

X-Power Series YCAE-X/YCAE-XH Modular Air-Cooled Chillers and Heat Pumps



Modular, efficient and intelligent air solutions from YORK



YORK® delivers efficient, reliable cooling and heating solutions to reduce your energy costs and maximize uptime.

Our customer care gives you complete peace of mind. Johnson Controls prides itself on being the largest service and preventative maintenance organization in the world.



YORK X-Power Series YCAE-X/YCAE-XH Modular Air-Cooled Chillers and Heat Pumps are based on innovative designs that guarantee exceptional performance. Decades of experience and expertise make YORK an industry-leading manufacturer of modular chillers.

Exceptional performance



These high-performance units are based on our latest patented technology.

History of reliability



Years of experience and innovation underpin all our units, which ensures stable performance, quality parts and multiple verifications for all our customers.

Smart control



New-generation microcomputers support the connection of up to 32 units, which allows for easy connections to your building automation system (BAS).

Flexible application

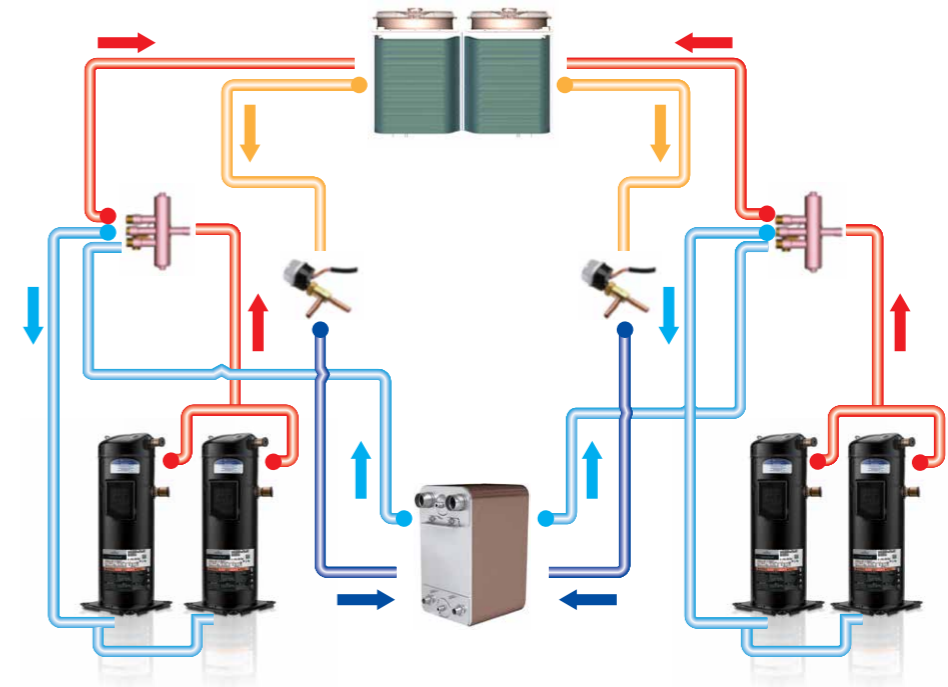


Meeting a variety of climates and locations without kits or add-ons.

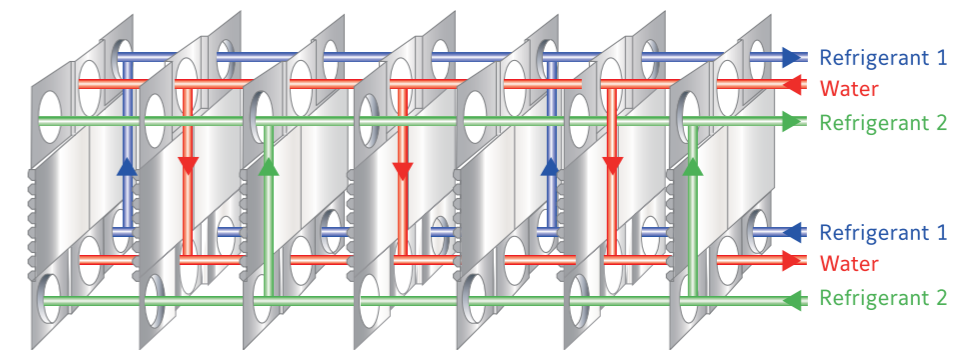
Exceptional performance

Efficient design

To maximize the performance of each unit, our solutions use a **parallel design** for compressors. When a compressor is operational, the heat-exchange area of the air-side heat exchanger and the water-side heat exchanger can be fully utilized. This improves the performance of each unit, especially for part-load performance.



The diagram below shows the design of a unit with **two refrigerant systems and an independent air duct**. The two refrigerant operations in a single module can easily operate independently, lowering the fan's power consumption at part-load to improve energy efficiency.



Our innovative designs allow for **multi-level energy regulation**. An individual unit is able to realize up to four levels of energy regulation: 0-25, 25-50, 50-75 and 75-100 percent. You can connect up to 32 units, offering a wider range of energy regulation – up to 128 levels. Connecting units this way is close to stepless regulation, yielding higher efficiencies and saving energy.



History of reliability

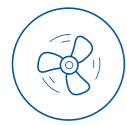
Two decades of advanced design

YORK combines almost two decades of expertise and experience into the design, operation and servicing of modular systems. We've already delivered more than one million reliable units to buildings all across the country.



Live and work in comfort and quiet

The YCAE-X Series can operate with noise levels as low as 65dB(A) to provide you with quiet living and working environments.



Enjoy quieter fans
The two-fan design of single modules effectively shares the air volume of individual fans to lower their operating noise.



Choose from multiple noise-reduction options
We offer many options that contribute to noise reduction, including unit baffles and acoustic cotton.



Reduce start-stop noise with next-generation computing
Our in-built microcomputer monitors the operation of your unit in real-time. It optimizes the logic of your unit to effectively reduce start-stop noise.

Reliable performance - long-lasting units

YORK ensures each component is monitored in real-time by balancing the operating time of compressors. Each compressor is adjusted for balance, extending the overall life of your unit.



Intelligent defrost

Our solutions select a defrost time that is based on the change in unit pressure and temperature. The option to manually defrost a unit is also available.

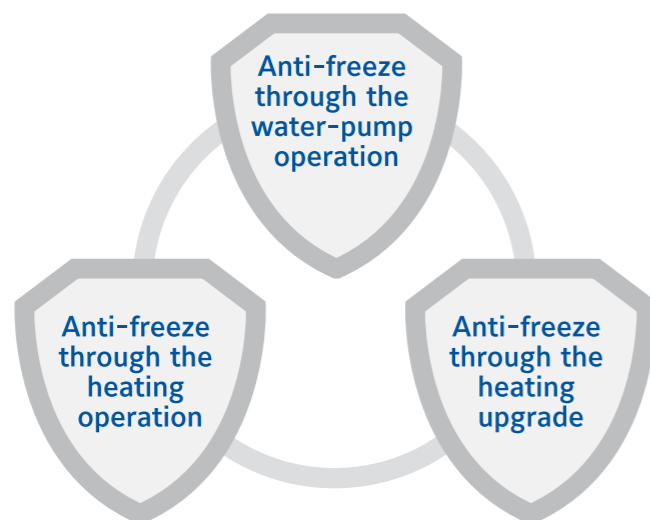
Each unit can simultaneously defrost and heat without shutting down. When multiple modules are operating, a single unit in defrosting mode does not impact the heating capabilities of other modules.



Intelligent anti-freezing

To automatically achieve anti-freeze conditions during the warmer months of the year, the return-water temperature in each unit is monitored in real-time.

