



Commercial Air Conditioners **2019/2020**



**Inverter Direct-drive Full  
Falling Film Centrifugal Chiller**  
Cooling Capacity: 250~1300RT  
50/60Hz

**Commercial Air Conditioner Division**  
**Midea Group**

Add.: Midea Headquarters Building, 6 Midea Avenue, Shunde, Foshan, Guangdong, China

Postal code: 528311

Tel: +86-757-26338346 Fax: +86-757-22390205

cac.midea.com    global.midea.com

Note: Product specifications change from time to time as product improvements and developments are released and may vary from those in this document.





# Midea CAC

Midea CAC is a key division of the Midea Group, a leading producer of consumer appliances and provider of heating, ventilation and air conditioning solutions. Midea CAC has continued with the tradition of innovation upon which it was founded, and emerged as a global leader in the HVAC industry. A strong drive for advancement has created a groundbreaking R&D department that has placed Midea CAC at the forefront of a competitive field. Through these independent efforts and joint cooperation with other global enterprises, Midea has supplied thousands of innovative solutions to customers worldwide.

We have three production bases: Shunde, Chongqing and Hefei.

MCAC Shunde: 38 product lines focusing on VRF, Split Products, Heat Pump Water Heaters, and AHU/FCU.

MCAC Chongqing: 14 product lines focusing on Water Cooled Centrifugal/Screw/Scroll Chillers, Air Cooled Screw/Scroll Chillers.

MCAC Hefei: 11 product lines focusing on VRF, Chillers, and Heat Pump Water Heaters.

MIDEA GROUP  
FORTUNE GLOBAL  
FORTUNE  
500

2017 >> Developed the large capacity air cooled scroll chiller.

2016 >> Acquire an 80% stake in Clivet.

2015 >> Launched the inverter direct-drive centrifugal chiller and magnetic chiller.

An international strategic Platform has brought Midea Group, Carrier Corporation and Chongqing General Industry Group together in the chiller business.

2013 >> Launched the super high efficiency centrifugal chiller with dual-stage compressor and full falling film evaporator.

2008 >> Developed the Smart Star new-generation Semi-hermetic centrifugal chiller.

2007 >> Won the first Midea centrifugal chiller project overseas.

2006 >> Launched the first VFD (Variable Frequency Drive) centrifugal chiller.

2004 >> Acquired MGRE entered the chiller industry.

2001 >> The R134a (LC) series centrifugal chiller was named as a key national product.

1999 >> Entered the CAC field.



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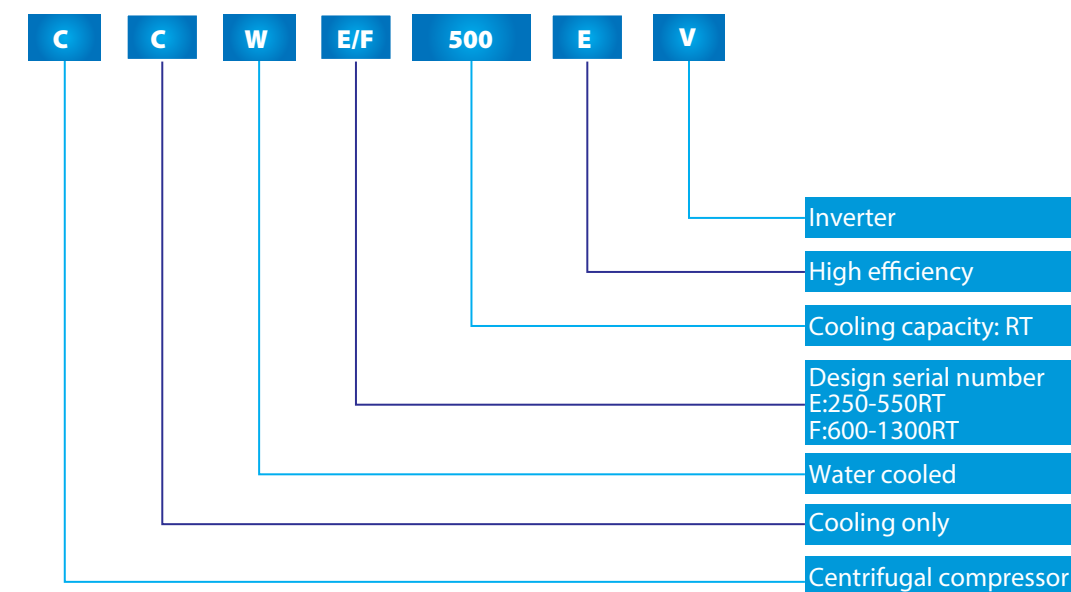
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## Overview

### Nomenclature



Certified in accordance with the AHRI Water-Cooled Water-Chilling and Heat Pump Water-Heating Packages Using Vapor Compression Cycle 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)

Midea Commercial Air Conditioner stands on the frontier of intelligent and effective technological development on the path towards technology and product innovation. By building an internationalized R&D team, we have overcome various technical bottlenecks and first developed international-advanced core technologies such as the horizontally back-to-back uniaxial direct-drive centrifugal compression and full falling-film evaporation. The industry and users have responded positively to these technologies as applied to our new inverter direct-drive centrifugal chiller.

### Benefits and Features:

**Energy saving:** COP up to 6.58, IPLV up to 10.69

**Technology leading:** more than 20 patents

**Environmentally friendly:** less refrigerant charge and lower noise

**Flexibility:** wider operation range but compact size



# Unit Member



VFD panel  
Unit-mounted and free standing are available.



Horizontally back-to-back compressor



Condenser with integral economizer (patented)  
250-550RT:Internal 600-1300RT:External



Full falling film evaporator (patented)



Environmentally friendly refrigerant



Inverter motor



Color touch screen

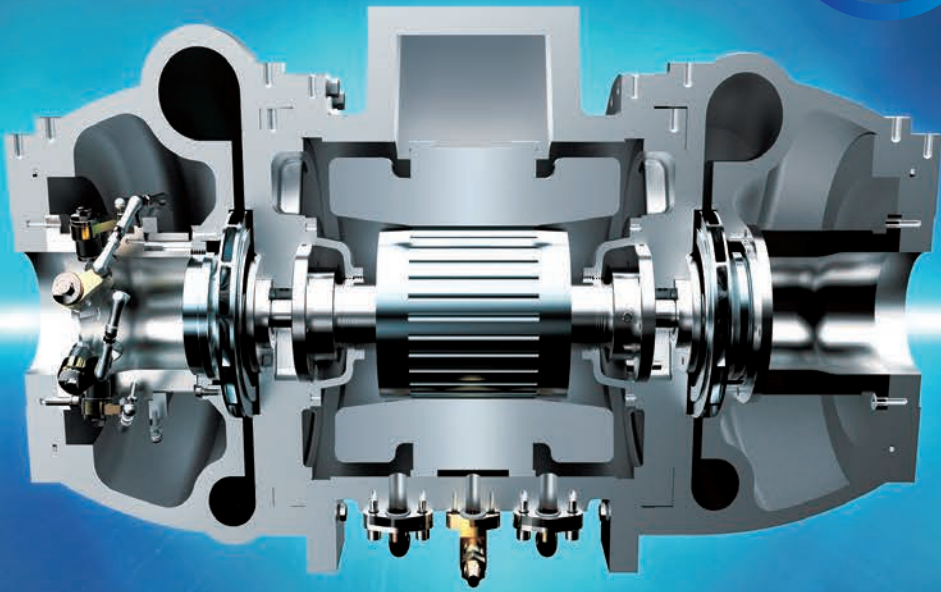


Condenser with integral sub-cooler

# Features

Horizontally back-to-back centrifugal compressor

7 Patents



Midea inverter direct-drive centrifugal compressor adopts the patented technologies as follow:

