

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



# Real comfort and true peace of mind

YORK high-performance chillers and heat pumps are paired with the correct terminal devices and equipped with advanced intelligent controls to create a unique water ecosystem. Through high-tech system control, you can adjust the operation of each component, which allows customers to enjoy a comfortable life with the peace of mind that comes with knowing you have chosen the very best.




Terminal  
device



T8610



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, and can be widely used in office buildings, hotels, and restaurants - among others - to help customers drive down their operational costs through sustainable energy savings.



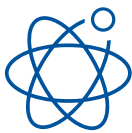
## Innovative design

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/system based on the optimal energy efficiency-based principle. Each module operates at its highest energy efficiency to deliver optimized system-level efficiency.

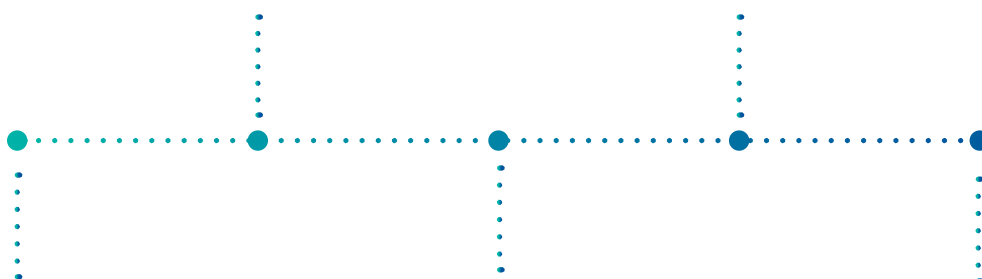
\* China Patent type - Innovation patent.  
Patent code: 201710151811.5



## Fan control algorithm

The fan control method effectively protects the normal operation of the compressor and improve 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

Wired controller ID patent streamlines design with a 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

# Exceptional results

YORK YMAE boasts industry-leading part-load IPLV efficiency of up to 6.3 under AHRI condition.



## DC Inverter EVI Scroll Compressor

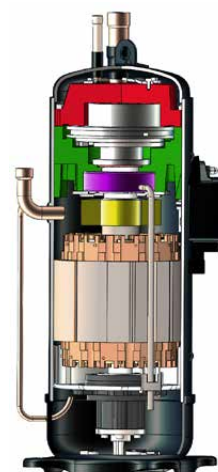
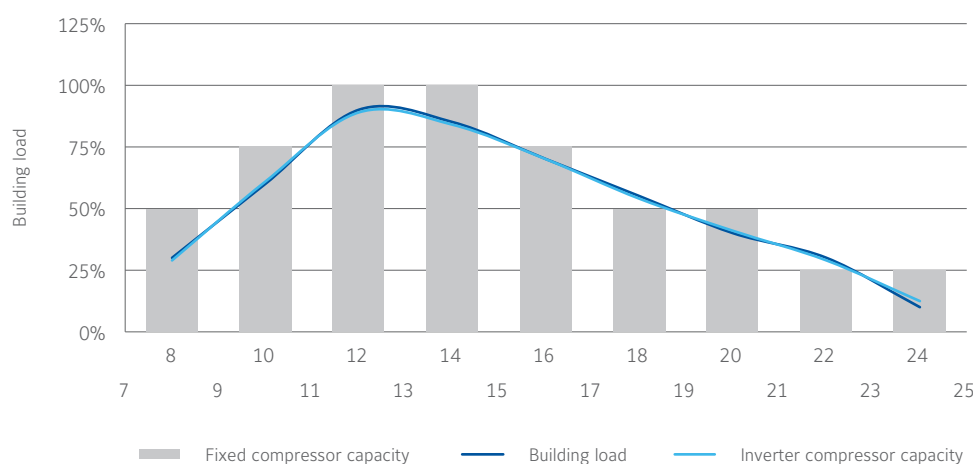
**New asymmetric wrap:** Optimized design reduces leakages and invalid suction superheating.

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

**Relieve 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.



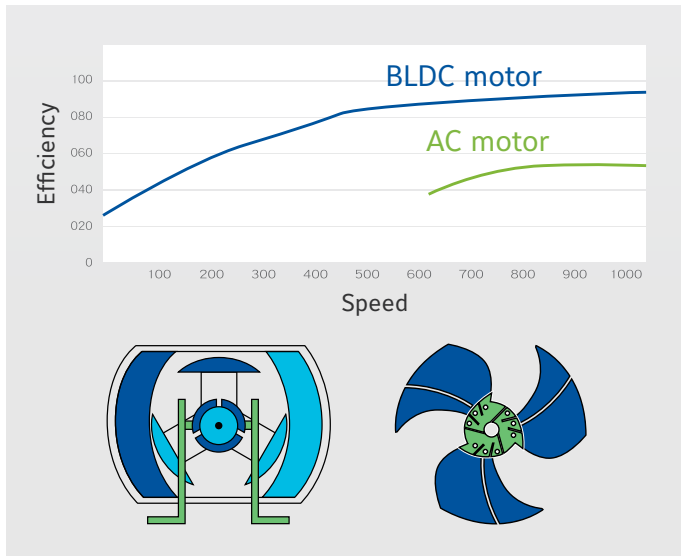
## YORK Inverter Driver – the brains of the operation

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, the customer.



