



# Air-cooled Chiller Solutions



SERIE RCAE\*\*\*HA22  
RCAEI15HA22  
RCAEI50HA22

**COLD SPACE**  
AIR CONDITIONERS EQUIPMENTS

14C202405



**COLD SPACE**  
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# Large Capacity Air Cooled Scroll Chiller

RHAE/RCAE



# Air-cooled Chiller Solutions



## RCAE \*\*\* HA22 (Compressor ON/OFF- R410A)

Mode	Model	Water Outlet Temp. °C	Ambient Temp. °C
Cooling	Standard	4~20	5~48
	Anti-freezing Fluid	-6~20	5~48
	Option (LA)	4~20	-20~48

**AHRI** CERTIFIED™  
www.ahridirectory.org

### Basic Information

Cooling capacity	115 – 300RT (Min.25%/33%)
Compressor	3/4/6/7/8, 2 Circuits
COP(AHRI)	3.0
Power supply	440~460V/3P/60Hz



# Overview

large capacity air cooled scroll chiller adopts a modular design. Two basic modules and maximum 8 units can be combined.

The unit can be widely used in various buildings including hotels, hospitals, schools, factories, office buildings etc.

## Core advantages



Heat Pump/  
Cooling Only



Eco-Friendly



Quiet Operation



Flexible Installation



Wide Operation  
Range



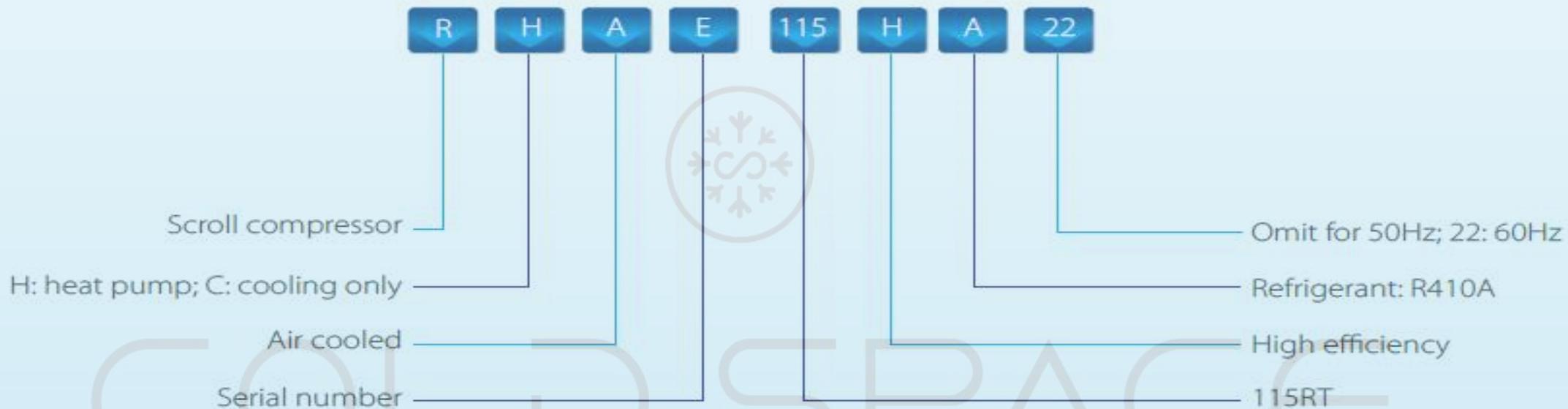
Intelligent Control



Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org)



## Nomenclature



## Operating range

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Operating condition	Cooling	Heating
Ambient temperature	0~48℃	-15~48℃
Water outlet temperature	5~20℃	20~50℃



Trapezoidal heat exchanger

Annular air inlet structure, face area of heat exchanger increases by 30%. More uniform air distribution and better heat exchange.



Fan and motor

Large air flow and low noise fan. High torque fan, high efficiency and low noise.



Electric control box

Leading brand components are adopted to ensure quality. The electric control box is designed on the front side to make installation fast and maintenance convenient.



Touch screen

The large 7-inch colorful touch screen makes man-machine interaction user friendly.



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Water side heat exchanger

The new design of baffle plate shell and tube evaporator improves 10% heat exchanging efficiency.



Gas-liquid separator

Gas-liquid separator ensures reliable operation of the system.



Danfoss large capacity compressor

Higher efficiency and longer life span.



# Features

## Hermetic scroll compressor

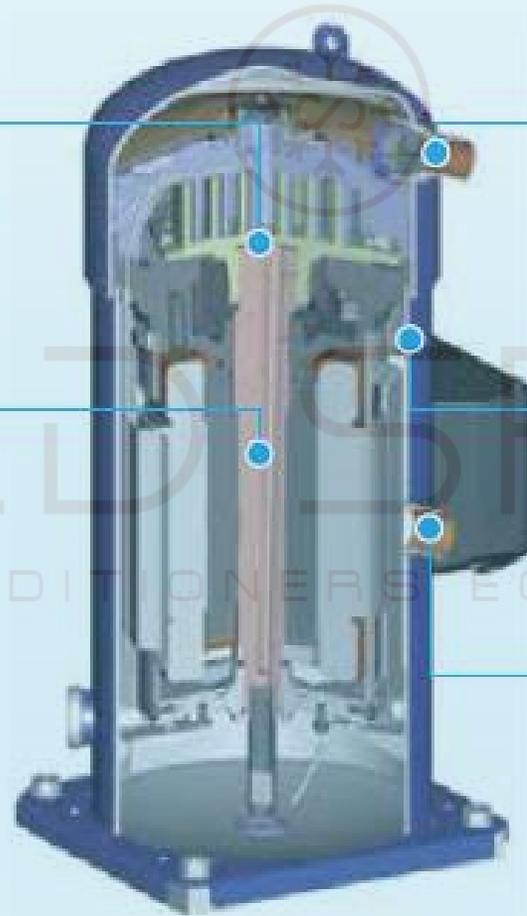
### High efficiency

Adopt the scroll design without contact and wear, reduce the friction inside the compressor, improve the efficiency.

### Low warranty cost

Eco-friendly lead-free polymer bearing, stable operation and help to reduce warranty cost.

The actual compressor maybe slightly different from the picture shown.



### Stable performance

Compressor outlet is equipped with check valve to avoid backflow of refrigerant and high reliability.

### No need for maintenance

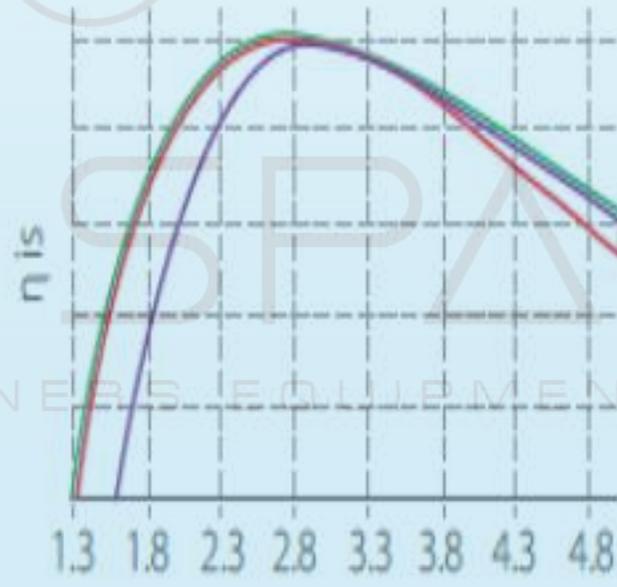
Hermetic design, no need for maintenance.

### Long service life

Suction refrigerant cooled motor, higher efficiency and longer service life of compressor.

## IDV (intermediate discharge valve)

The compressor adopts an intermediate discharge valve design. The system can operate efficiently under full pressure ratio to achieve high operating efficiency.



