YORK®

INSTALL CONFIDENCE

YORK® Commercial & Industrial HVAC 2019

Johnson Controls


Johnson
Controls

A more comfortable, safe and sustainable world

Johnson Controls

Take advantage of a broader range of capabilities

Johnson Controls now provides a wider spectrum of innovative products, expert installation and services, and systems integration to help improve operational and energy outcomes for customers worldwide.

- BUILDING AUTOMATION SYSTEMS
- CONTROLS
- HVAC EQUIPMENT
- AIR SYSTEMS
- SECURITY
- FIRE & HAZARD PROTECTION
- BUILDING SERVICES & PARTS
- LIGHTING, CONTROL & RETROFIT
- OPERATIONAL INTELLIGENCE & LOSS PREVENTION
- ENERGY STORAGE
- RETAIL SYSTEMS
- BUILDING WIDE SYSTEMS INTEGRATION

HVAC EQUIPMENT

Draw on the most comprehensive HVAC portfolio for commercial and residential buildings of all types, ages and sizes to enhance sustainability, energy use and the indoor environment.

- Chillers–air-cooled; water-cooled; connected
- Condensers and condensing units
- Dedicated outdoor air systems (DOAS)
- Duct-free mini-split systems
- Indoor packaged equipment and Rooftop units
- Variable refrigerant flow (VRF) systems

CONTROLS

Equip facilities with intelligent HVAC controls to keep occupants comfortable, run equipment efficiently and optimize operating budgets.

- Actuators
- Control panels
- Control sensors
- Current sensors and transducers
- Thermostats
- Valves
- Variable speed drives

SECURITY

Help protect and enhance working and living environments today and tomorrow with integrated, customer-specific solutions from the world's leading security company.

- 24/7 remote monitoring
- Access control
- Advanced video surveillance
- Intrusion detection
- Managed services

FIRE, LIFE-SAFETY & HAZARD PROTECTION

Help keep people and assets safe with comprehensive solutions, design, installation, service and monitoring from a world leading fire and life-safety systems provider.

- Fire alarm systems
- Fire sprinkler systems
- Fire suppression systems
- Mass notification systems
- Special hazard solutions

OPTIMIZATION & RETROFIT SERVICES

Make the most of existing building and financial assets through cost-effective upgrades, central plant strategies, and financing solutions.

- Central chiller plant optimization
- Clean energy assessments
- Energy performance contracts
- Energy retrofits
- Equipment financing
- Healthcare environment optimization
- Public/private partnerships
- Technology refresh services
- Turnkey upgrades and retrofits

LIGHTING CONTROLS & RETROFIT

Save energy, minimize costs and meet organizational goals with a range of services, from business remodels, to new construction lighting design, to municipal street lights.

- Lighting retrofits
- Street and roadway lighting
- Turn-key lighting upgrades

ENERGY STORAGE

Rely on our innovative distributed energy storage products to better manage energy use, cut costs and ensure electrical back-up for a building, campus or enterprise.

- In-building distributed energy storage system
- Modular distributed energy storage system

RETAIL SOLUTIONS

Gain real-time insights into retail facilities, inventories, employees & customers to achieve maximum business performance in a digitally driven shopping world.

- Loss Prevention
- Inventory Intelligence
- Traffic Insights

OPERATIONAL INTELLIGENCE & LOSS PREVENTION

Helps minimize costs, maximize operational performance and enhance return on investment in security programs with business intelligence solutions.

- Information management solutions
- Real-time location systems (RTLS) for asset management
- Video and traffic analytics

BUILDING SERVICES & PARTS

Tap into resources of the industry's largest service network for HVAC, security and life-safety system installation and product support. More than 12,000 technicians working out of nearly 500 local offices can provide 24x7x365 proactive monitoring, remote and on-site service and repair, and replacement parts.

- Aftermarket parts
- Building remote monitoring
- Building system and HVAC repair
- Planned and preventive maintenance
- Predictive and diagnostic services
- Security and life-safety system repair

BUILDING AUTOMATION SYSTEMS

Connect commercial HVAC, lighting, security and protection systems on one platform. Vital data and insights improve efficiency, productivity, and occupants' comfort and safety.

- Metasys® building automation system
- Metasys Enterprise Optimization applications

AIR SYSTEMS

Use efficient air flow building-wide to create healthy, comfortable and visually appealing environments that increase work productivity and occupant satisfaction.

- Air handling units
- Air measuring
- Chilled beams
- Dampers
- EcoAdvance™ HVAC load reduction (HLR) module
- Energy recovery ventilators
- Fan and blower
- Fans
- Filtration
- Grilles and diffusers
- Heating coils and cooling coils
- Louvers
- Under floor air distribution
- Unit ventilators
- Variable air volume (VAV) terminals
- Variable speed drives

BUILDING WIDE SYSTEMS INTEGRATION

Construct a smarter building by converging building, business/IT and specialty systems on an intelligent infrastructure. Let us streamline the process to measurably improve initial and lifecycle costs, enhance function, ensure connectivity and create an innovative, optimized, sustainable environment.

Reference sites

Our commitment to sustainability and energy efficiency dates back to 1885, with Warren Johnson's invention of the first electric room thermostat. Since then our focus has always been to increase a building's efficiency and operational performance.

The following sites represent building solutions we have developed for our customers based on wide-ranging cross industrial experience in HVAC&R equipment, controls, fire and security systems, and services for commercial and industrial buildings.

1

2

3

4

5

6

7

8

1

First building in Austria to be awarded a Green Building Certificate

Johnson Controls Metasys® Building Automation System helps UNIQA Towers in Vienna achieve a Green Building Certificate for energy efficiency.

2

The Gregor Mendel Institute

State-of-the-art technologies for world-class research.

3

Cisco. UK

Smart+Connected Communities installation designed to save energy costs and improves performance.

4

Fiserv (Europe) Ltd

Utilising latest developments in chiller's technology delivers energy savings and ongoing cost reductions for Fiserv.

5

THI GROUP

Solutions for the hospitality industry.

6

British Embassy. Berlin

Full Lifecycle Solution for British Governement's first Private Finance Initiative outside the UK.

7

IBM Headquarters

Adding value and conserving energy from the inside out.

8

Cologne Convention Center

The centrifugal chillers and the building automation system are indispensable in creating and managing an optimal indoor environment.

Catalogue content

*** AHRI CERTIFICATION PROGRAM**

YORK chillers have been tested and certified by Air-Conditioning, Heating and Refrigeration Institute (AHRI) in accordance with the latest edition of AHRI Standard 551/591 (S-I). Under this Certification Program, chillers are regularly tested in strict compliance with this Standard. This provides an independent, third-party verification of chiller performance. Refer to the AHRI site at: http://www.ahrinet.org/water_ chilling+packages+using+vapor+compression+cycle+_water_cooled_.aspx for complete Program Scope, Inclusions, and Exclusions as some options listed herein fall outside the scope of the AHRI certification program. For verification of certification, go to the AHRI Directory at www.ahridirectory.org.

Page

Air Handling Systems & Terminal Devices

Rooftop Equipment

Comprehensive Solutions

Chillers & Heat Pumps

SCROLL COMPRESSOR CHILLERS AND HEAT PUMPS

SCREW COMPRESSOR CHILLERS AIR-COOLED & WATER-COOLED

CENTRIFUGAL COMPRESSOR CHILLERS WATER-COOLED

ABSORPTION CHILLERS AND HEAT PUMPS

CENTRAL PLANT OPTIMISATION™ 10

Johnson Controls

AMICHI™ - S Series
Air cooled Scroll DC Inverter reversible heat pump

YVAG 012 to 018
A complete range from 11.2 kW up to 17.8 kW

High Efficiency
Providing the lowest possible operating costs

Our new **YORK® AMICHI™ - S** is designed for real world efficiency. Part load performances meet the highest efficiency values and delivers performance beyond typical heat pump efficiency levels in cooling and heating. The new reversible heat pumps exceed the requirements for the Ecodesign regulations for Heat Pumps through an optimized combination of YORK® efficiency-enhancing technologies.

YORK® AMICHI™ - S uses high efficiency DC inverter compressor together with advanced variable frequency drive technology which ensures stable operation across the entire operating range. Compressor frequency range goes from 15 ~ 120%, to quickly and efficiently meet the needs of residential load changes. **YORK® AMICHI™ - S** units not only uses a high efficiency DC inverter compressor, but also dual fans equipped with high efficiency, low noise DC inverter motor which adjusts the air flow to exactly match the capacity in a more accurate and efficient way.

