CoolRow In-Row Precision Air Conditioner

RIGHT POWER®
The Power Of Continuity

Overview

CoolRow is a kind of In-Row precision air conditioner developed for high-heat-density DCs, modular DC, low-PUE DC, container DC, and Computer roomslocal hot spot reconstruction.

High air return temperature	High energy efficiency ratio	100% sensible heat ratio	Target-specification refrigeration
In-Row installation	Rack style	Rear air return	Front air supply

Air-cooled Type:

CoolRow air-cooled type unit is consist of an IDU and an air-cooled condenser which is used for heat discharge.

Water-cooled Type/ Glycol-cooled Type:

The water-cooled/Glycol-cooled type consist of an IDU and a water-cooled condensing heat exchanger which is used to discharge heat by the cooling water system connected to it.. Water-cooled condensing heat exchangers fall into two types. They are plate heat exchangers and shell & tube heat exchangers, both of them can be installed outside a machinery room precision without leading cooling water into the precision

Remarks: The IDU type and specifications of the CoolRow air-cooled type is the same as that of CoolRow water-cooled type.

Chilled Water Cooled Type:

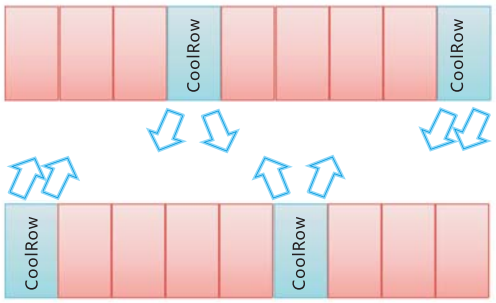
CoolRow chilled-water cool type unit is a kind of terminal unit. Therefore, it must be provided chilled water from water chiller.

Application

Typical Applications and Introductions

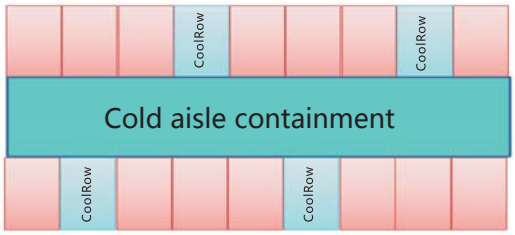
Application I:
Data Center With Cabinets Face-to-Face and Back-to-Back Layout

Face-to-face and back-to-back layout of racks form a hot channel and a cold aisle. Distributed in each row of racks, CoolRow abstracts hot air from the hot channel and then supplies cool air to the cold aisle after cooling the air. The CoolRow installed at the start of the rows forms a wind curtain to preventing the hot air from crossing with cool air. This application features simple layout and easy implementation.



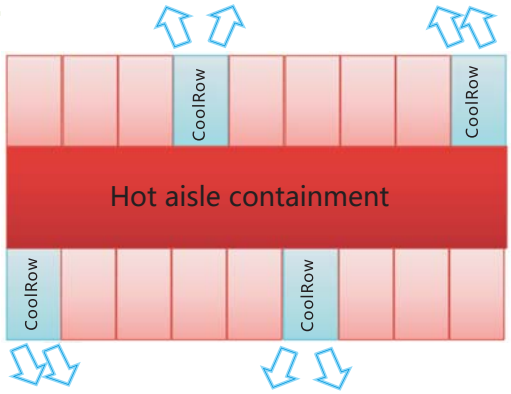
Application II:
Data Centers With Cold Aisle Containment

When CoolRow is installed in each row of racks placed face-to-face and back-to-back, a special structure is used to seal the space at the front (inlet side) of cabinets so that CoolRow abstracts hot air from the hot channel and supplies cool air to the closed space to form a cold aisle. Since the cool space is isolated from the hot space physically, CoolRow does not need to be installed at the start of a row. Even distribution of CoolRow in the rows helps optimize returned air distribution. This application mode enables cooling capacity to be fully used by equipment and it can avoids loss of the cooling capacity without additional refrigeration for Computer rooms. With the features of high efficiency and energy saving, this mode is one of the most popular applications currently.



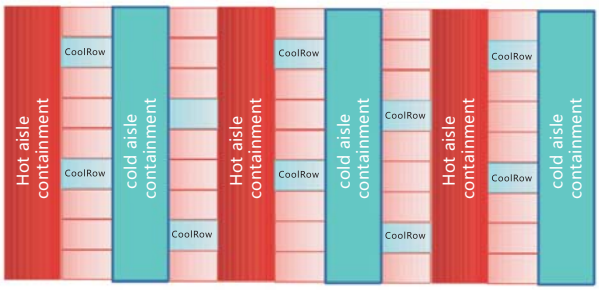
Application III:
Data Center With Hot Aisle Containment

When CoolRow is installed in each row of racks placed face-to-face and back-to-back, a special structure is used to seal the space at the rear (outlet side) of cabinets so that CoolRow abstracts hot air from the closed hot channel and supplies cool air outwards. Since the cool space is isolated from the hot space physically, CoolRow does not need to be installed at the start of a row. Even distribution of CoolRow in the rows helps optimize organization of supplied air flow.