## BLDC Fan

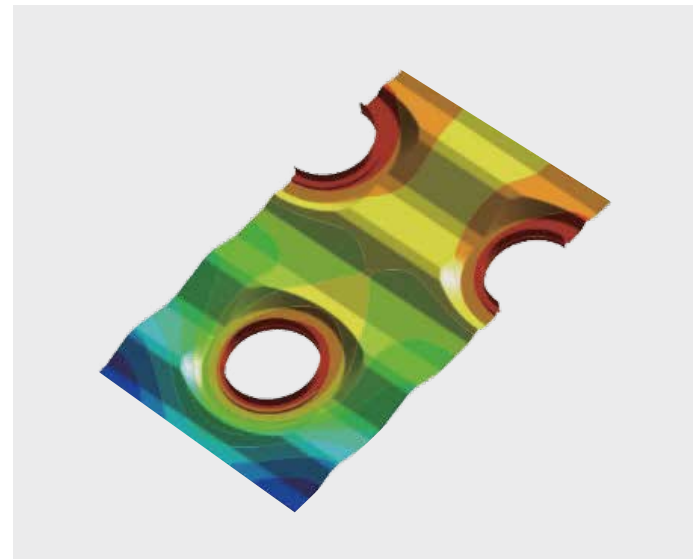
The fan blades have been aerodynamically optimized for streamlined style that delivers extraordinarily low operation noise. This means minimal disturbances for the people in your spaces. The high-efficiency electronically commutated DC brushless BLDC motor regulates fan using a stepless speed method.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



## Fin Plate Coil

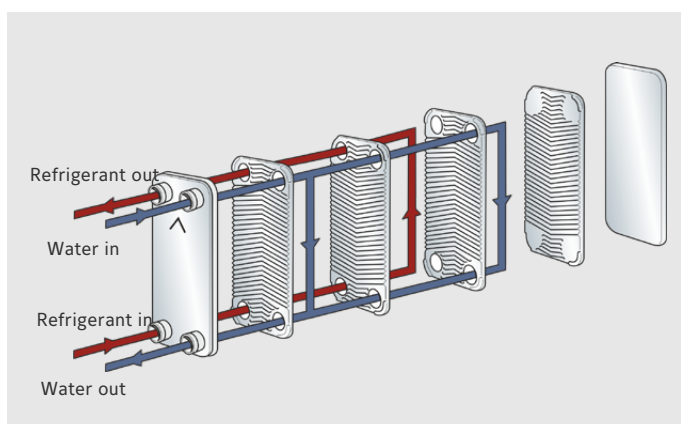
The airside heat exchanger features new corrugated fins with 7mm internal threaded copper tubes. The fins are made of hydrophilic aluminum foil to provide excellent hydrophilicity and corrosion resistance.

- The wave pattern design provides low airflow resistance, strengthens airflow disturbance and expands the heat transfer area. This makes for more effective heat exchange, which improves heat transfer efficiency.
- Smooth surface reduces risk of freezing.



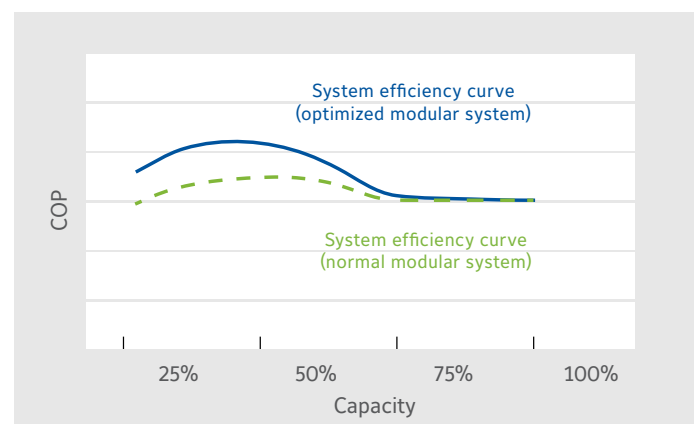
## Brazed Plate Heat Exchanger (BPHE)

A stainless steel high-efficiency BPHE ensures optimum heat transfer efficiency. This technology provides superior performance and longer life cycle. 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. results in increased system efficiency by 14-20 percent compared to the normal fixed-speed modular system





# Robust reliability

## Handling the heat and the cold

### Pre-defrosting technology

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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 all goes towards providing stable operation of heating in winter and continuous hot water for indoor use.