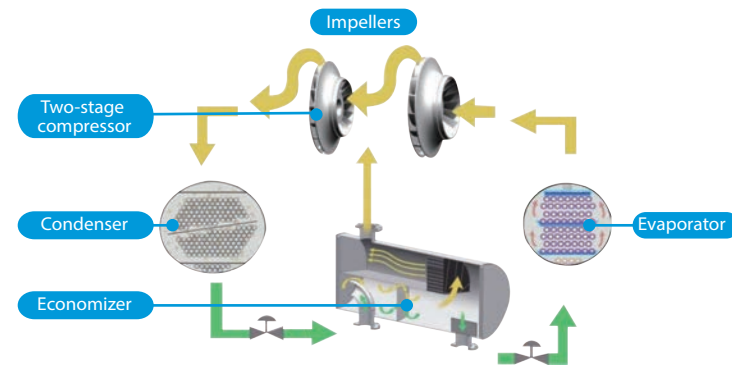
- 1) Horizontally back-to-back self-balanced impeller
- 2) Impeller profile joint and fastening technology
- 3) Inlet guide vane regulating mechanism with rolling element
- 4) Integration design of thrust plate and rotation axis
- 5) Wire leading device and motor equipped with wire leading
- 6) A centrifugal chiller inlet guide vane correcting algorithm
- 7) Gas-inlet regulation mechanism and centrifugal compressor with this mechanism



# Energy Saving

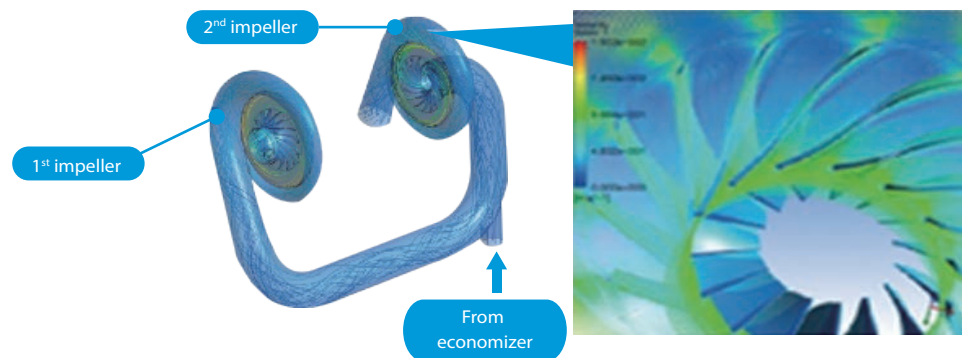
## Two-stage compressing >>

- ❖ 6% higher efficiency than single-stage compression.
- ❖ Lower speed and higher reliability.
- ❖ Unique three-stage separation economizer, reliable and effective.



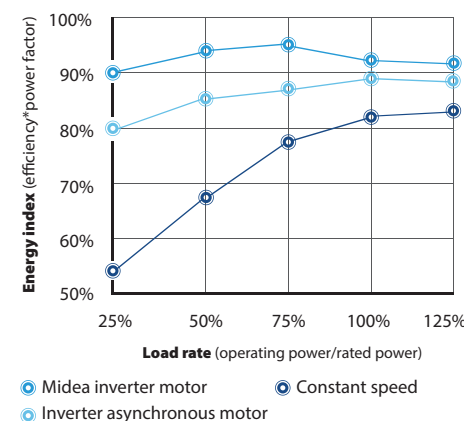
## Aerodynamic compressor design >>

- ❖ With 3D-flow closed and strongly backward-bladed impeller design, impeller efficiency higher than 97%.
- ❖ Unique pipeline crossover, with large backflow radius to reduce flow losses and noise.
- ❖ The technology of two-stage compression with economizer fully demonstrates the advantage of aerodynamic design and brings higher efficiency to the system.



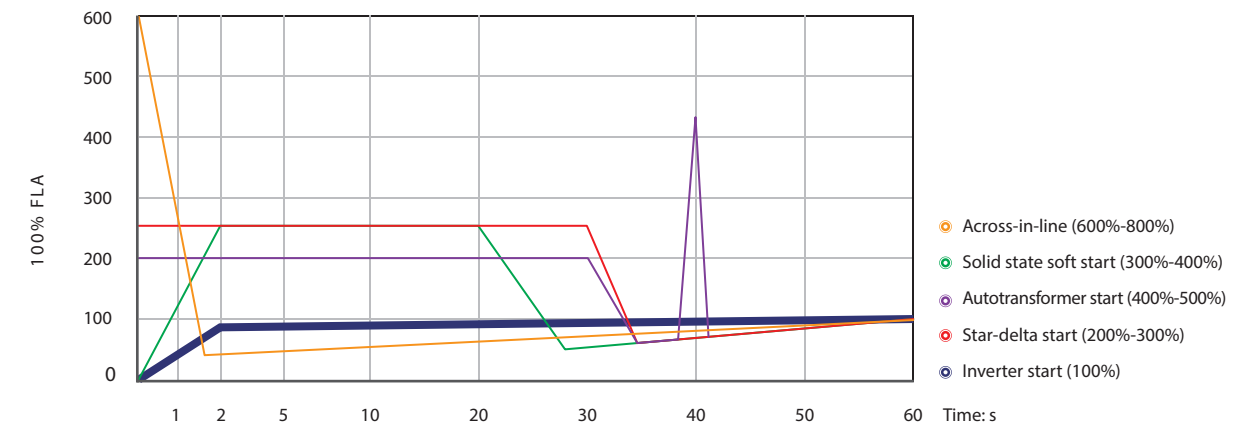
## High efficiency inverter motor >>

- ❖ Motor efficiency as high as 95.5%, energy index (efficiency\*power factor) over 2% higher than inverter asynchronous motor.
- ❖ High power density and small size, with size only 20% of AC inverter motor.
- ❖ Designed based on speed and high-frequency operation, with variable frequency range of 120~300Hz.



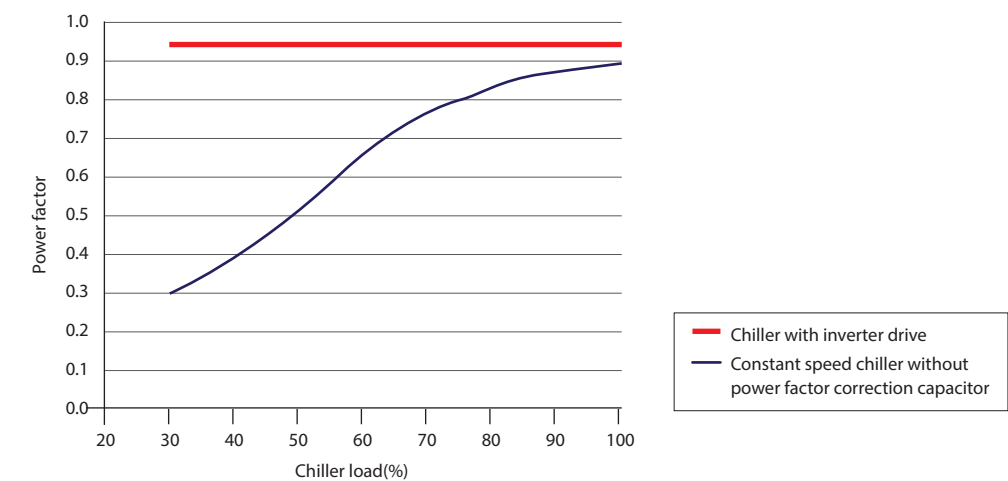
## Zero in-rush current >>

- ❖ The unit adopts inverter starting mode, which produces zero in-rush current during the starting process and enables a stable operation from 0A to FLA.



