



# YMAE Series Air-Cooled Full DC Inverter Modular Chiller and Heat Pump



The power behind **your mission**



# Real comfort and true peace of mind

When you choose YORK®, you know you've chosen the very best. Our high-performance chillers and heat pumps are equipped with advanced, intelligent controls. Paired with the correct terminal devices, a unique water ecosystem is created. You can adjust the operation of each component, which allows customers to enjoy a comfortable life.



Airside



IWE  
Thermostat



SC-EQ

The YORK YMAE Series is the result of our extensive experience in designing and producing high-performance modular chillers. Featuring several patented designs, YMAE performance meets and exceeds energy-use standards. The units are also flexible in their application. They can be used in office buildings, hotels and restaurants – among others – to help customers drive down their operational costs through sustainable energy savings.



## Innovative design

With patented technology, this unit is designed for ultra-high performance.



## Robust reliability

Designed with intelligent defrost and anti-freeze functionalities, these units don't fear the cold or heat.



## Amazing flexibility

The smart, compact design makes for easy installation and integration with other systems.



## Intelligent controls

With its upgraded smart control system and integrated design, operation is a breeze.



## Quality quiet comfort

Unique variable evaporation temperature design supplies relaxing comfort experiences.





# Innovative design

Smart thinking drives high performance



## Capacity control patent

This technology controls each module or system based on the optimal energy efficiency-based principle. Each module operates at its highest energy efficiency to deliver optimized system-level efficiency.

\* China patent type - Innovation patent.  
Patent code: 201710151811.5



## Fan control algorithm

The fan control method effectively protects the normal operation of the compressor and improves system operating efficiency.

\* China patent type - Innovation patent.  
Patent code: 201310068696.7



## Air-cooled heat pump defrost algorithm patent

The unit accurately controls the timing of defrosting, avoids the problem of poor heating or large indoor temperature fluctuations and improves comfort and system energy efficiency.

\* China patent type - Innovation patent.  
Patent code: 201310088762.7



## Wired controller ID patent

The design is streamlined with a user-friendly interface that powers easy operation.

\* China patent type - ID patent.  
Patent code: 201430546738.9



## DC overcurrent protection and overcurrent control circuit for DC variable frequency driver

This provides DC variable frequency overcurrent protection, which can meet overcurrent protection for both driver power module and motor.

\* China patent type - Innovation patent.  
Patent code: 201410491960.2

## Excellent performance

The YMAE series full DC inverter air-cooled chiller innovatively adopts the system design of full inverter, and the unit obtains high efficiency performance. The integrated part-load performance coefficient IPLV is as high as 4.82, which is much higher than the national energy-efficiency standard, leading the industry in performance and providing customers with more energy-saving solutions.



## DC Inverter EVI Scroll Compressor

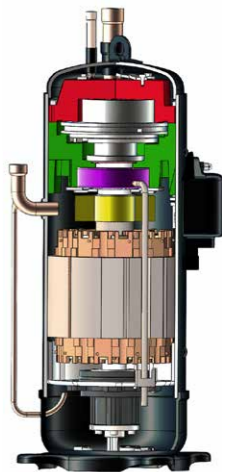
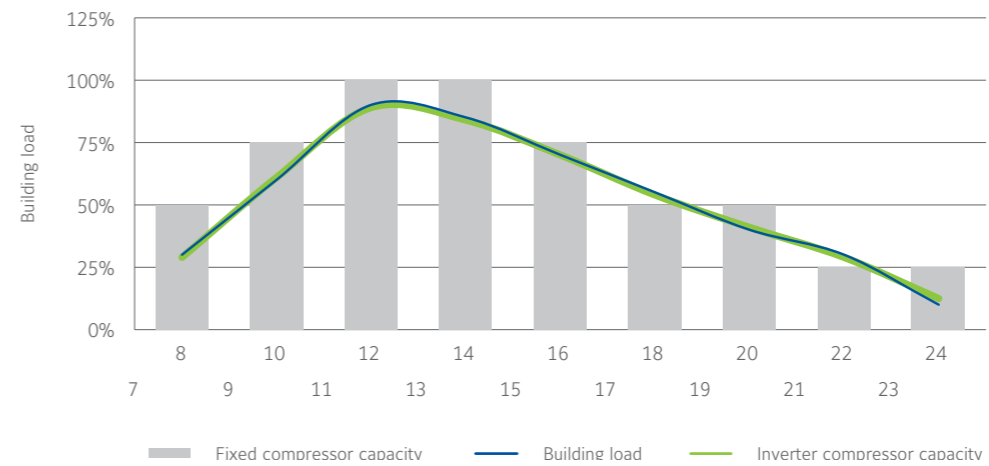
**New asymmetric wrap:** Optimized design reduces leakages and invalid suction superheating.

**Non-contact seal design:** Oil-film seal forms by lubricating oil to reduce friction for higher efficiency and reliability.

**Relief valve:** More adaptive to variable pressure conditions to provide higher part-load efficiencies.

**Enhanced Vapor Injection (EVI) technology:** significantly extends compressor operation map and increases efficiency.

**DC inverter technology:** delivers stepless capacity control for precise capacity matching to meet building-load variations and to reduce unit power input.



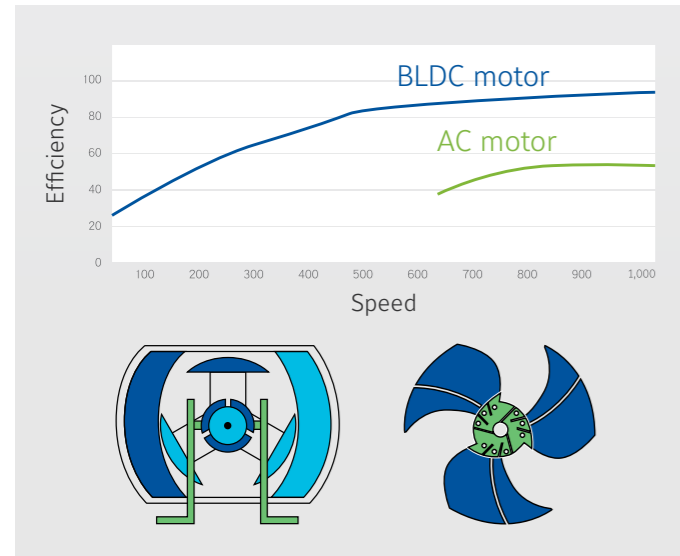
## YORK Inverter Driver - the brains of the operation

The YORK Inverter Driver is engineered to meet the challenging performance demands of the YMAE chiller. The solution smartly manages inverter system operation to boost chiller efficiency. This ultimately results in serious energy savings for you and the customer.



