



 **YORK**

Chillers and Heat Pumps

YORK® Amichi Series

YMAE Air-to-Water Inverter Scroll Heat Pumps

Efficiency-optimized heating and
cooling for best-in-class performance



Efficiency-optimized heating and cooling for best-in-class performance

YORK® New Generation Amichi Series

An evolution of 2021 ACR Awards Heat Pump Product of the Year, The new generation Amichi Series YORK YMAE is developed with full inverter system and enhanced vapor injection (EVI) technology, which boost industry leading seasonal efficiency and heating capability in cold climate with no compromise.

YMAE pioneering design makes it an ideal choice to accelerate our customer's path to decarbonization and electrification.



YMAE Air-to-Water Inverter Scroll Heat Pump

38~124kW | R454B | 2 pipe

YMAE is equipped with industry-leading high efficiency DC inverter, enhanced vapor injection system, EC fan, YORK® inverter drivers and Smart control platform , these core technologies delivers next level efficiency and heating capability to set the new benchmark for the industry.



Best-in-class
efficiency



Wide operation
range



Quiet
operation

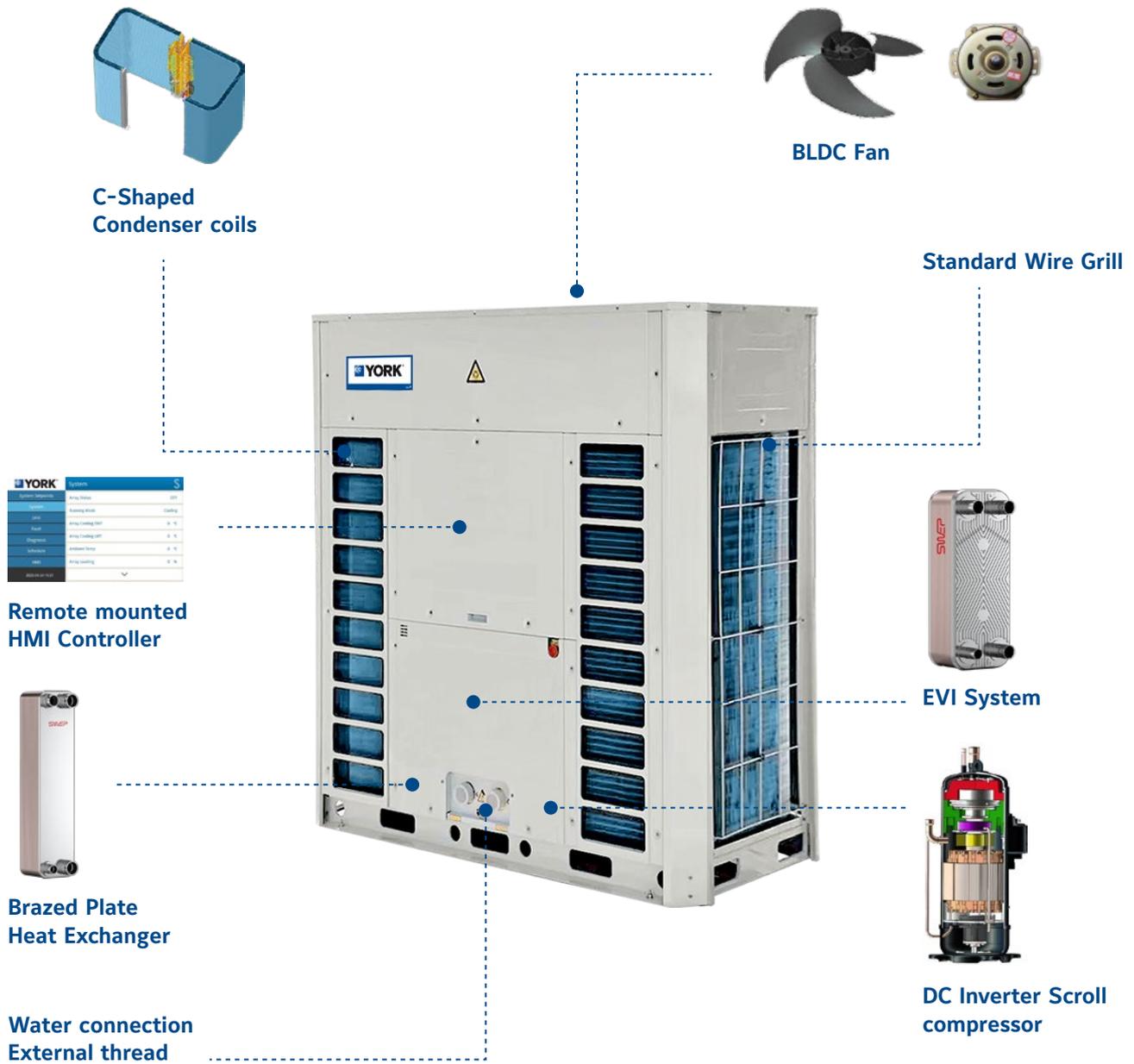


Robust
reliability

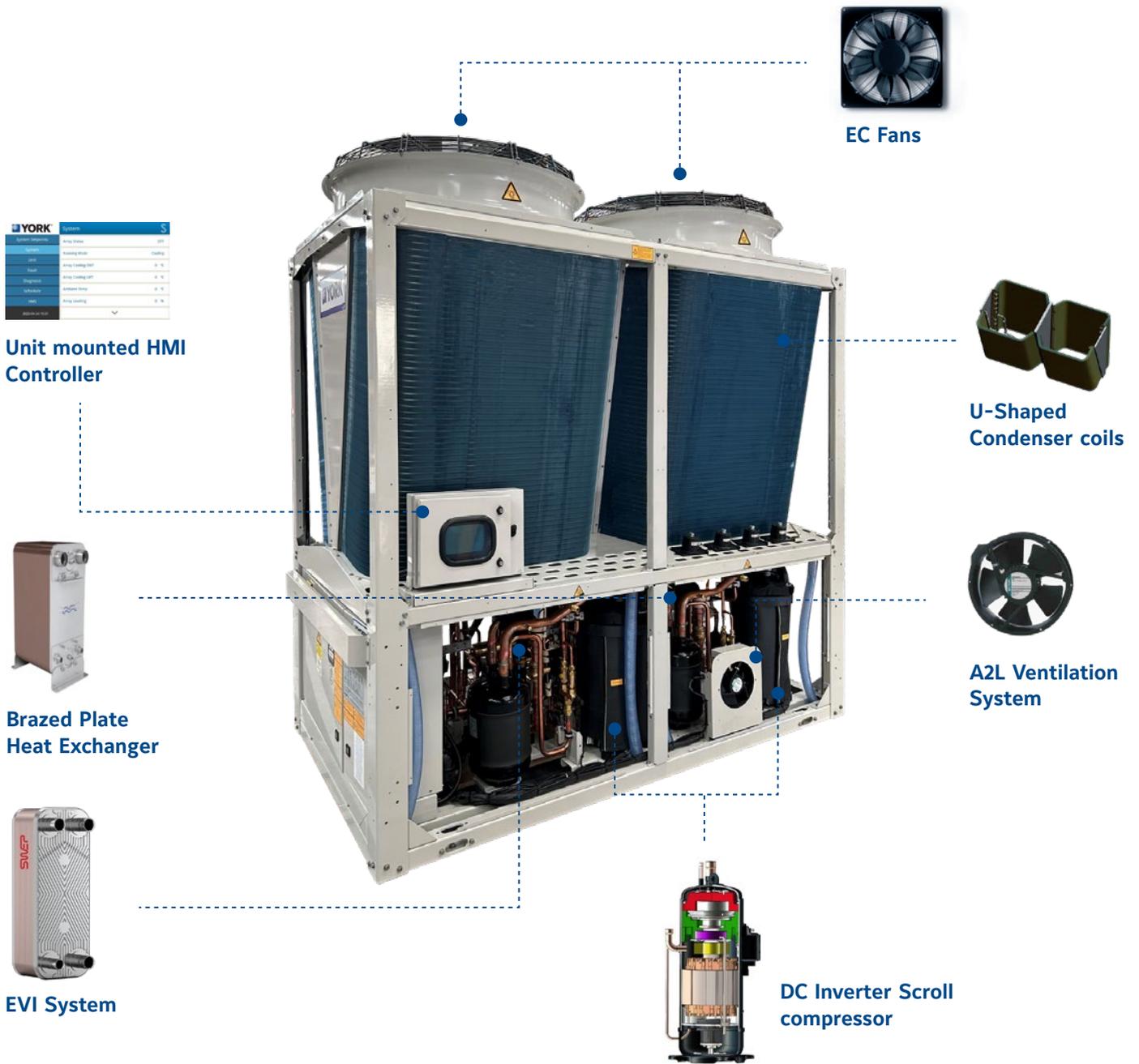


Sustainability