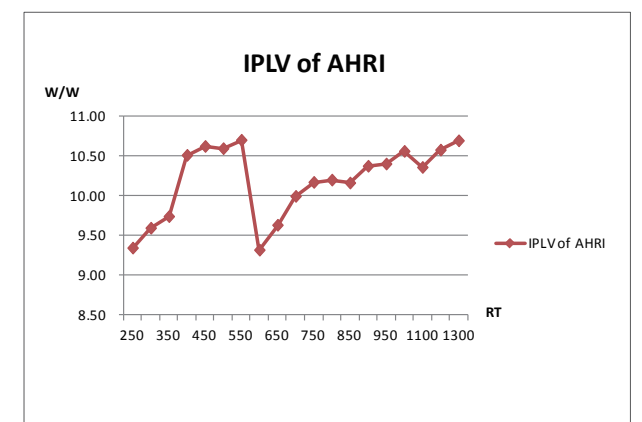
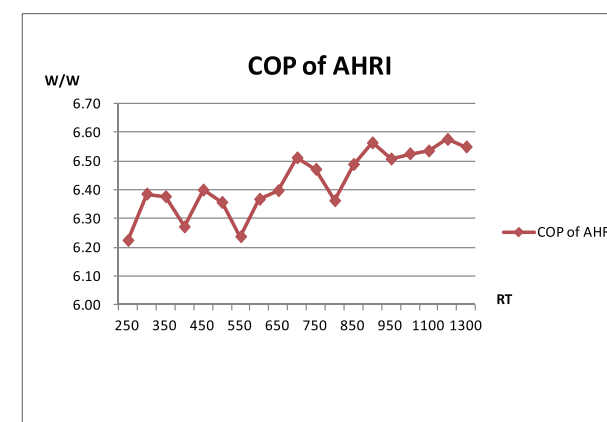
## 0.95 power factor >>

- ❖ The high power factor eliminates the need for a power factor connection capacitor.



## High efficiency >>

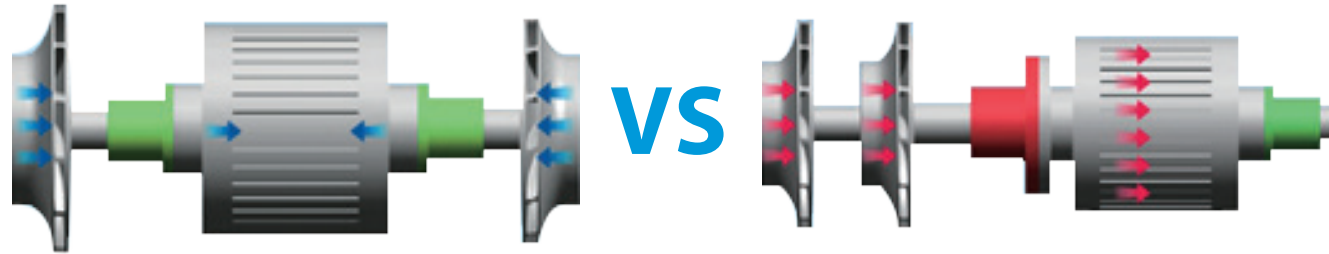
- ❖ Based on AHRI 550/590-2018 standards. From the diagram below, we can see the efficiencies of Midea direct-drive centrifugal chillers are higher than that of the standards.





# Technology Leading

## Horizontally back-to-back compression technology >>



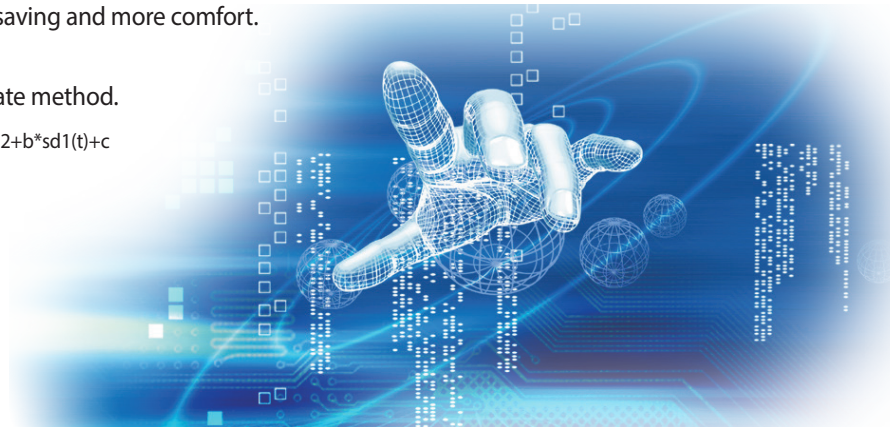
### Midea horizontally back-to-back impeller

- ❖ Midea first developed the patented horizontally back-to-back compression technology with crossover pipe structure.
- ❖ Balance the thrust forces for longer life span and improved efficiency by less seal leakage and no gear loss.

### Patented IGV correcting algorithm

- ❖ Realized stable load regulating, energy saving and more comfort.
- ❖ High precision and high compatibility.
- ❖ Invented a centrifugal chiller load regulate method.

Guide vane opening correction model:  $B=a*sd1(t)^2+b*sd1(t)+c$   
 B: the 2nd guide vane opening  
 sd1(t): the 1st guide vane opening  
 a: quadratic coefficient  
 b: monomial coefficient  
 c: constant

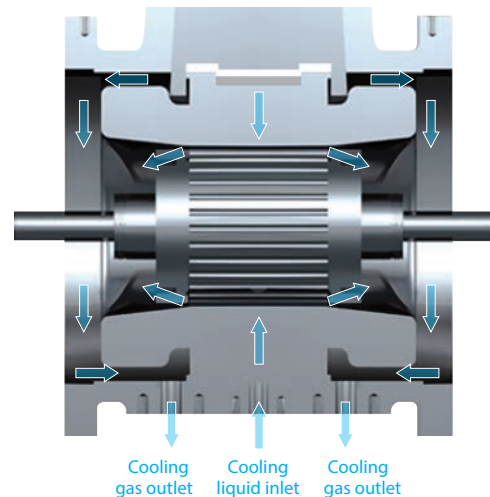


### Traditional serial impeller

- ❖ The traditional two-stage centrifugal impellers are arranged in serial to the same direction, and the axial forces on the two impellers are from the same direction and overlapped.
- ❖ More stress on thrust bearing, cause mechanical damage, and require higher reliability of bearing.