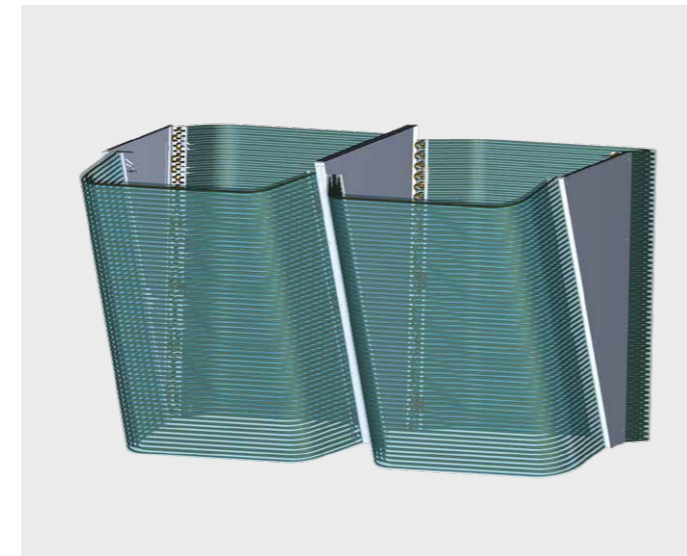
## BLDC Fan

The fan blades have been aerodynamically optimized for streamlined style that delivers extraordinarily low operating sound. This means minimal disturbances for the people in your spaces. The high-efficiency, electronically commutated DC brushless BLDC motor regulates the fan using a stepless speed method. The fan blades and motor align perfectly to deliver great low-energy consumption.



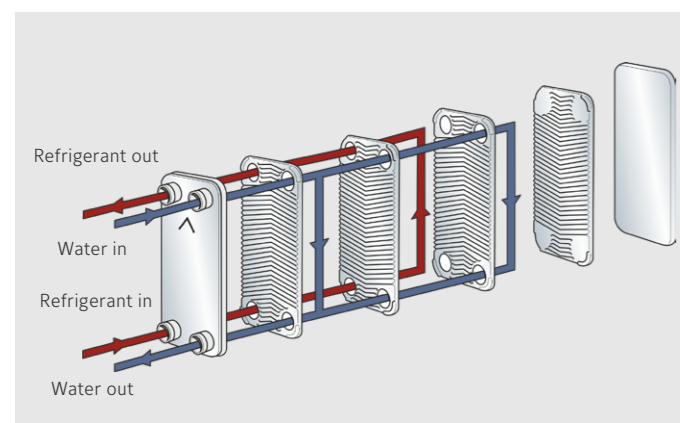
## High-efficiency U-shaped heat exchanger

The wind-side heat exchanger has an innovative U-shaped heat exchanger coil, with multi-faceted heat exchange and optimized wind field design. The new hydropilic aluminum foil fins with 7mm inner threaded copper tubes have strong corrosion resistance, low airflow resistance, fuller heat exchange and improved exchange efficiency.



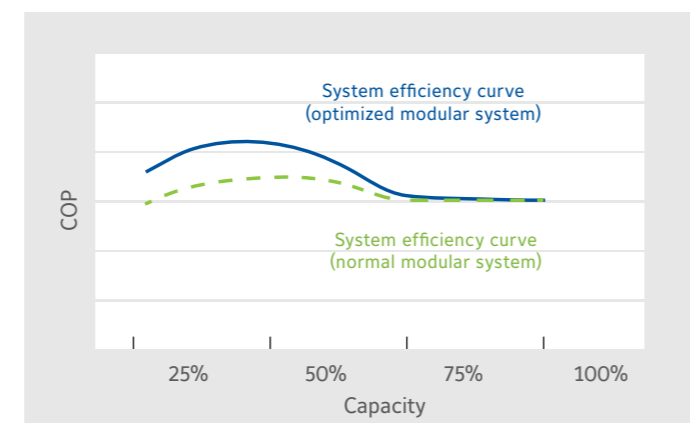
## Brazed Plate Heat Exchanger (BPHE)

A stainless steel high-efficiency BPHE ensures optimum heat-transfer efficiency. This technology provides superior performance and a longer lifecycle. In addition, the cross-and-counter flow design supplies water to the refrigerant circuit for full heat transfer with each refrigerant system. This maximizes chiller efficiency, especially under part-load operation.



## Real-time system efficiency optimization

Advanced control algorithms from YORK ensure your chiller system dynamically adapts to building load changes and tunes each individual unit to keep it running at its optimal efficiency. This results in increased system efficiency by 14-20 percent compared to the normal fixed-speed modular system.



# Robust reliability

## Standard Defrost Logic

### Pre-defrosting technology

With the unique pre-defrost technology, the heat exchanger always maintains a medium temperature during heating operation. This ensures the bottom of the unit will not be troubled by frosting in winter and the bottom heat exchanger will not freeze when snow melts. This provides stable operation of heating in winter and continuous hot water for indoor use.



### Intelligent defrost

Multiple defrosting features optimize the sequencing of the defrost cycle to address problems such as non-frosting and endless defrosting. It can intelligently choose a defrost time based on the change in the unit's pressure and temperature.

### Manual defrost

Manual defrost is also available for YMAE. When a thick layer of frost is formed because of high ambient humidity or an ice layer is formed under severe low temperatures, the manual defrost function can be executed to completely remove the frost or ice layer.



## Upgraded defrost technology

### Non-stop defrosting during heating operation

The YMAE can defrost and heat simultaneously without shutting down, giving you flexible functionality without the downtime. When multiple modules are operating, the defrosting of a single unit doesn't impact the heating operation of the other modules.

# Intelligent anti-freezing

## Summer operation

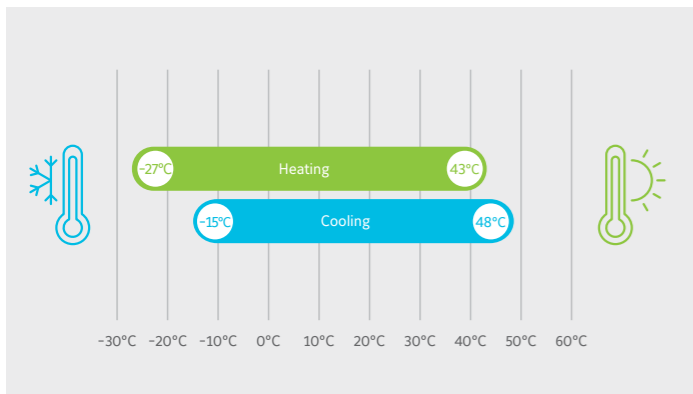
The YMAE features an automatic anti-freezing function. This works as the unit will stop running when the return water temperature is lower than set value. When water temperature reaches the set value, the unit automatically resumes operation.