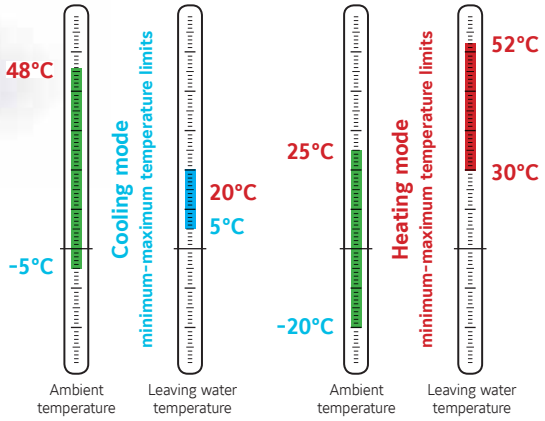
Low Sound Optimized

Thanks to the **YORK® AMICHI™ - S** component design, the unit sound emissions are as low as 54 dB(A) Sound Pressure at full load, reducing to as low as 40 dB(A) at part load operation.

YORK® AMICHI™ - S also has Silent Mode available, which reduces the sound level emissions by 5 dB(A) below full load levels.

Perfect Comfort in a Wide Operating Range
Wide operating envelope with lower sound levels

With the wide operating range, **YORK® AMICHI™ - S** is perfect for all climates. It does not matter if the ambient temperature in summer is 48°C or if in winter is -20°C, as the unit will maintain the efficiency in stable operation, to provide users with the most comfortable air conditioning experience. With the heating outlet water temperatures up to 52°C, the unit is perfect for radiant panels.



Easy Installation & Operation
Modular concept

The small packaged **YORK® AMICHI™ - S** heat pump comes as standards with a hydronic loop circulating pump, water flow switch, safety valve, fill valve and wye-strainer, saving space in the room and making installations easy and fast. The pumps can provide up to 150kPa available static pressure.

The units are designed for modular installations(up to 4 module combinations among all the models) to meet the needs of different residential and light commercial building demands. This permits installed capacities from 11.2-72 kW.

Exactly control at real time

YORK® AMICHI™ - S unit comes with RS485 interface, through the Modbus protocol, together with easy access and user-friendly real-time control.

Air cooled Scroll DC Inverter reversible heat pump

YVAG 012 to 018

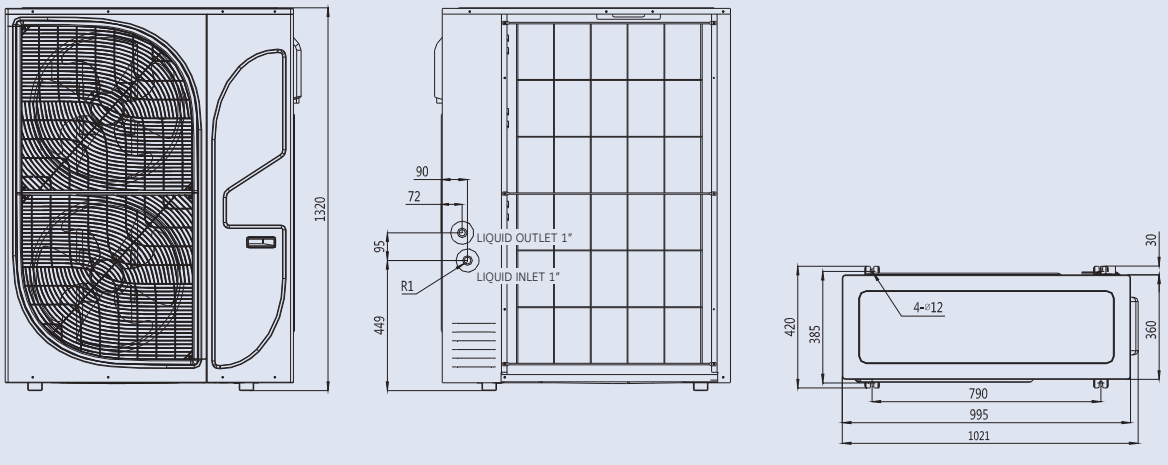
Technical features

Model			YVAG012	YVAG014	YVAG016	YVAG018
Performance	Nominal Cooling Capacity	kW	11.18	14.26	15.95	17.8
	Cooling Power Input	kW	4.01	5.29	5.73	6.94
	EER		2.79	2.7	2.78	2.56
	SEER		4.05	4.32	4.52	4.42
	ηc,h		159	170	177	174
	Nominal Heating Capacity	kW	10.94	13.11	15.41	18.46
	Heating Power Input	kW	3.65	4.28	4.68	6.27
	COP		3	3.06	3.29	2.94
	SCOP		3.47	3.55	4.02	3.9
	ηs,h		136	139	158	153
	Sound Power Level	dB(A)	68	70	70	74
Refrigerant	Refrigerant charge R410A	kg	2.8	3.3	4.0	4.0
Compressor	Type		Scroll DC Inverter			
	Quantity	#	1	1	1	1
Air side heat exchanger	Fan motor type		Brushless DC Fan Motor			
	Fans quantity	#	2	2	2	2
	Airflow	m3/h	2500 ~ 6600	2500 ~ 6600	2500 ~ 6600	2500 ~ 6600
	Working ambient temperature cooling mode		-5 ~ 48°C			
	Working ambient temperature heating mode		-20 ~ 25°C			
Water side heat exchanger	Type		Brazed Plate Heat Exchanger			
	Pump Type		Multiple-stage centrifugal pump			
	Nominal water flow	m3/h	1.9	2.4	2.7	3.1
	Unit external head	kPa	150	130	120	110
	Working range water leaving temp. cooling		5 ~ 15°C			
	Working range water leaving temp. heating		30 ~ 52°C			
Dimensions & Weight	Height	mm	995			
	Width	mm	360			
	Depth	mm	1320			
	Operating weight	kg	126	128	141	141
Electrical	Power supply	V/ph/Hz	230V/1ph/50Hz			

Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 12/7°C water leaving temperature Δt 5°C and 35°C ambient temperature.
Heating capacities in kW given for 40/45°C water leaving temperature and 7°C ambient temperature.
Ecodesign figures are calculated following variable outlet approach.
For Ecodesign calculations, please contact your JCI representative.

Dimensions and hydraulic connections

YVAG 012 to 018



Manufacturer reserves the rights to change specifications without prior notice.

AMICHI™ Series
Air cooled Scroll DC Inverter chiller and heat pump

YMAA 045 to 260 / YMPA 045 to 260

A complete range from 44 kW up to 254 kW

Exceeding Efficiency Standards

The YORK® Amichi™ Series Air-cooled DC Inverter Scroll Chiller and Heat Pump have been designed to meet tomorrow's efficiency standards today. Delivering performance beyond typical chiller and heat pump efficiency levels, the YORK® Amichi™ Series meets or exceeds stringent regulatory requirements (see chart, below) through an optimized combination of YORK® efficiency enhancing technologies.

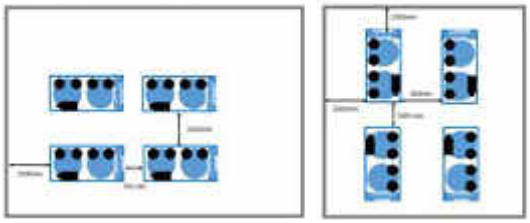
ECODESIGN REGULATIONS CATEGORY:	EFFICIENCY METRIC:	TOMORROW'S STANDARDS MET TODAY:
Comfort Heating	SCOP/ηsh	**Amichi™ Heat Pump:** Sept. 2017 Compliant (Tier 2)
Comfort Cooling	SEER/ηsc	**Amichi™ Chiller:** Jan. 2021 Compliant (Tier 2)
Process Cooling (Med. Temp.)	SEPR	**Amichi™ Chiller:** July 2018 Compliant (Tier 2)
Process Cooling (High Temp.)	SEPR	**Amichi™ Chiller:** Jan. 2021 Compliant (Tier 2)

Performance Without Compromise

The YORK® Amichi™ Series is a no-compromise solution for a variety of climates and locations. It can maintain efficiency in a variety of conditions without kits or add-ons (down to -18°C ambient in cooling mode and -15°C ambient in heating mode). With the smallest footprint across the widest capacity range on the market, the YORK® Amichi™ Series is also the perfect solution for high performance in smaller spaces. Our systems offer two levels of sound performance. If requirements call for sound attenuation beyond our standard low-noise levels, an optional Ultra Quiet Kit can further reduce sound power by 6 dBA, providing one of the quietest units available.