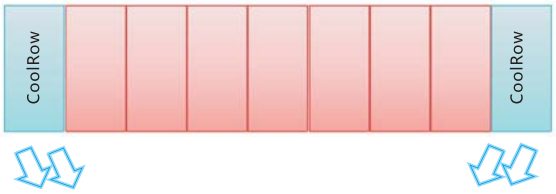
Application IV:
Data Center With Hot Aisle Containment & Cold Aisle Containment

This application mode combines the features of scenario 2 and scenario 3, and a special structure is used to seal the front and the rear of cabinetsrespectivelyto form a cold aisle containment and a hot aisle containment. By this, a fully-closed DC is formed. This application mode enables not only cooling capacity to be fully used but also EER to be improved, and it is one of the most effective applications.



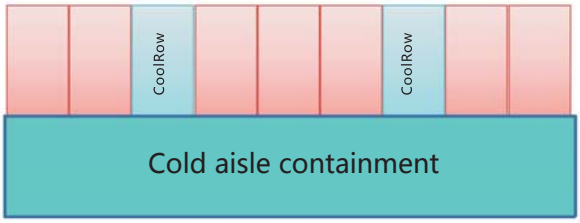
Application V:
Data Center With Single-Row Cabinets

For a small- or medium-size DC containing only one single row of cabinets, CoolRow should be preferentially installed at the start of the row to form a wind curtain that avoids the hot air from crossing with cool air. This application mode features simple layout and easy implementation, and it applies to running DCs that need capacity expansion and hotspot reconstruction.



Application VI:
Data Center With Single Row Cabinet and a Cold Aisle Containment

When CoolRow is installed according to scenario 5, a special structure is used to seal the front space of cabinets to form a cold aisle containment and isolate the cool space from the hot space physically to maximize utilization rate of the cooling capacity. CoolRow can be installed between cabinets without worries about the wind curtain problem. Coolrows' Even air distribution among rows or close installation to high-temperature cabinets helps optimize the returned air distribution condition. When CoolRow is installed according to scenario 5, a special structure is used to seal the front space of cabinets to form a cold aisle containment and isolate the cool space from the hot space physically to maximize utilization rate of the cooling capacity. CoolRow can be installed between cabinets without worries about the wind curtain problem. Coolrows' Even air distribution among rows or close installation to high-temperature cabinets helps optimize the returned air distribution condition.



There are still many other applications for CoolRow units, and they will not be described herein one by one since the limited space.

Excellent Performance

High Reliability

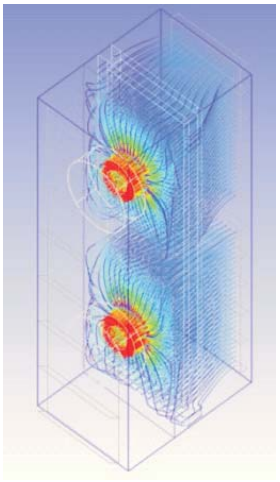
Main parts are provided by top-level suppliers in the air conditioning field. Each unit undergoes strict running test before delivery. Running time of main parts is recorded, and a warning is given if maintenance time is up. Automatic diagnosis function is provided to quicken troubleshooting.

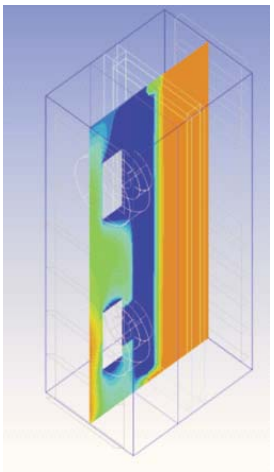
Excellent Energy Efficiency Performance

In-Row installation, target-specific refrigeration, and horizontal air return and supply. short air circulation loop with high efficiency. CoolRow can handle high-temperature returned air, so the EER is improved significantly. The SHR reaches 100%, which matches equipment in fully sensible heat state. Air flow distribution in the equipment is optimized to prevent air flow crossing and ensure high efficiency. Compared with traditional air conditioners, the EER of CoolRow is improved by more than 20%.

Refrigeration As Per Load Demands

CoolRow can be connected to up to 16 temperature sensors to collect important temperature datas of equipment cabinets.Basing on the datas collected, CoolRow can calculate out the cooling capacity requirement precisely.Cooling capacity output can be adjusted in the range from 20% to 100% to match heating capacity of loads.