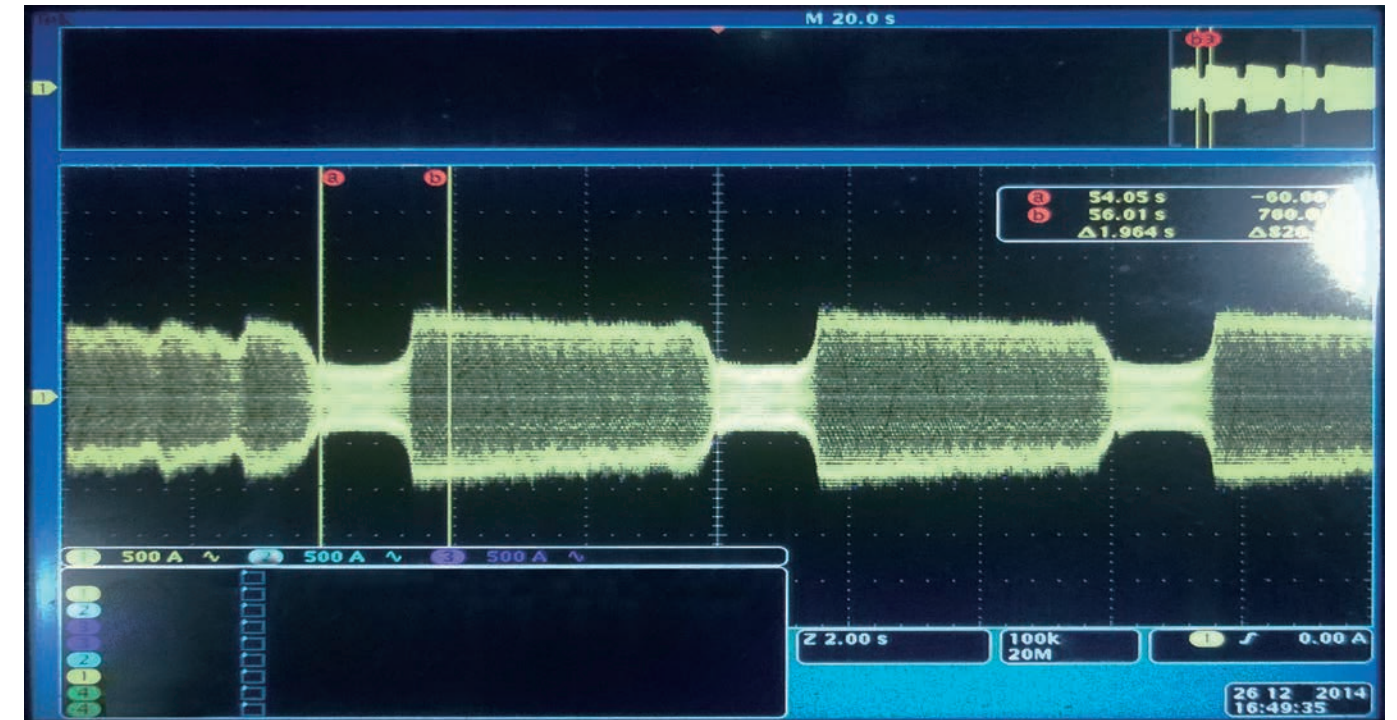
## 360° motor cooling technology >>

- ❖ The motor is cooled by the refrigerant, with liquid supply and gas return at the bottom, thus high efficiency.
- ❖ Cooling method eliminates the potential for shaft seal leaks and refrigerant/oil loss.
- ❖ The motor adopts F-level insulation design, with three PTC temperature switches preset in the winding to ensure constant safety.



## Anti-surge technology >>

- ❖ Extend the surge curve: real-time to adjust the motor speed in different operation condition.
- ❖ Precise monitor and comparing: real-time to monitor running current and comparing running current curve to current data base in the controller.

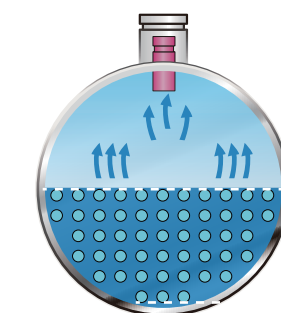


Typical current waveform in surging condition

## Full Falling Film Evaporating Technology >>

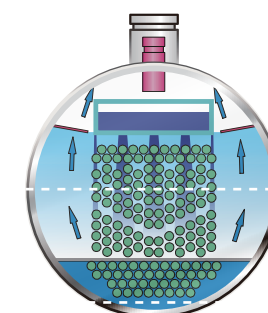
- ❖ First created the full falling film evaporator and adopted spray technology to achieve film evaporation on the surface of the heat exchange tube, greatly increasing overall heat transfer efficiency and reducing refrigerant charge by up to 40%.
- ❖ The patented refrigerant distributor can improve the homogeneity of the liquid to avoid local drying, fully showcasing the performance of the heat exchange tube and increasing unit efficiency.

Patent No: 201210414053.9; 201220552298.



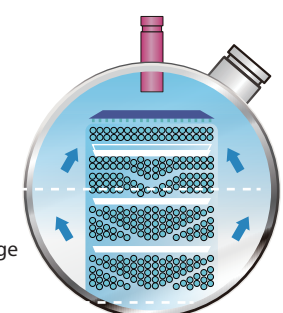
Flooded type

Full falling film reduced refrigerant charge by 40% compared with the flooded type



Falling film

Falling film reduced refrigerant charge by 25% compared with the flooded type



Midea full falling film

Almost zero liquid level

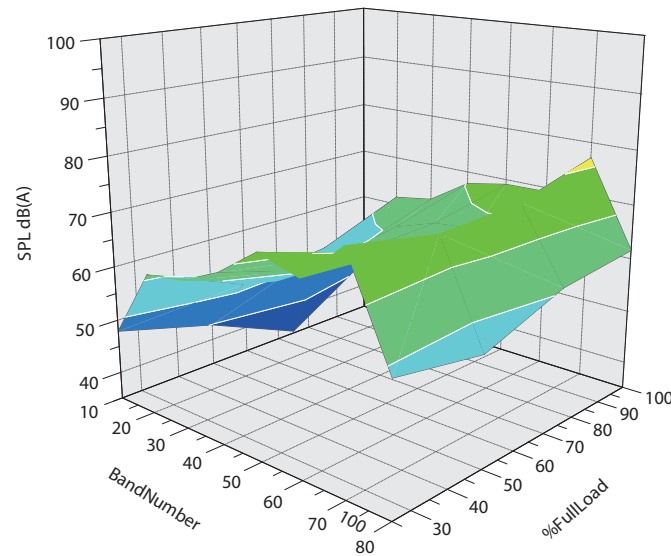
40% reduction in refrigerant charge



## Environmentally friendly

### Quieter operation >>

Midea inverter direct-drive centrifugal chiller is the quietest chiller in its size range with sound pressure ratings as low as 78 dB(A) per AHRI Standard 575. That makes it ideal for sound sensitive environments such as schools, performance halls, museums, condominiums and libraries.



### LEED >>

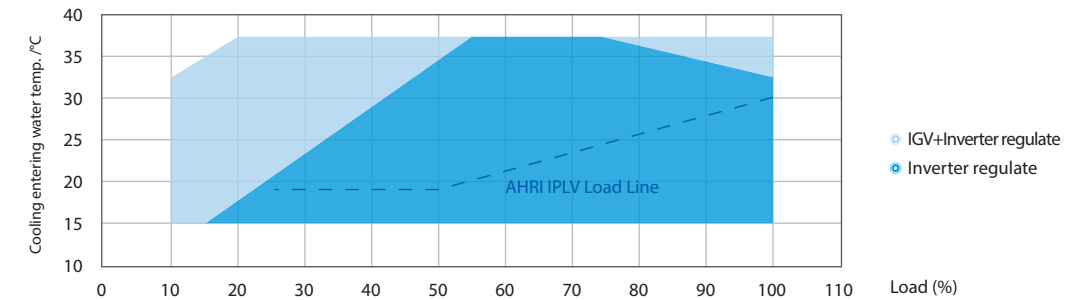
Zero-ozone depletion R134a refrigerant, green, and has no elimination cycle. Full falling-film technology reduces refrigerant charge by up to 40%, which enables you to qualify for maximum Leadership in Energy and Environmental Design®(LEED) points for Enhanced Refrigerant Management. And with the chiller's high efficiency, you can also earn additional points for credits from Optimized Energy Performance (EAc1).



