed cooling for VFD to make sure operate at low temperature ,more stable.

### Small Starting Current

VFD water chiller include soft starter to reduce the impact of starting current;

The VFD has its own DC reactor to minimize harmonic interference;

Optional low-harmonic filter. VFD input power meets the IEEE-519 specification for harmonic distortion with harmonic filter over-temperature protection and capacitance switching.

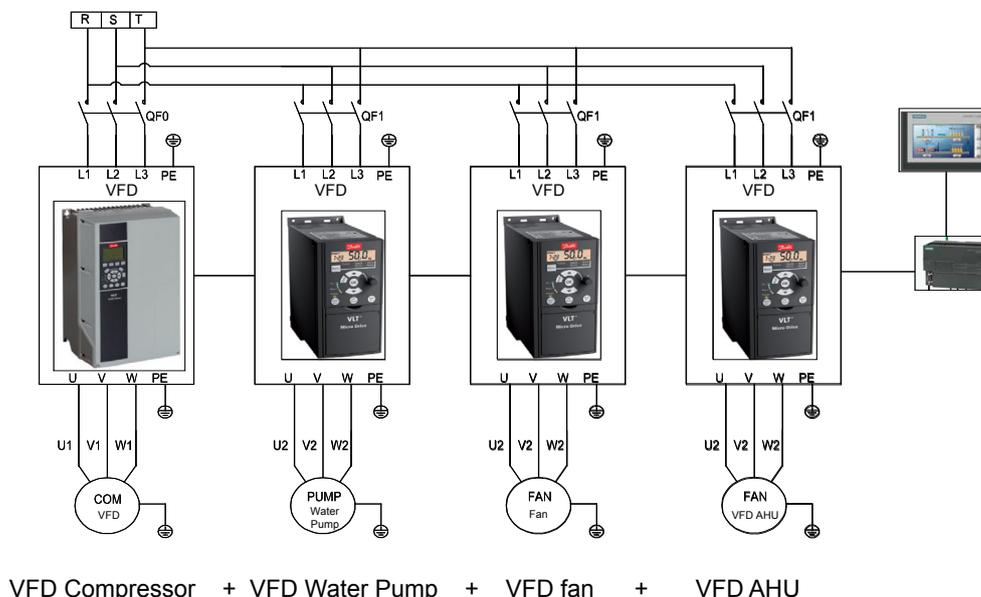


Comparison starting current curve between VFD and Star Delta

### Precise Temperature Control

The water temperature control within  $\pm 0.3^{\circ}\text{C}$  to maintain a high-precision temperature control standard.

## VFD Schematic Diagram



## Heat Exchanger Tube

### Condenser Heat Exchange Tube



Condenser heat exchange tube Specification sheet

Heat exchange tube material	Copper Tube	Aluminum Brass Tube	Nickel Copper Tube	Stainless Tube
Tube thickness option 1 (mm)	1	1.2	1	1
Tube thickness option 2 (mm)	1.1	1.3	1.1	1.15
Tube thickness option 3 (mm)	1.2	1.4	1.2	1.2
Tube thickness option 4 (mm)	1.3	1.5	1.3	1.35
Suitable for water quality	Standard non-corrosive neutral water	seawater	Alkaline water	Acid water

### Evaporator Heat Exchanger Tube



Evaporator heat exchange tube specification sheet

Heat exchange tube material	Copper Tube	Aluminum Brass Tube	Nickel Copper Tube	Stainless Tube
Tube thickness option 1 (mm)	1	1.2	1	1
Tube thickness option 2 (mm)	1.1	1.3	1.1	1.15
Tube thickness option 3 (mm)	1.2	1.4	1.2	1.2
Tube thickness option 4 (mm)	1.3	1.5	1.3	1.35
Suitable for water quality	Standard non-corrosive neutral water	seawater	Alkaline water	Acid water

**Important Notice:**

Heat exchanger is the key components of the chiller unit, whose technology directly affects the quality of the product. Also, the heat exchange tube, which is the only component of the heat exchanger in contact with the ambient, closely affects the life of the unit.

The thickness and material of the heat exchange tube are very important. Customers can choose the suitable material and thickness of heat exchanger tube according to the air and water quality.