- Efficiency curve of IDV combined
- Efficiency curve of open IDV
- Efficiency curve of closed IDV



## Built-in discharge temperature sensor

Installed in the vantage point of the compressor, it can timely sense the discharge temperature and perform the function immediately when the operation state of the compressor exceeds the safety limit and send a signal to the motor protection system to protect the compressor.



## Oil balance pipe

Under partial load conditions, the parallel compressor unit can store the lubricating oil in the unrunning compressor, thus greatly improving the reliability of the system. In addition, the oil stored in the compressor can improve the heat transfer effect in the evaporator, thus greatly improving the efficiency of the system.



## Check valve

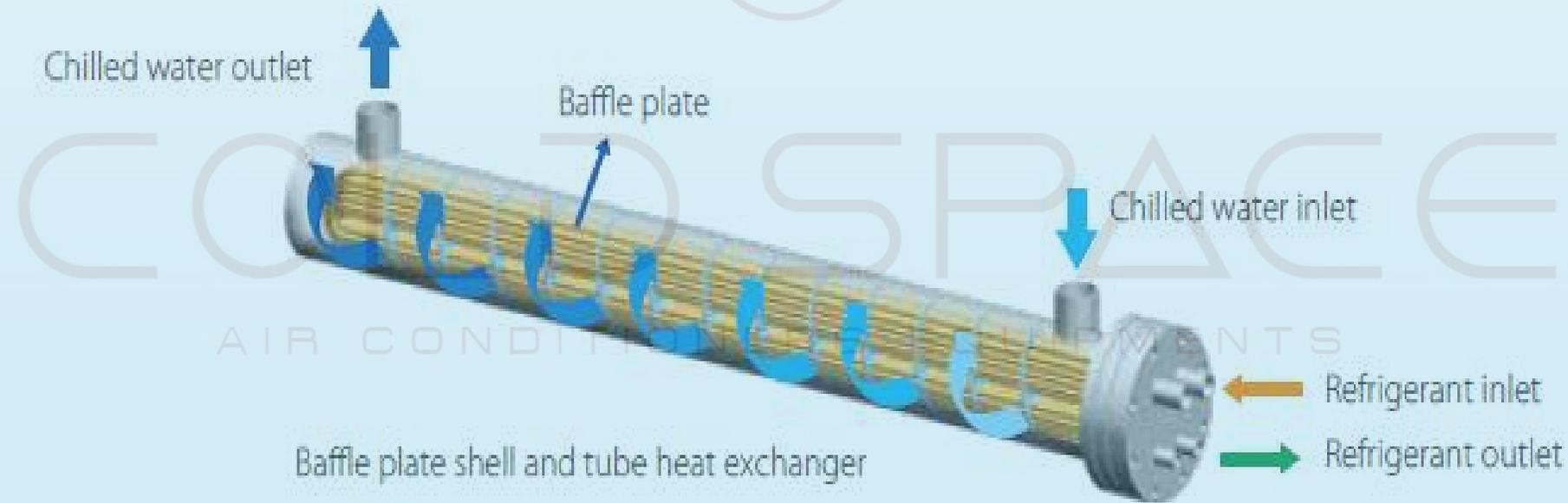
The top cover is kept in balance at the low pressure end after the compressor stops, so as to avoid excessive leakage at the high pressure end and ensure no-load start, which can improve the reliability of the compressor.





## High efficiency water side heat exchanger

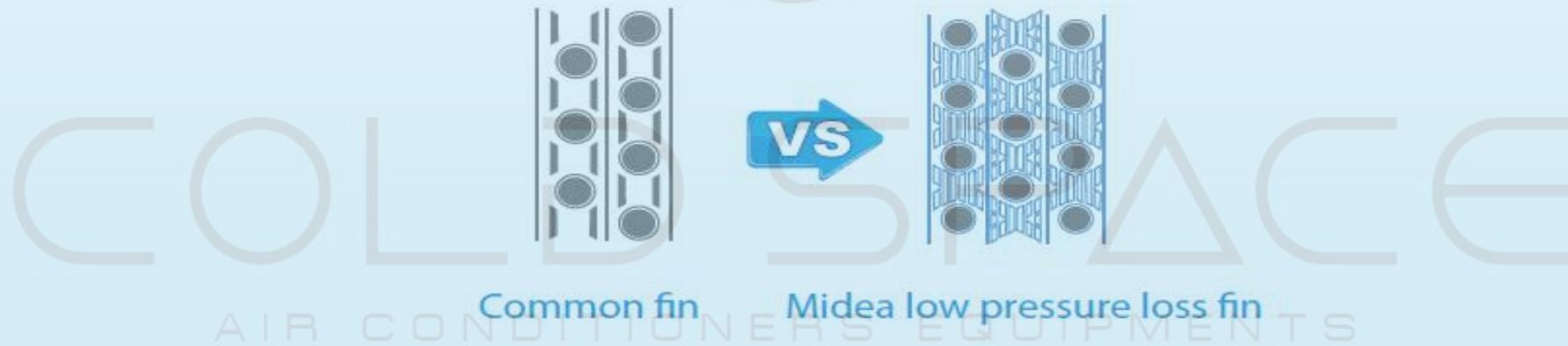
- ❖ The optimized design of simulation flow path and baffle plate are adopted to enhance heat transfer efficiency.
- ❖ The efficiency of the heat exchanger is increased by 10% compared with that of ordinary shell and tube heat exchanger.





## High efficiency air side heat exchanger

- ❖ Annular air inlet structure, face area of heat exchanger increases by 30%.
- ❖ Arc window structure hydrophilic aluminum fins, reduce pressure loss.
- ❖ High efficiency inner-threaded copper pipes greatly enhance heat exchange.
- ❖ The distribution method and the use of simulation flow optimization design, greatly improved heat exchange efficiency.