Units are equipped with three automatic anti-freeze measures to effectively prevent freezing in winter.



Reliable configuration for maximum efficiency

High-efficiency R-410A hermetic compressor

Motor life is extended because vital components are cooled effectively. The low-pressure chamber structure is designed so the crankcase is located in an area with lower temperatures, while the motor is cooled by the refrigerant in the low-temperature return gas to enhance system performance.

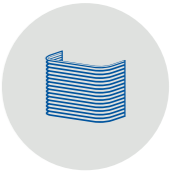
The air-side heat exchanger

The U-shaped heat exchanger is unique and provides multi-sided heat transfer and an optimized wind field. The standard hydrophilic aluminium foil fins supply strong anti-oxidation and resistance to corrosion.



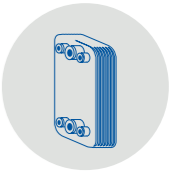
Customized fan assembly

Our fans are equipped with large-diameter round-angle axial fan blades, an integrated bell mouth and wind scoop design, and an IP55 double-speed motor for rigorous protection when units are installed outdoors.



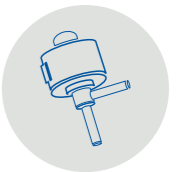
Efficient stainless steel heat exchanger

The stainless-steel structure provides you with stable, reliable units. The asymmetric flow field design lowers the pressure drop on the water side, improving anti-freeze performance.



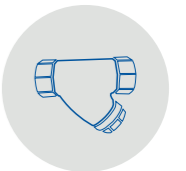
Electronic expansion valve

The operational pressure and temperature of units are optimized by ensuring the refrigerant flow is accurate. To achieve this, the 480-step, high-precision electronic expansion valves make intelligent adjustments to the flow of the refrigerant.



Filter and water flow switch

To prevent units clogging, copper filters are fitted as standard to stop dirt from entering the system. We also provide water flow switches on all units to avoid cracks due to poor water flow.





Tested to ensure maximum reliability

YORK tests all its solutions in its Highly Accelerated Life Test (HALT) lab. Each model of the YCAE-X Series has been tested in the HALT lab because it simulates the extremely harsh weather conditions our units will encounter – for example, wind, snow and rain. The climate conditions units will face over the course of a year are replicated during a two- to four-week test period to ensure our solutions operate reliably in the field.

HALT lab

The picture above shows a unit being tested in a simulated ambient temperature of between -25°C and -60°C .

Smart control

Local control and communication

Advanced touchscreen controllers

Standard Wired controller

This controller is compact, aesthetically pleasing and comes with a user-friendly LCD touchscreen. It can be connected to up to 16 units. The air conditioning (AC) system's cooling capacity range can be expanded by up to 2,448kW.



Standard wired controller



OptiView LT controller

This controller has a 7in. color touchscreen, which can display more parameters than a standard controller. The multi-level user permission setup ensures the safe operation of the AC system.

The controller is easy to maintain and flexible. You can upgrade the software using a USB. You can also connect the controller to as many as 32 units and expand the range of the AC system's cooling capacity to 4,896kW.



OptiView LT controller



Remote control and communication made easy

All units have an RS-485 interface, which supports Modbus/BACnet protocols for easy connection to your building automation system (BAS).

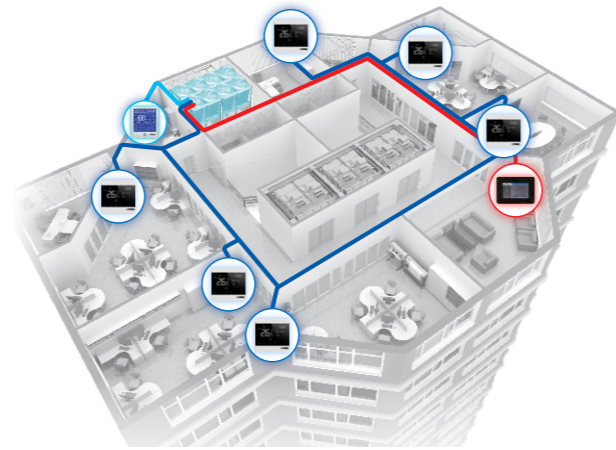
Connecting to your BAS



Interlocking

The YCAE-X Series supports:

- The operation of a variable-frequency water pump to enable a variable flow from the primary pumping system, which makes the operation more energy efficient
- An RS-485 interface, which means the host switch can be controlled via the T8600 networked thermostat change to via the IWE Thermostat (eg: T8620, E1120)
- The option to connect two central controllers at the same time to meet the control requirements of two different groups of managers
- Functions such as a remote on-off switch, a remote heating-cooling switch, interlocking with the terminal thermostat switch and remote alarming



Schedule control

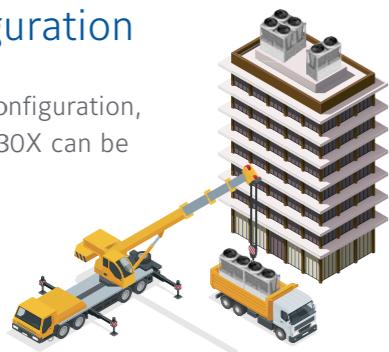
Simple, easy-to-use settings enable you to set a time – day or week, except for holidays – to automatically switch units on or off.



Flexible application

Adaptable configuration

To facilitate greater unit configuration, the YCAE100X and YCAE130X can be connected together.



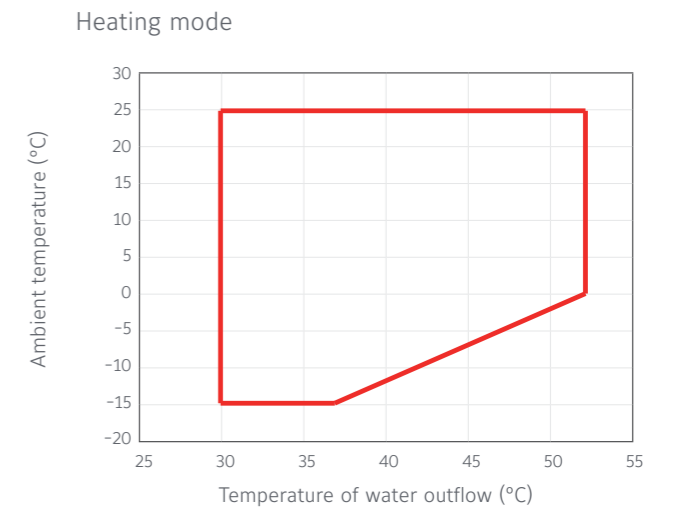
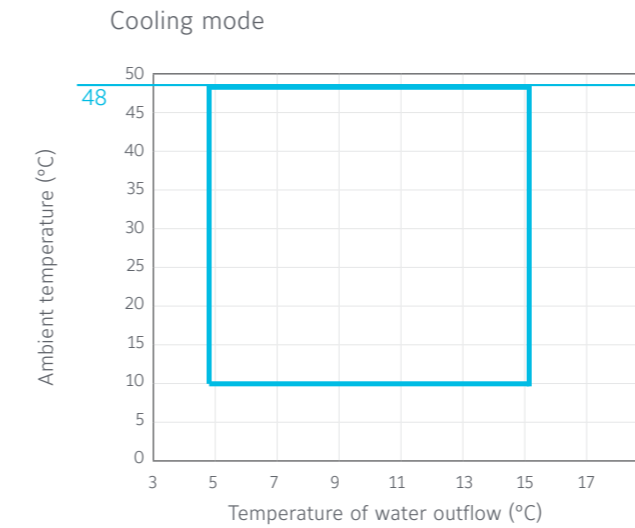
Adjustable options