CFD Analysis Chart on Air Flow and Temperature Field within the Equipment Cabinet

Optimal Components

Advanced Controller

- Load following technology, flexibly output refrigeration capacity
- Externally connect 16 remote temperature sensors and exactly sense the temperature field change
- Standard configure RS485 intelligent communication port and seamlessly access to the remote monitoring
- Configure with external customized alarm interface and link with fire alarm and other important alarms.

Large Touchscreen Displayer

- 7-inch HD super-large touchscreen displayer
- Exquisite pictures and texts that how various kinds of information
- Temperature & humidity curves
- Super-large information storage
- (Optional) 3-inch button-operated LCD

Elegant Structure And Easy Installation Design

- Two sets of connectors are reserved for top piping or bottom piping.
- Piping way can be changed at the job site.
- Horizontal support column are provided to facilitate levelness adjustment on site.
- Unit length is consistent with common cabinet length (1100 mm), which facilitates installation and ensures consistency.

Optimal-efficiency Running Design:

- Fans run at optimal efficiency, instead of the highest speed.
- Both efficiency and redundancy can be ensured at the same time.

High-efficient Fan

- Full-coverage fan layout Inlets and outlets cover the entire vertical surface.
- Airflow is even and omni-directional.
- Hot swapping design and easy maintenance

Varied Air Supply Modes

- CS model adopts front air supply mode, suitable for cold aisles containment.
- Guide grilles can be configured at the job site to adjust air supply directions.
- Multiple groups of guide grilles can implement different air supply mode at the same time.

Product Features

(Air-cooled type, Water-cooled type, Glycol-cooled type)

Fully-deployed Evaporator

The evaporator is fully deployed from upper to lower and from left to right, so it covers a large area.
Uniform air distribution and high heat exchange efficiency.
The evaporator is designed in two sections with a two-section condensing water gathering system, so that the "water blowing" problem can be effectively avoid.

Efficient Compressor

The compressor adopts R410A refrigerant which does no harm to the ozonosphere and nor increases the greenhouse effect, and boasts a high cooling efficiency.
The scroll compressors are provided by first-class suppliers and it can achieve a good balance between reliability and EER.

High Accuracy Expansion Valve

The mechanical typeTXV are provided by first-class suppliers and controls refrigerant flow by automatically adjusting the opening degree baseing on thermal balance state of the refrigeration system.
(Optional) The EXV features high control precision, optimal adjustment performance, and high efficiency.

Technical Parameters

CR***EA/W	025	035	012	025	035	060
Air supply mode	The default mode is rear air return and front air supply. A direction-adjustable guiding plate can be configured on site to implement other air supply modes, including front air supply, leftward air supply, rightward air supply, bilateral air supply.					
Air volume (m3/h)	5000	8200	2500	5000	8200	11000
Total cooling capacity (kW)	25.0	38.1	12.5	25.0	38.1	60.0
Sensible cooling capacity (kW)	25.0	38.1	12.5	25.0	38.1	60.0
Refrigerant type	R410A environmentally-friendly refrigerant					
Compressor type	Hermetic scroll fixed speed compressor		Totally enclosed scroll EC compressor			
Expansion valve type	Mechanical thermostatic expansion valve		Electronic expansion valve			
Fan type	Directly connected EC draught fan					
Air filter	G4 filter					
Power supply	380V/50Hz 3N~					
FLA (A) (Cooling only)	23.8	27.9	12.8	23.8	27.9	36.7
FLA (A) (constant temperature & humidity)	28.3	37	17.3	28.3	37	45.8
Optional heating capacity (kW)	3	6	3	3	6	6
Optional humidification capacity (kg/h)	2	2	1	2	2	2
Humidifier water inlet(only for humidification)	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"
Condensing water drainage pipe (mm)	20	20	20	20	20	20
Refrigerant gas pipe (mm)	19	22	12.7	19	22	25
Refrigerant liquid pipe (mm)	16	19	9.52	16	19	19
Unit weight (kg)	310	400	190	290	380	450
Dimensions Width x Depth x Height (mm)	300×1100×2000	600×1100×2000	300×1000×2000	300×1100×2000	600×1100×2000	600×1100×2200

Remarks:

1. Testing conditions: the air return temperature is 37 degrees; the relative humidity is 24%; the condensing temperature for air-cooled/ water-cooled/ glycol-cooled type is 45 degrees.

2. FLA indicates the maximum current of a unit in standard configuration condition, and this value don not include the current of air-cooled ODUs and itis used to select units power supply specification.