Common smooth pipe

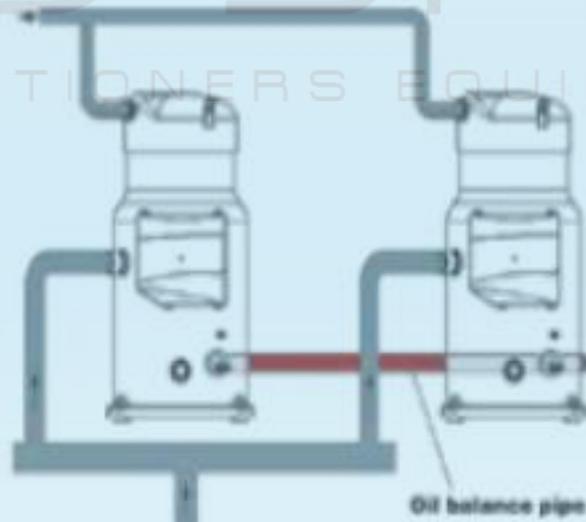


Inner-threaded copper pipe



## Reliable oil system

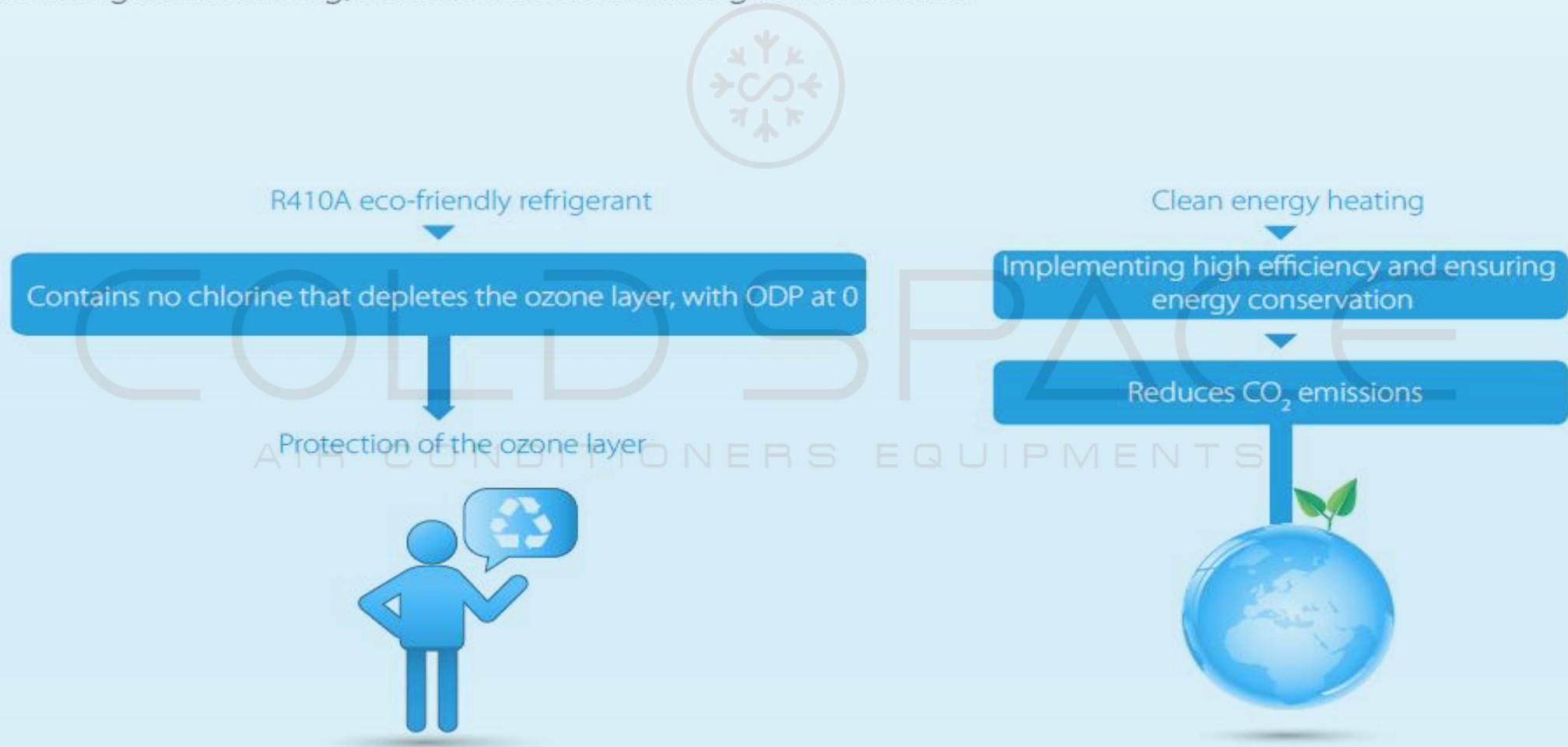
- ❖ Low pressure chamber compressor with vertical structure, oil tank is at the bottom of the compressor.
- ❖ For parallel compressor units, two compressors are in one group and connected by oil balance pipe. The oil balance pipe is located below the oil level to ensure the oil pressure balance for the compressors.
- ❖ The system pipeline is equipped with a gas-liquid separator, which can effectively prevent the liquid strike and make the compressor run more stably.
- ❖ With oil-collecting design in the suction pipe, it can effectively prevent the migration of oil and refrigerant to the compressor during shutdown under extreme low load conditions.





## Eco-friendly

- ❖ R410A does not contain chlorine that depletes the ozone layer and its Ozone Depletion Potential (ODP) value is 0, fully protecting the environment.
- ❖ Helpful to obtain green building, LEED and other building certifications.



## High precision EXV, more accurate temperature control

- ❖ The EXV used is highly precise which takes only a few seconds to go from fully closed to fully open state.
- ❖ There is no static superheat phenomenon and can realize low load start. This reduces the heat loss in shutdown and enhances the stability and reliability of the unit.



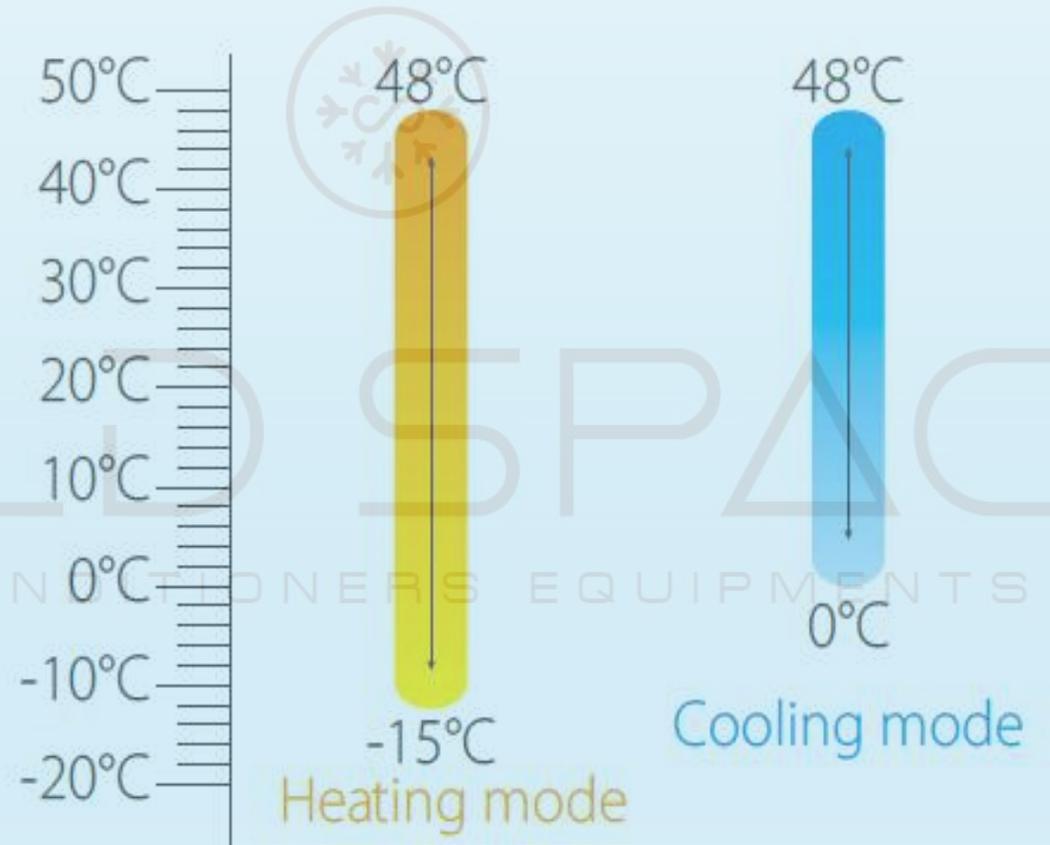
High precision EXV

Traditional thermal expansion valve



## Wide operation range

Cooling mode: 0°C to 48°C. Heating mode: -15°C to 48°C.





## Seamless connection

- ❖ Modular design concept, free combination to meet different capacity requirements. Possible to increase capacity in the future expansion.
- ❖ The "V" module design allows lateral ventilation and heat exchange. Multiple modules can be seamlessly connected to reduce the installation area.

Seam connection



Seamless connection





## Quiet operation

- ❖ High efficiency and low noise fan design.
- ❖ The fan impeller is optimized with professional flow field software to ensure good aerodynamics and a larger air flow with less noise, improving the heat exchange on the air side.
- ❖ The noise reduction box for the compressor makes the running noise of the unit greatly reduced.