### Intelligent defrost

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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

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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

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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, tested, reliable

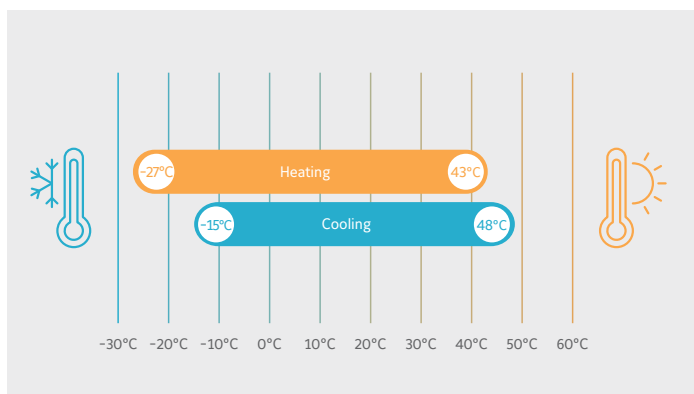
YORK tests all its solutions in its Highly Accelerated Life Test (HALT) lab. The YMAE Series has been tested in the HALT lab because it simulates the extremely harsh weather conditions our units will encounter. The climatic conditions units will face over the course of a year are replicated during a 2-4 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.

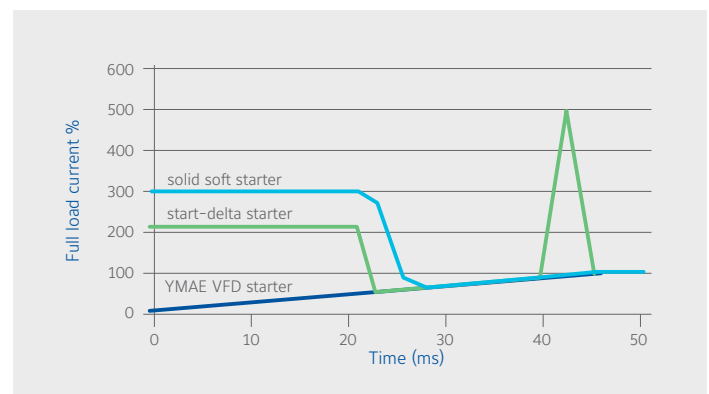


Simulated ambient temperature of between -25°C and 60°C.

(Highly Accelerating Lifecycle Testing Lab)

## 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 lifetime.

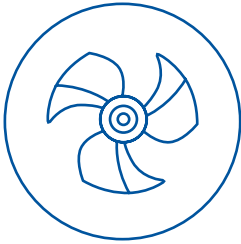




# Premium components

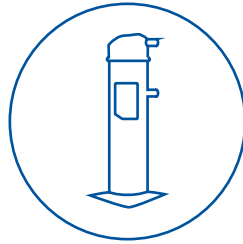
## Customized fan assembly

Optimized fan kit with BLDC motor - high reliability guaranteed.



## High Efficiency Inverter Scroll Compressor (R410A)

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



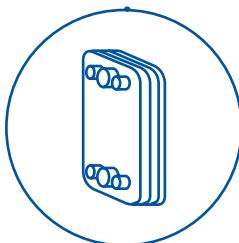
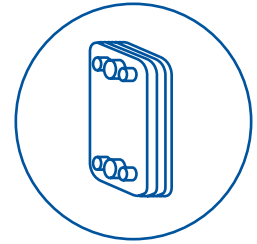
## Airside heat exchanger

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



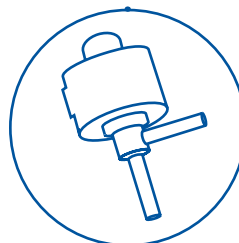
## High-efficiency brazed plate

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



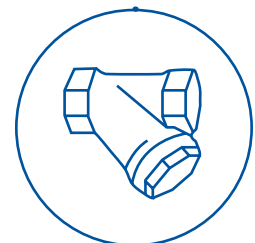
## Economizer - BPHE

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



## Electronics 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.



# 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 of the constraints of cold weather that is out of a traditional chiller's operating range.



## Greater options, more applications

Integrated hydraulic kits and expansion tank 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.

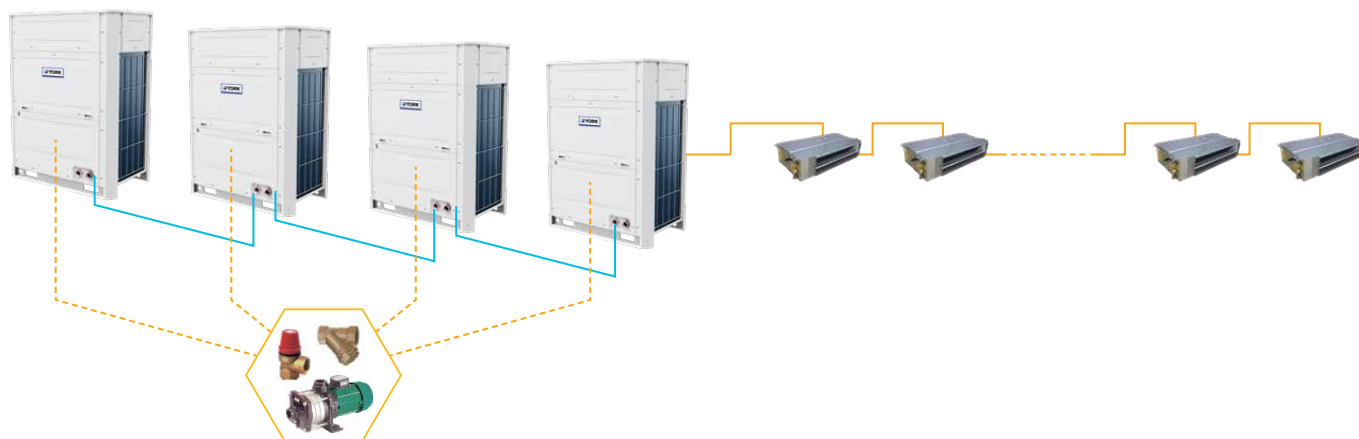
## T8610 networked thermostat

Our unit features an RS485 interface, which means the host switch can be controlled via the T8610 networked thermostat. Up to 64 thermostats can be connected to this system.