Greater design flexibility

- 9 package models or modular combinations
- Controls can be parent/child controller if application requires
- Maximum of 32 units below 130 kW
- Maximum of 16 units above 130 kW



Air cooled Scroll DC Inverter chiller and heat pump

YMAA 045 to 260 / YMPA 045 to 260

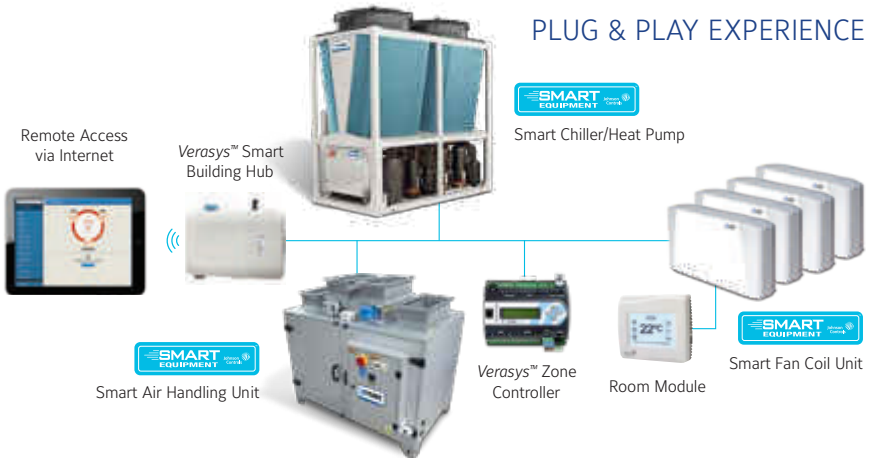
Technical features

Model			YMAA / YMPA								
			45	65	80	100	130	160	200	230	260
Performance	Cooling capacity c/o units	kW	44	60	78	99	122	159	188	221	254
	EER		2.84	2.79	3.11	3.00	2.95	3.12	3.04	3.08	3.06
	SEER		4.38	4.5	4.43	4.24	4.42	4.24	4.28	4.17	4.34
	ηs,c		172	177	174	167	174	167	168	164	171
	Cooling capacity h/p units	kW	44	60	78	99	122	159	188	221	254
	Heating capacity h/p units	kW	50	61	87	99	132	161	191	231	254
	COP		3.05	3.07	3.23	3.12	2.97	3.26	3.22	3.22	3.06
	SCOP		3.45	3.44	3.4	3.41	3.54	3.32	3.36	3.47	3.3
	ηs,h		135	134	133	133	138	130	131	136	129
	Sound power level STD / LN	dB(A)	80/75	82/77	81/77	83/79	84/80	86/82	87/82	88/83	89/84
Refrigerant	Refrigerant circuits	#	1	1	2	2	2	3	3	4	4
	Refrigerant (R410A) charge	kg	9.5	12.3	17.6	20.5	22.8	29.5	32	43.3	46
Compressor	Type		DC Scroll Inverter + Scroll								
	Capacity steps	%	Stepless (Inverter)								
	Quantity		2	2	3	3	4	5	6	7	8
Air side heat exchanger	Fan motor type		EC motor								
	Fans quantity		1	1	2	2	2	3	3	4	4
	Working ambient temp. cooling mode		-18 ~ 48°C								
	Working ambient temp. heat. mode		-15 ~ 25°C								
Water side heat exchanger	Type		Plate Heat Exchanger								
	Unit water volume (w/o pump kit)	l	9	10	11	14	15	27	29	32	34
	Pump Type		Fixed / Variable Speed Drive Pump					Variable Speed Drive Pump			
	Nominal water flow	l/s	2.1	2.9	3.7	4.7	5.8	7.4	9.1	10.5	11.9
	Pressure drop	kPa	25	24	23	30	38	23	29	41	38
	Working range water leaving temp. cooling		-8 ~ 20°C								
	Working range water leaving temp. heating		25 ~ 55°C								
Dimensions & Weight	Height (w/o pump kit)	mm	2440					2500			
	Width (w/o pump kit)	mm	1200					3050			
	Depth (w/o pump kit)	mm	1500		2240						
	Operating weight (w/o pump kit)	kg	575	598	875	901	979	1922	2003	2235	2316

YMAA: Cooling only units models. YMPA: Air to water heat pump models.
Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature
SEER and SCOP calculated according to EN14511 and EN14825
ηs calculated according to Ecodesign regulation for chillers comfort cooling and heating (813/2013, 2016/2281)
Ecodesign figures are calculated following variable outlet approach.
For other Ecodesign calculations, please contact your JCI representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Advanced Control Made Easy

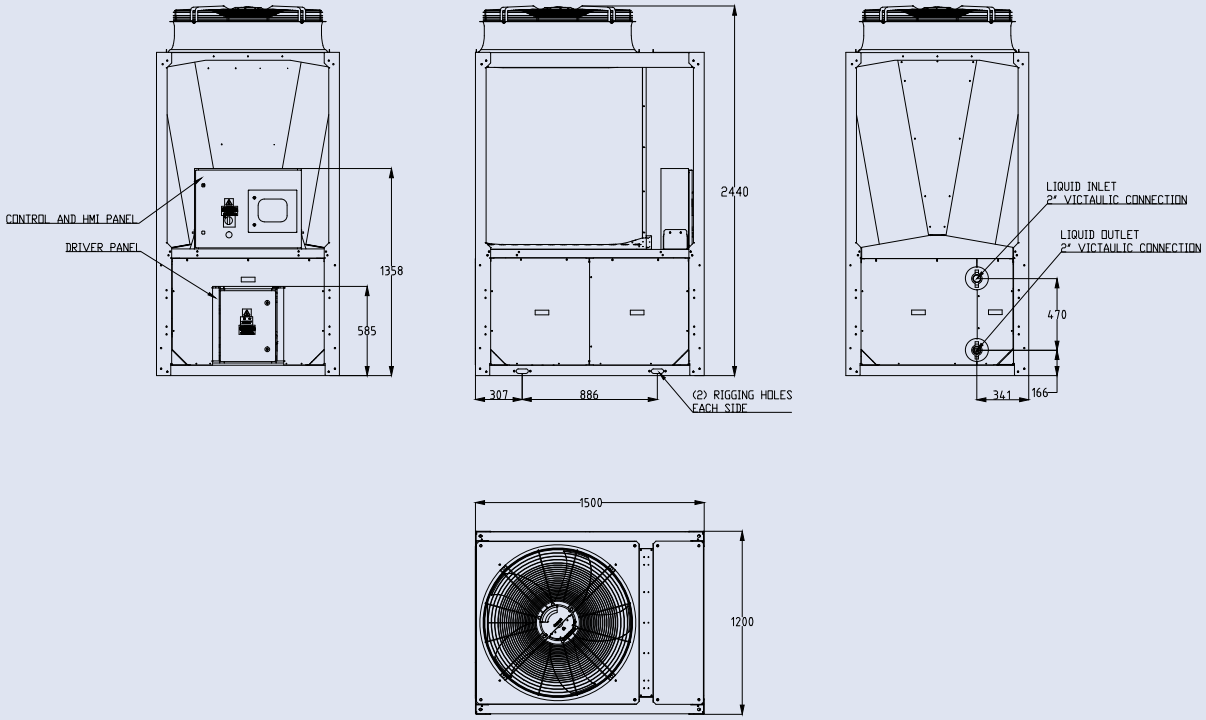
To help maximize efficiency and keep you in control, the YORK® Amichi™ Series comes standard with integrated Smart Equipment. This technology allows the equipment to connect seamlessly to building controls like our world-class Verasys™ system, where smart-enabled equipment can self-identify and interoperate.



Manufacturer reserves the rights to change specifications without prior notice.