## Flexibility

### Wider operation map >>

- ❖ Only inverter regulation on AHRI condition to save energy.
- ❖ Capacity load from 10%~100% and cooling EWT up to 37 °C are able to satisfy the application requirement of multiple operating conditions(load10%-20% need hot gas bypass).



### More choices >>

Unit-mounted and free standing starter panel are available.



Option 1



Option 2

### Compact size >>

Compact size is ideal for retrofit as well as small installation space project. The space savings can add up as quickly as the energy savings.





## ❖ Specifications

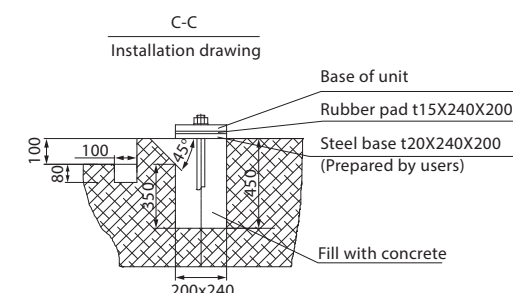
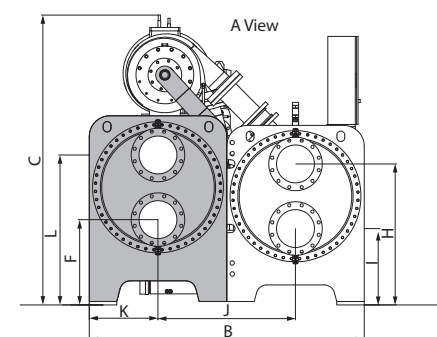
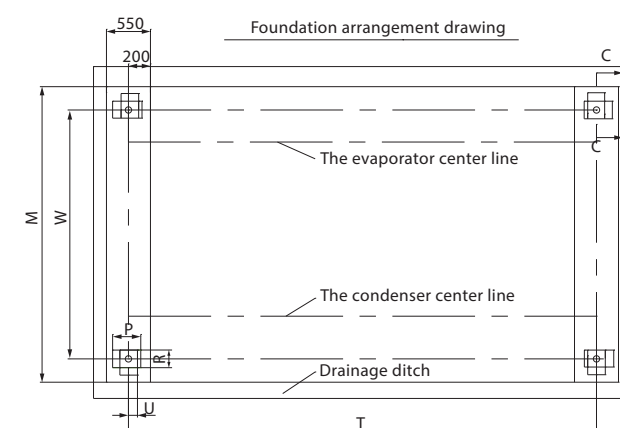
Note:

(1) Performance and efficiency are based on AHRI 550/590-2018. Evaporator conditions: water inlet=54°F, water outlet=44°F, fouling factor=0.0176m<sup>2</sup>. °C/kW;  
Condenser conditions: water inlet=85°F, water outlet=94.3°F, fouling factor=0.0440m<sup>2</sup>. °C/kW.

(2) The design's max working pressure for both the evaporator and condenser are 1.0MPa, but higher pressure can be customized if required.

(3) 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.

**Unit-mounted:**



## ❖ Dimensions



## ❖ Specifications

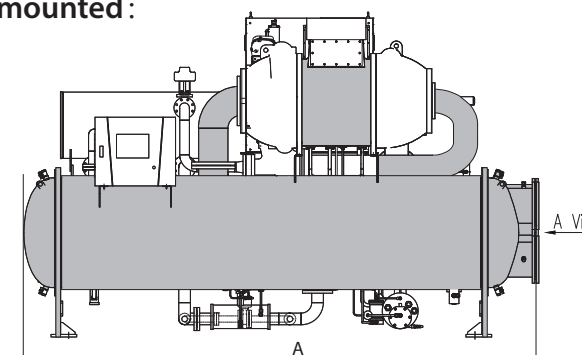
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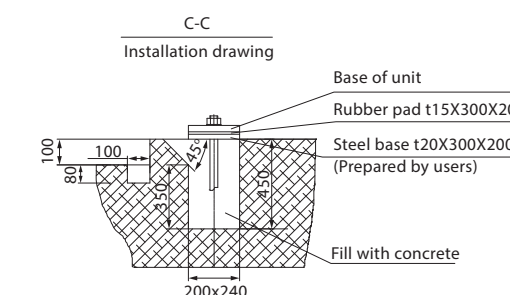
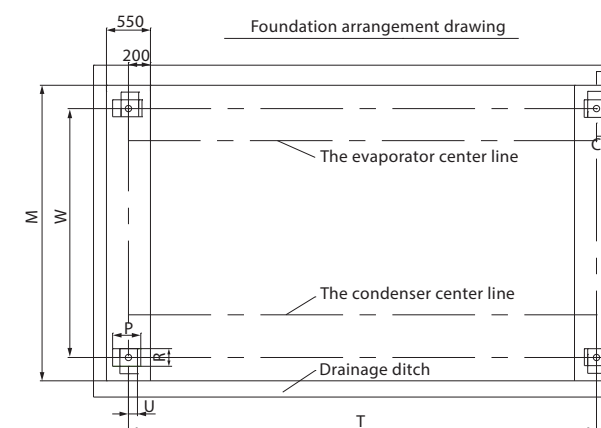
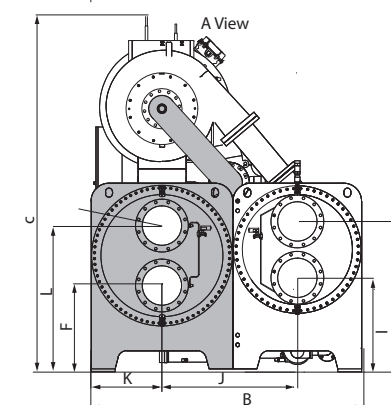
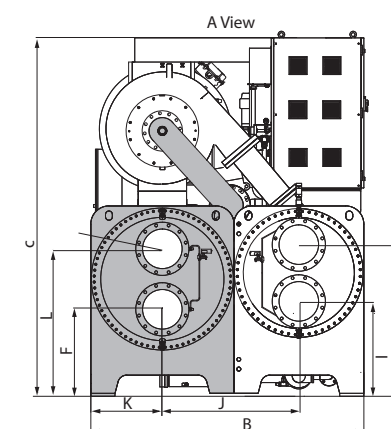
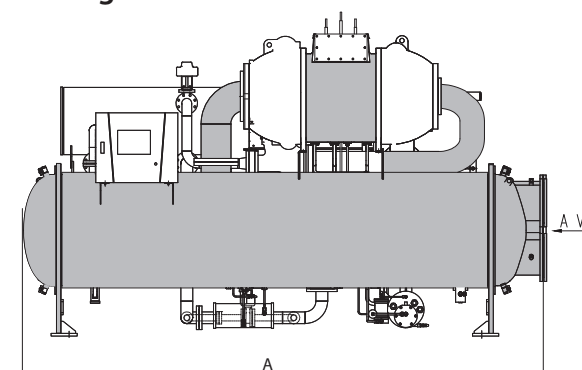
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**Unit-mounted:**