YMAE0045 to 0065 configuration



YMAE0130 configuration





R454B



INVERTER



E.V.I. SYSTEM





SMART EQUIPMENT



EUROVENT CERTIFIED PERFORMANCE

Exceeds efficiency standards

The **YORK YMAE Air-to-Water Inverter Scroll Heat Pump** is designed to meet tomorrow's efficiency standards today. Delivering performance beyond typical efficiency levels, this heat pump boasts an industry-leading **SCOP up to 4.24** according to EN14825.

This exceeds stringent regulatory requirements through an optimized combination of efficiency-enhancing technologies from Johnson Controls.

YMAE	YMAE is at the top of its class	
SEER	Up to 4.86	Exceed the Ecodesign Tier 2 standard by 19%
SCOP	Up to 4.24	Exceed the Ecodesign Tier 2 standard by 32%

High-efficiency DC inverter scroll compressor with EVI

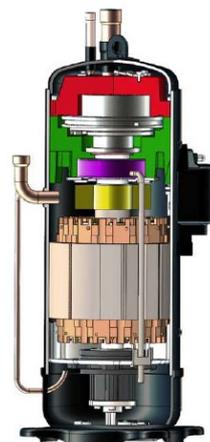
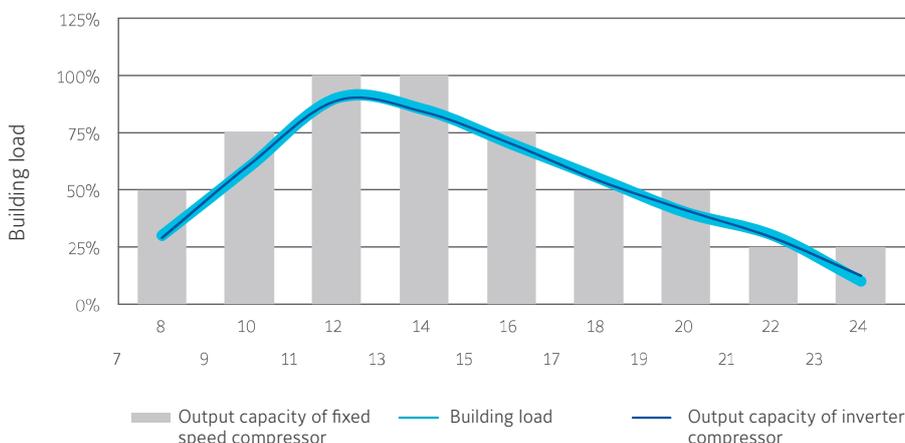
YMAE Series uses the proven design of the direct current (DC) inverter compressor, which embraces all of the design features driven for exceptional efficiency all year around. It deliver stepless capacity control from 19% to 100%, allowing precise capacity matching for building loads and reducing unit power input, resulting in a significant energy consumption savings for the chiller and heat pump system.