## Tested reliability

YORK tests all its solutions in its Highly Accelerated Life Test (HALT) lab. The YMAE Series has been tested in the HALT lab because it simulates the extremely harsh weather conditions our units will encounter. The climate conditions units will face over the course of a year are replicated during a two- to four-week test to guarantee our solutions operate reliably in the field.

## Wide operating range

YMAE has a wide operating range for full-year operation.  
 Cooling: operating ambient temperature from -15°C to 48°C for superior cooling performance.  
 Heating: operating ambient temperature from -27°C to 43°C for stable heating performance that caters to different customer requirements.



- Notes:
- Consult local agency for OAT below -25°C

## Winter operation

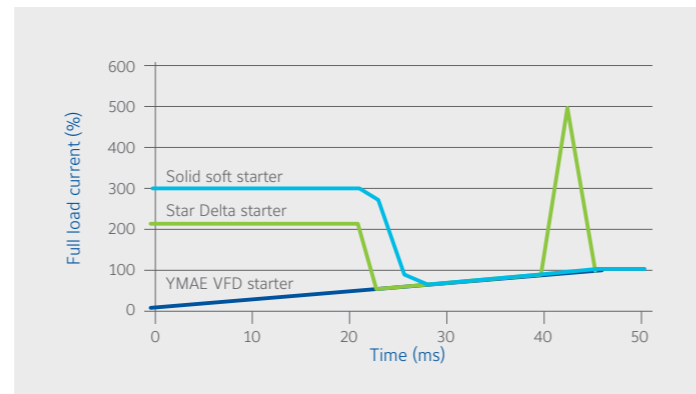
**Step 1**  
 Automatically start the circulating pump by detecting ambient and water temperature. This helps prevent the water pipes from freezing.

**Step 2**  
 If the water temperature does not reach set temperature after the circulating pump is activated, the compressor will automatically start the heating operation until water temperature reaches the set point.



## Low inrush current

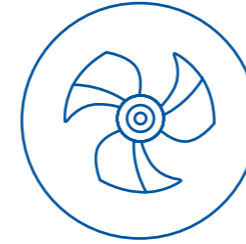
The inverter compressor has a low start-up current - in fact, the maximum start-up current is smaller than the nominal current. This avoids shock to motors and drives from sudden current surges during start-up and enables a smaller transformer capacity and extended chiller lifecycle.



# Premium components

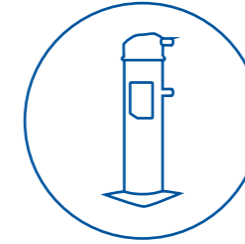
## Customized fan assembly

Optimized fan kit with BLDC motor - high reliability guaranteed.



## High-efficiency inverter scroll compressor (R-410A)

Optimize internal oil circulation to lower rate (OCR) and enjoy enhanced chiller reliability with dynamic oil-balance system.



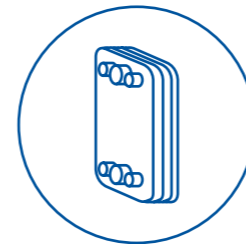
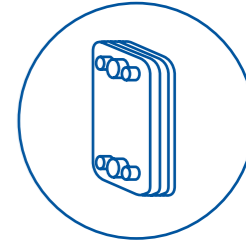
## Airside heat exchanger

Standard hydrophilic aluminum plate fin with 7mm internally threaded copper tube ensures strong resistance to oxidation and corrosion.



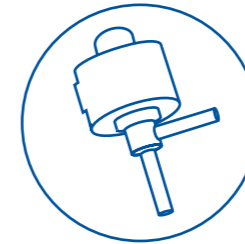
## High-efficiency brazed plate

Stainless steel construction with asymmetrical channel distribution brings reduced waterside pressure drop and excellent anti-freeze capability.



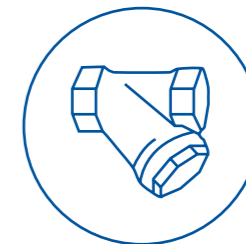
## Economizer - BPHE

Economizer system with electronic expansion device permits a considerable increase in cooling capacity by lowering sub-cooling temperatures and contributes to optimized chiller efficiency.



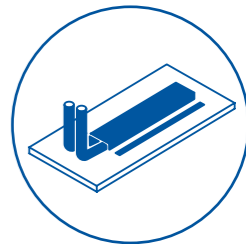
## Electronic expansion valve

The high-precision electronic expansion valve intelligently and adaptively regulates the refrigerant flow to ensure the system operates with optimal pressure and temperature.



## Water filter and flow switch

- Standard water filter to protect unit from blockage by preventing large particles from entering
- Water flow switch eliminates risk of freezing and cracking caused by low unit water flow



## Frequency-driven, liquid-cooled

- YMAE140X unique inverter-driven liquid cooling to improve efficiency
- Low internal temperature of power devices
- Guaranteed reliability of the inverter
- Ensures normal air conditioning unit operation in harsh environments



# Amazing flexibility

## Compact design, easy transportation

The YMAE uses our patented compact cabinet design to provide a small footprint. This means it can be directly transported and installed by cargo elevator to meet high-rise building installation requirements.



## Easy commissioning

Our unit's wide leaving-water temperature range in heating mode allows for a unit commissioning schedule free from the constraints of cold weather that is out of a traditional chiller's operating range.



## Abundant options, more applications

Integrated hydraulic kits and expansion tanks are available to fit with the YMAE. These save installation space, time and cost. An SC-EQUIP board can support BAC protocol and communication intermediate relay kits as an SQ offering can extend the number of maximum air terminal device connections to 64 units.



## Variable primary flow

The YMAE Series supports variable frequency pump operation, which increases the energy efficiency of the unit.

## Networked IWE Thermostat

Our unit features an RS485 interface, which means the host switch can be controlled via the networked IWE Thermostat. Up to 64 thermostats can be connected to this system.

## Modular design means you can customize your setup

The YMAE Series allows up to 32 units to be connected to form one system. This and the wide system capacity range (45-4320kW) makes the YMAE Series the ideal solution for multiple-phase investment.

Notes:

- Internal hydraulic kits are available
- Please be aware of the pressure head difference when different models are combined as one system



## Easy installation

YMAE045/065X units offer external static pressure up to 80Pa to effectively make up for wind-pressure losses and to avoid air short circuits. This makes the YMAE Series the ideal choice for those with constrained layouts (louvers, for example) and for high-rise residential buildings needing typhoon resistance.