**Free standing:**

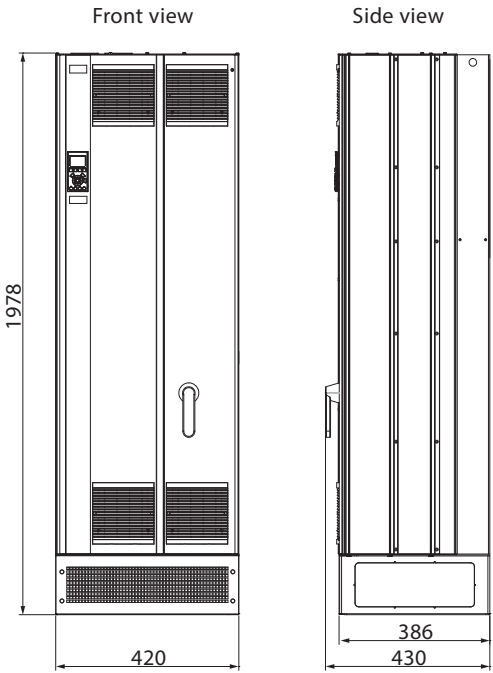


Model	Dimension			Uint base						Pipe locate position					
	L (A)	W (B)	H (C)	M	W	P	R	U	T	F	L	K	I	H	J
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
CCWF600EV	4700	1950	2750	2550	1750	240	200	200	3780	635	1095	500	683	1143	970
CCWF650EV															
CCWF700EV															
CCWF750EV															
CCWF800EV															
CCWF850EV	4750	2150	2900	2750	1950	240	200	200	3780	710	1180	550	765	1225	1070
CCWF900EV															
CCWF950EV															
CCWF1000EV															
CCWF1100EV															
CCWF1200EV	4800	2260	3050	2860	2060	240	200	200	3780	720	1220	593	785	1255	1130
CCWF1300EV															

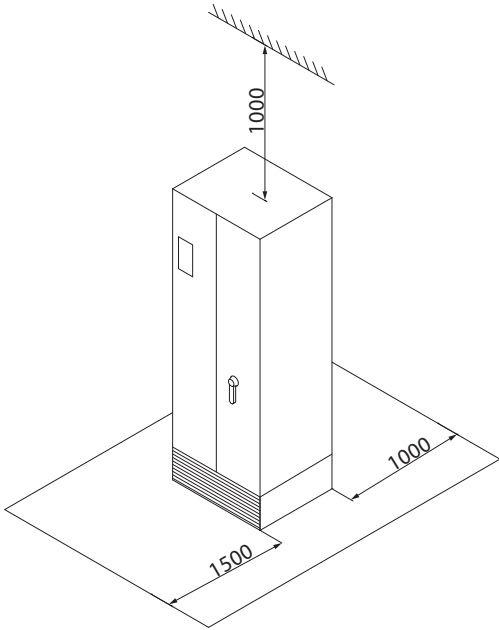


### VFD starter panel dimension

#### CCWE250EV-CCWE500EV

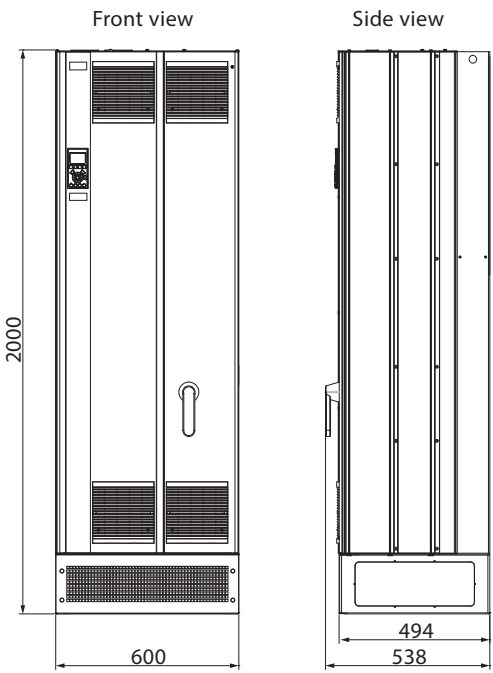


Free standing starter panel



Starter panel space layout

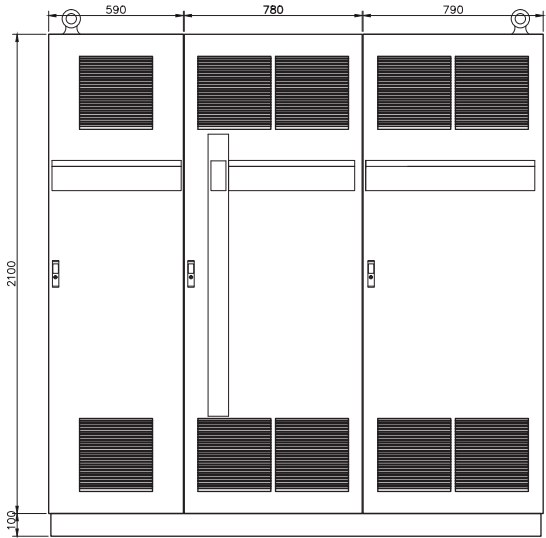
#### CCWE550EV



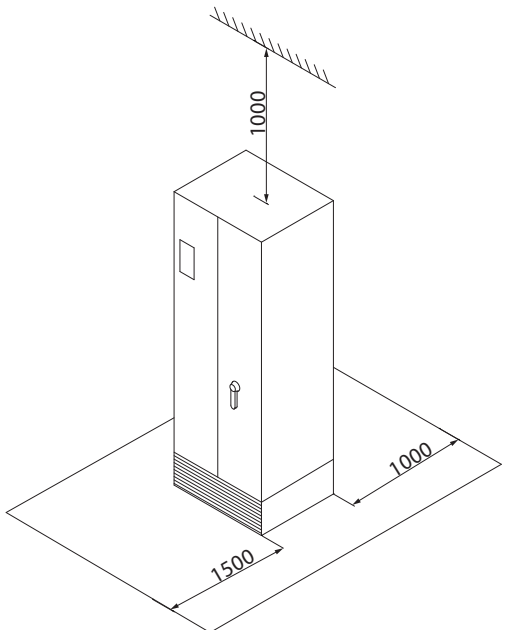
Free standing starter panel

Model (CCWE***EV)	250	300	350	400	450	500	550
Weight of starter panel (kg)	210	210	210	230	280	280	280

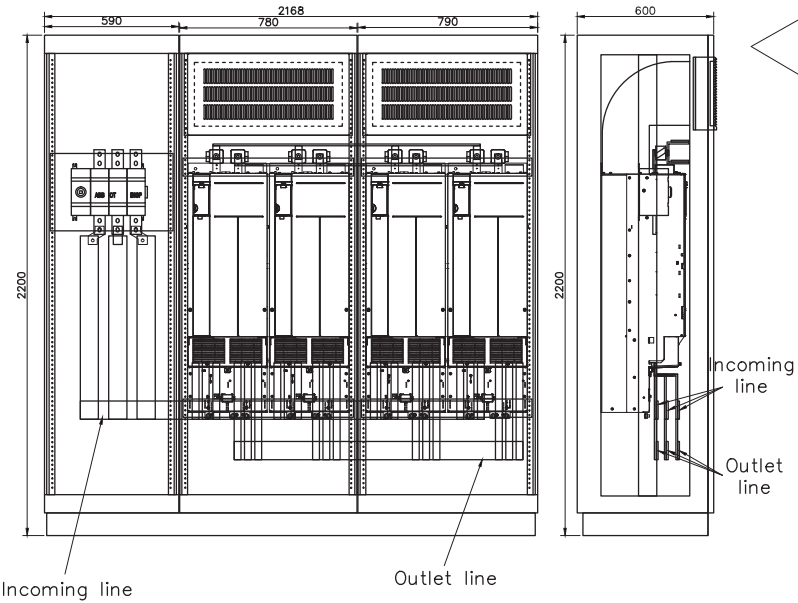
#### CCWF600EV-CCWF1300EV



Free standing starter panel



Starter panel space layout



Free standing starter panel

Model (CCWF***EV)	600	650	700	750	800	850	850	900	950	1000	1100	1300
Weight of starter panel (kg)	650	650	650	650	750	750	750	750	750	750	1017	1561