Multiple configurations:

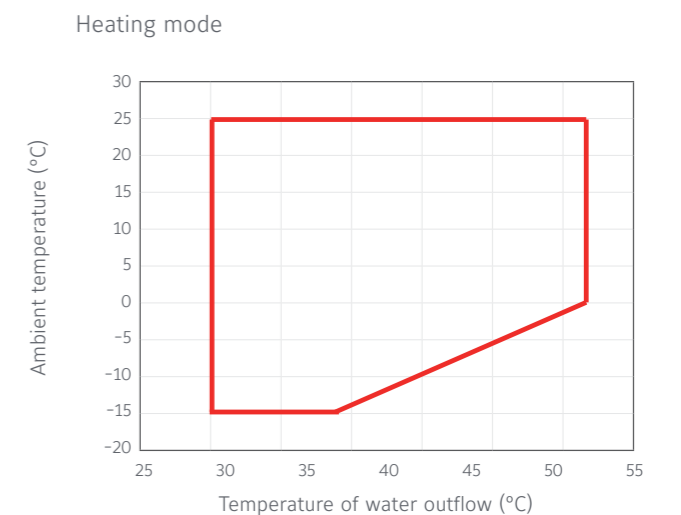
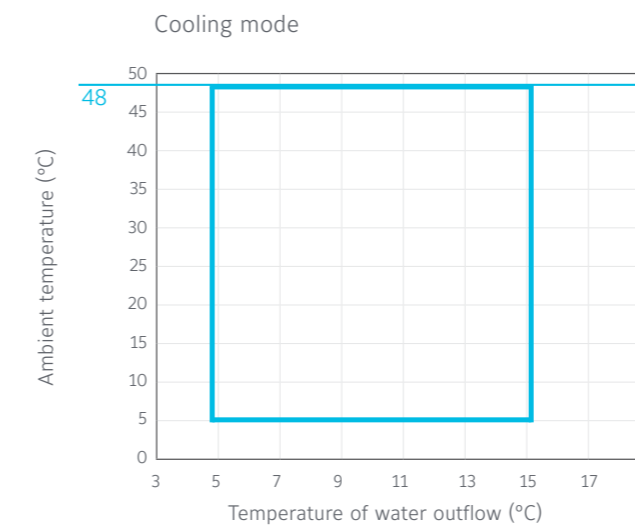
- Wire and enclosure
- Spring isolation with 1in. distortion
- Sound kits
- Wired controller
- Smart View II controller
- SC-Equip assembly (converting BACnet)

Unit operation range

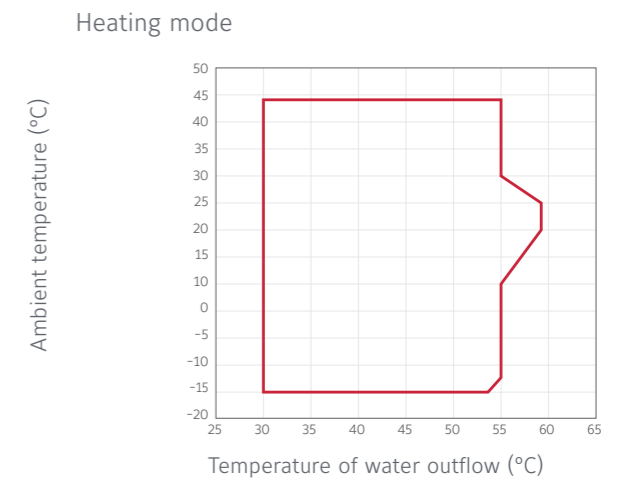
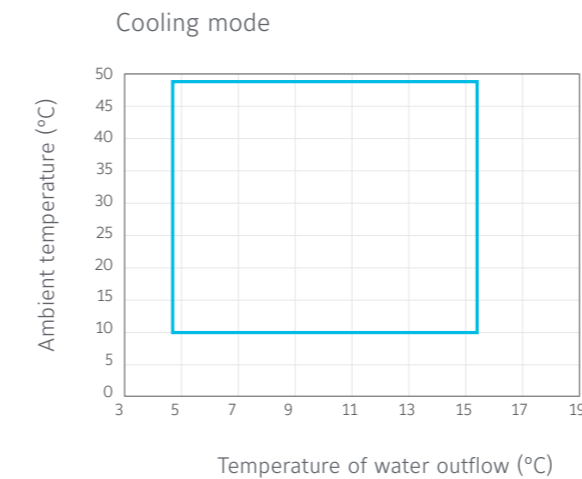
YCAE065X



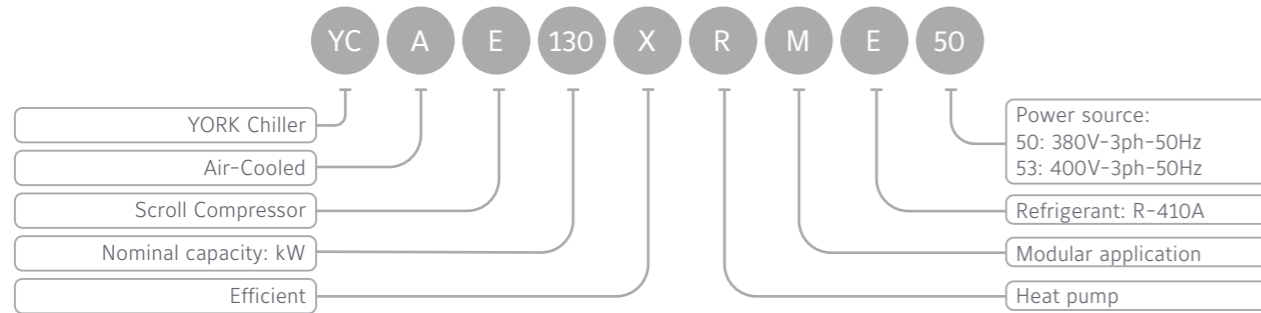
YCAE100/130X



YCAE160X



Product nomenclature for YCAE-X Series



Technical features

Model		YCAE065XRME	YCAE100XRME	YCAE130XRME	YCAE160XRME	
Nominal Cooling Capacity	kW	65	100	130	153	
Nominal Heating Capacity	kW	66	100.7	131.9	160	
Nominal Cooling Power Input	kW	20.4	29.2	39.3	45.1	
Nominal Heating Power Input	kW	20	31	42.8	45.3	
Power Source	V/ph/Hz	380/3/50				
Refrigerant	-	R-410A				
Compressor	Type	Scroll				
	Quantity	Unit	2	3	4	2
Fan	Fan Quantity	Unit	2	2	2	2
	Volume	m ³ /h	11,000 x 2	12,500 + 21,500	21,500 x 2	23,000 x 2
	Fan Power	kW	0.9 x 2	0.87 + 1.65	1.65 x 2	1.82 x 2
	External Static Pressure (ESP)	Pa	30	0	0	0
Water-side Heat Exchanger	Type	BPHE				
	Nominal Flow	m ³ /h	11.2	17.2	22.4	26.3
	Pressure Drop	kPa	61	60	60	62
	In / Out Piping	-	DN50	DN65	DN65	DN65
Piping Connection	-	Threaded connection	Clamp connection	Clamp connection	Clamp connection	
Dimension	Length x Width x Height	mm	1,650 x 760 x 1,700	2,250 x 1,200 x 2,420	2,250 x 1,200 x 2,420	2,250 x 1,200 x 2,460
Unit Weight	Operation Weight	kg	503	864	982	925
Electric	Rated Current (Cooling / Heating)	A	37.4/36.7	55/58	74/80	86/86
	Max. Current	A	52	85	112	100

Nominal conditions:
Cooling capacities in kW given for 7/12°C water-leaving temperature and 35°C dry bulb (DB) ambient temperature.
Heating capacities in kW given for 40/45°C water-leaving temperature and 7°C DB ambient temperature.