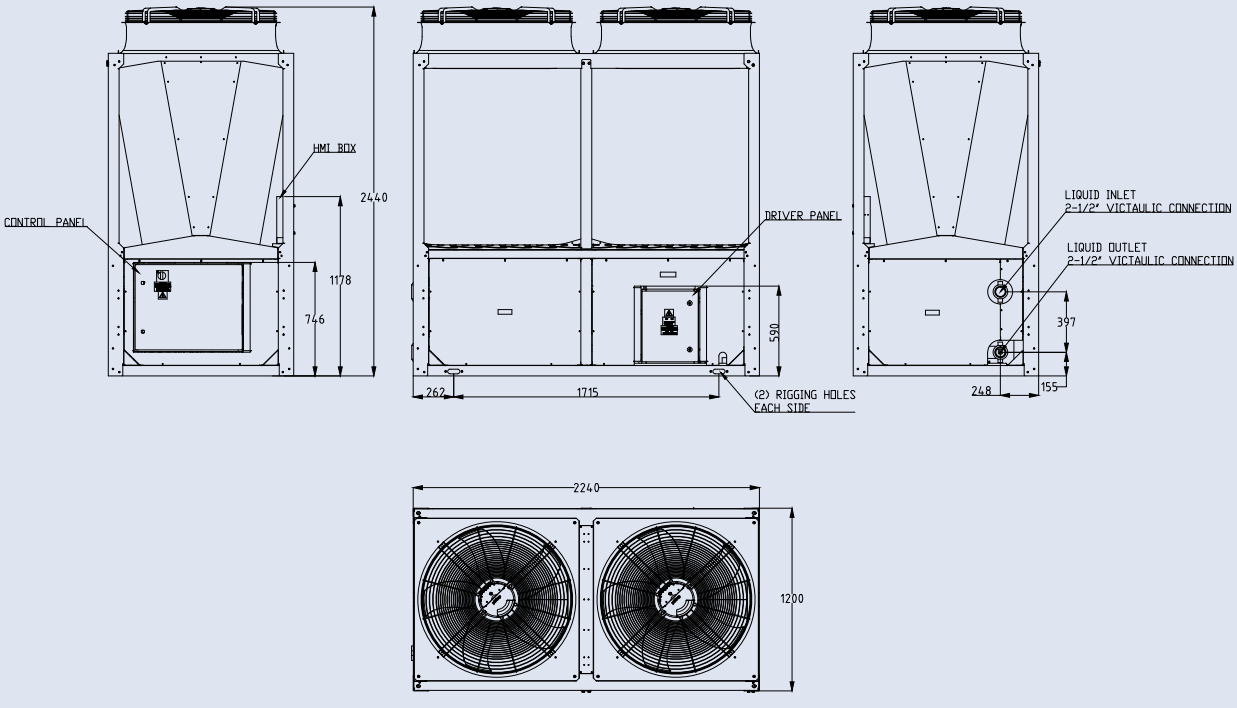
Dimensions and hydraulic connections

YMAA-YMPA 045 and 065 Single unit



All dimensions in mm. Drawings not a scale.

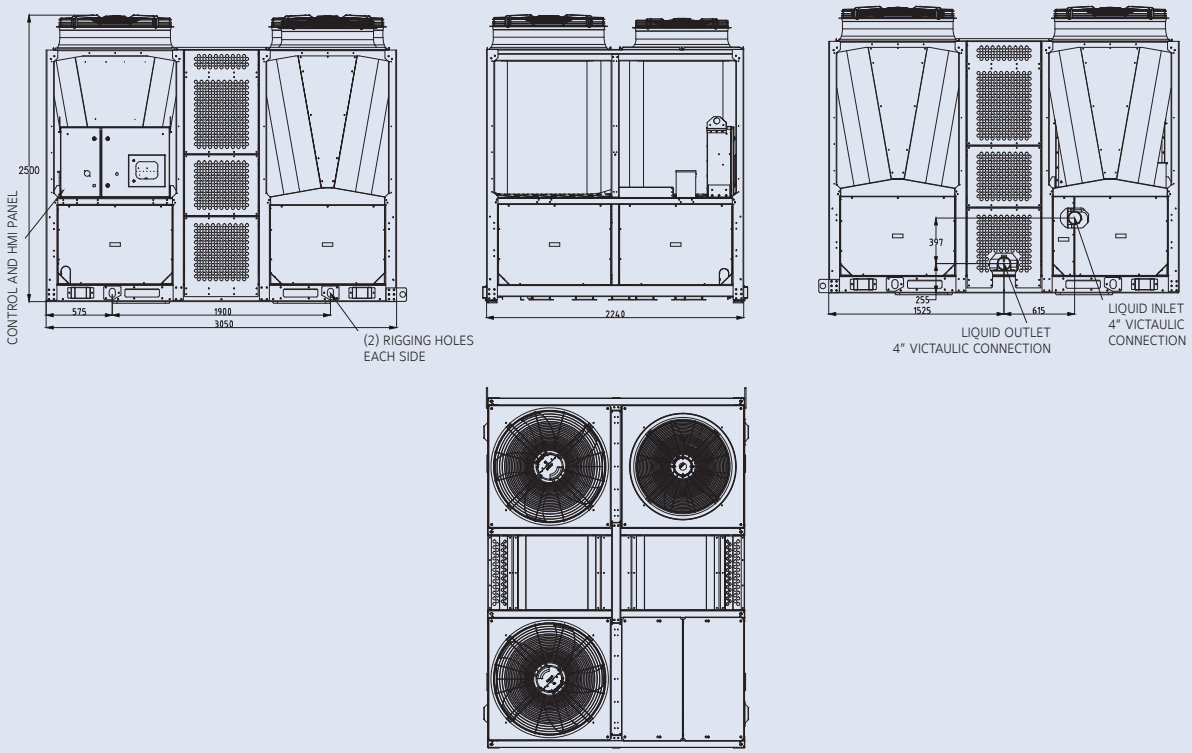
YMAA-YMPA 080 to 130 Single unit



All dimensions in mm. Drawings not a scale.

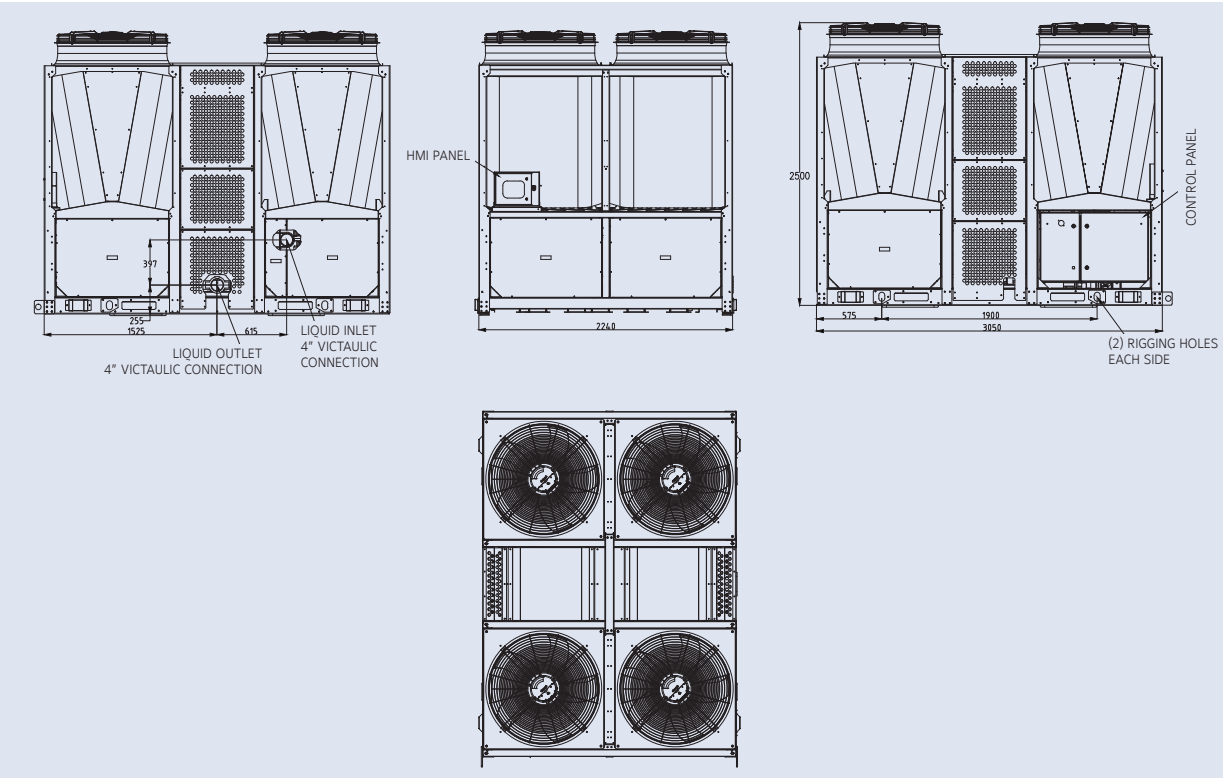
YMAA 045 to 260 / YMPA 045 to 260

YMAA-YMPA 160 and 200 Single unit



All dimensions in mm. Drawings not a scale.

YMAA-YMPA 230 and 260 Single unit

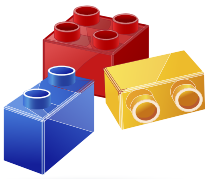


All dimensions in mm. Drawings not a scale.

YCME / YHME Series 2
Modular screw chillers and heat pumps

YCME/YHME 0162HE to 0222HE

A complete range from 160 kW up to 224 kW



Modular concept

Provide flexibility and achieve reliability

Up to 8 modules in one water system brings important benefits.

Achieve reliability

Full redundancy – Safety first. Should a module fail, the remaining modules maintain operational continuity.

Example of module configurations

Fully configurable units

Increase the versatility

Up to 60 different options and accessories make our chiller as unique as the project needs.