# Options/Accessories

Accessories	Standard	Optional
Power supply	380V-3Ph-50Hz	50Hz: 400V, 415V 60Hz: 380V, 400V, 440V, 460V, 480V
Water inlet/outlet connection type	Flange	×
High pressure water boxes	1.0MPa	1.6MPa, 2.0MPa
Water boxes	Compact	Marine
Pressure vessel pass	2 passes	1 pass or 3 passes
VSD (Variable speed drive)	√	×
Chiller starter	Free standing VFD panel	Unit-mounted
Chiller sequence management (Chiller Plant Manager)	×	√
Chiller vibration isolator	Rubber	Spring
Dual compressor	×	√
Heat recovery	×	Full recovery
Chilled water Delta T	5°C	6°C~11°C
Centrifugal heat pump	×	Hot water temperature up to 45°C
Water storage	×	√
Communication protocol	Modbus-RTU (RS485)	BACnet
Hot gas bypass	×	√
Flow switch	Differential pressure	×
Witness performance testing	×	√

# Operating and Control System

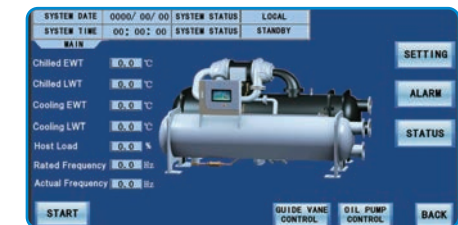
## -Intelligent color touch screen

- ❖ The perfect operating and control system of centrifugal chiller integrates a series of control and monitoring functions including intelligent operations, safety protection and interlocking control to achieve reliable start, high efficiency operations and internal control of chiller.
- ❖ Midea is responsible for the installation and commissioning of centrifugal chiller to ensure more convenient and more secure operation for users.



### Interface display

- 10-in true color graphic display interface
- Touch screen
- Operating status
- Multi-level passwords
- Operation parameters
- Pre-alarm/alarm display and record



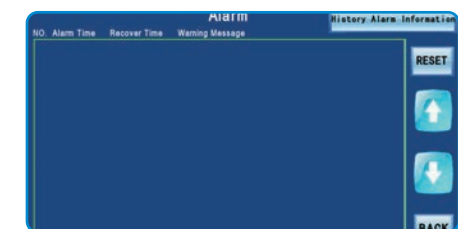
### Operation control

- User-set water leaving temperature
- Auto loading/unloading
- Soft-loading
- Pause function
- Independent start/stop function
- Timer
- Inquiry of unit details



### Interlocking control

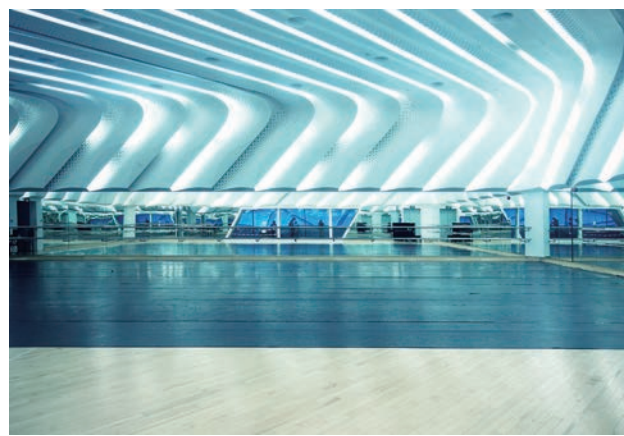
- Pre-lubrication/post-lubrication of oil pump
- Compressor anti-surge interlocking
- Pre-operation/post-operation of water pump
- Safety checks before startup
- Interlocking control on the starter panel
- Pre-alarm of interlocking
- Pause/Stop mode IGV interlocking
- Frequency control (loading/unloading, anti-surge)
- Reserved port for PC
- Superheat degree monitoring (suction and discharge)
- Pressure of lubricating oil is low/too low
- Oil pump overload
- Temperature of lubricating oil is high/too high
- Starter panel fault
- Running current of the compressor is high/too high
- Start time too long
- Running current of the compressor is too low
- Water-break of evaporator and condenser
- Evaporation pressure low/too low
- Frost protection
- Condensing pressure high/too high



### Safety protection



# Reference Projects



## Guangzhou Baiyun International Airport

<b>Country:</b>	China
<b>City:</b>	Guangzhou
<b>Total capacity:</b>	37,980 RT
<b>HVAC:</b>	Centrifugal chiller (inverter direct-drive, high efficiency)



## Shanghai Metro Line 2

<b>Country:</b>	China
<b>City:</b>	Shanghai
<b>Total capacity:</b>	1,850 RT
<b>HVAC:</b>	Centrifugal chiller, Air-cooled screw chiller (inverter direct-drive)



## Plaza Corona (Five star)

<b>Country:</b>	Peru
<b>City:</b>	Tumbes
<b>Total capacity:</b>	1,200 RT
<b>HVAC:</b>	Air cooled screw chiller, Centrifugal chiller (inverter direct-drive)





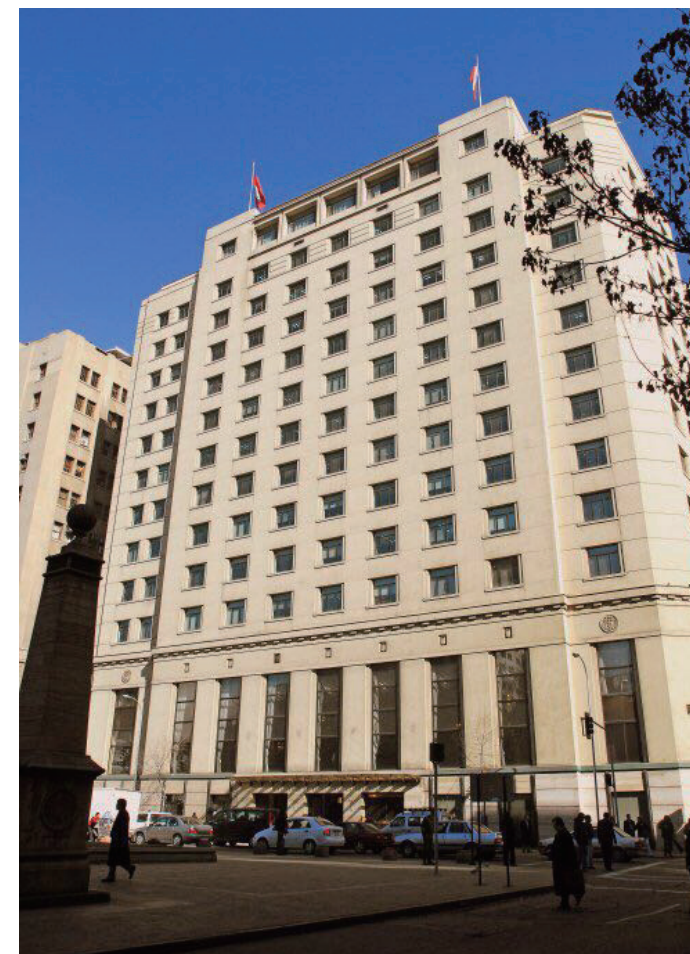
### Grand Mercure Hotel (Five Star)

<b>Country:</b>	Indonesia
<b>City:</b>	Jakarta
<b>Total capacity:</b>	1,200 RT
<b>HVAC:</b>	Centrifugal chiller (inverter direct-drive)