## Cloud Service (Remote Monitor)

Central A/C cloud service system



**Cloud service value:**

- Remote control adjustment
- Remote monitor
- Remote upgrade
- Fault warning
- Remote diagnosis
- Product distribution management
- Historical data analysis

## Electric Heater

When the outdoor temperature is very low, the evaporation temperature of the air source heat pump must be very low, therefore the compressor operates at a high compression ratio, which inevitably leads to a decrease in the volumetric efficiency and the indication efficiency of the compressor. In this way, the heating capacity and heating coefficient of the heat pump will decrease. A better way is to add auxiliary heat source equipment, and an electric heater is ideal auxiliary heat source.



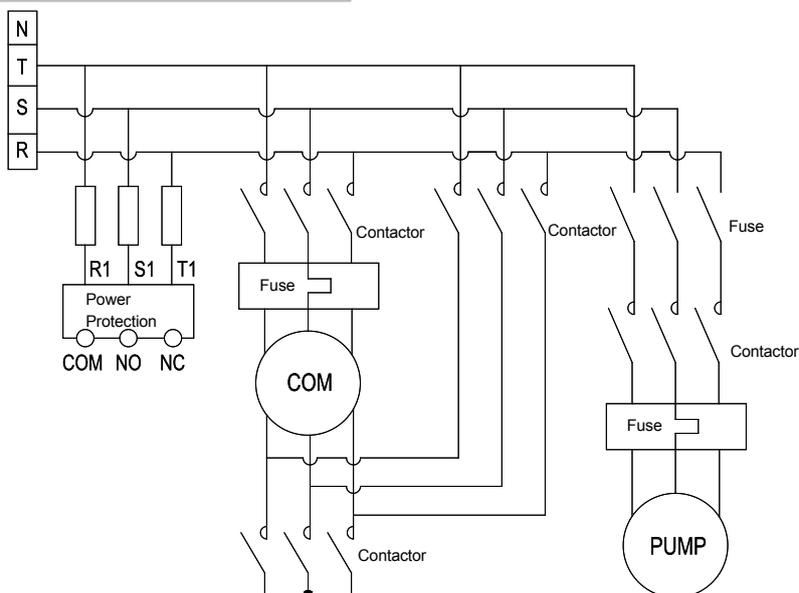
Specifications and models of electric device parameters

Model	80HW-M250CDH4	80HW-M300CDH4	80HW-M350CDH4	80HW-M450CDH4
Auxiliary electric heating device (KW)	100	120	150	150

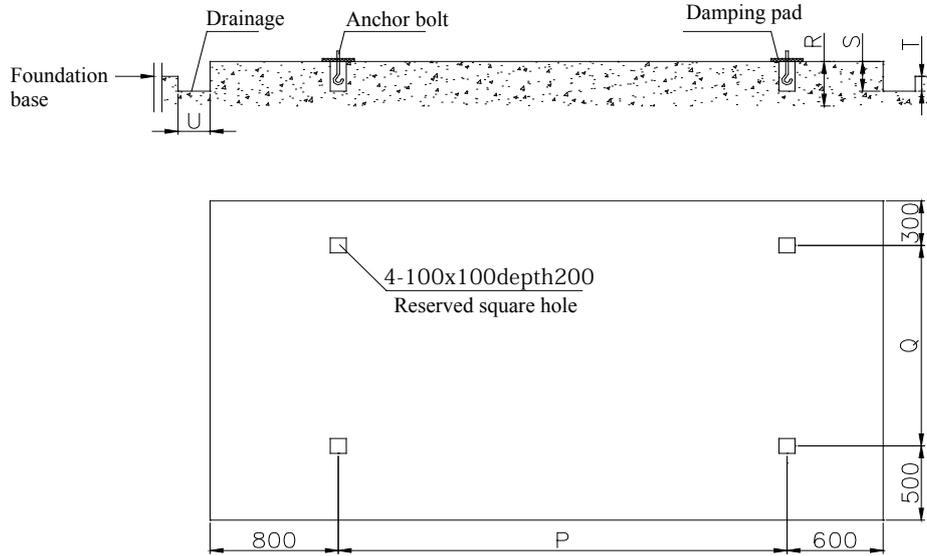
## Alternative List

Unit protection net	Keep the inside of the unit clean and prevent object entering
Snowblock	Mainly used in the snow areas, effectively preventing the impact of snow to protect various components of the unit.
Low Temperature Coolant	To prevent the pipe from freezing during shutdown, a low temperature coolant can be used
Compressor elimination sound	Additional noise reduction for places with special noise requirements
Air circuit breaker	Increase protection, failure protection, auto-reclosing, charge protection, dead zone protection, inconsistent three-phase protection, and instantaneous follow-up jump
Hot Water Pump	Can be integrated design, the pump system is connected to the unit
AHU	As the terminal air supply device
Low temperature cold recovery	Optional device to cold recovery at zero cost