80Pa





# Intelligent controls

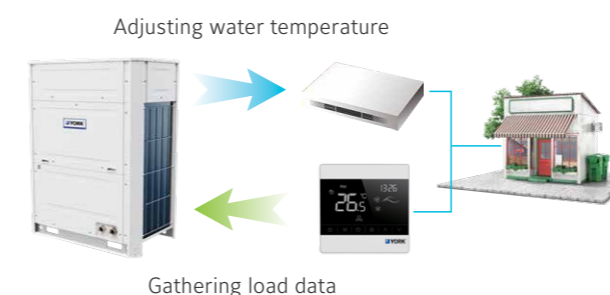
- The YMAE Series is equipped with an exclusive integrated control system from YORK that empowers free control communication between IWE Thermostat (eg: T8620) and the chiller. With one simple touch on the T8620, users can quickly set chiller operation mode and status without any other chiller controller. This all makes for easy wiring and convenient control for customers
- Our full inverter control system is equipped with a multiple linkage function. This means the product will optimize water system operation in line with the customer's usage to guarantee the best performance
- YMAE units can connect two central controllers simultaneously to meet the control requirements of separate management groups
- The YMAE Series can support functions such as remote on-off, remote heating-cooling switch, interlocking with a terminal thermostat switch and remote alarming
- The units have an RS-485 interface, which supports MODBUS/BACnet protocols for easy connection to the building automation system (BAS)
- Two touchscreen controllers are provided for customers to choose from:
  - Standard wired controller: The controller is compact and beautiful with a user-friendly LCD touchscreen. It can be connected to up to 16 units. The range of the air conditioning system's cooling capacity can be expanded to 2,160 kW
  - Optiview LT controller: The 7in. color touchscreen can display more parameters than a standard controller. The multilevel user permission setup ensures the safe operation of the air conditioning system. The controller supports software upgrade via a USB, making it easy to maintain. It can be connected to up to 32 units and the range of the air conditioning system's cooling capacity can be expanded to 4,320kW
- The customer can set a time (day or week, except for holidays) to have the units automatically switched on or off



# Smart control platform

## Sensitive

The highly sensitive IWE Thermostat closely monitors the actual and target temperatures of every room, instantly communicating requirements and load changes to the system and gathering data on usage requirements over time.



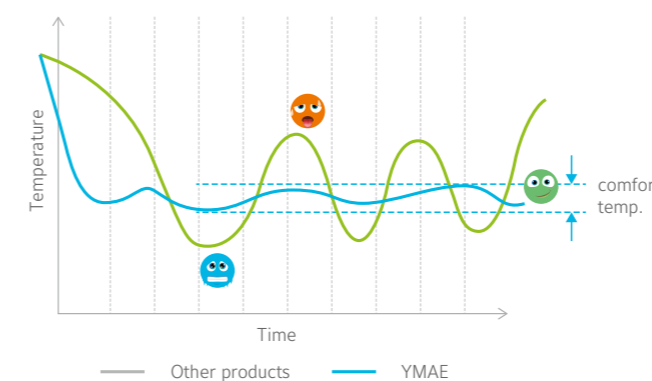
## Manageable

Our YORK smart control system makes everything easy for you to manage. Fan coil cooling and heating, as well as underfloor heating, can be controlled directly through the thermostat, while a single switch allows instant activation of the air conditioning system. In addition, indoor and outdoor units can be controlled as one using our Building Automation System (BAS), giving you convenient management of your smart building.



## Adaptable

The YORK smart system adaptively adjusts the water temperature, compressor and water pump running state in accordance with indoor and outdoor load changes. The results include more comfortable temperatures and humidity levels as well as annual operating costs that can be reduced by up to 18 percent.



## Reliable

Enjoy peace of mind with our proven reliability. YMAE offers an automatic exhaust system as well as a debugging mode, which uses operational data to detect, diagnose and manage faults. This minimizes downtime and increases the stability of your system's operation.

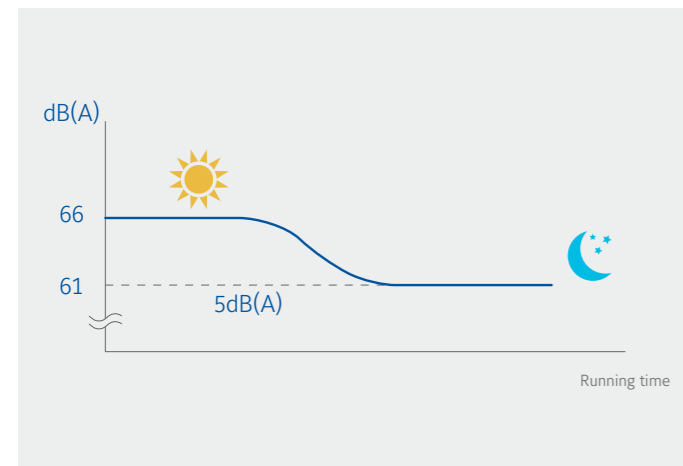
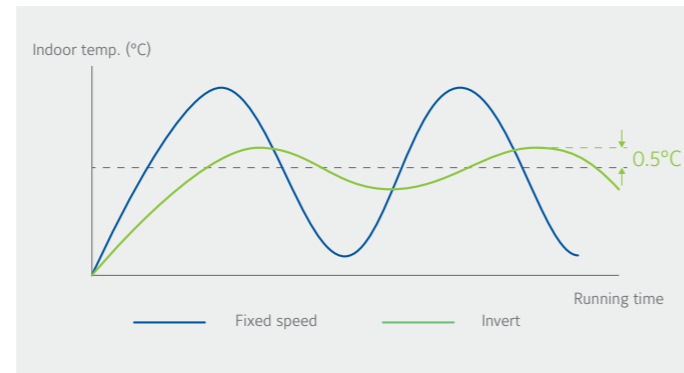
## Transformative

YMAE supports open combinations with other modular chiller products. It can combine with YCAE-X, YMAA and YMPA units to provide more choice and flexibility for customers.

# Quality, quiet comfort

## Comfortable environments

The unique variable evaporating temperature control of the YMAE allows for an auto-adaptive temperature control range between 5–20°C in cooling mode. The inverter system supplies part-load chiller operations with a higher evaporating temperature under off-design conditions, which can maintain moderate humidity to reduce the symptoms of respiratory system discomfort and dry skin. Precise temperature control provides stable indoor air temperatures with less fluctuations for superior comfort.