YCAE-XHR

The complete heat recovery unit

The highly efficient YCAE-XHR provides customers with all the advantages of the YCAE-X Series – a proven line of outstanding systems in the modular air-cooled water / heat pump market.

This new generation of YCAE-X heat recovery units reduces energy costs and increases the sustainability of domestic and commercial heating and cooling systems. They achieve this by increasing the heat recovery function, which maximizes the system's use of power and contributes to environmental sustainability.

The high efficiency of the YCAE-XHR makes it the perfect system for any building. It supplies the occupants or staff of all premises with the desired levels of hot water and air conditioning without consuming excess electricity.

This is why the YCAE-XHR is also widely used in a range of facilities, such as hotels, offices, schools, hospitals and restaurants.

Exceptional performance delivers constant hot water and cool air



Integrated part-load value (IPLV) up to 4.35

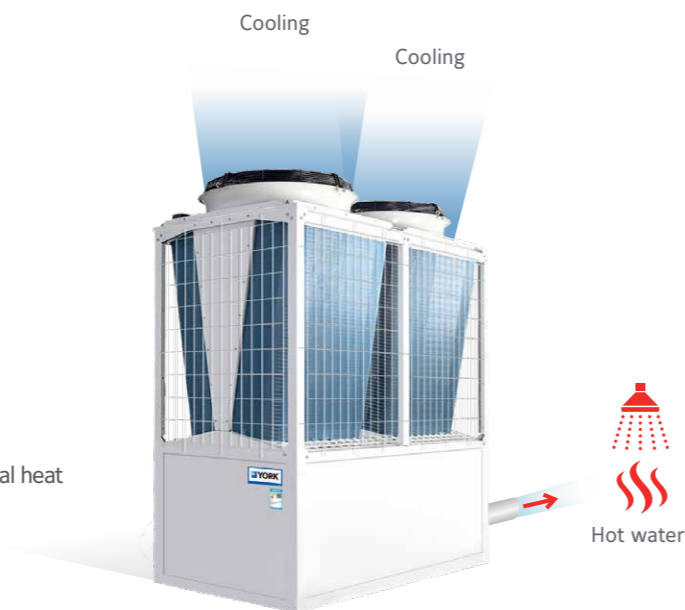
A flexible system

Multi-functional including cooling / heating / hot water for domestic use, adapts to the needs of every property owner – commercial or domestic. The heating switches modes without stopping for maximum convenience. Air conditioning and hot water functions run simultaneously to ensure this system always meets the needs of our customers.

Continuous innovation for free hot water

The advanced design of the YCAE-XHR means:

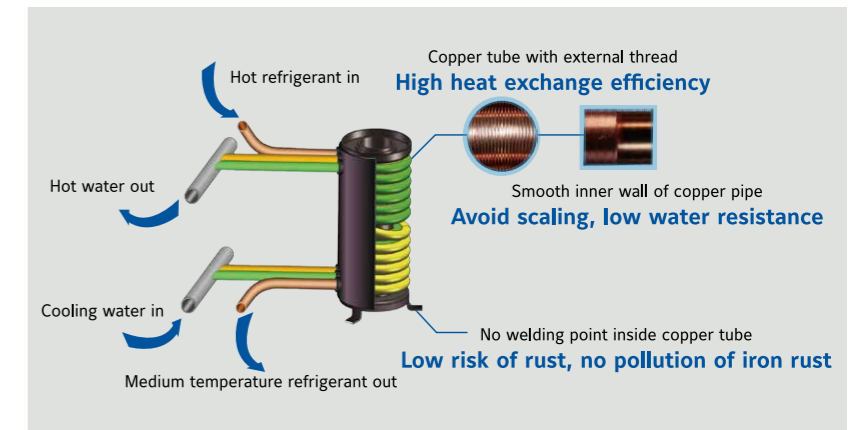
- It supplies free hot water during the summer
- It does not need additional energy during the cooling season
- It increases energy efficiency by building on multiple patents
- It automatically switches between full heat recovery and partial heat recovery using a patented solution



Enjoy clean, hot water throughout the year

This efficient, long-lasting system supplies water in a range of ways:

- **Hot water throughout the transition season**
Each unit generates its own hot water
- **Consistent hot water throughout the year**
The system guarantees the steady supply of hot water within an ambient temperature range of -15°C to 48°C
- **Cleaner water for all applications**
The highly efficient, shell coil-type heat exchangers used in each unit are designed to prevent the build-up of rust and limescale. This ensures the water supply is clean, which extends the life of each unit, lowering maintenance costs



Auxiliary heat exchanger (barrel type)

Outstanding heat recovery in a single-system design

A solution adapted to all needs

The YCAE-XHR features a single-system design that offers full heat recovery. A single unit is able to produce up to 1.76 tons of warm water per hour.

The system can be adapted to almost any building as it is so easy to expand. It has a large capacity because up to 32 units can be combined together and hot water adjustments go up to 64 stages.



To calculate the heating capacity of a unit, use the following equation:

$$Q = c \times m \times \Delta T$$

$$m = \rho \times V$$

$$\Delta T = T_{out} - T_{in}$$

- Q: Heating capacity, kW
- c: Specific heat capacity of the substance, 4.2kJ/kg·K for water
- m: The mass of the sample, kg
- ρ : The density, 10³kg/m³ for water at 4°C
- V: The volume, m³/h, 1h = 3,600s
- ΔT : The change in temperature, °C

To calculate the water productivity per hour, follow this scenario:

In the hot water mode, the heating capacity is 82kW when the ambient temperature is 20°C dry bulb (DB) or 15°C wet bulb (WB).

If the start water temperature is 15°C, and end water temperature is 55°C, what is the water productivity per hour?

Use this equation to find out:

$$V = \frac{Q}{c \times \rho \times \Delta T}$$

$$V = \frac{82}{4.2 \times (55 - 15) \times 10^3} \times 3600$$

$$V = 1.76 \text{ m}^3/\text{h}$$

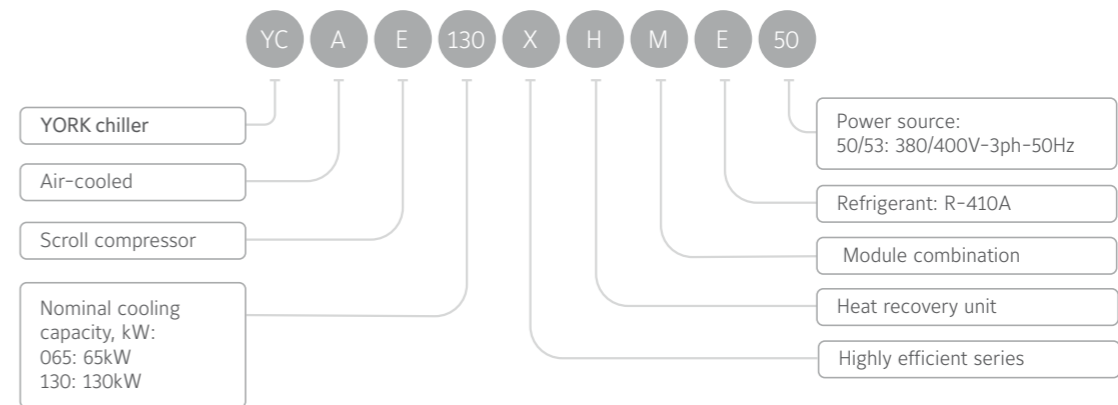
What makes the YCAE-XHR so reliable?