Low noise fan



Low noise compressor



Noise reduction box for compressor (optional for 50Hz unit; standard for 60Hz unit; 60Hz unit without noise reduction box is optional )



## Advanced microcomputer control

Independently developed advanced microcomputer control panel, with multiple functions such as product operation control function and safety protection. Among them, the high-speed processing chip can quickly obtain the operating parameters of the chiller system and timely issue control instructions for rapid processing, so as to realize the intelligent control of the unit and ensure the stable operation of the unit.





# Colorful Touch Screen

## ❖ Complete control functions

The control functions that can be realized include:

self-set outlet water control temperature, load intelligent control, self-equipped Master&Slave control, intelligent defrosting, intelligent low temperature control etc.

## ❖ Complete protection functions

High pressure protection, low pressure protection, overload protection, discharge temperature protection, water flow protection, pressure ratio protection, discharge superheat protection etc.





## 460V-3Ph-60Hz, Cooling only

Model		Unit	RCAE115HA22	RCAE150HA22	RCAE230HA22	RCAE265HA22	RCAE300HA22	
Nominal parameter	Cooling capacity	kW	400.0	535.0	800.0	935.0	1070.0	
	Cooling power input	kW	134.0	179.0	268.0	313.0	358.0	
	Cooling COP	kW/kW	2.985	2.988	2.985	2.987	2.988	
	IPLV	kW/kW	4.028	4.129	4.028	4.085	4.129	
	Partial heat recovery*	kW	112.0	150.0	224.0	262.0	300.0	
Compressor	Type	/	Hermetic scroll compressor					
	Quantity	System 1	/	2	2	2	2	2
		System 2	/	1	2	1	1	2
		System 3	/	-	-	2	2	2
		System 4	/	-	-	1	2	2
Energy regulation mode	/	Adaptive energy regulation						
Refrigerant	Type	/	R410A					
	Charge amount	System 1	kg	47	45	47	47	45
		System 2	kg	23	45	23	23	45
		System 3	kg	-	-	47	45	45
		System 4	kg	-	-	23	45	45
Power supply	/	460V-3Ph-60Hz						
Rated current	A	197.5	263.9	197.5/197.5	197.5/263.9	263.9/263.9		
Start current	A	589.0	673.0	589.0/589.0	589.0/673.0	673.0/673.0		
Max. operating current	A	257.7	343.6	257.7/257.7	257.7/343.6	343.6/343.6		
Air side heat exchanger	Type	/	High efficiency internal thread pipe + hydrophilic aluminum fin					
	No. of fan	/	6	8	12	14	16	
	Air flow rate	m <sup>3</sup> /h	20000×6	20000×8	20000×12	20000×14	20000×16	
	Motor power input	kW	2.4×6	2.4×8	2.4×12	2.4×14	2.4×16	
	Water side heat exchanger	Type	/	Shell and tube				
Water flow rate		m <sup>3</sup> /h	68.80	92.02	137.6	160.8	184.0	
Pressure drop		kPa	85.6	83.1	85.6	85.6	83.1	
Water pipe connection		mm	DN125	DN125	DN125+DN125	DN125+DN125	DN125+DN125	
Max. working pressure		kPa	1000	1000	1000	1000	1000	
Partial heat recovery heat exchanger (optional)*	Type	/	Plate heat exchanger					
	Water flow	m <sup>3</sup> /h	6.5	8.6	6.5+6.5	6.5+8.6	8.6+8.6	
	Water side pressure drop	kPa	13.9	15.1	13.9+13.9	13.9+15.1	15.1+15.1	
	Connecting pipe diameter	mm	DN50	DN50	DN50+DN50	DN50+DN50	DN50+DN50	
Unit dimensions	Length	mm	3530	4700	7060	8230	9400	
	Width	mm	2300	2300	2300	2300	2300	
	Height	mm	2500	2500	2500	2500	2500	
Unit weight	kg	3150	3900	6300	7050	7800		
Operating weight	kg	3300	4100	6600	7400	8200		

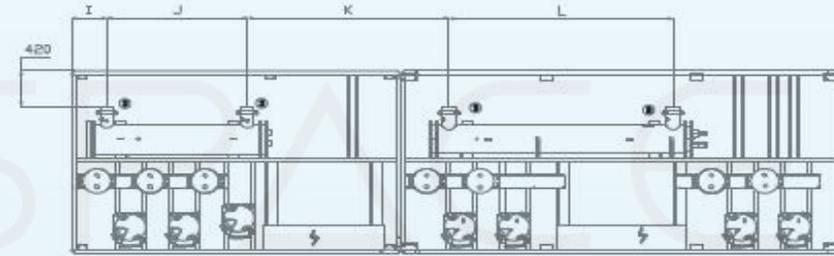
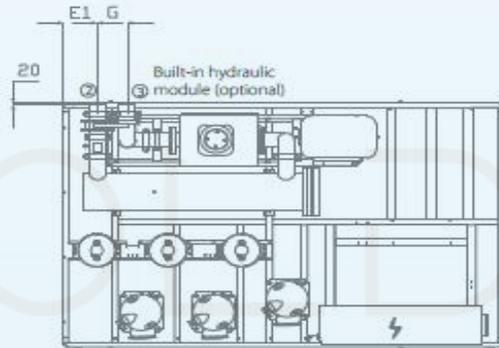
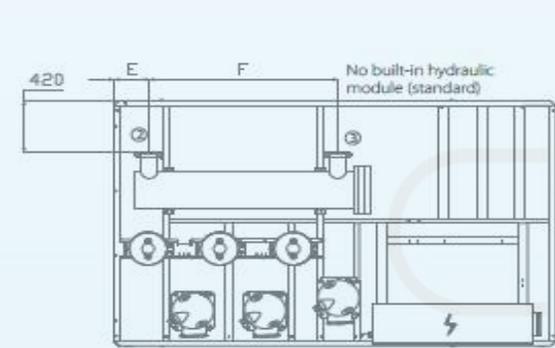
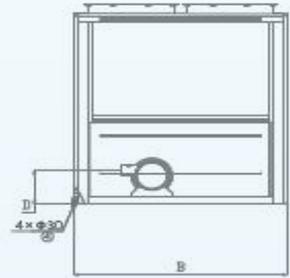
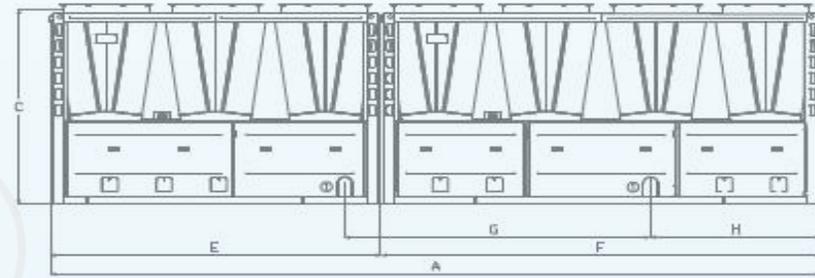
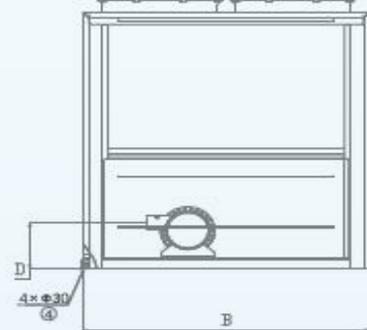
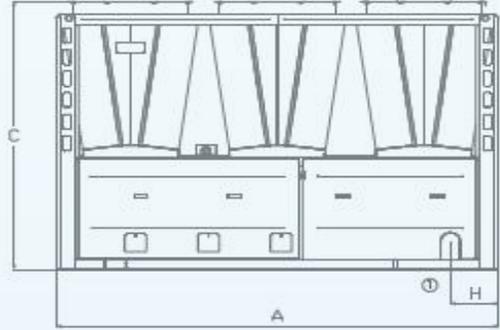
**Note:**

- Cooling: chilled water outlet temperature 7°C, water flow=cooling capacity×0.172m<sup>3</sup>/(h×kW), outdoor ambient temperature 35°C DB; Partial heat recovery: hot water inlet/outlet temperature=40°C/55°C, chilled water outlet temperature 7°C, water flow=cooling capacity×0.172m<sup>3</sup>/(h×kW), outdoor ambient temperature 35°C DB.
- IPLV calculations according to standard performances (in accordance with AHRI 550/590).
- Partial heat recovery is optional, adding this function will affect the weight of the unit and other parameters. Please consult Midea technical personnel for details.
- As a result of the continuous improvement of the product, the above parameters may be changed, please refer to the product nameplate and in-kind.