Some of the most interesting are:

Sound attenuation compressor enclosure

Dual pump option

Heat recovery option

Modular screw chillers and heat pumps

YCME/YHME 0162HE to 0222HE

YCME Air-cooled Chiller Performance Data

Individual modules		YCME0162HE	YCME0182HE	YCME0202HE	YCME0222HE
Cooling capacity	kW	159.6	179.6	204.5	224.4
Total power input	kW	51.32	57.75	65.34	71.01
SEER		4.11	4.13	4.12	4.12
ηs, c		161	162	162	162
Sound power level	dB(A)	96	97	98	99
Dimensions (H x W x D)	mm	2450 x 1955 x 2290		2450 x 1955 x 3230	
Operating weight	kg	1300	1340	1590	1680
Chilled Water Outlet (std, options Low / High)	°C	+5°C ~ +15°C, with Options -10°C ~ +5°C / +15°C ~ +30°C			
Ambient Air Temperature	°C	-15°C ~ +46°C			
Electrical Power Supply		3N ~ 400V 50Hz			

YHME Air-cooled Heat Pump Performance Data

Individual modules		YHME0162HE	YHME0182HE	YHME0202HE	YHME0222HE
Cooling capacity	kW	149.7	169.6	194.6	209.5
Total power input	kW	51.09	57.88	65.97	70.3
Heating capacity	kW	145.4	145.4	185.5	185.5
Total power input	kW	51.56	51.56	65.32	65.32
SCOP		Meet Ecodesign requirements			
ηs, h					
Sound power level	dB(A)	96	97	98	99
Dimensions (H x W x D)	mm	2450 x 1955 x 2290		2450 x 1955 x 3230	
Operating weight	kg	1400	1420	1680	1760
Chilled Water Outlet (std, options Low / High)	°C	+5°C ~ +15°C, with Options -10°C ~ +5°C / +15°C ~ +30°C			
Heated Water Outlet	°C	+35°C ~ +55°C			
Ambient Air Temperature (Cool / Heat)	°C	-15°C ~ 46°C / -9.5 (DB), -10 (WB) ~ +21 (DB), +15.5 (WB)			
Electrical Power Supply		3N ~ 400V 50Hz			

Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature.
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature.
Ecodesign figures are calculated following variable outlet approach.
For Ecodesign calculations, please contact your JCI representative.
Sound Pressure: measured at 1.5m height, and at 1m distance from the control panel.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Widest operating range at highest efficiency

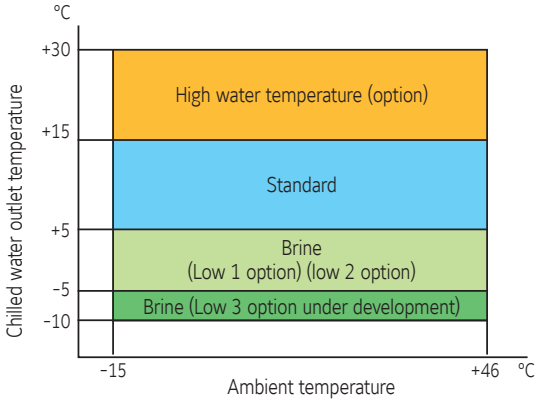
YCME/YHME Cooling operating range

Chilled water outlet temperature: -10°C to +30°C
Ambient temperature: -15°C to +46°C

YHME Heating operating range

Hot water outlet temperature: +35°C to +55°C
Ambient temperature: -10°C (WB) to +15.5°C (WB)

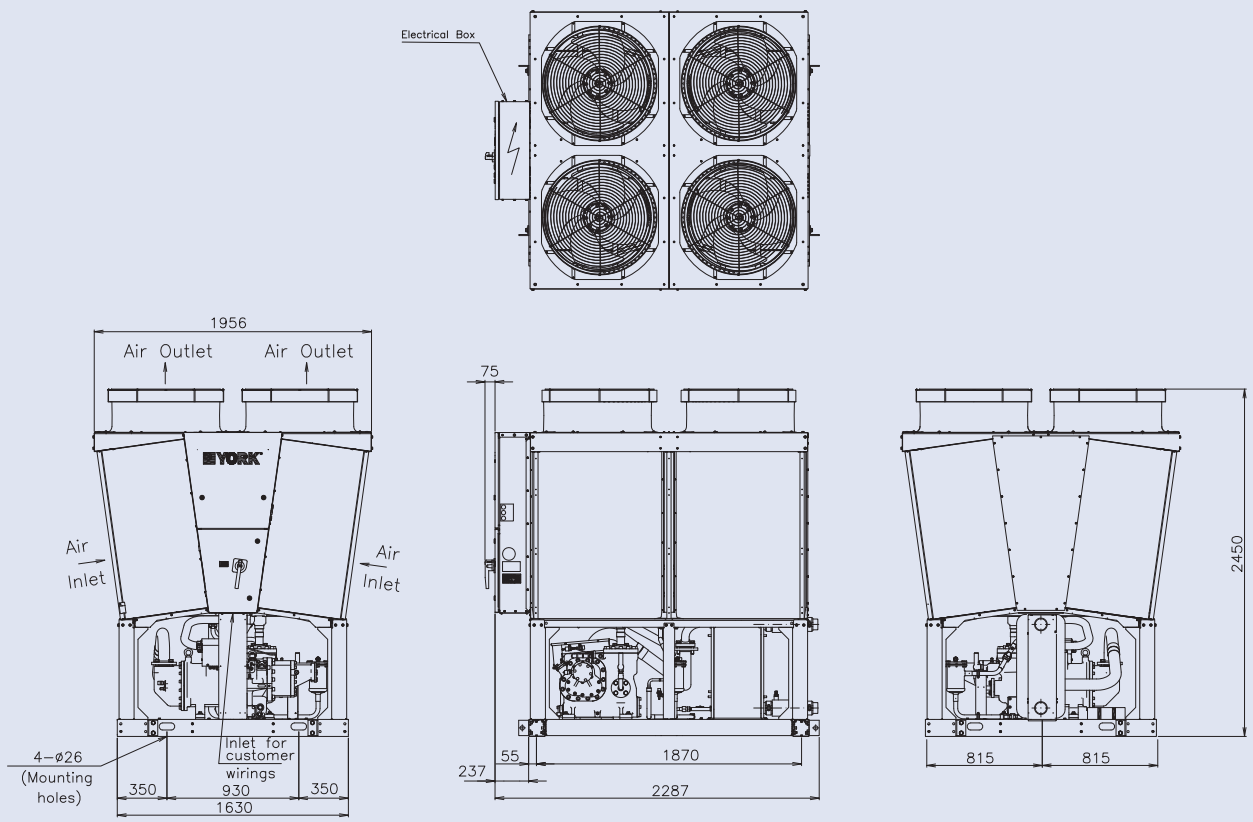
Two operating modes selectable at commissioning allow the installation's performance to focus on either high efficiency or high accuracy outlet water temperature.



Manufacturer reserves the rights to change specifications without prior notice.