- **A single system failure does not affect the operation of the other system.**
So, if the air conditioning system breaks down, the hot water system will continue to perform to the desired level
- **Units operate independently of each other** so the breakdown of one modular unit does not result in the malfunction of other units in the same system
- The **service life of the system is extended** because its unique oil-return design improves the reliability of every unit
- The patented high-pressure gas separator **ensures the stable operation** of the entire system
- **The heating system is extremely reliable in winter.** Multiple defrosting measures optimize the sequencing of the defrost cycle to address problems such as non-frosting and endless defrosting. Our unique pre-defrosting design ensures the heating operation is stable in winter
- **The patented design of this system ensures that fluctuations in water temperature are very small.** This reduces the frequency of each unit starting and stopping



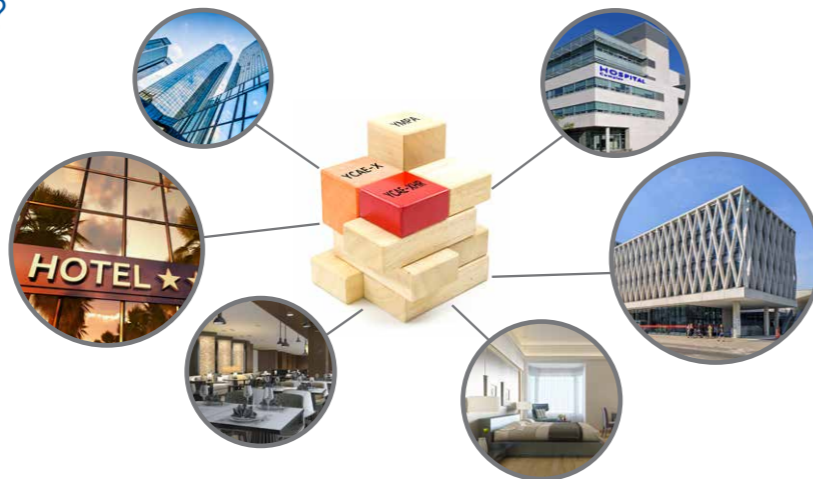
Normal operation

YCAE-XHR



Why is the YCAE-XH so flexible?

- **It is extremely adaptable.** It is utilized in various applications to meet many different customer needs
- The system can be **integrated with standard modular machines** in the YCAE-X Series
- It is also possible to combine the system with **variable frequency modular machines** in the YMAA/YMPA Series
- To expand the capacity of the system, simply splice in and join up to 32 units



The benefits of intelligent design

The YCAE-XHR represents the best of intelligent design:

- **The YCAE-XHR is designed to run efficiently.** When it is connected to different types of modular units, the control logic utility optimizes the efficiency of the hot water and air conditioning systems. This reduces energy costs for both heating and cooling
- The system allows our customers to **set the priority for the cooling, heating and hot water modes** according to the cooling or heating load. Each application is tailored to the specific needs and schedules of business owners and their staff
- The system can **raise or lower priorities** according to load and water temperatures to address a customer's particular requirements while still maintaining highly efficient operating levels



Performance parameters - YCAE-XHR Series

				YCAE065XHME50	YCAE130XHME50
Air Conditioning Mode	Refrigeration	Cooling Capacity	kW	64	130
		Cooling Input Power	kW	21.3	39.3
		Energy Efficiency Rating (EER)	kW/kW	3	3.3
		IPLV	kW/kW	3.99	4.35
	Heating	Heating Capacity	kW	64.5	131
		Heating Input Power	kW	20.8	41.6
Hot Water Mode	Heating	Coefficient of Performance (COP)	kW/kW	3.1	3.15
		Heating Capacity	kW	82	82
		Input Power	kW	19.7	19.6
		Hot Water Circulation Flow	m ³ /h	14.1	14.1
Heat Recovery Mode	Heating	COP	kW/kW	4.16	4.18
		Nominal Cooling Capacity	kW	62	128
		Heat Recovery	kW	80.5	80.5
Compressor	Form	Heat Recovery Heat Input Power	kW	18.6	39.5
		Quantity	Station	Scroll compressor	
Fan	Form	Quantity	Station	2	4
		Number Of Fans	Station	2	2
		Air Volume	m ³ /h	22,000	42,000
		Motor Power (Single)	kW	0.9	1.65
Air Conditioner-Side Heat Exchanger	Form	ESP	Pa	30	0
		Brazen plate heat exchanger			
		Water Pressure Drop	kPa	61	60
		Inlet And Outlet Pipe Size	-	50	DN65
		Water Pipe Connection Method	-	Clamp	
		Water Flow	m ³ /h	11	22.4
Hot Water-Side Heat Exchanger	Form	Shell-coil heat exchanger			
		Water Pressure Drop	kPa	76	72
		Inlet And Outlet Pipe Size	-	Rc 2in.	Rc 2in.
		Water Pipe Connection Method	-	Thread	
Dimensions	Form	Water Flow	m ³ /h	14.1	14.1
		Length x Width x Height	mm	1,650 x 760 x 1,700	2,250 x 1,200 x 2,420
Unit Weight	Form	Running Weight	kg	600	1,060
Electrical Specifications	Form	Rated Current / Refrigeration / Heating	A	38.5	74.2
		Maximum Current	A	52	104

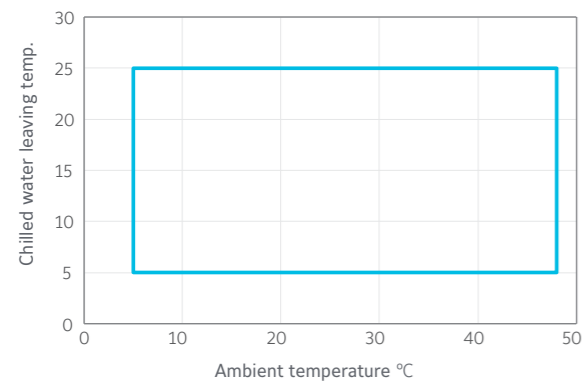
Note:

1. The manufacturer reserves the right to change these specifications without notice
2. Outside temperature 35°C (DB). Host refrigeration / outlet temperature: 7/12°C
3. Rated heating capacity test conditions: outside temperature: 7°C (DB) / 6°C wet bulb (WB), heating / outlet temperature: 40/45°C
4. Heat recovery conditions: outside temperature: 35°C; inlet and outlet water temperature of unit air conditioner: 7/12°C; hot water inlet and outlet temperature of the unit: 40/45°C
5. Outside temperature: 15/20°C; hot water inlet and outlet temperature of the unit: 40/45°C