# Dimensions and base diagrams

## Dimensions



Note: ① Power incoming line ② Chilled water outlet Victaulic connection ③ Chilled water inlet Victaulic connection ④ Lifting point

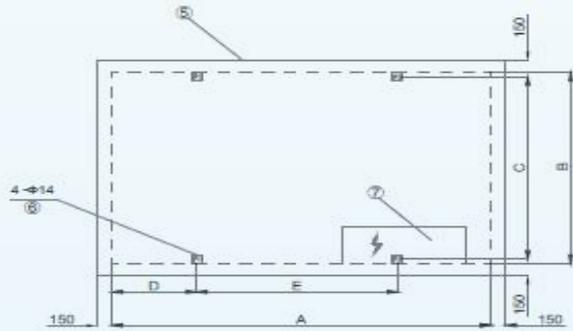
Note: ① Power incoming line ② Chilled water outlet Victaulic connection ③ Chilled water inlet Victaulic connection ④ Lifting point

Model	Dimensions (unit: mm)								
	A	B	C	D	E	E1	F	G	H
RHAE90HA RCAE90HA RCAE115HA22	3530	2300	2500	430	280	280	1500	235	385
RHAE120HA RCAE120HA RCAE150HA22	4700	2300	2500	430	1080	420	1730	925	1820

Model	Dimensions (unit: mm)											
	A	B	C	D	E	F	G	H	I	J	K	L
RHAE180HA RCAE180HA RCAE230HA22	7060	2300	2500	430	3530	3530	3530	385	280	1500	2030	1500
RHAE210HA RCAE210HA RCAE265HA22	8230	2300	2500	430	3530	4700	3265	1820	280	1500	2830	1730
RHAE240HA RCAE240HA RCAE300HA22	9400	2300	2500	430	4700	4700	4700	1820	1080	1730	2970	1730



Base diagrams



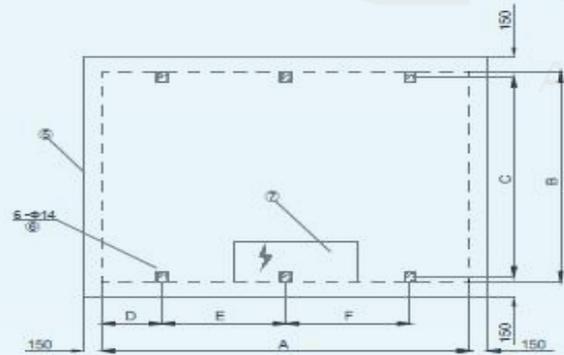
- ⑤ Installation foundation
- ⑥ Spring isolator installation hole
- ⑦ Electric control box

Model	Dimensions (unit: mm)				
	A	B	C	D	E
RHAE90HA RCAE90HA RCAE115HA22	3530	2300	2220	644	2200

Model	Spring isolator at all points	
	P1	P2
RHAE90HA RCAE90HA RCAE115HA22	MHD-1050	MHD-1050

Note:

1. The spring isolator is optional.
2. The value in the spring isolator model indicates the bearable weight (unit: kg). For example, "1050" in "MHD-1050" indicates 1,050kg.



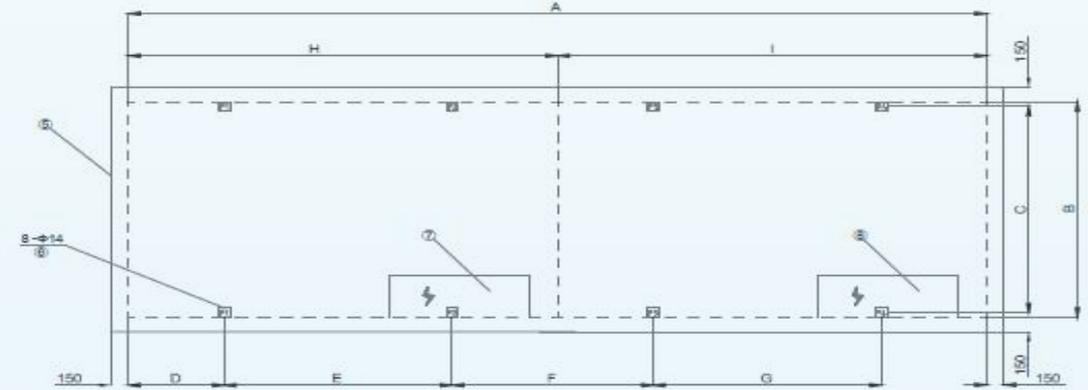
- ⑤ Installation foundation
- ⑥ Spring isolator installation hole
- ⑦ Electric control box

Model	Dimensions (unit: mm)					
	A	B	C	D	E	F
RHAE120HA RCAE120HA RCAE150HA22	4700	2300	2220	844	1412	1600

Model	Spring isolator at all points		
	P1	P2	P3
RHAE120HA RCAE120HA RCAE150HA22	MHD-850	MHD-850	MHD-850

Note:

1. The spring isolator is optional.
2. The value in the spring isolator model indicates the bearable weight (unit: kg). For example, "850" in "MHD-850" indicates 850kg.



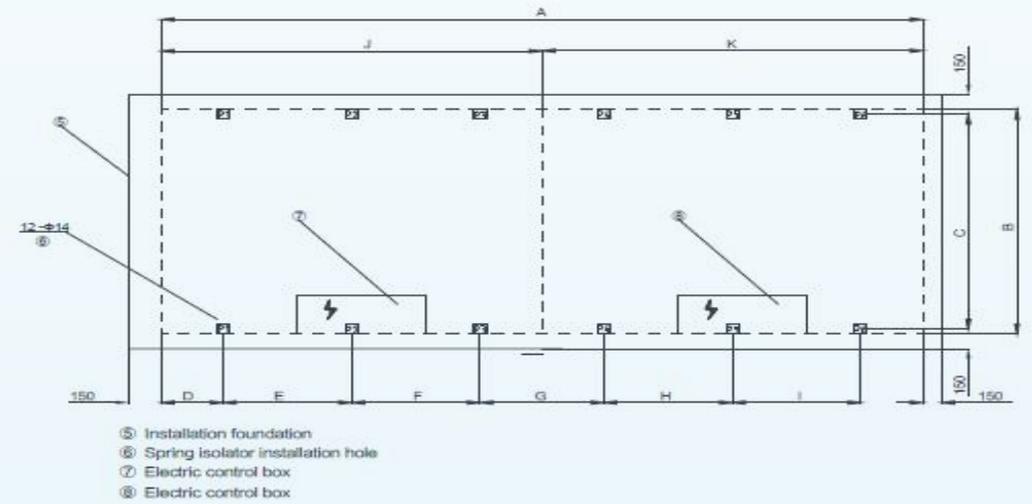
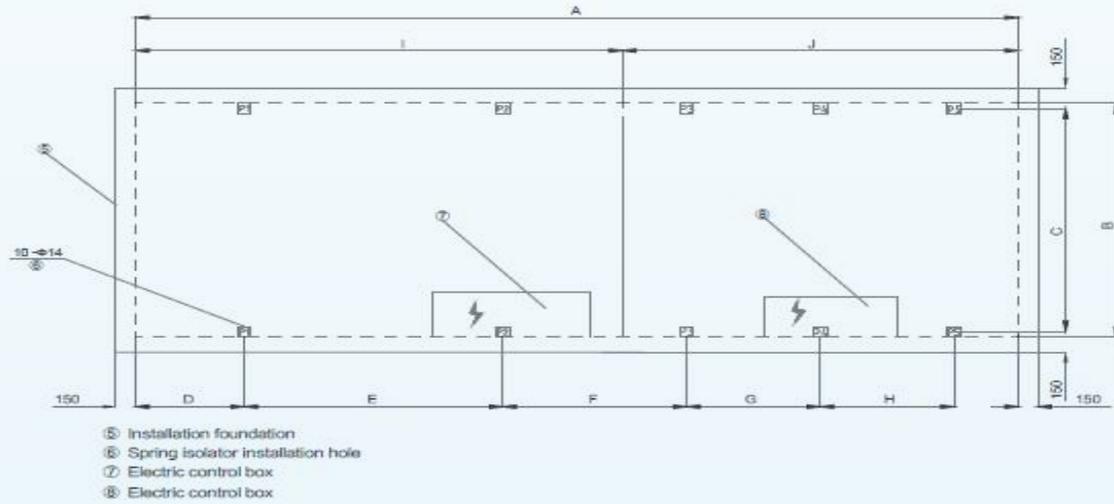
- ⑤ Installation foundation
- ⑥ Spring isolator installation hole
- ⑦ Electric control box
- ⑧ Electric control box