## Modular design means you can make a setup just for you

The YMAE Series allows up to 32 units to be connected to form one system. This and the wide system capacity range (45-2080kW) makes the YMAE series the ideal solution for multiple phase investment.

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



## Easy installation

YMAE 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





# Ideal across a range of verticals

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YMAE Series units are extremely adaptable and can be used in a range of applications. From hotels to offices, and from shopping centers 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  $-10^{\circ}\text{C}$ , making it ideal for process cooling applications. Alternatively, while heating, and the highest hot water leaving temperature can go up to  $60^{\circ}\text{C}$ , perfect for different air terminal devices.



Shops



Hotels



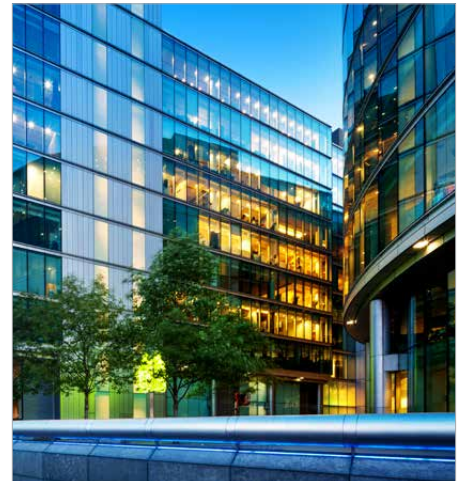
Process cooling



Hospitals



Museums



Offices



# Intelligent controls

- The YMAE Series is equipped with an exclusive integrated control system from YORK that empowers free control communication between a networked thermostat (T8610) and the chiller. With one simple touch on the T8610, 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 AC system's cooling capacity can be expanded to 1040 kW.

**Optiview LT controller:** The 7-inch color touchscreen can display more parameters than a standard controller. The multilevel user permission setup ensures the safe operation of the AC 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 AC system's cooling capacity can be expanded to 2080 kW.

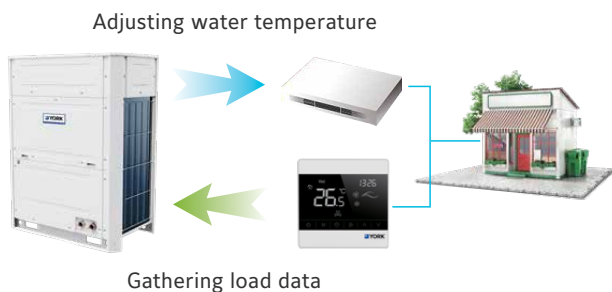
- The customer can set a time (day or week, except for holidays) to have the units automatically switched on or off.



# Smart control platform

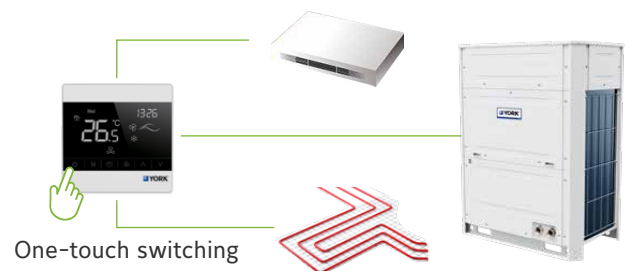
## Sensitive

The highly sensitive T8610 intelligent 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.



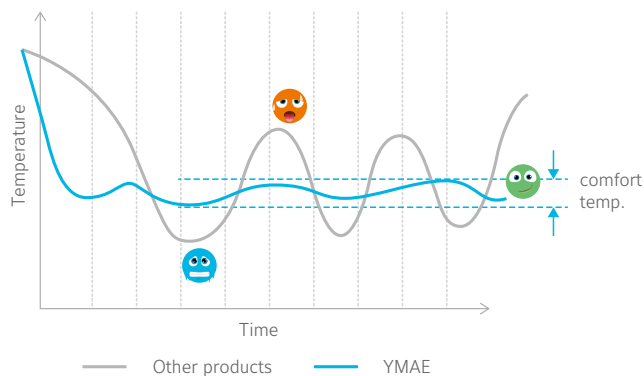
## Manageable

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 support 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.