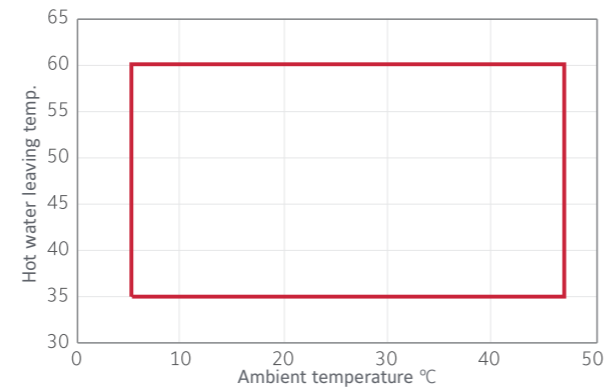
Unit operating range diagram

YCAE065XH/YCAE130XH

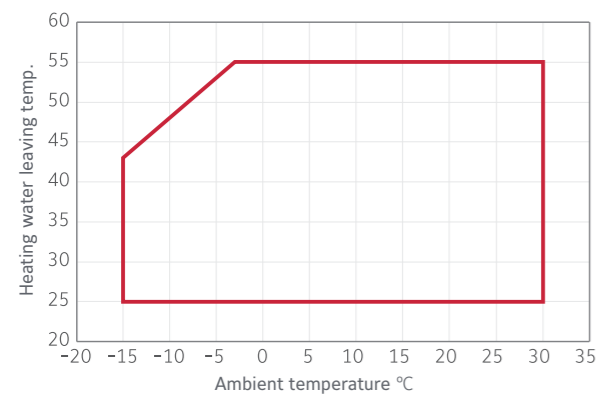
Cooling



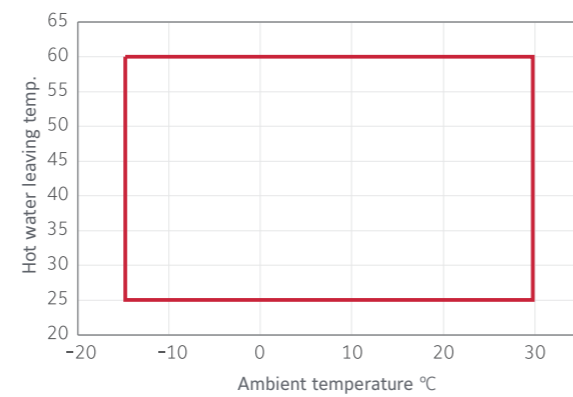
Cooling and heat recovery



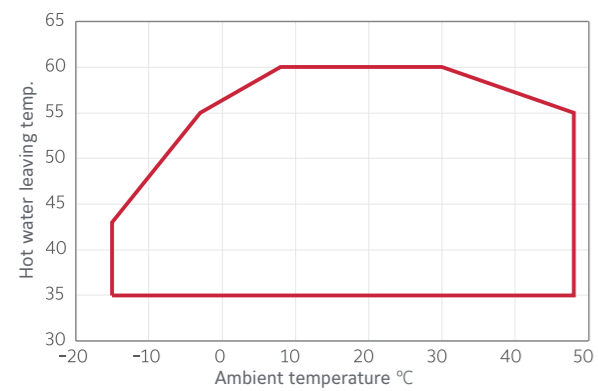
Heating



Heating and hot water

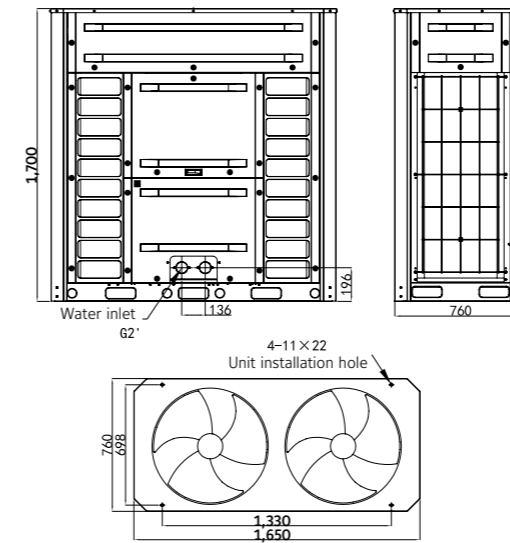


Independent hot water heat pump



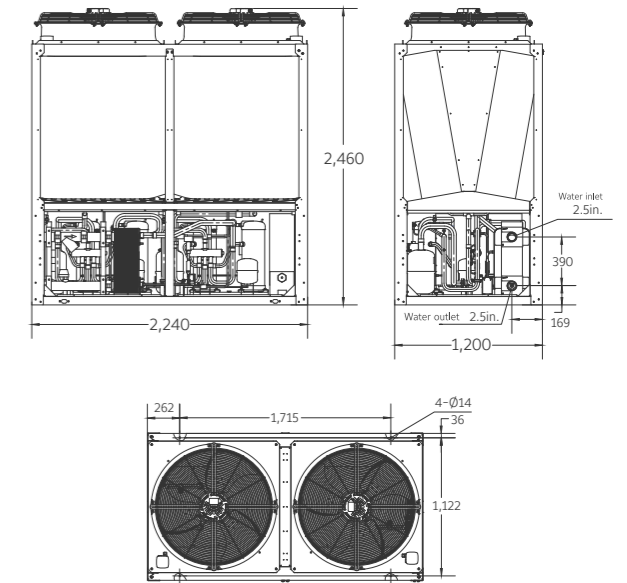
Dimensions

YCAE065X

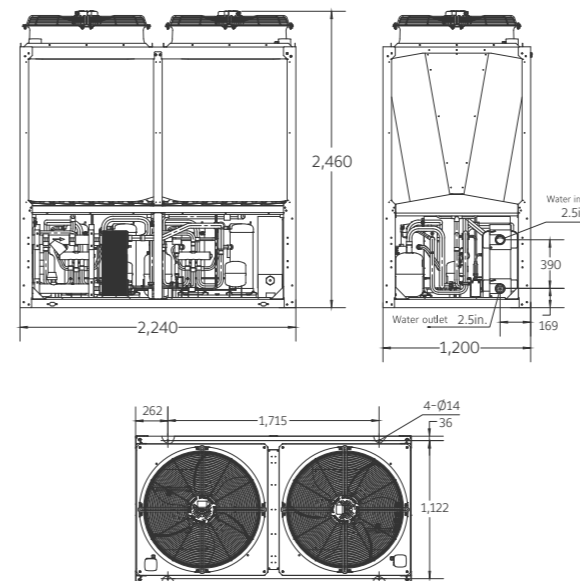


Grille and baffle are optional for the YCAE100/130X Series

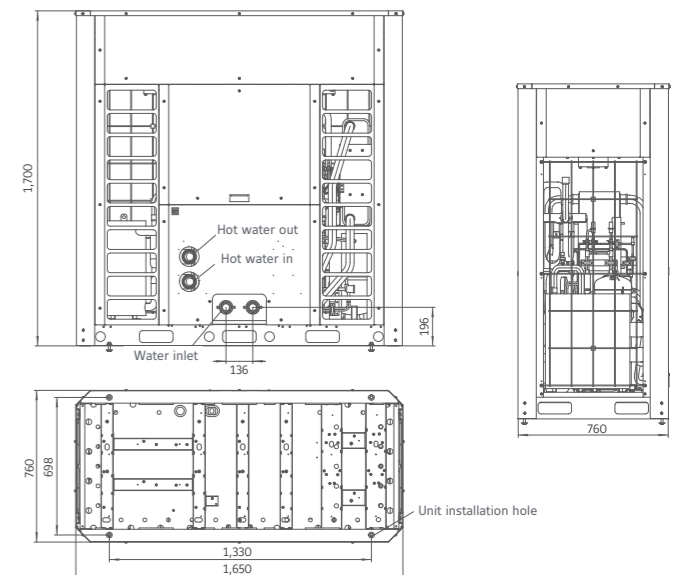
YCAE100/130X



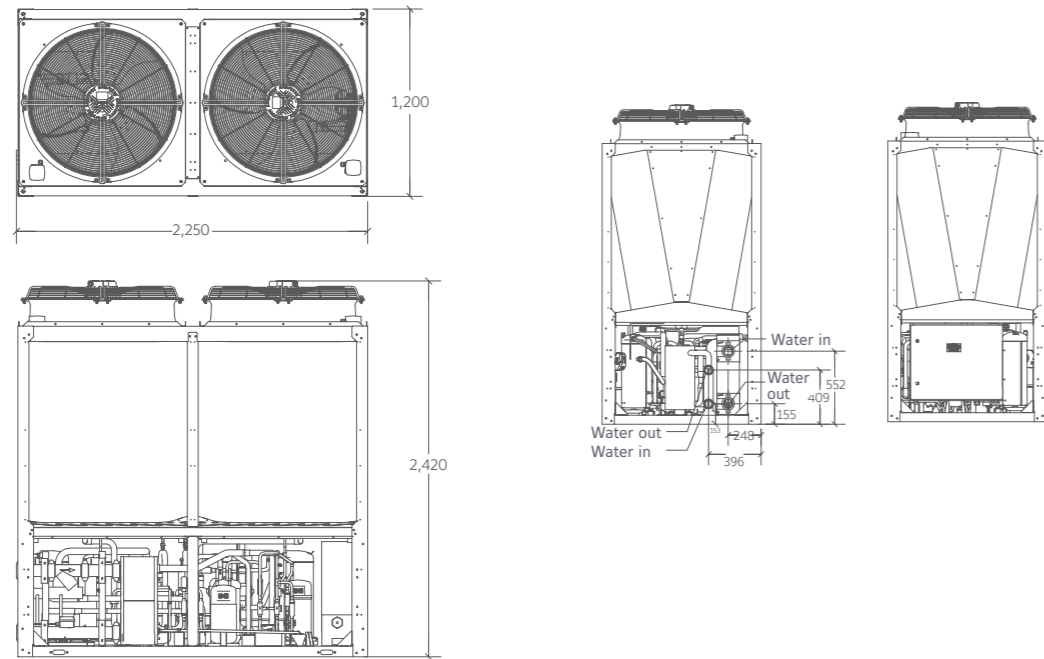
YCAE160X



YCAE065XH

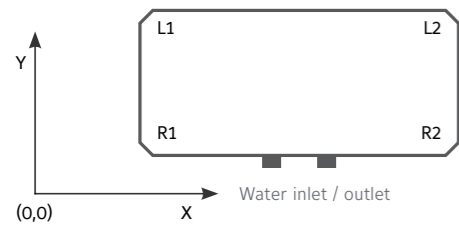


YCAE130XH



Weight distribution

YCAE065X/YCAE065XH



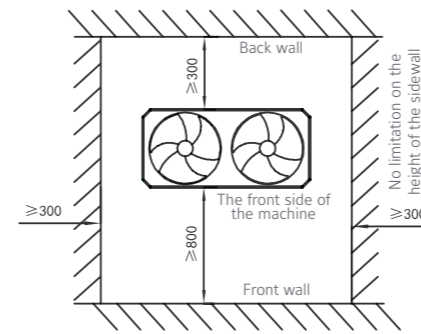
YCAE100/130X/160X



		Unit	R1	L1	R2	L2
YCAE065XRME	Load	kg	127	112	130	109
	Location	(x-mm, y-mm)	(160, 31)	(160, 729)	(1,490, 31)	(1,490, 729)
YCAE100XRME	Load	kg	169	205	222	267
	Location	(x-mm, y-mm)	(262, 36)	(262, 1,158)	(1,977, 36)	(1,977, 1,158)