## Wiring Diagram



## Foundation Base Diagram



Model	P	Q	R	S	T	U
80HW-M250CDH4	1600	2050	300	200	100	200
80HW-M300CDH4	2000	2155	300	200	100	200
80HW-M350CDH4	2000	2155	300	200	100	200
80HW-M450CDH4	2000	2155	300	200	100	200
40STE-110CDHS4	1800	2050	300	200	100	200
40STE-160CDHS4	1800	2050	300	200	100	200
40STE-210CDHS4	2800	2050	300	200	100	200
40STE-240CDHS4	2800	2050	300	200	100	200
40STE-280CDHS4	3600	2050	300	200	100	200
40STE-310CDHS4	3600	2050	300	200	100	200
40STE-340CDHS4	3600	2050	300	200	100	200
80HW-15CDSM4	520	760	300	200	100	200
80HW-30CDSM4	700	880	300	200	100	200
80HW-60CDDM4	1050	950	300	200	100	200
80HW-80CDDM4	1450	1050	300	200	100	200

### Installation Notes

1. In order to prevent the air return of the fin heat exchanger and avoid the malfunction of the unit, the recommended minimum spacing of the unit is as follows: 2 meters from the side wall and 2 meters from the front wall. The height space leaves 10 meters, the spacing between other units is 2 meters; Outdoor installation height is 0.5 meters to 0.8 meters from the ground. If the above spacing is not guaranteed, the performance of the unit may be affected, or a running stop failure may occur;
2. There should be no more than one wall above the top of the unit;
3. The foundation should ensure sufficient strength, which can be made of reinforced concrete or steel, and the horizontal deviation of the basic plane is not more than 0.1%;
4. Configure the matching damper according to the operating weight of the unit.



**H.Stars Group**

H.Stars (Guangzhou) Refrigerating Equipment Group Ltd., established in 1992, in Economic & Technological Development Zone of Guangzhou, China, composed of 8 subsidiaries to provide one-stop solution to HVAC customers, specializing in R&D, production, design and installation. As the company grows, H.Stars group expands its business globally and has sold to 53 different countries. H.Stars Group is awarded with "New and High Technology Enterprise in Guangzhou" and has become the training base of many universities both in China and abroad via technology cooperation.

H.Stars group supplies an extensive line of Commercial and Industrial Energy Saving HVAC products including: Air Cooled Chiller, Water Cooled Chiller, Industrial Chiller, Centrifugal Chiller, Magnetic oil free centrifugal chiller, Multi-function Chiller, Hot Water Unit, Heat Recovery Unit, Heat Pump Unit, Condensing Unit, Glycol Chiller, Shell and Tube Heat Exchanger, Air Handling Unit, Fan Coil Unit, Cooling Tower, etc. all type of HVAC products.

H.Stars Group has been dedicated in quality and innovation and is technically strong in commercial and industrial application as a HVAC manufacturer. Apart from obtaining plenty of energy-saving product patents, H.Stars Group has achieved CE certifications for Pressure Vessel and standard chillers, BR1, ASME, ISO9001:2000, ISO14001:2004 and other certifications.

A good reputation of H.Stars Group has been built and delivers a full HVAC service to customers worldwide. Our products are widely applied in industries for cooling of Laser generators, Welding electrodes, Cutting machines, Electric spark machines, Extrusion process, Hydraulic System, Electroplating, Ultrasonic Cleaning, Ion Plating film, Electronic facility, Electrical appliance components, Compressed Gas Dehumidification, Dairy and Beverage Cooling processing, Pharmaceutical and Biological products, Medical equipment, Glass Coating, Tempered Glass and Cultivation Sea Food.

H.Stars Group will continue to develop energy saving and environmental friendly equipment to create "The Efficiency Planet" as our obligation. By focusing on customers' needs and wants in order to contribute more our potentials, from now on, H.Stars Group will hand in hand with you to be a shining star in the foreseeable future.



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