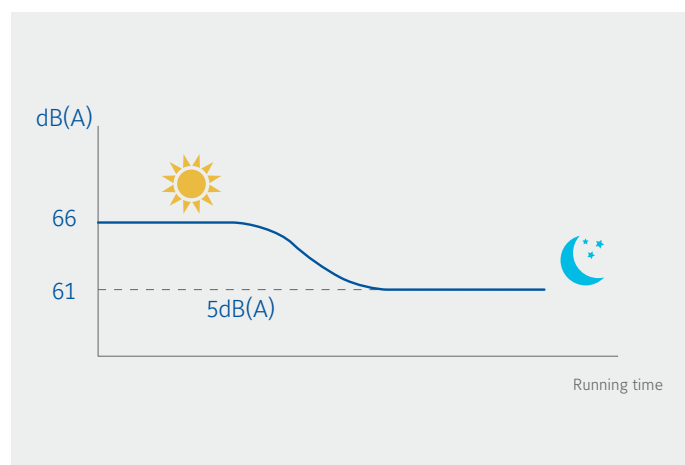
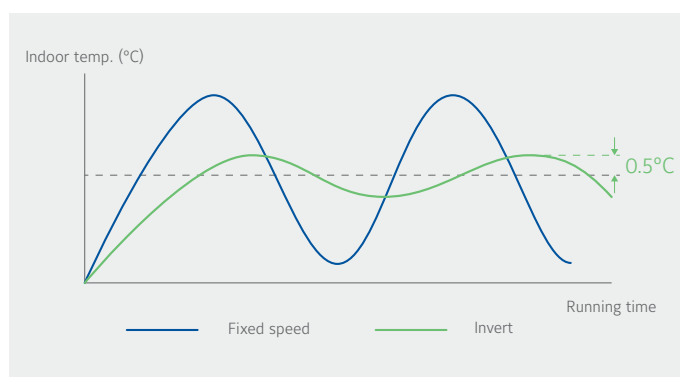




# Quality quiet comfort

## Comfortable environments

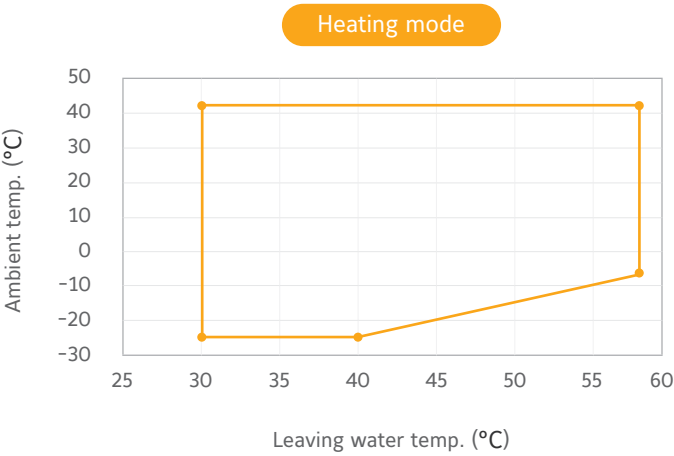
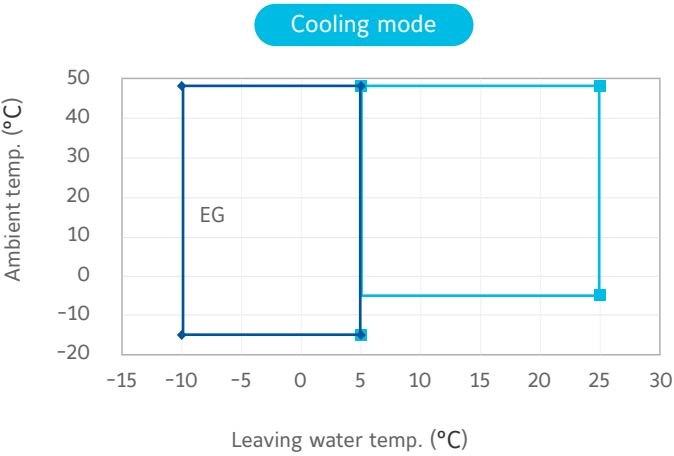
The unique variable evaporating temperature control of the YMAE allows for an auto-adaptive temperature control range between 5-20°C in cooling mode. The inverter system supplies part-load chiller operations with a higher evaporating temperature under off-design conditions, which can maintain moderate 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.