Model	Dimensions (unit: mm)								
	A	B	C	D	E	F	G	H	I
RHAE180HA RCAE180HA RCAE230HA22	7060	2300	2220	644	2200	1330	2200	3530	3530

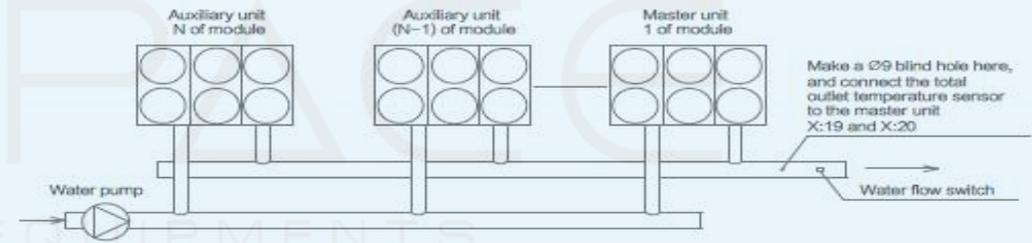
Model	Spring isolator at all points			
	P1	P2	P3	P4
RHAE180HA RCAE180HA RCAE230HA22	MHD-1050	MHD-1050	MHD-1050	MHD-1050

Note:

1. The spring isolator is optional.
2. The value in the spring isolator model indicates the bearable weight (unit: kg). For example, "1050" in "MHD-1050" indicates 1,050kg.



When several modular units are combined for use, the total water outlet temperature sensor must be added to the general water outlet pipe. The specific operations are as follows: (Remarks: The total water temperature sensor is a unit accessory.)



Model	Dimensions (unit: mm)									
	A	B	C	D	E	F	G	H	I	J
RHAE210HA RCAE210HA RCAE265HA22	8230	2300	2220	644	2200	1530	1412	1600	3530	4700

Model	Spring isolator at all points				
	P1	P2	P3	P4	P5
RHAE210HA RCAE210HA RCAE265HA22	MHD-1050	MHD-1050	MHD-850	MHD-850	MHD-850

Note:  
1. The spring isolator is optional.  
2. The value in the spring isolator model indicates the bearable weight (unit: kg). For example, "1050" in "MHD-1050" indicates 1,050kg.

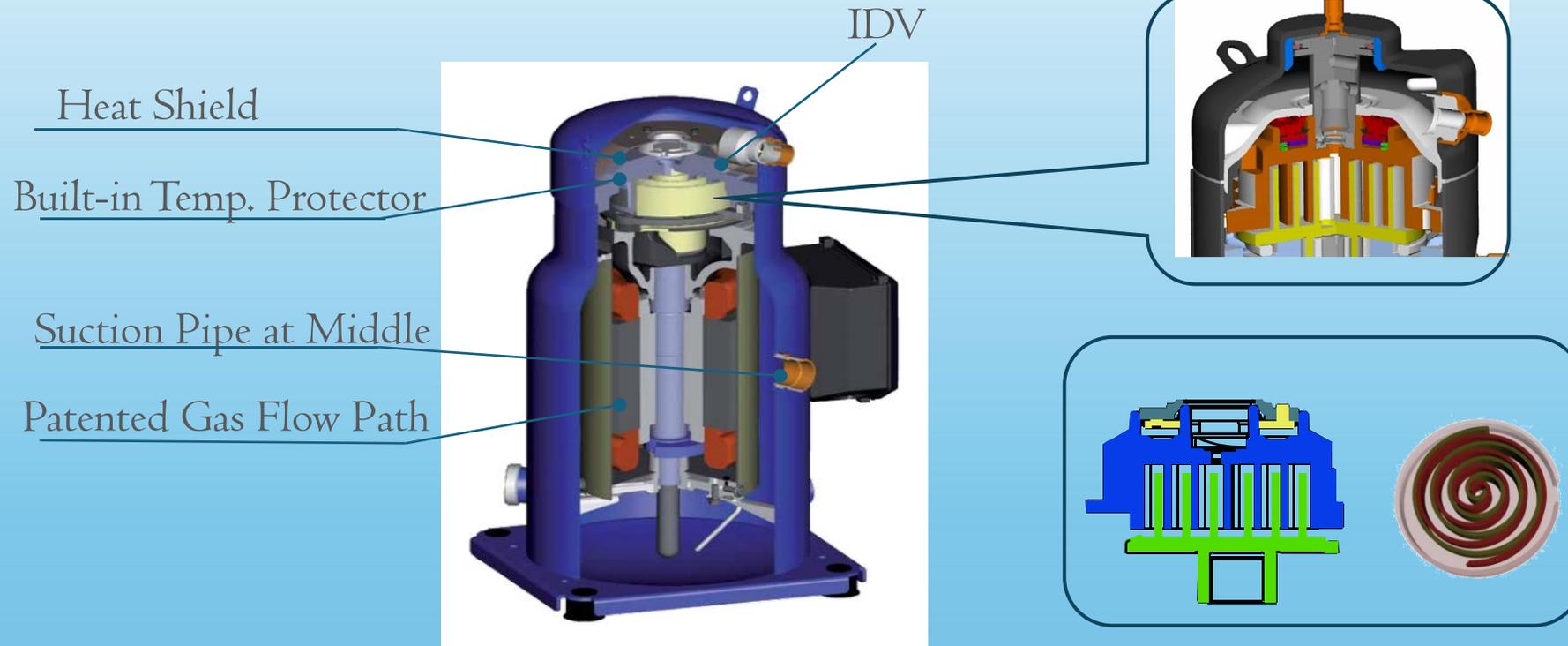
Model	Dimensions (unit: mm)										
	A	B	C	D	E	F	G	H	I	J	K
RHAE240HA RCAE240HA RCAE300HA22	9400	2300	2220	944	1412	1600	1688	1412	1600	4700	4700

Model	Spring isolator at all points					
	P1	P2	P3	P4	P5	P6
RHAE240HA RCAE240HA RCAE300HA22	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850	MHD-850