Dimensions and hydraulic connections

YCME/YHME 0162-0182

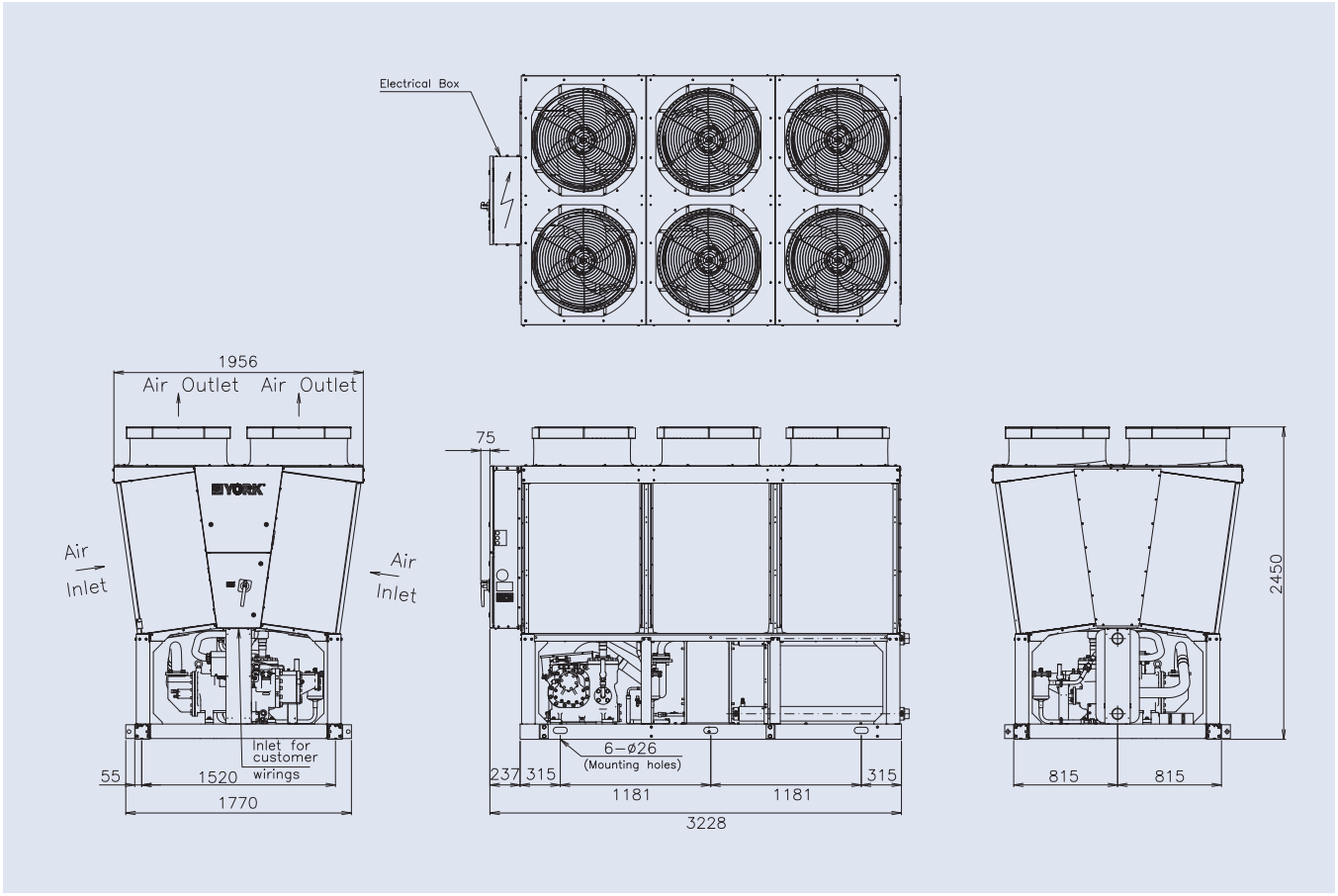


All dimensions in mm. Drawings not a scale.

Size	Hydraulic connections
YCME/YHME 0162-0182	2" 1/2 Victaulic Ø 76.1 mm

YCME/YHME 0162HE to 0222HE

YCME/YHME 0202-0222



All dimensions in mm. Drawings not a scale.

Size	Hydraulic connections
YCME/YHME 0202-0222	2" 1/2 Victaulic Ø 76.1 mm

YLAA
Air-cooled scroll compressor chiller

Cooling capacities from 198 kW to 525 kW

Features

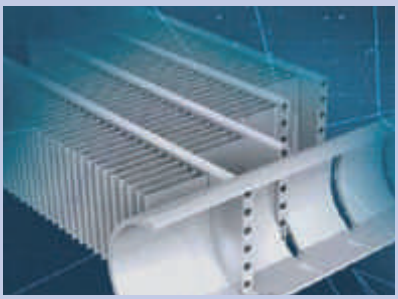
The **YORK YLAA TEMPO** air-cooled chiller is an environmental leader.

Utilising scroll type compressors and microchannel condenser coil technology the **YLAA** delivers premium efficiency for all air conditioning applications.

YLAA chillers are a self-contained cooling solution that is light-weight and compact for convenient installation on the ground or on building rooftops.

Options / Accessories

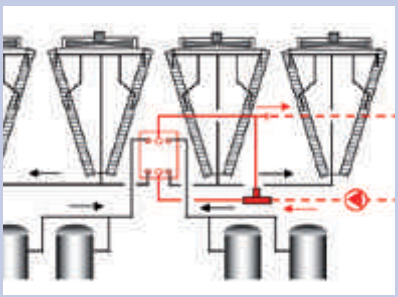
- Soft start
- Power Factor Correction Capacitors
- Low ambient kit
- BMS Interfacing options
- Dual pressure relief valves
- Victaulic coupling
- Flow switch
- Heat recovery option
- Enclosure options
- Sound attenuation options
- Anti-vibration mounts options
- Hydrokits with single and dual pump
- Epoxy Post-coated Dipped Microchannel Coils
- VSD Fans



The TEMPO delivers energy efficiency levels that surpasses Eurovent A Class requirements. Aluminium microchannel condenser coil technology is one reason for this premium efficiencies.

Ultra quiet operation can be obtained through optional dual or low speed fans and a compressor accousitc enclosure.

A single point power connection and optional, factory packaged water pumps, water filter and flow switch provide fast and easy installation.



An optional heat recovery feature can be added to provide hot water to 50°C; which is useful for facility heating or hot water preheating.

Air-cooled scroll compressor chiller

YLAA 0195 to 0517

Nominal capacity

YLAA	0195	0221	0262	0286	0301	0350	0392	0442	0457	0517
Cooling capacity (kW)	198	211	248	273	297	348	380	431	457	525
EER	3.09	3.20	3.10	2.60	2.97	2.94	2.99	2.93	2.91	2.91
SEER	4.23	4.17	4.05	3.86	4.02	3.9	4.27	4.17	4.42	4.25
ηs, c	166	164	159	151	157	153	168	164	174	167
Sound power level dB(A)	87	87	93	89	90	91	95	92	95	92
Sound power level Low Noise Version dB(A) (1)	82	84	87	87	86	87	88	88	89	89

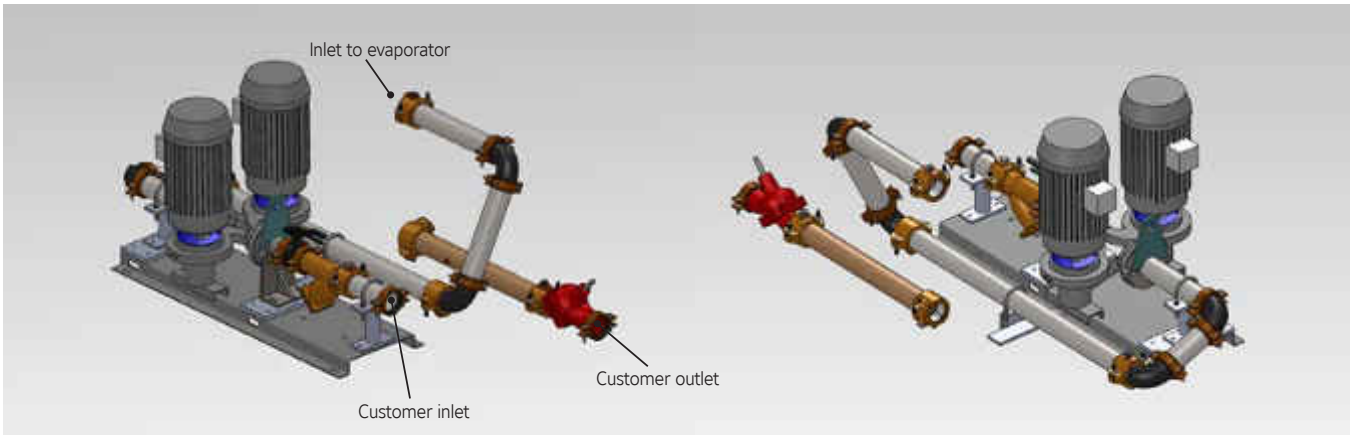
Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Ecodesign figures are calculated following variable outlet approach.
For Ecodesign calculations, please contact your JCI representative.
(1) Low noise version fits Ultra Quiet Fans and compressor acoustic enclosures
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Technical data

YLAA			0195	0221	0262	0286	0301	0350	0392	0442	0457	0517
Dimensions	Length	mm	2911				3614		3690	4769		
	Width	mm	2254			2242	2254		2242	2254		
	Height	mm	2507									
Operating weight kg			1706	1721	1852	1853	2170	2339	2508	3343	3481	3615

YLAA Pump Kit

- Two option levels - basic and full featured - for maximum flexibility
- More impeller size options for better match to customer requirements
- New, smaller pump motors suitable for primary-secondary systems



YORK® YLAA Scroll with Low GWP R454B

Cooling capacity: 190-530 kW

GWP: 467 (AR5)