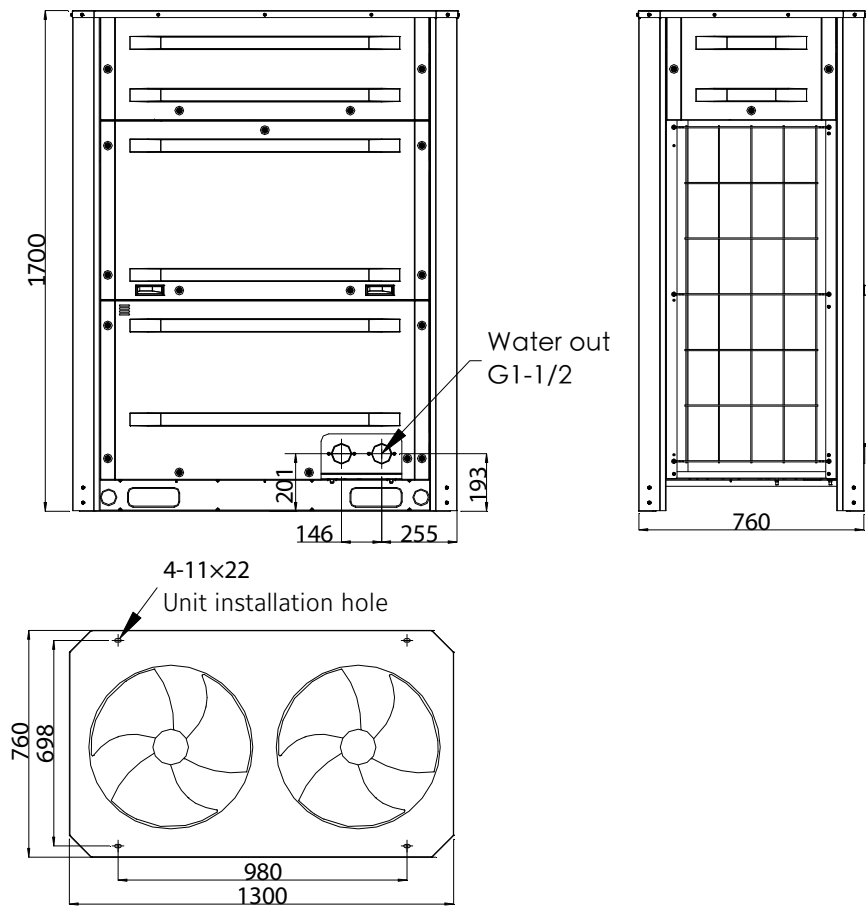
## Low sound operation

- The inverter technology used for the compressor and fan motors significantly minimizes noise levels at part-load operation and ensures quiet operation all day.
- Silent mode: When selecting this 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.