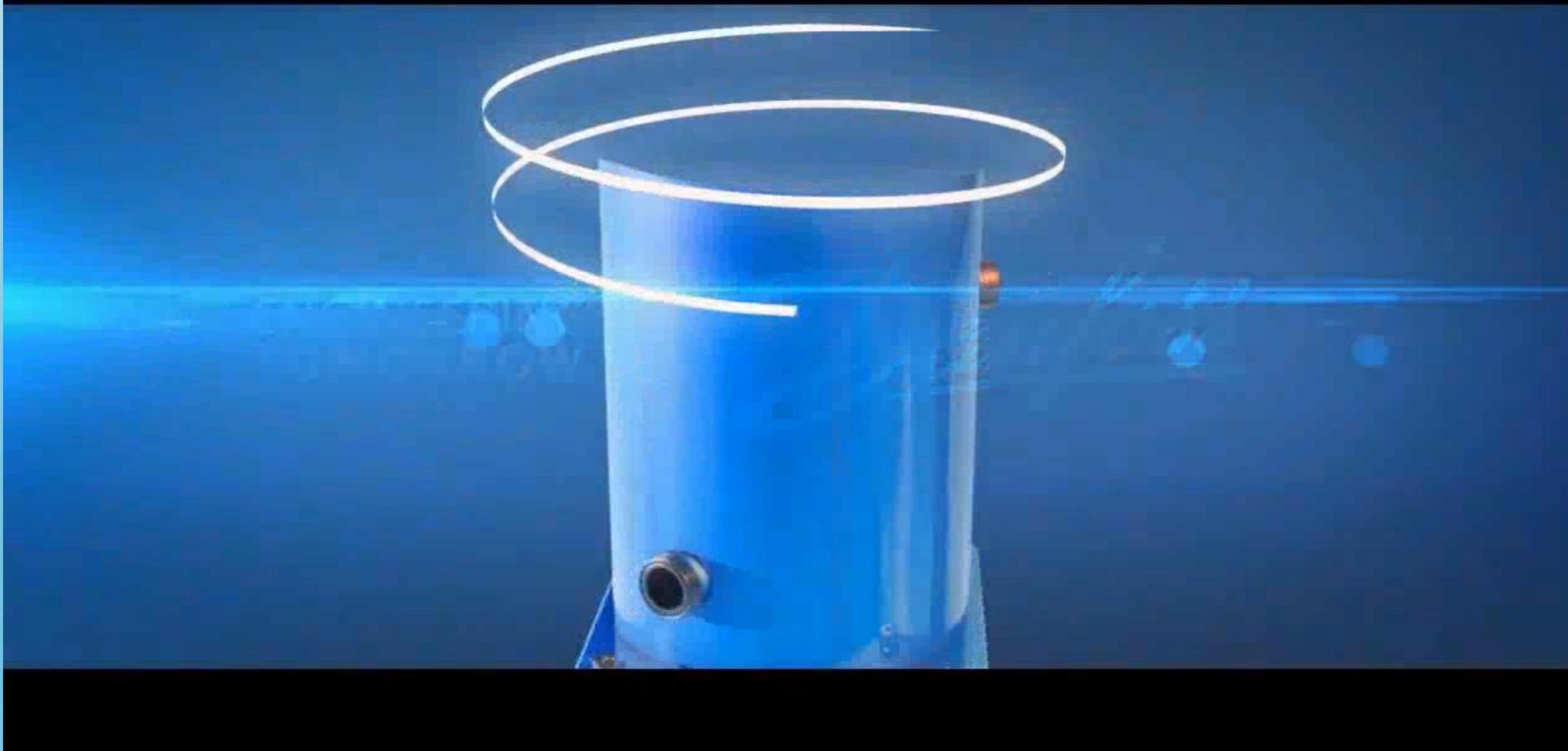
Note:  
1. The spring isolator is optional.  
2. The value in the spring isolator model indicates the bearable weight (unit: kg). For example, "850" in "MHD-850" indicates 850kg.

# Key Technologies

## Compressor

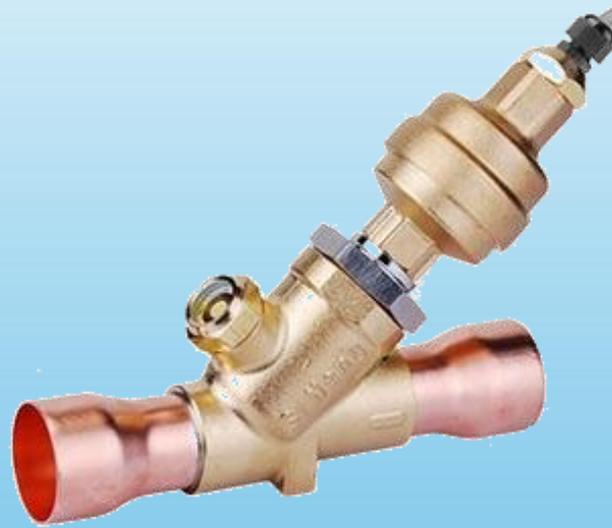


- Danfoss Brand Compressor.
- IDV : Intermediate Discharge Valves.



# Key Technologies

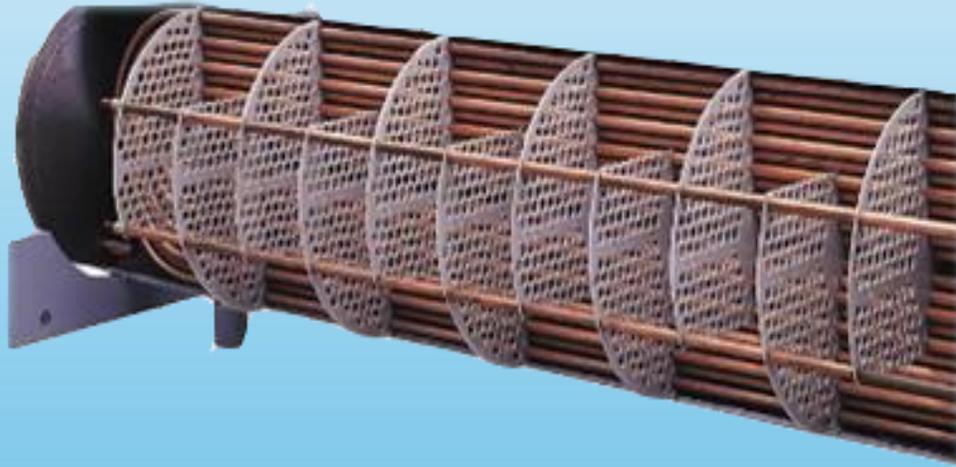
EXV



- Danfoss brands, stable and reliable quality
- Responsive, no hysteresis, improve unit energy efficiency
- PID high-precision adjustment to ensure that the whole situation is stable and efficient operation

# Key Technologies

Evaporator – DX type



- Improve the heat transfer coefficient, strengthen the heat transfer
- No heat transfer dead area, all the transfer area can be used, Good for avoid freezing.
- Without any oil problem especially in lower part load
- Significantly lower water pressure drop(about 30% lower at the same flow rate).