## Low sound operation

- The inverter technology used for the compressor and fan motors significantly minimize noise levels at part-load operation and ensures quiet operation all day.
- When selecting Silent Mode, unit control precisely limits the cooling capacity within pre-defined values for lower noise levels. This was achieved by reducing the inverter frequency of the compressor and fan motors.

## Ideal across a range of verticals

YMAE Series units are extremely adaptable and can be used in a range of applications. From hotels to offices, and from shopping malls to data centers, the YMAE fits the bill. One of the things that makes the YMAE so suitable is its wide operation range. In cooling mode, the lowest

leaving-water temperature is down to -10°C, making it ideal for process cooling applications. Alternatively, while heating, the highest hot water leaving temperature can go up to 60°C; perfect for different air terminal devices.



Shops



Hotels



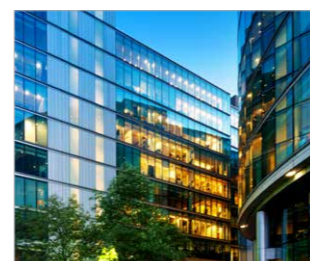
Process cooling



Hospitals

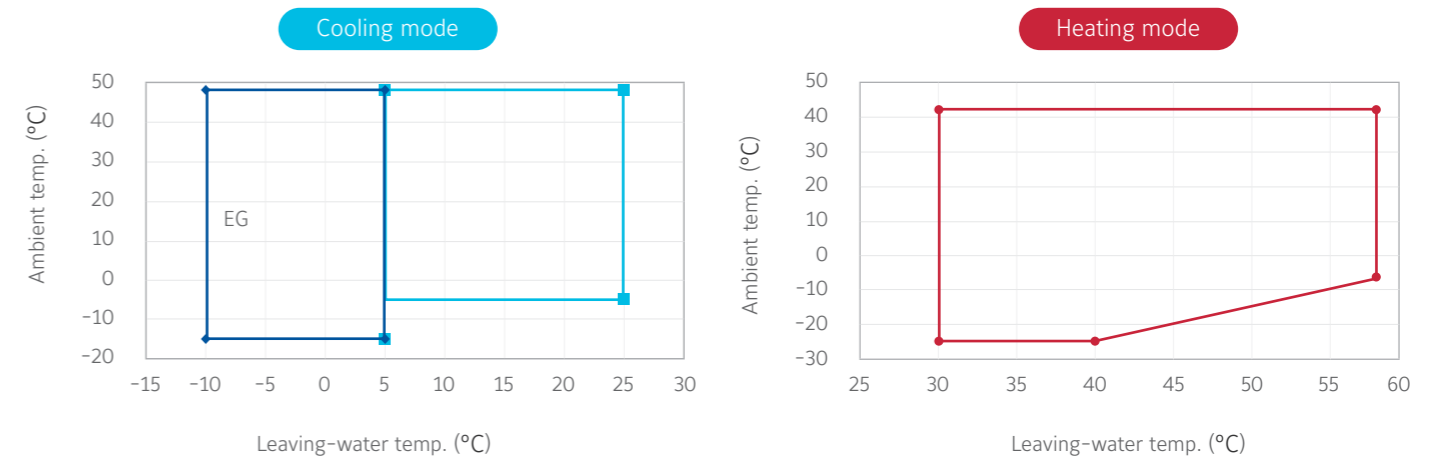