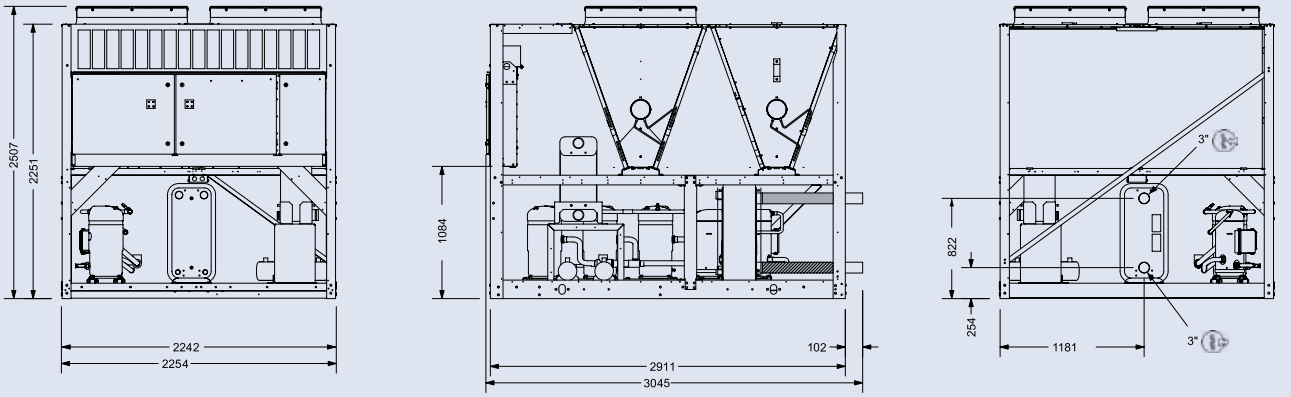
- 75% lower than R410A
- 30% lower than R32

Expected performances (TBC)

- 1.5% reduction in capacity vs R410A
- 2-3% improvement in FL COP vs R410A
- 1-2% reduction in PL SEER vs R410A

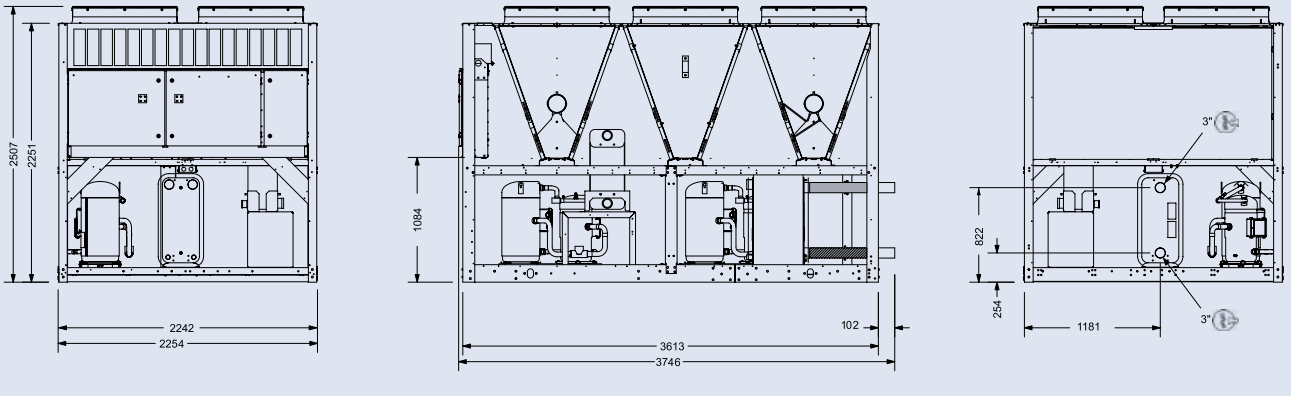
Dimensions and hydraulic connections

YLAA 0195, 0221 & 0262



All dimensions in mm. Drawings not a scale.

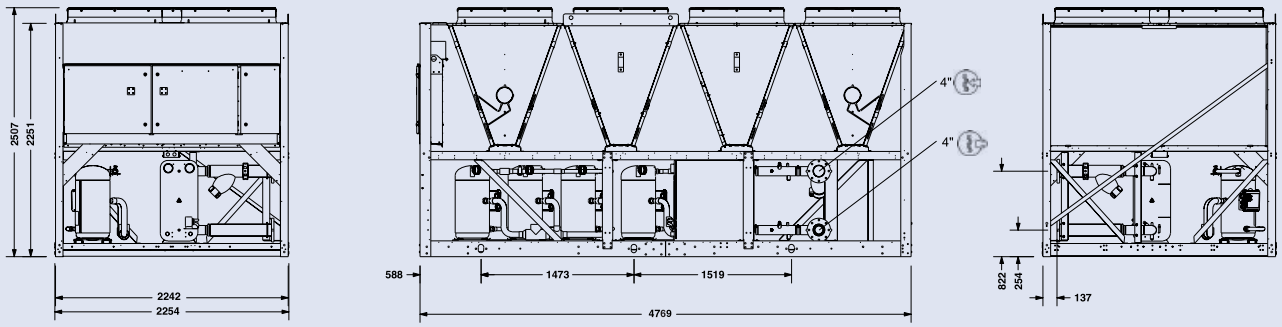
YLAA 0301 & 0392



All dimensions in mm. Drawings not a scale.

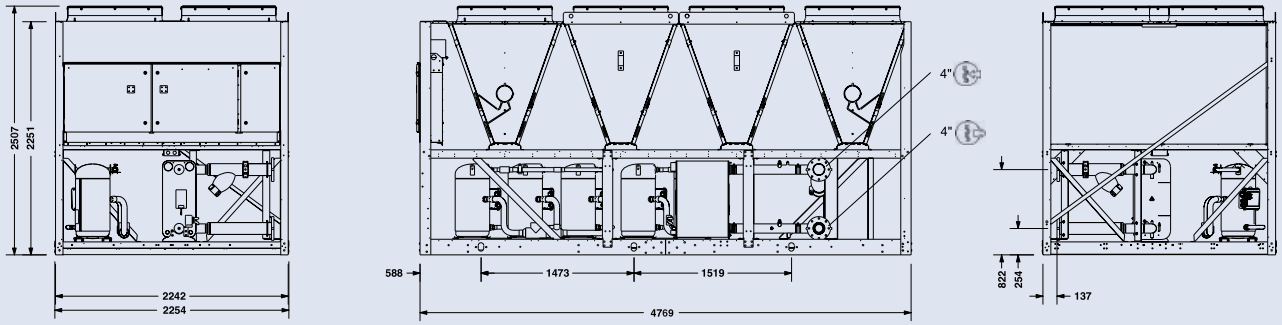
YLAA 0195 to 0517

YLAA0442



All dimensions in mm. Drawings not a scale.

YLAA0457 & 0517



All dimensions in mm. Drawings not a scale.

YLRA
Air cooled heat pump scroll compressor

Cooling capacities from 181 kW to 307 kW
Heating capacities from 200 kW to 327 kW

At Eurovent Standard Conditions all models meet A Class energy efficiency levels for heating mode.

Features

YLRA are available in 6 models, from 200 to 330, with a nominal capacity range from 181 to 307 kW in cooling mode and from 200 to 327 kW in heating mode. Up to 3.99 ESEER with EC fans.

Except for the fans all the units have the same configuration of base units (structure, electrical board, compressors and coils).

Each model is available in the following acoustic versions:

- Basic Low Noise version (BLN): These models are equipped with delta connected fans running at a fixed rpm and are fitted with compressor boxes to reduce noise emissions.
- Super Low Noise version (SLN): Those models are equipped with special inverter fans driven by EC (electronic brushless type), fitted with a variable speed controller which allows the fans to operate at a very low rpm. The chillers are supplied with compressor boxes and soundproof jackets on compressors reducing significantly the noise emissions.

The BLN model is also available in an EC version (developed for high seasonal efficiency) which has the same equipment as that of the standard BLN model, except that the units are equipped with special inverter fans driven by EC (electronic brushless type) motors with integrated electronic inverter, to ensure low energy consumption.