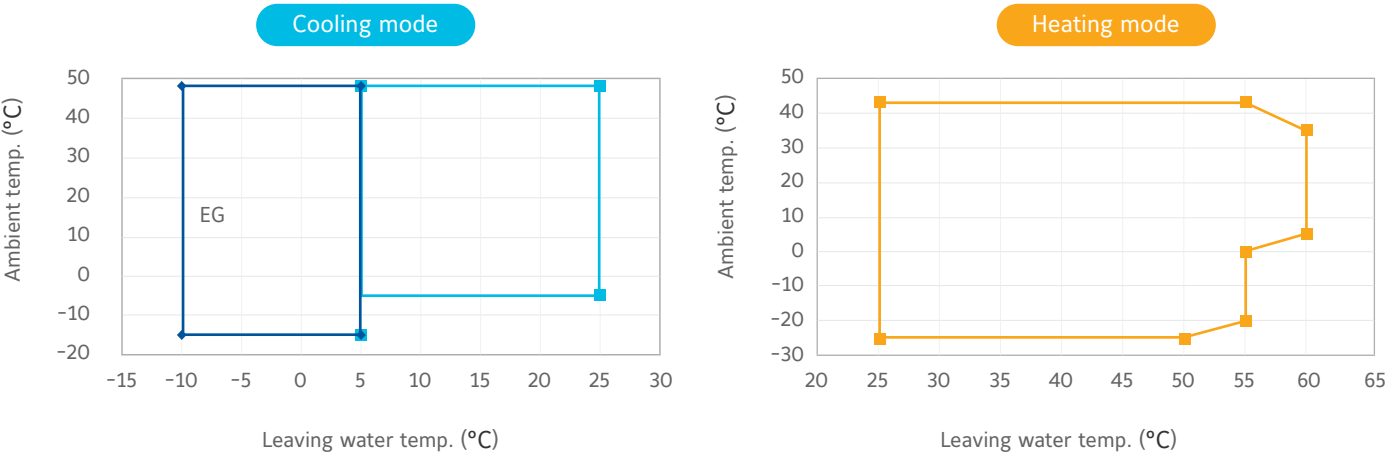
# YMAE045 operating range



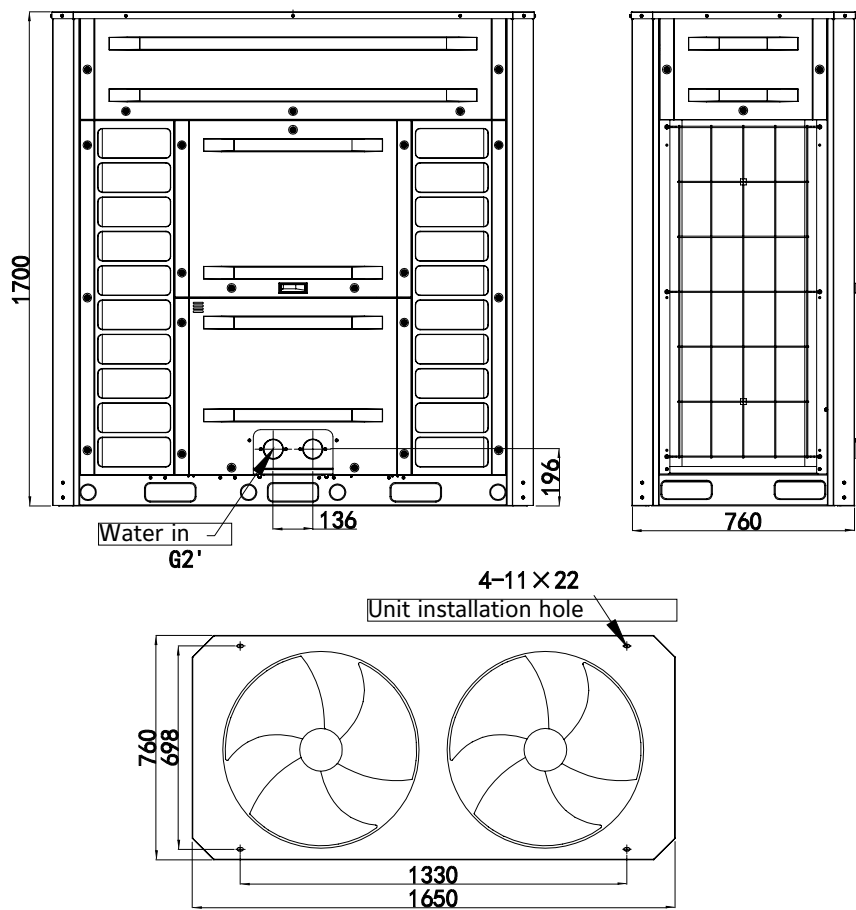
## YMAE045



# YMAE065 operating range

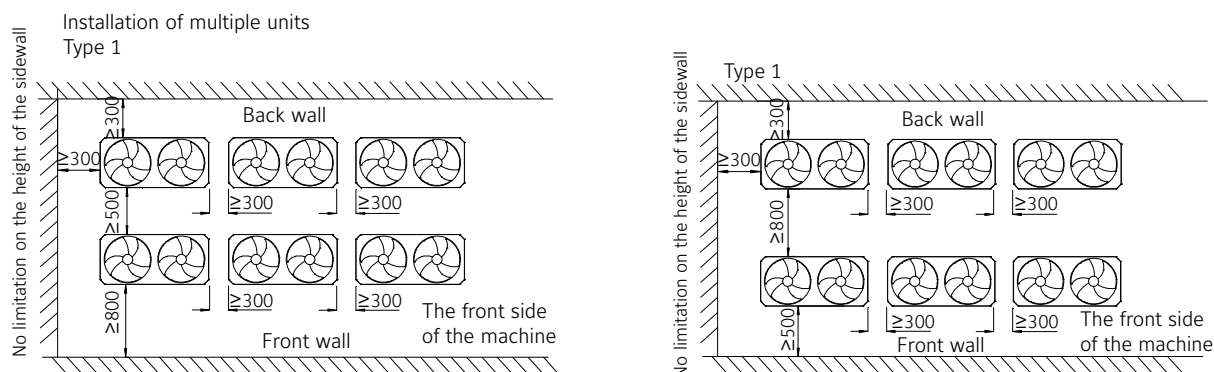


YMAE065



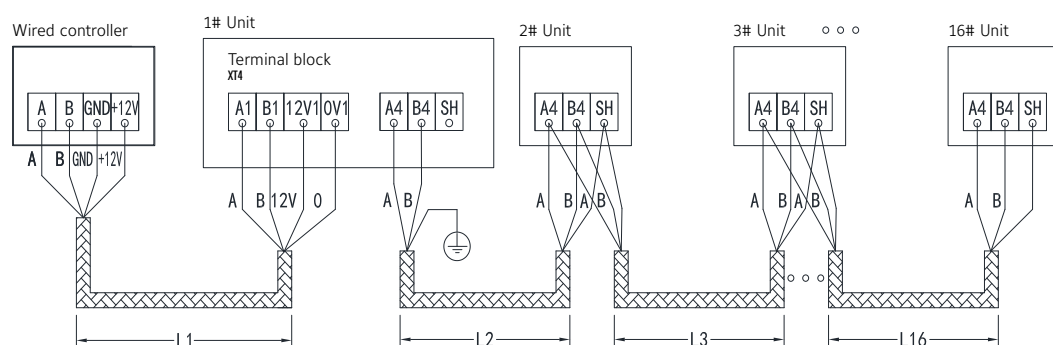


## Installation

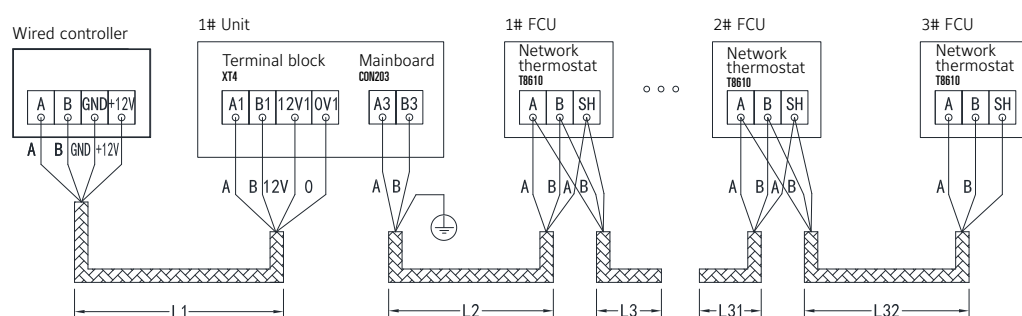


## Field wiring

## Communication network of chillers



## Communication network of fan coil units



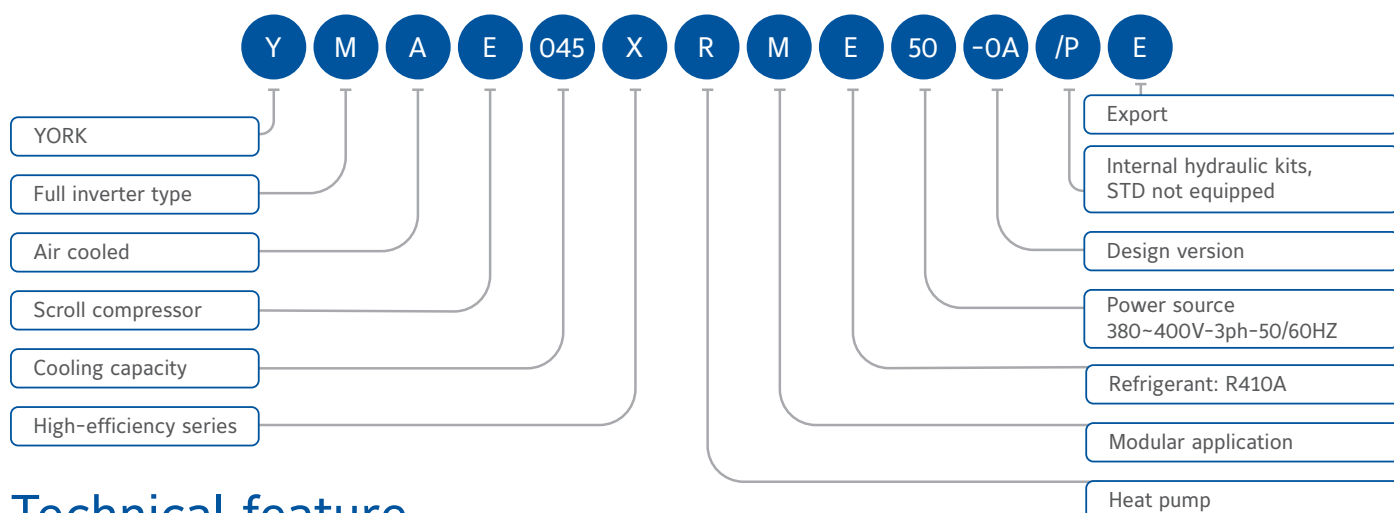
1. The communication cable between unit and controller should be four-core mesh-shielded cable at a length not exceeding 15m. The unit must also be grounded.
2. The communication cable between unit and FCU should be four-core mesh shielded cable and length not exceed 15 m. Besides, the unit must be grounded. 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 < 100 m	100 m < L < 500 m
Cable type	RVSP2 x 0.75mm2	RVSP2 x 1.0mm2

Notes:

- a. Shielded twisted pairs are recommended for the communication lines.
- b. Communications line to be provided by the customer.
- c. When connecting more than 32 FCUs, please contact JCI for confirmation.

# Product nomenclature



## Technical feature

Model			YMAE045XRME	YMAE045XRME50-P	YMAE065XRME	YMAE065XRME-P
Cooling capacity	kW		45.0		65.0	
Heating capacity	kW		46.0		66.0	
Total cooling Input Power	kW		16.4		21.7	
Total Heating Input Power	kW		14.3		20.0	
GB IPLV (C)	kW/ kW		4.5		4.8	
Sound Pressure (Low Sound/standard)	dB(A)		63/66		65/68	