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.



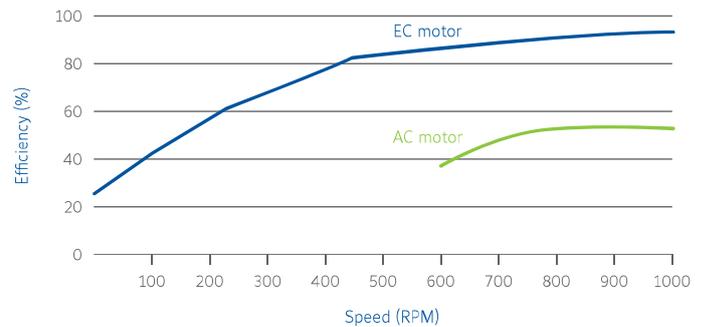


YORK® inverter driver

The YORK® inverter driver is engineered to meet the challenging performance demands of the YMAE chiller. Coupled with smart control logic, the solution smartly manages system operation and ultimately delivers excellent energy savings throughout entire life cycle for the customer.

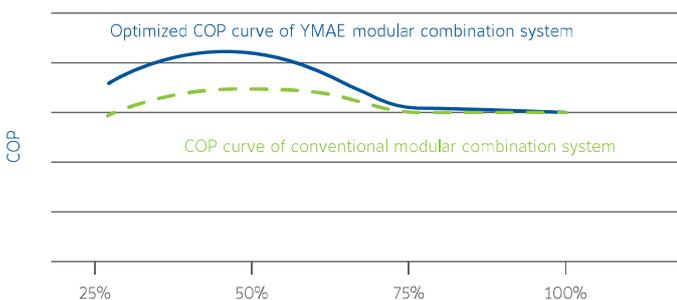
Electronically commutated (EC) fan

The YMAE use the high efficiency EC fan motors better aerodynamics to improve overall system efficiency and sound performance, particularly in part-load conditions. This means minimal disturbances for the people in your spaces. At reduced ambient temperatures, the head pressure control varies fan speeds, the fan blades and motor align perfectly to deliver great low energy consumption and ensure reliable operation.



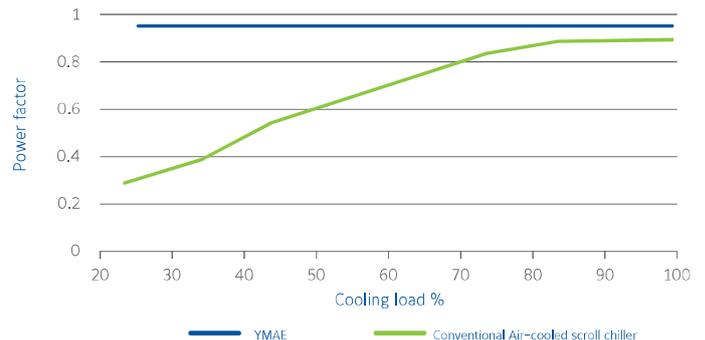
Real-time system efficiency optimization

The YMAE system automatically adjusts output capacity smoothly according to the actual changing load of indoor terminal units ensure that each module in the combination system always maintains its excellent energy efficiency and that the whole system operates efficiently while saving energy throughout its life circuit.



High power factor

The power factor of YMAE module is up to 95%, which reduces the required power capacity of transformer. Unlike traditional scroll chillers, the power factor does not reduced at part load. This saves electricity by improving the utilization rate of transmission equipment and reducing the circuit loss of power lines.



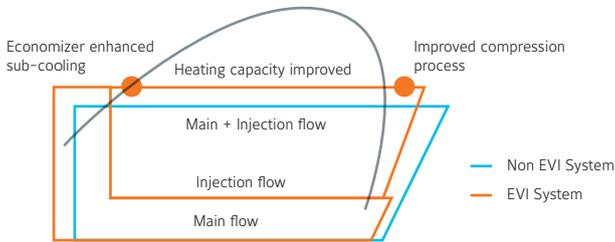
Performance without compromise

Superior heating performance

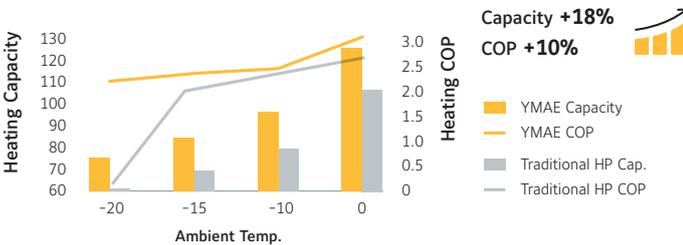
The EVI scroll compressor (Enhanced Vapor Injection) system includes the addition of a small, brazed plate heat exchanger (economizer), an expansion valve, and injection port built into the compressor. The effect is to enhance the overall efficiency of the heating mode at low ambient temperatures, improving the overall performance of the system by up to 20%.

The following example demonstrates the potential advantages of EVI technology in a YMAE 130 kW heat pump with an LWT of 45°C. The heating capacity is increased by 18%, and the COP rises by 10%. Furthermore, the heating operational range is extended to -25°C, which exceeds the capacity of traditional HP systems, which are mostly limited to -15°C.