YCAE130XRME	Load	kg	212	264	235	272
	Location	(x-mm, y-mm)	(262, 36)	(262, 1,158)	(1,977, 36)	(1,977, 1,158)
YCAE065XHME	Load	kg	190	170	190	170
	Location	(x-mm, y-mm)	(160, 31)	(160, 729)	(1,490, 31)	(1,490, 729)
YCAE130XHME	Load	kg	362	317	403	335
	Location	(x-mm, y-mm)	(262, 36)	(262, 1,158)	(1,977, 36)	(1,977, 1,158)
YCAE160XRME	Load	kg	307	337	262	283
	Location	(x-mm, y-mm)	(262, 36)	(262, 1,158)	(1,977, 36)	(1,977, 1,158)

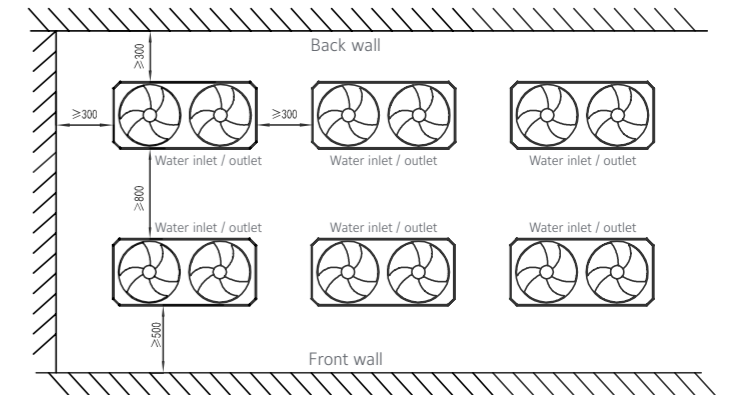
YCAE065X/YCAE065X/YCAE065XH

Installation of a single unit



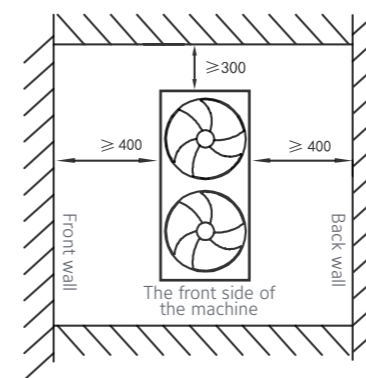
Note: See Installation, Operation, and Maintenance (IOM) manual for other installation styles. It is recommended that the height of the wall not be higher than the installation height of the units.

Installation of multiple units

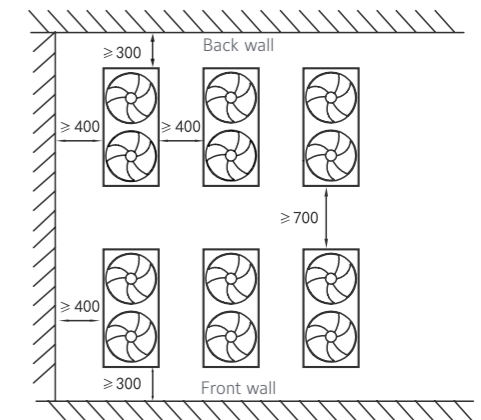


YCAE100/130/160X

Installation of a single unit



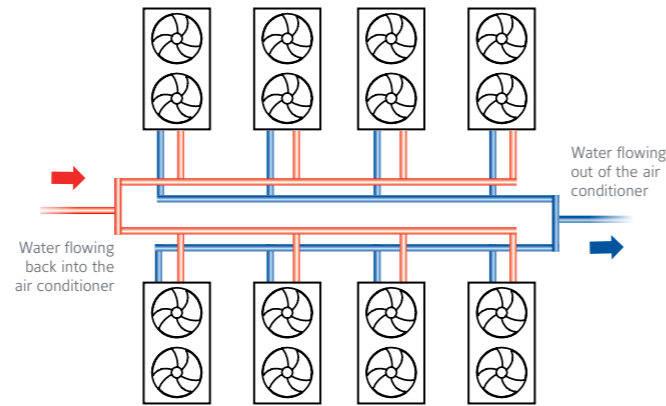
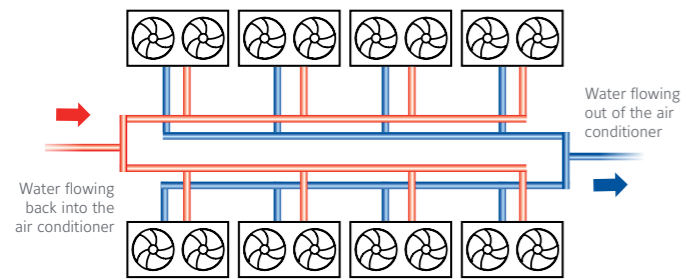
Installation of multiple units