Power Supply	V/ PhHz		380V~400V-3ph-50/60Hz	380V~400V-3ph-50Hz	380V~400V-3ph-50/60Hz	380V~400V-3ph-50Hz
Refrigerant			R410A			
Compressor	Type	/	EVI Inverter Scroll			
	Quality	/	1			
Fan	Fan Type		BLDC fan			
	Fan Quality	/	2			
	Total Air Flow Volume	l/s	2500~15000		0~22000	
Pump	Power	kW	-	1.1	-	1.1
	External Pump Head	mm	-	22.0	-	15.0
Water Heat Exchanger	Water Piping Size	inch	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	1300 x 760 x 1700		1650 x 760 x 1700	
Rated Current	A		25.0	27.0	35.6	38.2
Max. Continuous Current	A		27.0	29.0	48.5	50.5
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 12/7°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.

#### About Johnson Controls

At Johnson Controls, we transform the environments where people live, work, learn and play. From optimizing building performance to improving safety and enhancing comfort, we drive the outcomes that matter most. We deliver our promise in industries such as healthcare, education, data centers and manufacturing. With a global team of 100,000 experts in more than 150 countries and over 130 years of innovation, we are the power behind our customers' mission. Our leading portfolio of building technology and solutions includes some of the most trusted names in the industry, such as Tyco®, YORK®, Metasys®, Ruskin®, Titus®, Frick®, Penn®, Sabroe®, Simplex®, Ansul® and Grinnell®.

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