Enhanced Vapor Injection

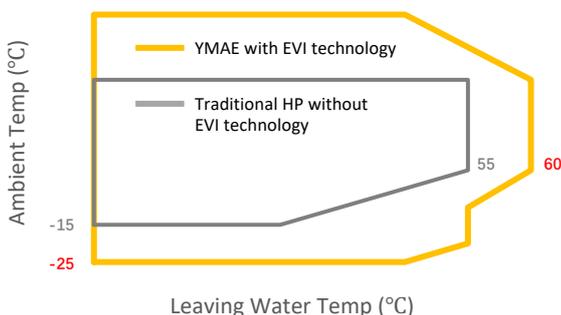


Heating performance



Wide operation range

YMAE is a no-compromise solution for a variety of climates and locations. Built specifically to deliver better performance through a wider operating envelope, this heat pump can maintain efficiency in a variety of conditions without kits or add-ons – up to 48°C ambient in cooling mode and down to an impressive -25°C ambient in heating mode and be capable of providing the chilled leaving water temperature down to -12°C and hot water up to 60°C.



Quiet operation

Recognition of the importance of sound reduction is growing and can be a very important design criterion for any project. York maintains the widest selection of sound mitigating options in the market place and can provide the most cost effective option to meet any requirement.

In the real world, chillers run 99% of the time in off-design conditions, thus the sound performance at partial load really counts. The traditional fixed speed chillers address limited reduction in sound level at partial load. While for the inverter chiller, thanks to the inverter technology, the compressor frequency can be lower down and result in a significant sound reduction, in most case, the expensive sound enclosure are not necessary.

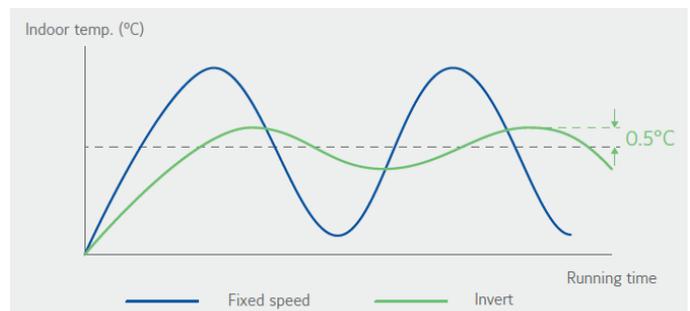
We want to ensure our neighbors are comfortable too, even in retrofits. That's why our systems offer three levels of sound performance. If requirements call for sound reduction beyond our standard low-noise levels, an optional Ultra Quiet Kit can further reduce sound power by an impressive 4dBA, providing one of the quietest units available.



Stable temperature control

The unique variable evaporating temperature control of the YMAE allows for an auto-adaptive temperature control range between -12~20°C in cooling mode and -25~60°C in heating 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.



Amazing flexibility

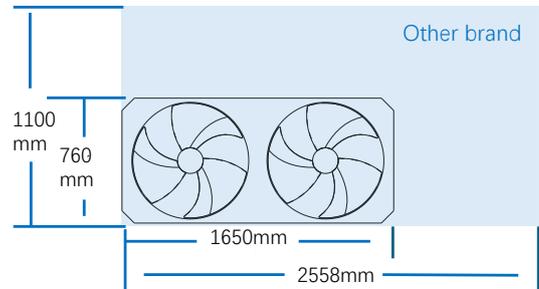
Compact design, easy transportation

The YMAE (45 to 65kW) 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.



Best-in-class footprint

The YMAE (45 to 65kW) units are designed with compact dimensions for easy installation. With a length of 1.65m for 65kW and a width of 0.76m, the units require minimal layout.



Advanced control made easy

Comfort, productivity and up to half of the energy used in your building – these are all factors affected by how your heat pump operates and how it interacts with other components in your HVAC/R system. To help maximize efficiency and keep you in control, the YORK® YMAE comes as standard with integrated advanced controls and communication technologies. This technology allows the equipment to connect seamlessly to building controls, such as our world-class Verasys system, where enabled equipment can self-identify and interoperate.

Verasys provides a plug-and-play experience, with no programming or commissioning tools required. Remote access over a secure internet connection and alarm notifications via email or text are possible through Verasys. The user-friendly graphical interface provides easy access to critical equipment and facility information to help minimize the risk of unplanned downtime and costly repairs.

Verasys also provides enhanced energy efficiency control. The key to this efficiency is demand control, where Verasys routes the energy requirements of a room or space to the heating and cooling equipment – matching the demand side and the supply side to provide greater overall energy efficiency.

In addition to Verasys integration capabilities, this model provides added flexibility with standard BACnet MS/TP, Modbus RTU or N2 connectivity for communication with virtually any building management system. This advanced, embedded control capability also allows multiple heat pumps to be connected and monitored through a single controller, which features a touchscreen display that has easy-to-use, web-style interface and intuitive navigation for easy access to operational data. Information can be displayed in multiple languages and setup is very easy.

Plug and Play experience



SG ready



Intelligent, efficient and environmentally friendly

As the demand for renewable energy sources continues to grow, we understand the need for a reliable and stable energy supply. Our heat pumps are designed to effectively manage fluctuations in power generation from wind energy and photovoltaics.

With our smart grid-ready heat pumps, power surpluses can be seamlessly removed from the grid and converted into valuable heating energy. This surplus energy is then stored in a buffer, ensuring a consistent and dependable energy supply. Not only does this innovative solution benefit the environment by reducing our reliance on fossil fuels, but it also brings significant savings to heat pump owners.

By utilizing power when it is most favorable, our heat pumps optimize energy consumption, resulting in lower energy costs and a more sustainable lifestyle. Join the green revolution and experience the benefits of our smart grid-ready heat pumps. Contact us today to learn more and start enjoying a reliable, environmentally friendly energy solution.