Museums

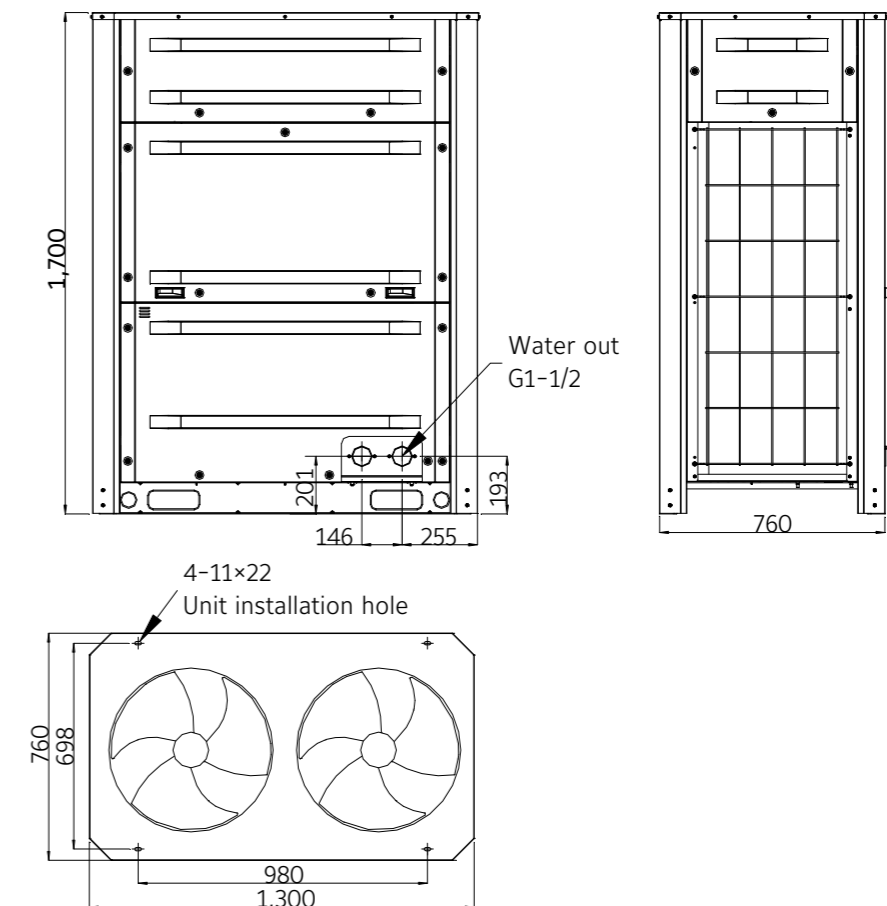


Offices

## YMAE045X operating range

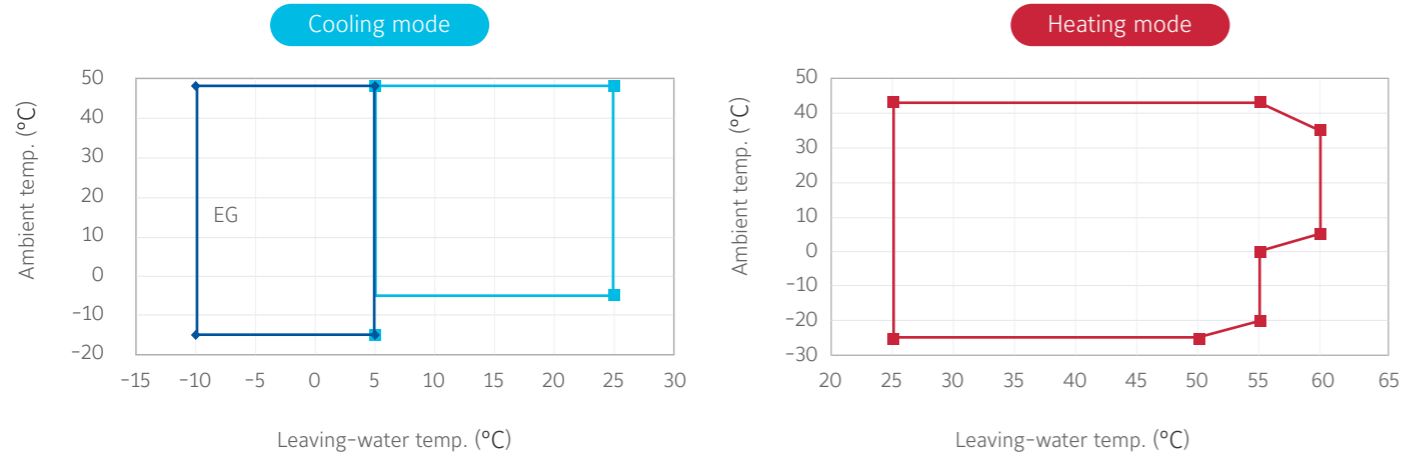


## YMAE045X

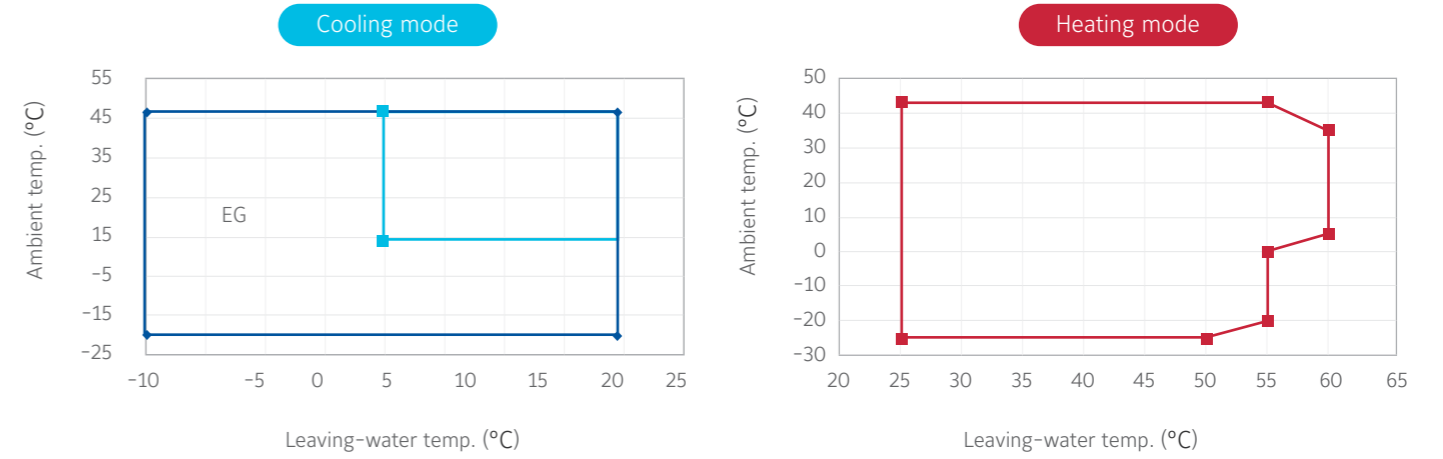




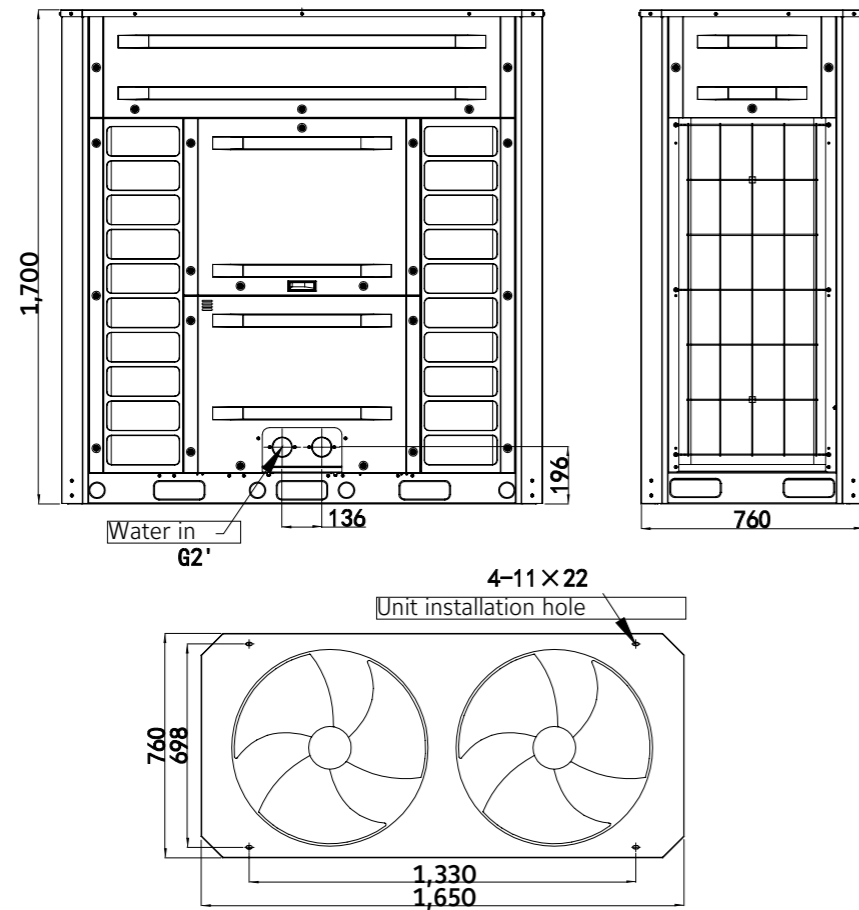
# YMAE065X operating range



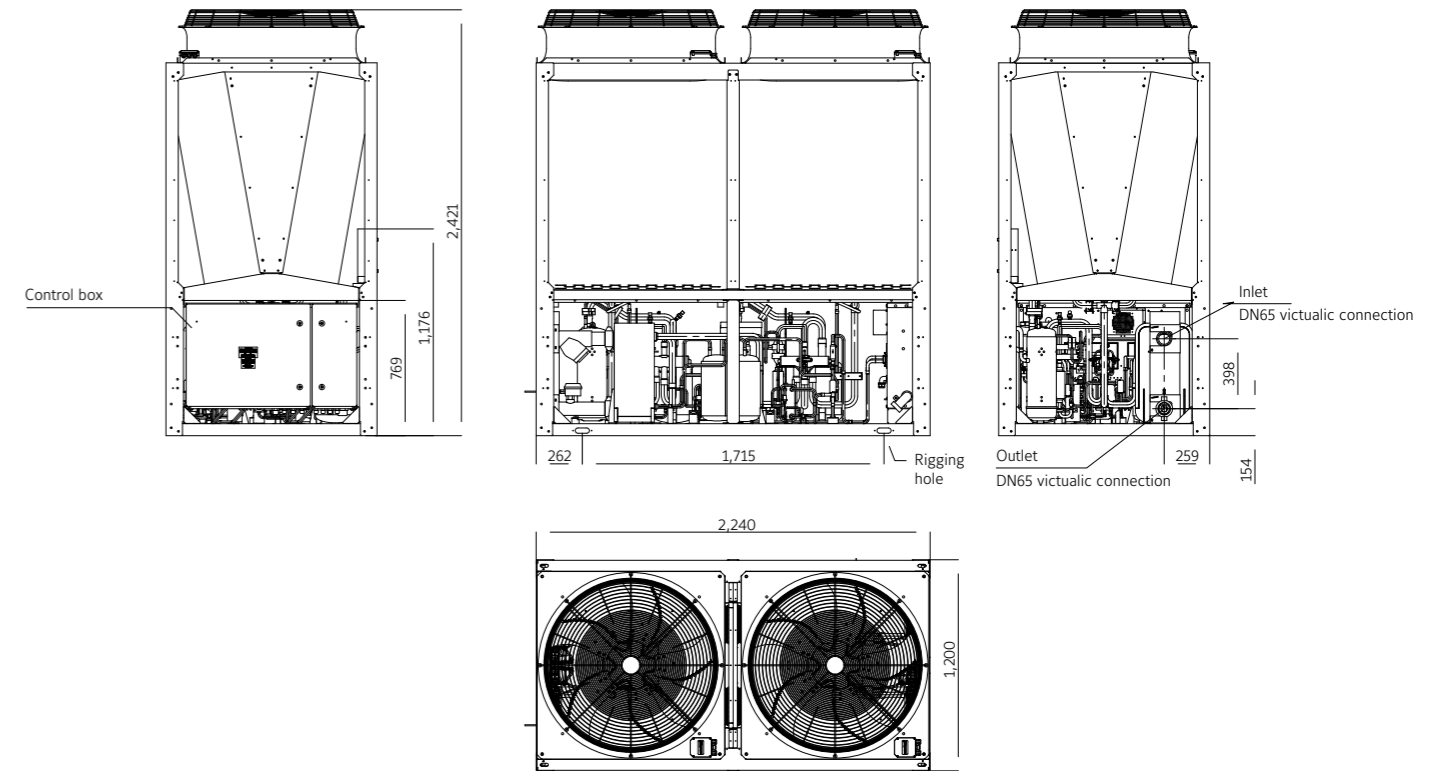
# YMAE140X operating range



YMAE065X

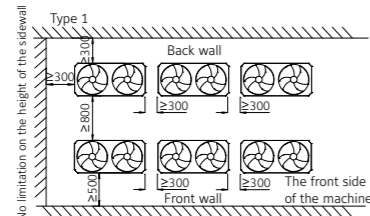
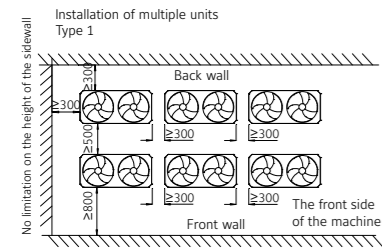


YMAE140X

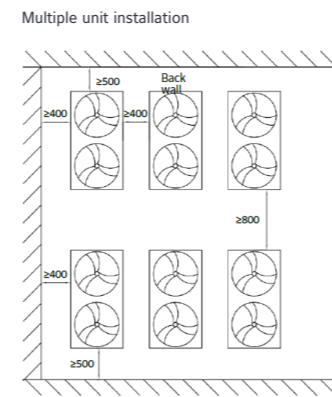
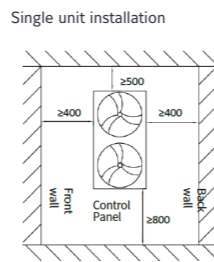