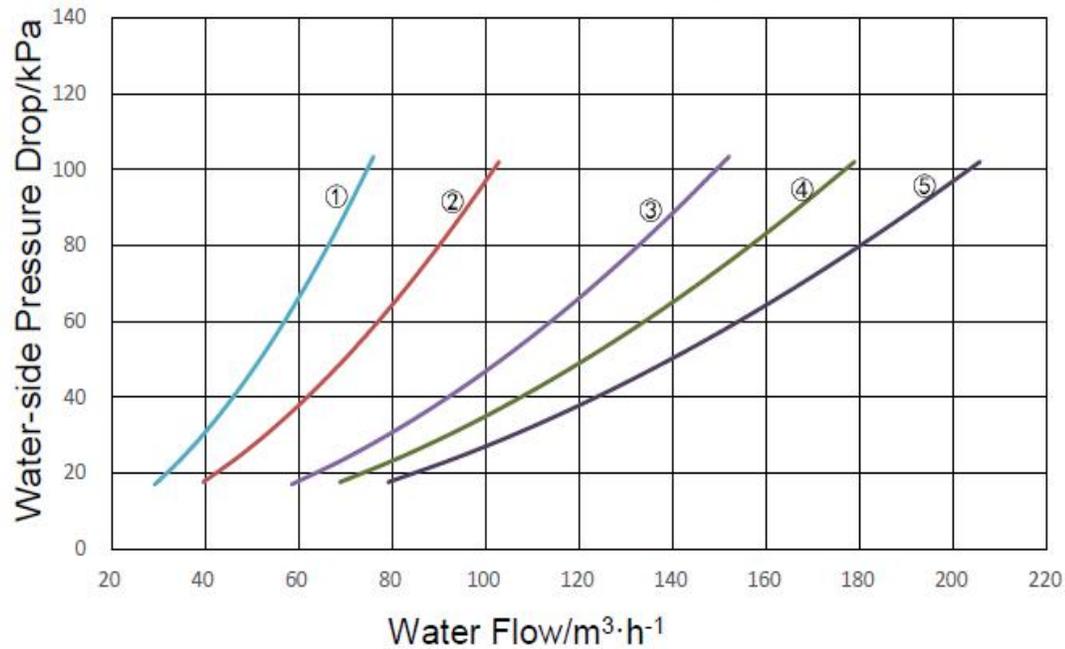
## Rangos de Operación

	Operating range
	Cooling
Ambient temperature	0°C to 48°C
Water outlet temperature	5°C to 20°C
Maximum inlet and outlet water temperature difference	10°C
Voltage	Rated voltage $\pm 10\%$
Difference between voltage phases	$\pm 2\%$
Power frequency	Rated frequency $\pm 2\%$
Max. operating pressure on the water side of the heat exchanger	1.0MPa
Ambient air quality	Cannot be used in corrosive atmospheric environments. Cannot be used in environments with extremely high humidity.
Water drainage system	Water accumulation height at the place of installation cannot exceed the base of the unit.
Altitude	$\leq 1980\text{m}$ (Applicable to standard units)

**Para garantizar el funcionamiento normal de la unidad, el caudal de agua del intercambiador de calor de carcasa y tubos debe mantenerse dentro del rango permitido. Un caudal de agua bajo puede provocar la congelación en los tubos de cobre del intercambiador de calor o causar fugas de refrigerante; mientras que un caudal de agua excesivo puede doblar o romper los tubos de cobre del intercambiador de calor y la placa deflectora, dañando todo el intercambiador de calor de carcasa y tubos.**

Incluso cuando la unidad esté apagada, el caudal de agua en el intercambiador de calor de carcasa y tubos no debe exceder el 150% del caudal nominal.

### Water Flow-Pressure Drop Curve

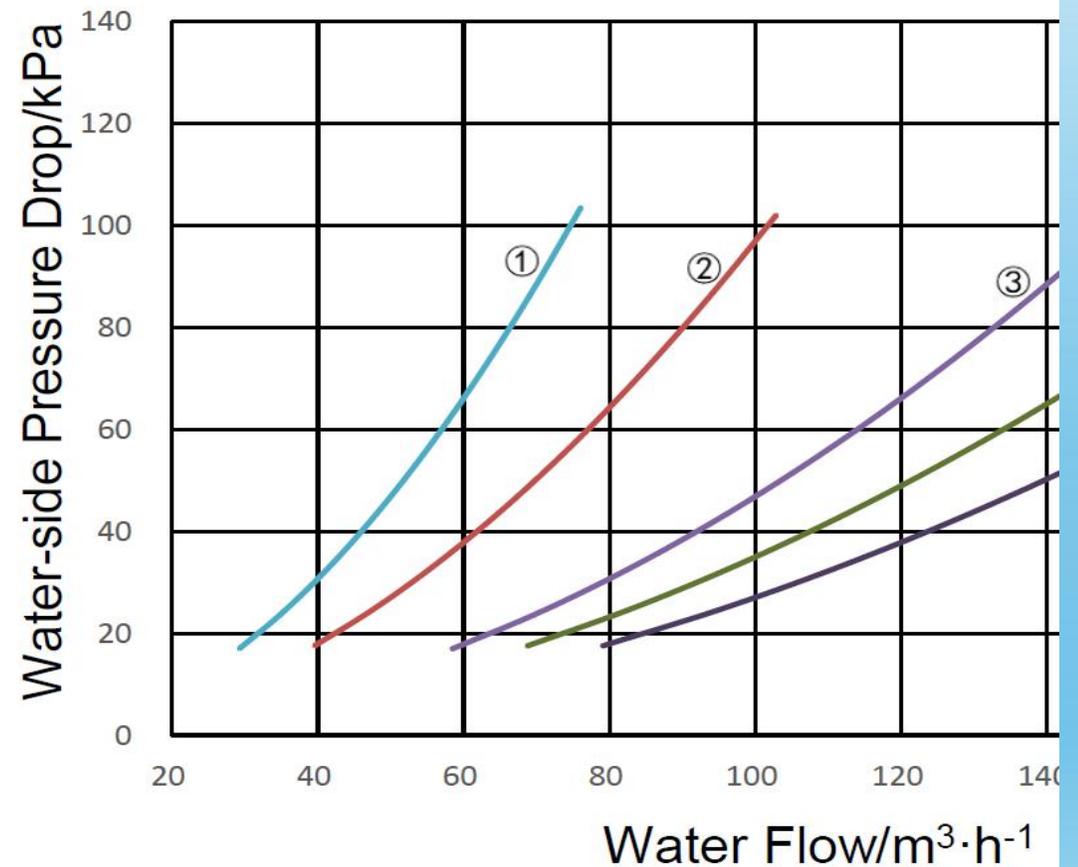


Standard Series Water Resistance Curve

Model Table:

No.	Model
①	RCAE115HA22
②	RCAE150HA22

Rango permitido de caudal de agua y la pérdida de presión en el lado del agua del intercambiador de calor de carcasa y tubos.



Para unidades estándar, el caudal en el evaporador puede ser variable.

Independientemente del caudal de agua, la unidad puede mantener una temperatura constante en la salida de agua.

El caudal de agua debe ser mayor que el caudal mínimo especificado, y la variación del caudal por minuto no puede exceder el 30%. Si el caudal de agua cambia demasiado rápido, la capacidad de agua del sistema debe aumentarse de **4.7 L/kW** a **7.1 L/kW**.

La capacidad mínima de agua del sistema de circulación se obtiene a partir de la siguiente fórmula:

Volume = Q(kW) * N (L)	
Type	N (L)
Air conditioning conditions	4.7
Process conditions	7.1

**Q (kW):** Capacidad nominal de enfriamiento bajo condiciones de operación estándar.



## Reference Projects



### Energy Station of Hubin New District, Suqian

- 📍 Country: China
- 📍 City: Suqian
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 1,375 RT



### Guiyang International Trade Mart

- 📍 Country: China
- 📍 City: Guiyang
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 1,820 RT





### Shijiazhuang Fifteenth High School

- 📍 Country: China
- 📍 City: Shijiazhuang
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 2,125 RT



### NTP Novi Sad Scientific and Technological Centre

- 📍 Country: Serbia
- 📍 City: Novi Sad
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 600 RT



### White Sails Batumi

- 📍 Country: Georgia
- 📍 City: Batumi
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 855 RT



### Guiyang International Trade Mart

- 📍 Country: Georgia
- 📍 City: Batumi
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 1,000 RT



### Jerarsi Hospital

- 📍 Country: Georgia
- 📍 City: Tbilisi
- 🏢 Outdoor Units: Air cooled scroll chiller
- 📊 Total Capacity: 750 RT



COLD SPACE  
AIR CONDITIONERS EQUIPMENTS



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