A history of reliability

The YORK® YMAE Air-to-Water Inverter Scroll Heat Pump is a no-compromise solution that delivers industry-leading efficiency, unmatched flexibility, world-class sound performance, extensive control capability and long-lasting reliability. These highly optimized designs use advanced components and innovative thinking to provide the best-in-class performance only the world's leader in heat pump solutions can deliver.

When your reputation is at stake, count on efficient, reliable cooling and heating solutions from YORK® to lower costs and maximize uptime with dependability. Our local stocking allows quick shipment to North American locations. And with our units shipping as a complete package, everything arrives at the same time. We also offer a variety of standardized, locally-stocked parts to ensure our systems continue to provide maximum uptime.

With the YORK® YMAE Air-to-Water Inverter Scroll Heat Pump, we're building on our legacy of cooling solutions and technology leadership. We don't judge success based on theoretical findings but real-world experience. Our first-generation modular heat pump was built more than a decade ago. We use DC inverter technology proven over 30 years of use and our adoption of inverter scroll technology dates to 1985.

Every new YORK® chiller is subjected to a Highly Accelerated Life Test (HALT) during the design product development stages. This testing simulates a variety of extreme conditions and ensures long-term operational reliability and quality. But our pursuit of quality doesn't stop there.



- **Decades of extensive air-cooled expertise** is backed by proven components used in a variety of conditions in installations across the globe
- **Compressor management improves overall reliability** by balancing system operation time between each compressor
- **Smart logic controller** coordinates and optimizes units for off-design and part-load operation
- **Intelligent defrost** optimizes the sequencing of the defrost cycle and allows the remaining modules in the system to continue to provide heat, reducing interruptions
- **Compliance and certifications** include EcoDesign 2021 regulatory compliance, Eurovent certification, and CE/ PED certification



Safety is our priority

The YORK® Amichi Series Air-Cooled DC Inverter Scroll Heat Pump is designed for safe operation. The new R454B refrigerant was chosen with safety and low toxicity in mind. R454B has a 78 percent lower GWP value in comparison to R410A and is classified in safety class A2L (non-toxic and difficult to ignite).

This heat pump is equipped with refrigerant leakage sensors, additional switch cabinet ventilation, and software management for leak warning messages. With multiple functional and reliability tests, quality assurance is enhanced.

To maximise safety, the system design has been verified by a third-party certification body to increase customer peace of mind. The customized components together with our advanced technology, give absolute confidence.

		Refrigerant Safety Groups	
Flammability	Higher	A3	B3
	Lower	A2	B2
	Difficult to Ignite and Sustain	A2L	B2L
	No Flame Propagation	A1	B1
		Lower	Higher
		No identified toxicity at concentrations ≤ 400 ppm	Evidence of toxicity below 400 ppm
		Toxicity	

Source: ASHRAE Standard 34 Safety Classification



Customized hermetic scroll compressors designed for A2L refrigerant



Optimized plate heat exchanger, suitable for R454B application



A ventilation system installed inside the unit to ensure no A2L gas accumulates



Leakage detective sensor equipped to detect any gas leakage



Dedicated to sustainability

At Johnson Controls, we are dedicated to protecting the environment. This goes back to our founder, Warren S. Johnson, and his invention of the electric thermostat in 1885. It sparked a fundamental shift in the energy efficiency of buildings. Now, all over the world, our products and services empower customers and communities to consume less energy and conserve resources.

The European 2050 Vision towards a low-carbon economy is targeting a reduction of 80 to 95 percent in greenhouse gas emissions by looking at the reduction of the three parameters in the graphic compared to 1990 values.

EU energy efficiency improvement targets also strongly influence the HVAC market. Buildings are the largest consumers of energy today, and HVAC systems account for a significant portion of a building's energy consumption. This is why the HVAC industry is a focus of European Environmental Policies. The F-Gas regulation addresses direct emissions while EPBD, EcoDesign, and RES are directives focused on indirect greenhouse gas emissions by improving the efficiency of HVAC systems and buildings.

With a low GWP of just 466 and zero ODP, the R-454B refrigerant belongs in the HFO class, which eliminates ODP and reduces GWP.

The YORK® YMAE Air-to-Water Inverter Scroll Heat Pump with R-454B refrigerant complies with the HFC Phase Down plan to reduce greenhouse gas emissions. The physical properties of R-454B are similar to the R-410A refrigerant. In fact, most of the components designed for R-410A can be used with R-454B.

This new model uses 10 percent less refrigerant compared to products that use R-410A. In addition, it will maximize the use of existing components to cut waste. This heat pump is an eco-friendly offering whose operations work to protect our environment.



Safe and reliable

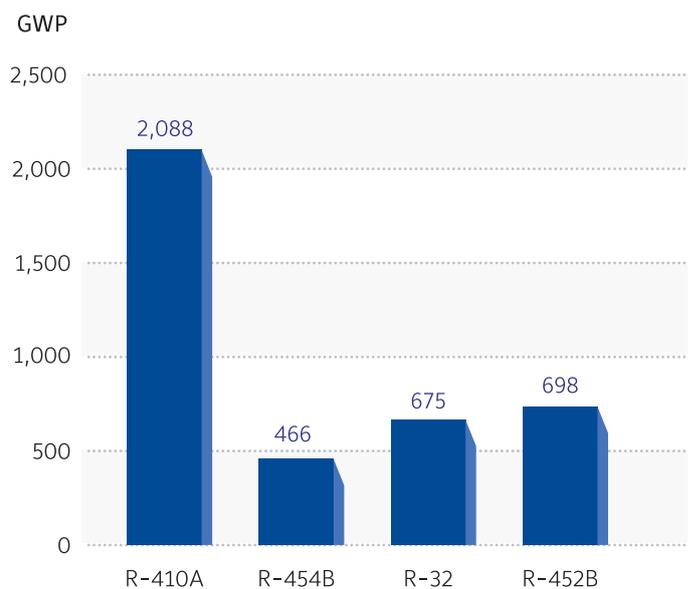
Toxicity and flammability must be addressed for all refrigerant options. Systems must be designed for new refrigerants and undergo long-term testing.