# Installation

## YMAE045/065X

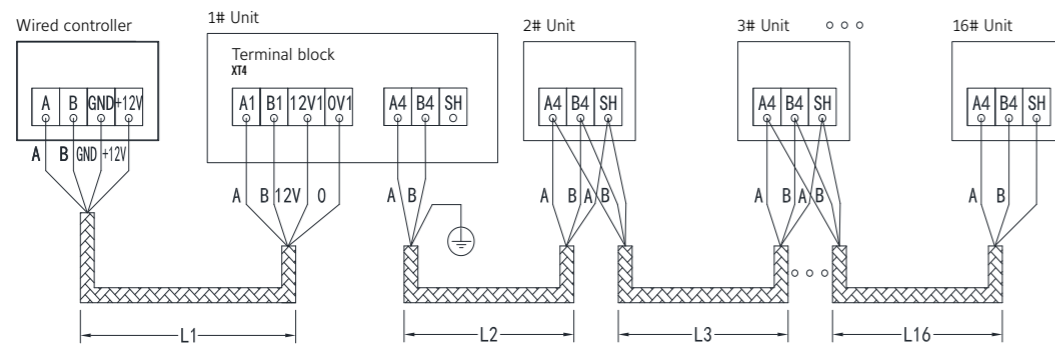


## YMAE140X

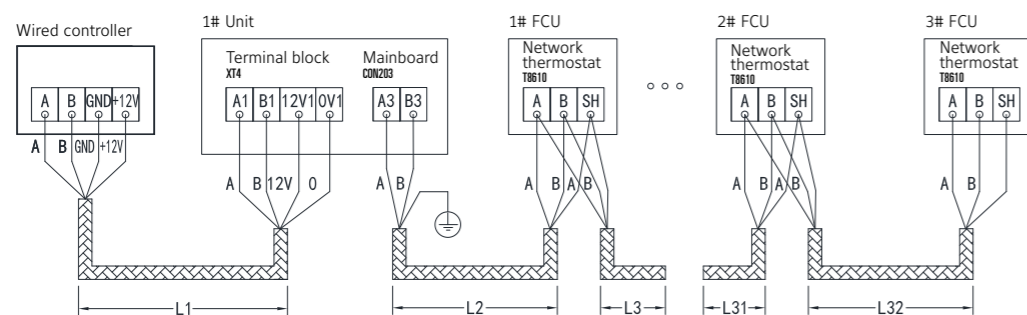


# Field wiring

## Communication network of chillers



## Communication network of fan coil units



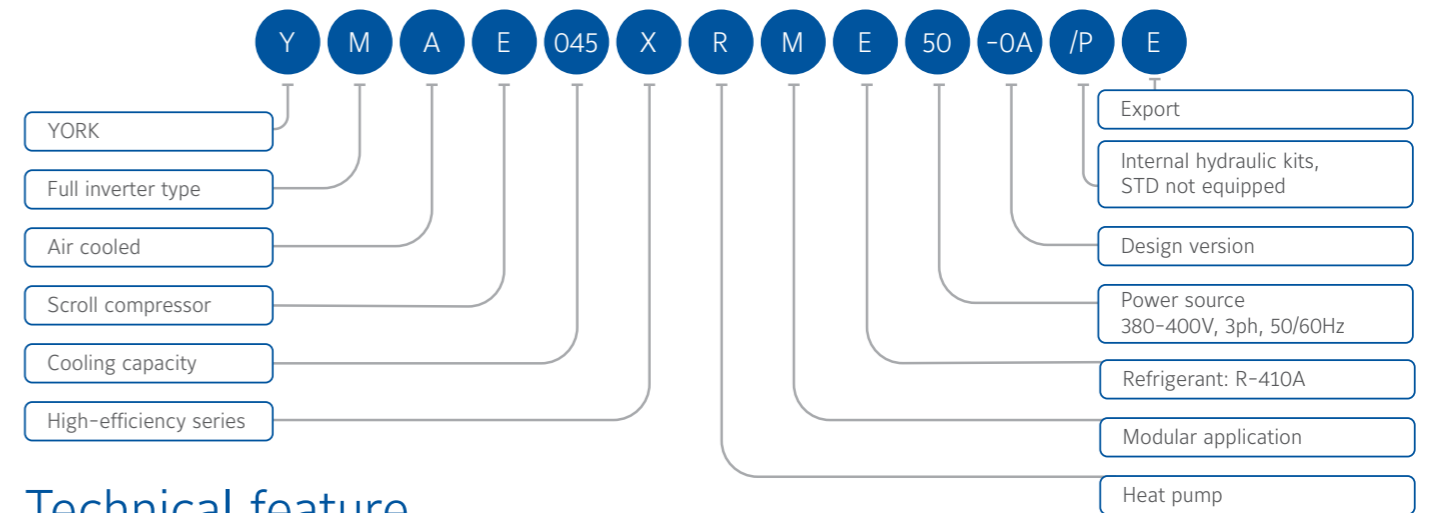
1. The communication cable between unit and controller should be four-core mesh-shielded cable at a length not exceeding 15m. The unit must also be grounded
2. The communication cable between unit and FCU should be four-core mesh shielded cable and length not exceed 15m. Besides, the unit must be grounded. Please see the preceding table for cable requirements

Total Length for Wires from Wire Control Device to the Last Units	L=L1+L2+L3+L4+.....+L32 (unit: m)	
	L < 100m	100m < L < 500m
Cable Type	RVSP2 x 0.75mm <sup>2</sup>	RVSP2 x 1.0mm <sup>2</sup>

### Notes:

1. Shielded, twisted pairs are recommended for the communication lines
2. Communications line to be provided by the customer
3. When connecting more than 32 FCUs, please contact Johnson Controls for confirmation

# Product nomenclature



# Technical feature

Model		YMAE045XRME50	YMAE045XRME50-P	YMAE065XRME50	YMAE065XRME50-P	YMAE140XRME50
Cooling Capacity	kW	45		65		135
Heating Capacity	kW	46		66		145
Total Cooling Input Power	kW	16.4		21.7		42.1
Total Heating Input Power	kW	14.3		20		43.9
GB IPLV (C)	kW/kW	4.50		4.80		4.82
Sound Pressure (Low sound / standard)	dB(A)	63/66		65/68		65/69
Power Supply	V/PhHz	380-400V, 3ph, 50/60Hz	380-400V, 3ph, 50Hz	380-400V, 3ph, 50/60Hz	380-400V, 3ph, 50Hz	380-400V, 3ph, 50/60Hz
Refrigerant		R-410A				
Compressor	Type	EVI Inverter Scroll				
	Quality	1				2
Fan	Fan Type	BLDC fan				
	Fan Quality	2				
	Total Air Flow Volume	l/s	0-15,000	0-22,000		0-44,000
Pump	Power	kW	-	1.1	-	1.1
	External Pump Head	mm	-	22	-	15
Water Heat Exchanger	Water Piping Size	in.	G1-1/2' external thread		G2' external thread	
	Flow Rate	l/s	2.15		3.11	
	Pressure Drop	kPa	45		50	
Dimension	Length x Width x Height	mm	1,300 x 760 x 1,700		1,650 x 760 x 1,700	
Rated Current	A	25	27	35.6	38.2	69.6
Max. Continuous Current	A	27	29	47.8	50.5	94.3
Weight	Net Weight	kg	332	350	410	430
	Operation Weight	kg	339	357	413	433

### Notes:

The manufacturer reserves the right to change these specifications without notice.  
 Rated cooling capacities in kW given for 7/12°C water-leaving temperature and 35°C dry bulb (DB) ambient temperature.  
 Rated heating capacities in kW given for 40/45°C water-leaving temperature and 7°C DB ambient temperature.  
 Sound data is tested in YORK lab which may vary according to different installation conditions.



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At Johnson Controls (NYSE:JCI), we transform the environments where people live, work, learn and play. As the global leader in smart, healthy and sustainable buildings, our mission is to reimagine the performance of buildings to serve people, places and the planet.

Building on a proud history of nearly 140 years of innovation, we deliver the blueprint of the future for industries such as healthcare, schools, data centers, airports, stadiums, manufacturing and beyond through OpenBlue, our comprehensive digital offering.

Today, with a global team of 100,000 experts in more than 150 countries, Johnson Controls offers the world's largest portfolio of building technology and software as well as service solutions from some of the most trusted names in the industry.

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