Units layout

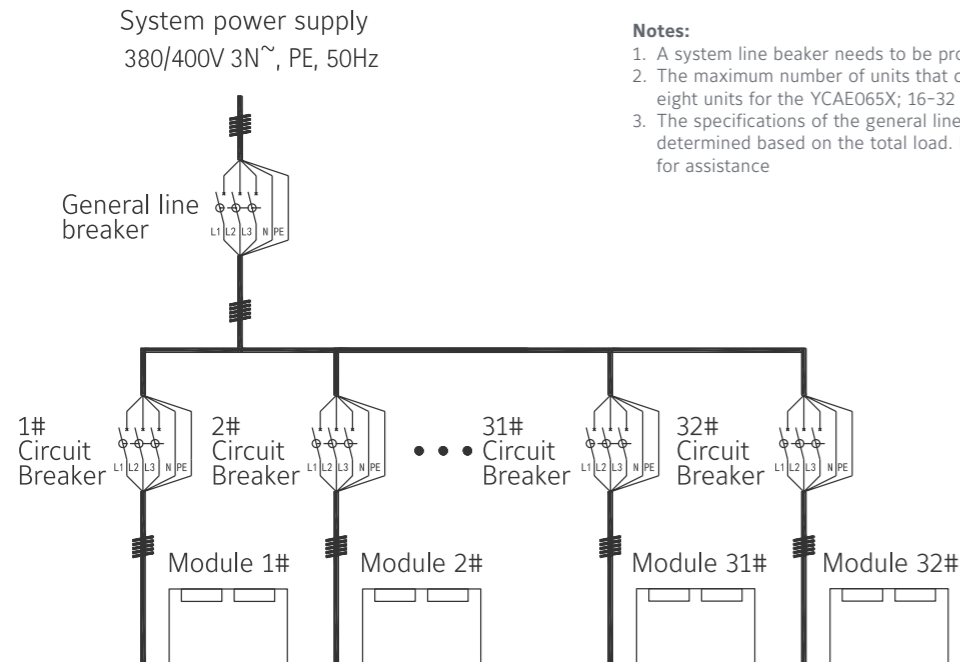
YCAE065X/YCAE065XH

YCAE100X/YCAE130X/YCAE160X/YCAE130XH



Field wiring

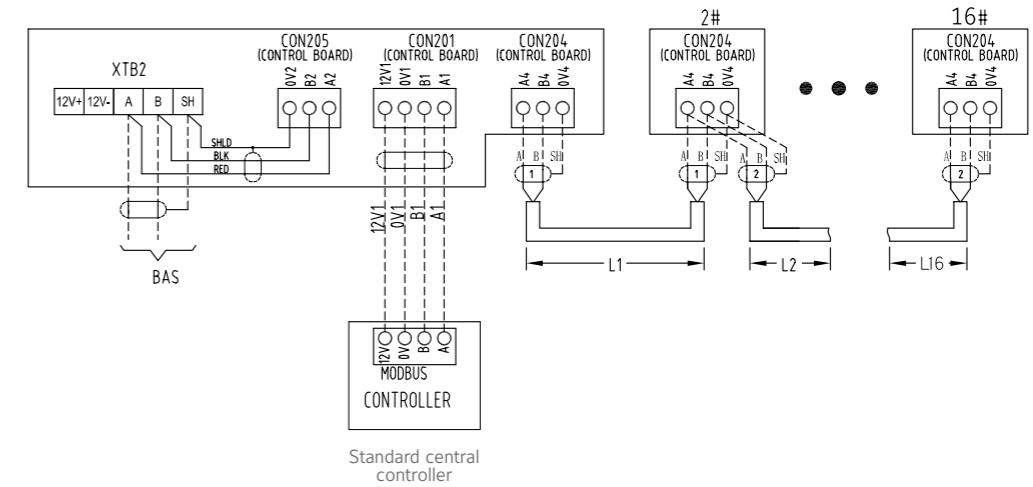
System power distribution



- Notes:**
1. A system line breaker needs to be provided by the customer
 2. The maximum number of units that can be connected to the system currently: eight units for the YCAE065X; 16-32 units for the YCAE100/130X
 3. The specifications of the general line breaker and the power cable need to be determined based on the total load. Please contact YORK aftersales personnel for assistance

Field wiring

YCAE-X and YCAE-XH series communication network (standard central controller)

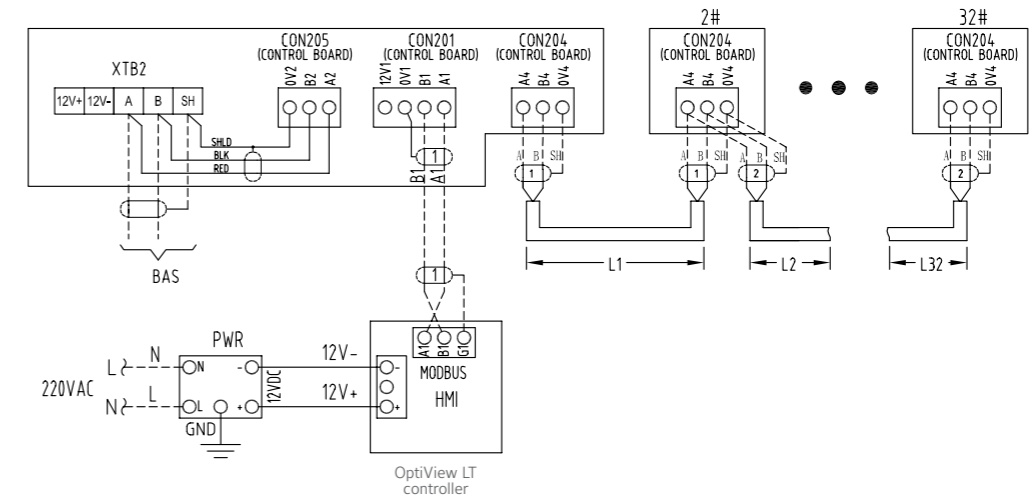


Telecommunications line requirement

Total Length for Wires from Wire Control Device to the Last Units	L=L1+L2+...+L16(m)		
	L<100m	100m<L<500m	L>500m
Corresponding Communication Wire Type	PVVPS 2x0.75mm ²	PVVPS 2x1mm ²	Contact Johnson Controls Service

- Notes:**
1. Shielded, twisted pairs are recommended for the communication lines
 2. Communications line to be provided by customer

YCAE-X and YCAE-XHR series communication network (OptiView LT controller)



Telecommunications line requirement

Total Length for Wires from Wire Control Device to the Last Units	L=L1+L2+...+L32(m)		
	L<100m	100m<L<500m	L>500m
Corresponding Communication Wire Type	PVVPS 2x0.75mm ²	PVVPS 2x1mm ²	Contact Johnson Controls Service

- Notes:**
1. Shielded, twisted pairs are recommended for the communication lines
 2. Communications line to be provided by customer

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