Efficient and sustainable

Future refrigerant choices must present equal or better overall performance values than current refrigerants. Energy efficiency is the ultimate priority to reduce the carbon footprint of HVAC products.

Available and affordable

Local availability at a reasonable cost is critical for building owners' bottom line.



78% lower GWP than R-410A
31% lower GWP than R-32
10% less charge than R-410A

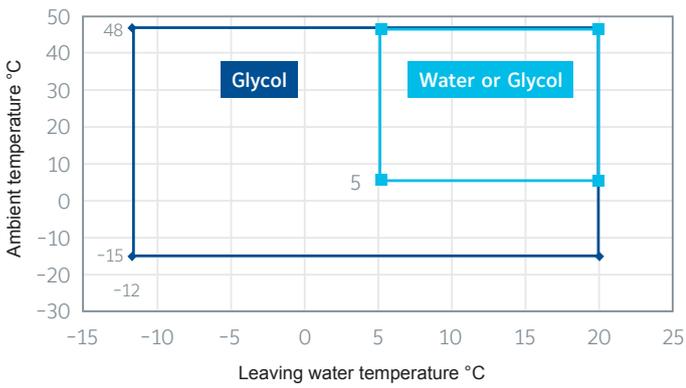


Want to know more about transitioning to low-GWP refrigerants? Scan the QR code or visit: www.johnsoncontrols.com/corporate-sustainability/commitments/refrigerant-transition