3. Please contact us for any unlisted data in this data sheet.

4. The height, depth and special functions of CoolRow series can be customized according to different demands, and please contact us for details.

Product Features

(Air-cooled Outdoor Condenser)

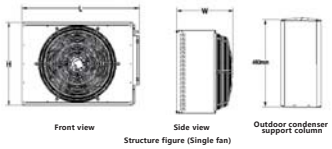
Special Design For R410A Refrigerant

With marine-grade inoxidizable aluminum-alloy structural part, metal-blade fan and stainless steel connection, the condenser boasts high adaptability, high reliability, and long working life.

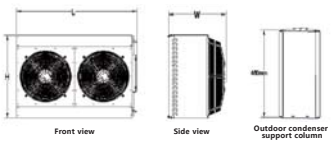
With inverter stepless regulation technology, the condenser changes its fan speed according to the condensing pressure. Compared with traditional condensers, this condenser has energy saved and noise reduced, this kind of condenser can save more energy and reduce more noise. Attaching with a installation foot, it can be installed horizontally or vertically.

Technical Parameters

Standard Model	ASC16-A	ACS32-A	ACS42-A	ACS50-A	ACS60-A	ACS72-A	ACS80-A	ACS90-A	ACS99-A
Quantity of draught fans (set)	2	1	1	1	1	2	2	2	2
Power supply to the unit	220V/50Hz ~	380V/50Hz 3~							
Specification of refrigerant pipe joint	Φ12.7/Φ9.52	Φ22/Φ16		Φ28/Φ22		Φ28/Φ22		Φ28/Φ22	
Weight kg	65	120	128	136	152	168	168	226	245
Unit size-L (mm)	755	1360	1360	1560		1860		2360	
Unit size-W(mm)	420	655	661	661		655		661	
Unit size-H (mm)	1198	968	968	1273		1273		1273	



Structure figure (Single fan)



Structure figure (Dual fans)

Remarks:

1. Horizontal installation or vertical installation can be adopted for outdoor condenser.
2. The support column used for horizontal installation are attached when delivery, and the height is 450mm.
3. Please contact us for any unlisted data in this data sheet.

Product Features

(Chilled water cool type)

Fully-deployed Evaporator

The heat exchanger fully covers the cross-sectional area of a rack.
With air flow evenly distributed, the heat exchanger has high heat exchange efficiency.
The evaporator is designed in two sections with a two-section condensing water gathering system, so that the "water blowing" problem can be effectively avoid.

Electric Water Flow Valve

The electric two-way water flow valve is provided by first-class suppliers, featuring high regulating precision and high reliability. There is also electric three-way valve for option.

Technical Parameters

CR***EC	025	045	060	025 (Height Rise Type-Ⅰ)	(Height Rise Type-Ⅱ)
Air supply mode	Front air supply & Rear air return; Air deflector can be configurable to realize multiple air supply and return modes.				
Cooling capacity when water inlet/outlet temp is 7℃ /12℃(kW)	38.9	50.4	70.1	/	
Cooling capacity when water inlet/outlet temp is 10℃ /15℃(kW)	34.6	44.4	62.4	37.8	
Cooling capacity when water inlet/outlet temp is 13℃ /18℃(kW)	30.3	38.8	54.5	32.6	
Air circulation volume (m3/h)	5000	7000	11000	5200	/
Water valve type	Configure two-way valve, with three-way valve optional				40.3
Fan type	Directly connected EC fan				34.6
Air filter	G4 filter				5400
Power supply		380V/50Hz 3N~		220V/50Hz ~	
Power distribution parameter FLA (A) (single cold)	6.1	3.4	5.1	6.1	6.1
FLA (A)(Cooling only)	19.7	12.5	14.2	19.7	19.7
Optional heating amount (kW)	3	6	6	3	3
Optional humidification amount (kg/h)	2	2	2	2	2
Humidifier water inlet	G1/2	G1/2	G1/2	G1/2	G1/2
Drain pipe of condensate water (mm)	20	20	20	20	20
Water inlet and outlet pipe of chilled water (in)	1 1/4	1 1/4	1 1/2	1 1/4	1 1/4
Unit size Width x Depth x Height (mm)	300×1100×2000	600×1100×2000	600×1100×2000	300×1200×2200	300×1200×2500

Remarks:

1. Testing conditions: the temperature of return air is 37 ; the relative humidity is 24%.
2. The maximum current adopted when the unit is under the standard configuration is used for the power supply.
3. The standard configuration of the chilled water unit contains two-way water flow regulating valve, and the electric three-way valve is also configurable
4. The height, depth and special functions of CoolRow series can be customized according to different demands, and please contact us for details.