### Taiwan Taoyuan Hospital

<b>Country:</b>	China
<b>City:</b>	Taiwan
<b>Total capacity:</b>	500 RT
<b>HVAC:</b>	Centrifugal chiller (inverter direct-drive)



### Chile Ministry of Foreign Affairs

<b>Country:</b>	Chile
<b>City:</b>	Santiago
<b>Total capacity:</b>	600 RT
<b>HVAC:</b>	Centrifugal chiller (inverter direct-drive)

### Rupafil Textile Mill

<b>Country:</b>	Pakistan
<b>City:</b>	Multan
<b>Total capacity:</b>	550 RT
<b>HVAC:</b>	Centrifugal chiller (inverter direct-drive)





# Reference Projects List

Project	Country	City	HVAC	Cap./ Nos
Plaza Corona Project	Peru	Tumbes	Centrifugal chiller (Inverter direct-drive)+Screw chiller	Total Cooling cap 1200RT, 3nos
Ministry of Foreign Affairs	Chile	Santiago	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 600RT, 2nos
Grand Mercure	Indonesia	Jakarta	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 1200RT, 3nos
Qingyuan City Hospital	China	Qingyuan	Centrifugal chiller(Inverter direct-drive)+Screw chiller	Total Cooling cap 900RT, 2nos
Taoyuan Hospital	China	Taiwan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 500RT, 1nos
Rupafil Textile Mill	Pakistan	Multan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 550RT, 1nos
Coca-Cola Enterprises	China	Taiwan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 500RT, 1nos
Xuzhou Xindu Shopping Mall	China	Xuzhou	Centrifugal chiller(Inverter direct-drive), Water-cooled screw chiller	Total Cooling cap 607RT, 2nos
Shenyang Dispatch Building	China	Shenyang	Centrifugal chiller(Inverter direct-drive+high efficiency), Water-cooled screw chiller	Total Cooling cap 2348RT, 6nos
Lanzhou West Railway Station	China	Lanzhou	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 3000RT, 6nos
Guangzhou Baiyun International Airport	China	Guangzhou	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 37980RT, 30nos
Shanghai Metro	China	Shanghai	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 1850RT, 6nos
Longkou Xiangchi Company	China	Weifang	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 550RT, 1nos
Yihe Runfeng Company	China	Beijing	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 1400RT, 3nos
Midea Global Innovation Center	China	Foshan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 250RT, 1nos
Midea Wuhan Refrigeration Equipment Co., Ltd	China	Wuhan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 400RT, 1nos
Wuhu Meizhi Air Conditioning Equipment Co., Ltd	China	Wuhu	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 350RT, 1nos
Welling Factory	China	Foshan	Centrifugal chiller(Inverter direct-drive)	Total Cooling cap 400RT, 1nos
Indriati Solo Hospital	Indonesia	Thoreau	Centrifugal chiller(High efficiency)	Total Cooling cap 700RT, 1nos
Dalma Mall	UAE	Abu Dhabi	Centrifugal chiller(Super high efficiency)	Total Cooling cap 10000RT, 5nos
Sanliurfa Harran university	Turkey	Sanliurfa	Centrifugal chiller	Total Cooling cap 2900RT, 3nos
The Mixs Mall	Laos	Vientiane	Centrifugal chiller	Total Cooling cap 1300RT, 2nos
Federal Security Service	Russia	Moscow	Centrifugal chiller	Total Cooling cap 4400RT, 5nos
Butovo Mall	Russia	Moscow	Centrifugal chiller	Total Cooling cap 1100RT, 2nos

Project	Country	City	HVAC	Cap./ Nos
Hartono Mall	Indonesia	Djakarta	Centrifugal chiller	Total Cooling cap 9000RT, 9nos
Shenzhou Textile Mills	Vietnam	Ho Chi Minh City	Centrifugal chiller(High efficiency)	Total Cooling cap 8200RT, 10nos
Kangle Liangheng Shopping Mall	China	Linxia	Centrifugal chiller(Inverter)	Total Cooling cap 2000RT, 2nos
Liujiaxia Hotel	China	Tianshui	Centrifugal chiller(Inverter)	Total Cooling cap 1000RT, 2nos
Zaoyang Mixs Mall Investment co., LTD	China	Xiangyang	Centrifugal chiller(Inverter)	Total Cooling cap 1350RT, 2nos
Tianhe Airport	China	Wuhan	Centrifugal chiller(Inverter)	Total Cooling cap 1650RT, 3nos
Guilin Yiwu International Shopping Mall	China	Guilin	Centrifugal chiller(Inverter)	Total Cooling cap 1950RT, 3nos
The People's Hospital of Feng Country	China	Xuzhou	Centrifugal chiller(Inverter)	Total Cooling cap 2000RT, 3nos
The People's Hospital of Shouguang City	China	Shouguang	Centrifugal chiller(Inverter)	Total Cooling cap 1800RT, 3nos
Wuxiang Taihang Hotel	China	Changzhi	Centrifugal chiller(Inverter)	Total Cooling cap 1400RT, 2nos
Mengshan XindaCentral Plaza	China	Wuzhou	Centrifugal chiller(Inverter)	Total Cooling cap 800RT, 2nos
Institute of High Energy Physics	China	Beijing	Centrifugal chiller(High efficiency)	Total Cooling cap 2000RT, 2nos
Shunde Desheng Plaza	China	Foshan	Centrifugal chiller(High efficiency)	Total Cooling cap 1300RT, 1nos
The People's Hospital of Feidong Country	China	Hefei	Centrifugal chiller(High efficiency)	Total Cooling cap 3000RT, 3nos
Chuzhou Suning	China	Chuzhou	Centrifugal chiller(High efficiency)	Total Cooling cap 1600RT, 2nos
Tianhong World Trade Plaza	China	Zhoukou	Centrifugal chiller(High efficiency)	Total Cooling cap 3200RT, 4nos
Wenzhou Transportation International TaoBao Mall	China	Wenzhou	Centrifugal chiller(High efficiency)	Total Cooling cap 3000RT, 3nos
Chongqing Zhaojia Real Estate Development co., LTD	China	Chongqing	Centrifugal chiller(High efficiency)	Total Cooling cap 900RT, 1nos
The Second Hospital of Shanxi Medical College	China	Taiyuan	Centrifugal chiller(Super high efficiency)	Total Cooling cap 2000RT, 2nos
Mingyue Home Furnishing	China	Shijiazhuang	Air-cooled screw chiller(Super high efficiency)	Total Cooling cap 1104RT, 6nos
China Food Headquarters	China	Weifang	Air-cooled screw chiller(Super high efficiency)	Total Cooling cap 3250RT, 23nos
Jianghai Bigui Garden Phoenix Hotel	China	Jiangmen	Water-cooled screw chiller(High efficiency)	Total Cooling cap 600RT, 2nos
Zhongshan Nantou Station	China	Zhongshan	Water-cooled screw chiller(High efficiency)	Total Cooling cap 700RT, 2nos
Shuangyashan Broadcasting and Television Center	China	Shuangyashan	Water-cooled screw chiller(Inverter)	Total Cooling cap 824RT, 2nos
Shenzhen Railway Station	China	Shenzhen	Centrifugal chiller(Oil-free+high efficiency), Water-cooled screw chiller	Total Cooling cap 18525RT, 58nos
Hangzhou South Railway Station	China	Hangzhou	Centrifugal chiller, Air-cooled screw chiller(Inverter+high efficiency)	Total Cooling cap 1578RT, 10nos