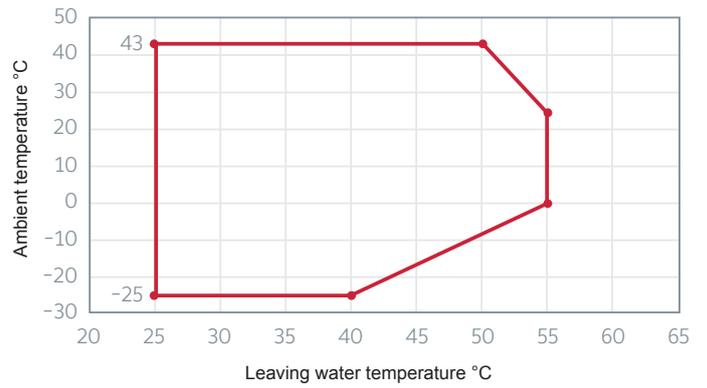
YMAE Operating Range

YMAE0045

Cooling mode

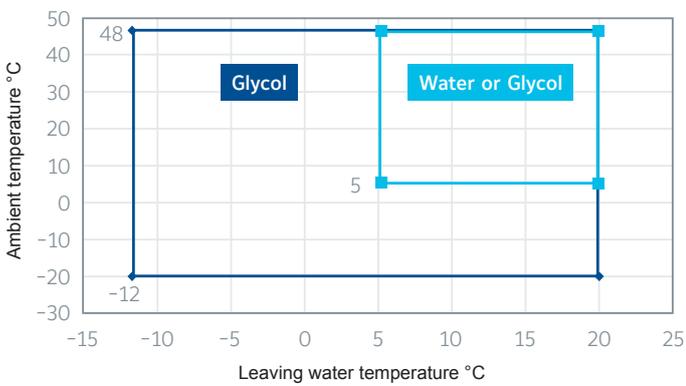


Heating mode

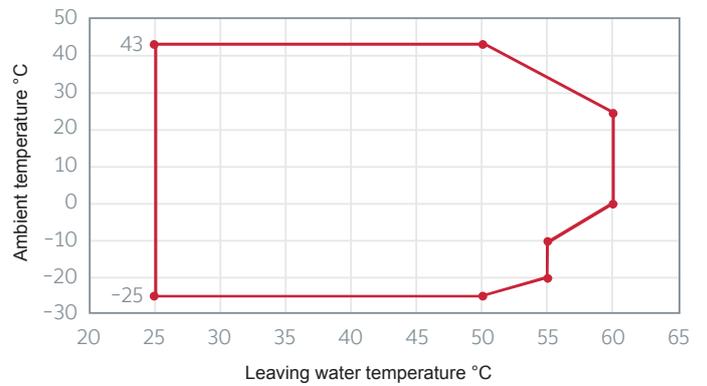


YMAE0050 to 0130

Cooling mode



Heating mode



Technical Features

Standard sound unit

Model			YMAE0045	YMAE0050	YMAE0065	YMAE0130
Cooling	Cooling Capacity	kW	43.5	50.0	60.0	124.0
	Power input	kW	14.8	15.9	21.3	42.5
	EER	kW/kW	2.94	3.15	2.82	2.92
	SEER	kW/kW	4.65	4.64	4.50	4.70
	$\eta_{s,c}$	%	183.1	182.8	177.2	185.2
	Sound power level	dB(A)	80	79	82	83
Heating	Heating Capacity	kW	48.0	53.0	60.5	139.0
	Power input	kW	15.6	15.6	18.7	43.4
	COP	kW/kW	3.08	3.40	3.23	3.20
	SCOP	kW/kW	4.10	4.22	4.10	4.06
	$\eta_{s,h}$	%	161.0	165.6	161.1	159.4
	Refrigerant	Type		R454B		
Circuit quantity		#	1	1	1	2
Refrigerant charge/circuit		kg	10.0	10.5	10.5	11.5
Compressor	Type		DC inverter scroll with EVI			
	Capacity step		Stepless (Inverter)			
	Quantity		1	1	1	2
Air side heat exchanger	Coil type		Copper Tube, Aluminum Plate Fin			
	Fan type		Axial fan, BLDC motor			Axial fan, EC inverter motor
	Fan quantity		2			
	Outdoor air temp range (cooling)	°C	-15 ~ 48	-20 ~ 48		
	Outdoor air temp range (heating)	°C	-25 ~ 43			
Water side heat exchanger	Type		Brazen plate heat exchanger			
	Water connection		External thread	External thread	External thread	Victaulic
	Size of water pipe		G2"	G2"	G2"	DN65
	Nominal water flow rate (cooling)	l/s	2.08	2.39	2.87	5.92
	Nominal water flow rate (heating)	l/s	2.29	2.53	2.89	6.64
	Pressure drop (cooling)	kPa	42	36	50	50
	Pressure drop (heating)	kPa	50	40	51	58
	Leaving water temp range (cooling)	°C	-12 ~ 20			
	Leaving water temp range (heating)	°C	25 ~ 55	25 ~ 60	25 ~ 60	25 ~ 60
Dimensions	Height	mm	1700	1700	1700	2420
	Length	mm	1650	1650	1650	2240
	Width	mm	760	760	760	1200
Weight	Shipping weight	kg	475	495	495	1075
	Operating weight	kg	480	502	502	1090
Electrical	Power supply	V/Ph/Hz	400V - 3Ph - 50Hz			

- Net values at Eurovent nominal conditions:
 - Cooling capacities in kW given for 7°C leaving water temperature $\Delta t5^\circ\text{C}$ and 35°C ambient temperature.
 - Heating capacities in kW given for 45°C leaving water temperature $\Delta t5^\circ\text{C}$ and 7°C ambient temperature.
 - SEER and SCOP are calculated according to EN14511 and EN14825.
 - η_s is calculated according to Ecodesign regulation for chillers comfort cooling and heating (813/2013, 2016/2281)
- SEER is calculated following fixed water flow and variable outlet approach (FW/VO) .
 SCOP is calculated following variable water flow and variable outlet approach (VW/VO).
 For other Ecodesign calculations, please contact your JCI representative.



Manufacturer reserves the rights to change specifications without prior notice.

Technical Features

Low sound unit

Model			YMAE0045	YMAE0050	YMAE0065	YMAE0130
Cooling	Cooling Capacity	kW	38.0	45.0	54.0	118.0
	Power input	kW	11.4	13.9	18.4	38.1
	EER	kW/kW	3.32	3.23	2.93	3.10
	SEER	kW/kW	4.70	4.67	4.61	4.86
	$\eta_{s,c}$	%	185.3	184.0	181.4	191.3
	Sound power level	dB(A)	75	75	77	79
Heating	Heating Capacity	kW	41.5	49.0	54.0	128.0
	Power input	kW	12.2	13.9	15.9	39.1
	COP	kW/kW	3.41	3.53	3.39	3.27
	SCOP	kW/kW	3.97	4.24	4.20	3.94
	$\eta_{s,h}$	%	156.0	166.6	165.1	154.5
Refrigerant	Type		R454B			
	Circuit quantity	#	1	1	1	2
	Refrigerant charge/circuit	kg	10.0	10.5	10.5	11.5
Compressor	Type		DC inverter scroll with EVI			
	Capacity step		Stepless (Inverter)			
	Quantity		1	1	1	2
Air side heat exchanger	Coil type		Copper Tube, Aluminum Plate Fin			
	Fan type		Axial fan, BLDC motor			Axial fan, EC inverter motor
	Fan quantity		2			
	Outdoor air temp range (cooling)	°C	-15 ~ 48	-20 ~ 48		
	Outdoor air temp range (heating)	°C	-25 ~ 43			
Water side heat exchanger	Type		Brazed plate heat exchanger			
	Water connection		External thread	External thread	External thread	Victaulic
	Size of water pipe		G2"	G2"	G2"	DN65
	Nominal water flow rate (cooling)	l/s	1.82	2.15	2.58	5.64
	Nominal water flow rate (heating)	l/s	1.98	2.34	2.58	6.12
	Pressure drop (cooling)	kPa	33	30	42	38
	Pressure drop (heating)	kPa	39	35	42	48
	Leaving water temp range (cooling)	°C	-12 ~ 20			
	Leaving water temp range (heating)	°C	25 ~ 55	25 ~ 60	25 ~ 60	25 ~ 60
Dimensions	Height	mm	1700	1700	1700	2420
	Length	mm	1650	1650	1650	2240
	Width	mm	760	760	760	1200
Weight	Shipping weight	kg	475	495	495	1079
	Operating weight	kg	480	502	502	1093
Electrical	Power supply	V/Ph/Hz	400V - 3Ph - 50Hz			

1. Net values at Eurovent nominal conditions:

- Cooling capacities in kW given for 7°C leaving water temperature $\Delta t_5^\circ\text{C}$ and 35°C ambient temperature.
- Heating capacities in kW given for 45°C leaving water temperature $\Delta t_5^\circ\text{C}$ and 7°C ambient temperature.
- SEER and SCOP are calculated according to EN14511 and EN14825.
- η_s is calculated according to Ecodesign regulation for chillers comfort cooling and heating (813/2013, 2016/2281)

2. SEER is calculated following fixed water flow and variable outlet approach (FW/VO) .

SCOP is calculated following variable water flow and variable outlet approach (VW/VO).

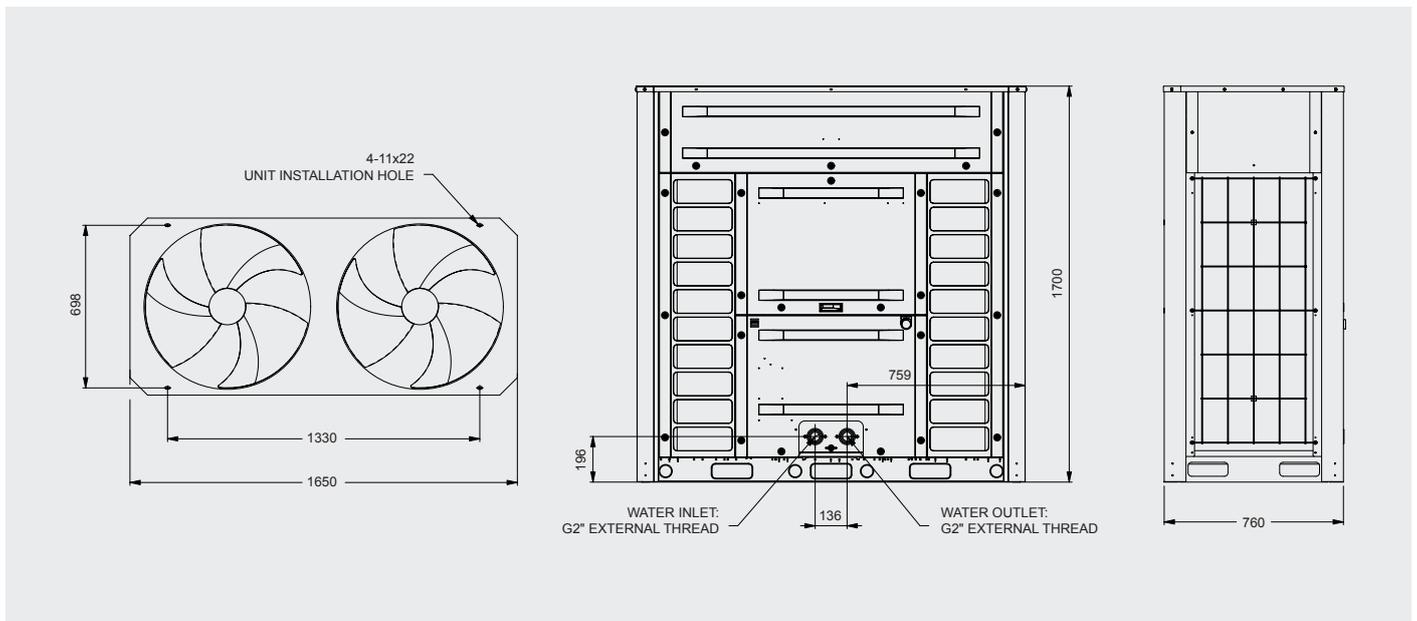
For other Ecodesign calculations, please contact your JCI representative.



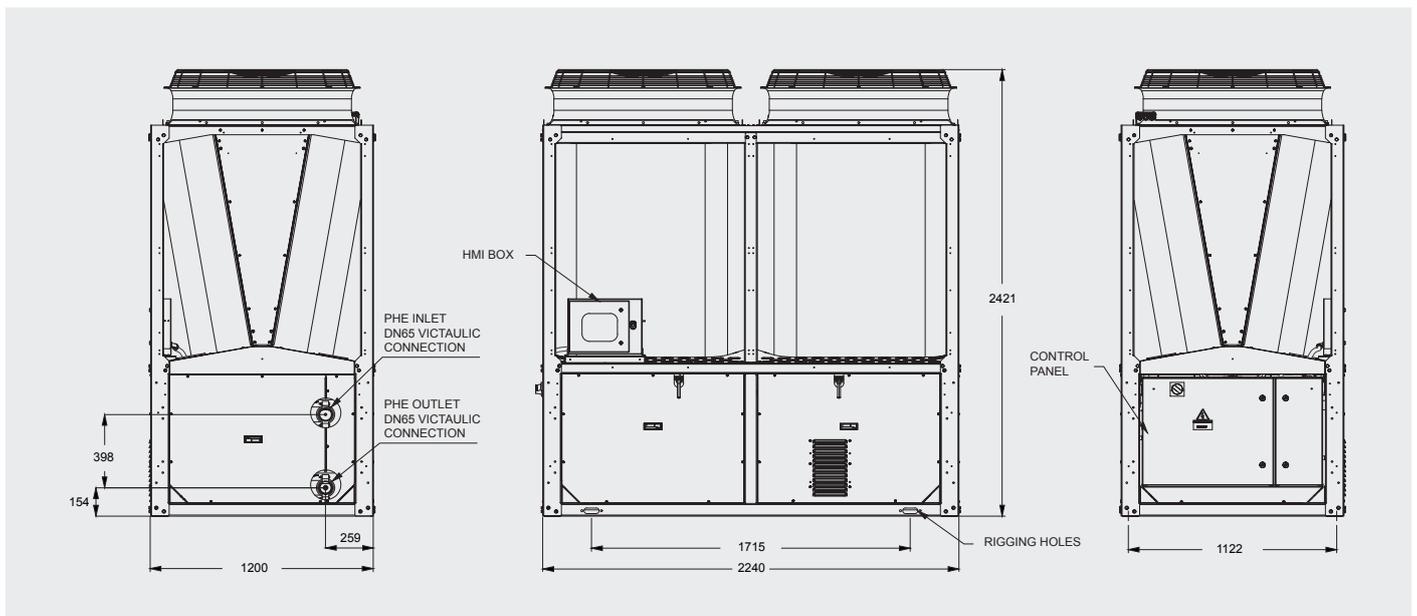
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Dimensions and Hydraulic Connections

YMAE0045/0050/0065



YMAE0130





About Johnson Controls

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.

Visit www.johnsoncontrols.com for more information or follow us [@johnsoncontrols](https://twitter.com/johnsoncontrols) on social platforms.