Options / Accessories

- ModBus protocol kit for BMS (standard)
- Lonwork protocol kit for BMS
- Bacnet protocol kit for BMS
- Soft start
- Power factor correction capacitors
- Compressors overload protection
- Condensing control kit (down to -14°C ambient temperature in cooling mode)
- Polar version (down to -18°C ambient temperature in heating mode)
- Double set point
- HP & LP manometers
- E-coating Al/Cu condenser coils
- Chiller grilles
- Desuperheater
- Optional hydro kits
- Remote ON/OFF control
- Remote keyboard panel
- Sequencer unit
- Spring isolators
- Flow switch
- Water filter

Heat pump scroll compressor

YLRA 0200 to 0330

Nominal capacity

YLRA BLN versions	0200	0230	0260	0280	0300	0330
Cooling capacity (kW)	181.3	213.6	243.7	261.1	287.7	307.4
EER	2.93	2.92	2.91	2.88	2.92	2.97
SEER	4.35	4.25	4.225	4.225	3.95	3.925
ηc, h	171	167	166	166	155	154
Heating capacity (kW)	200.1	229	262.3	279.6	305.6	327.2
COP	3.22	3.23	3.21	3.2	3.22	3.21
SCOP	3.25	3.43	3.43	3.43	3.33	3.43
ηs, h	127	134	134	134	130	134
Sound power level (dBA)	92	92	93	93	94	95

Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature
Ecodesign figures are calculated following variable outlet approach.
SCOP calculated according to EN14825. ηs calculated according to Ecodesign regulation for heating (2016/2281)
Sound levels are at fully loaded conditions. Sound power level values refer to ISO standard 3744 and Eurovent 8/1
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Technical data

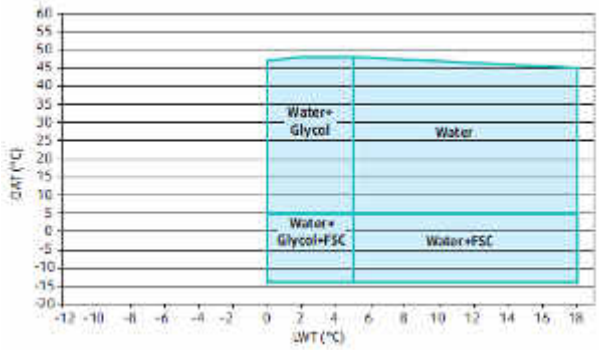
YLRA BLN versions			0200	0230	0260	0280	0300	0330
Dimensions	Length	mm	3 500				4 550	
	Width	mm	2 150					
	Height	mm	2 600					
Operating weight (kg)			1858	1993	2216	2226	2806	2899

Operating limits

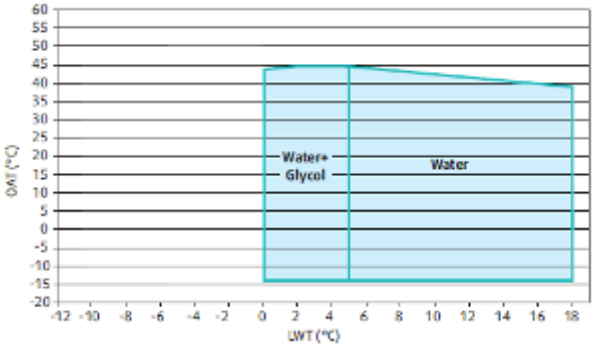
Thanks to the different versions available, the **YLRA** is working in a wide operating envelope in cooling mode. Special attention to the **Polar Version** optional, which is extending the heating envelope of the units to allow operation at ambient temperatures as low as **-18°C.**

Operating limits in cooling mode

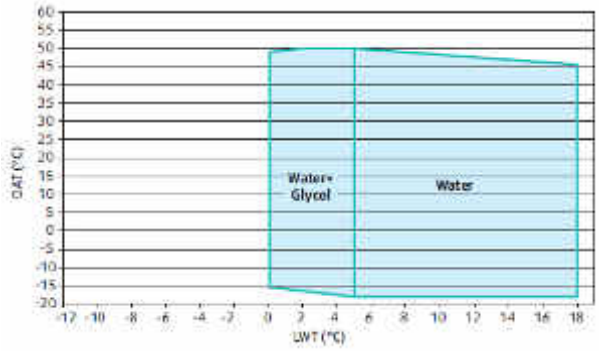
YLRA BLN



YLRA SLN

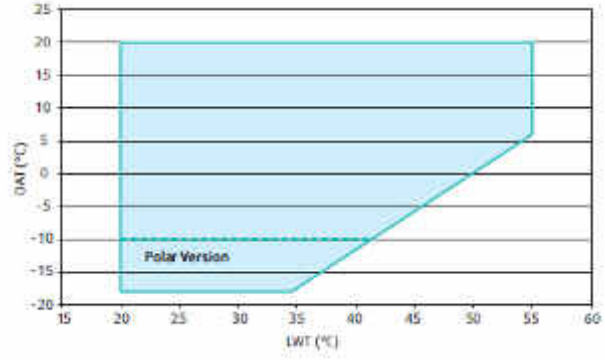


YLRA BLN with EC fans



Operating limits in heating mode

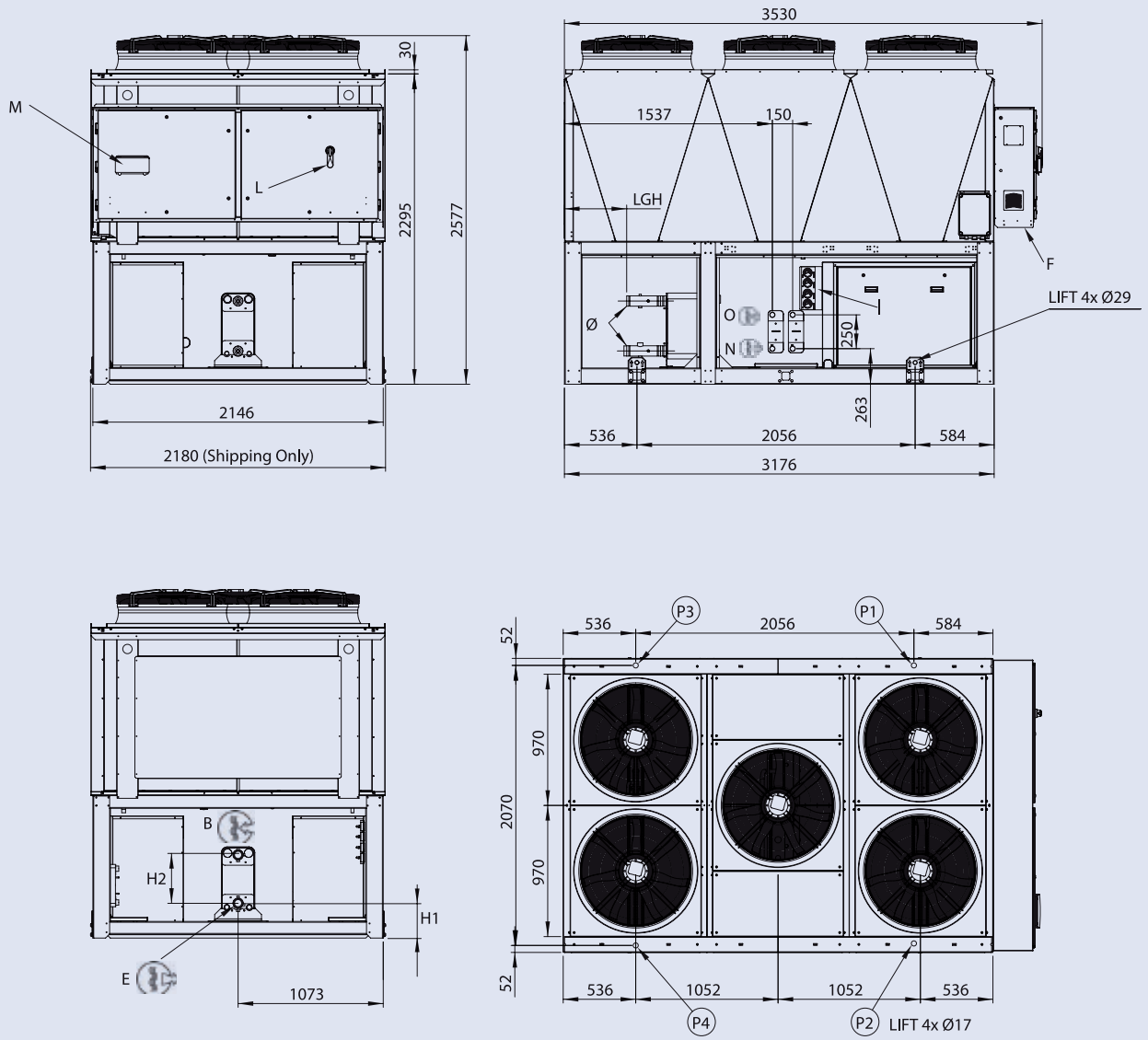
Polar Version



Manufacturer reserves the rights to change specifications without prior notice.

Dimensions and hydraulic connections

YLRA 0200 to 0280



All dimensions in mm. Drawings not a scale.

NOTES:
***B, E** - WATER CONNECTION GAS M*
***F** - ELECTRICAL POWER SUPPLY*
***I** - GAUGE KIT (ACCESSORY)*
***L** - MAIN SWITCH*
***M** - CONTROL KEYPAD / DISPLAY*

OPTIONAL DESUPERHEATER
***N** - WATER INLET Ø1" GAS M*
***O** - WATER OUTLET Ø1" GAS M*

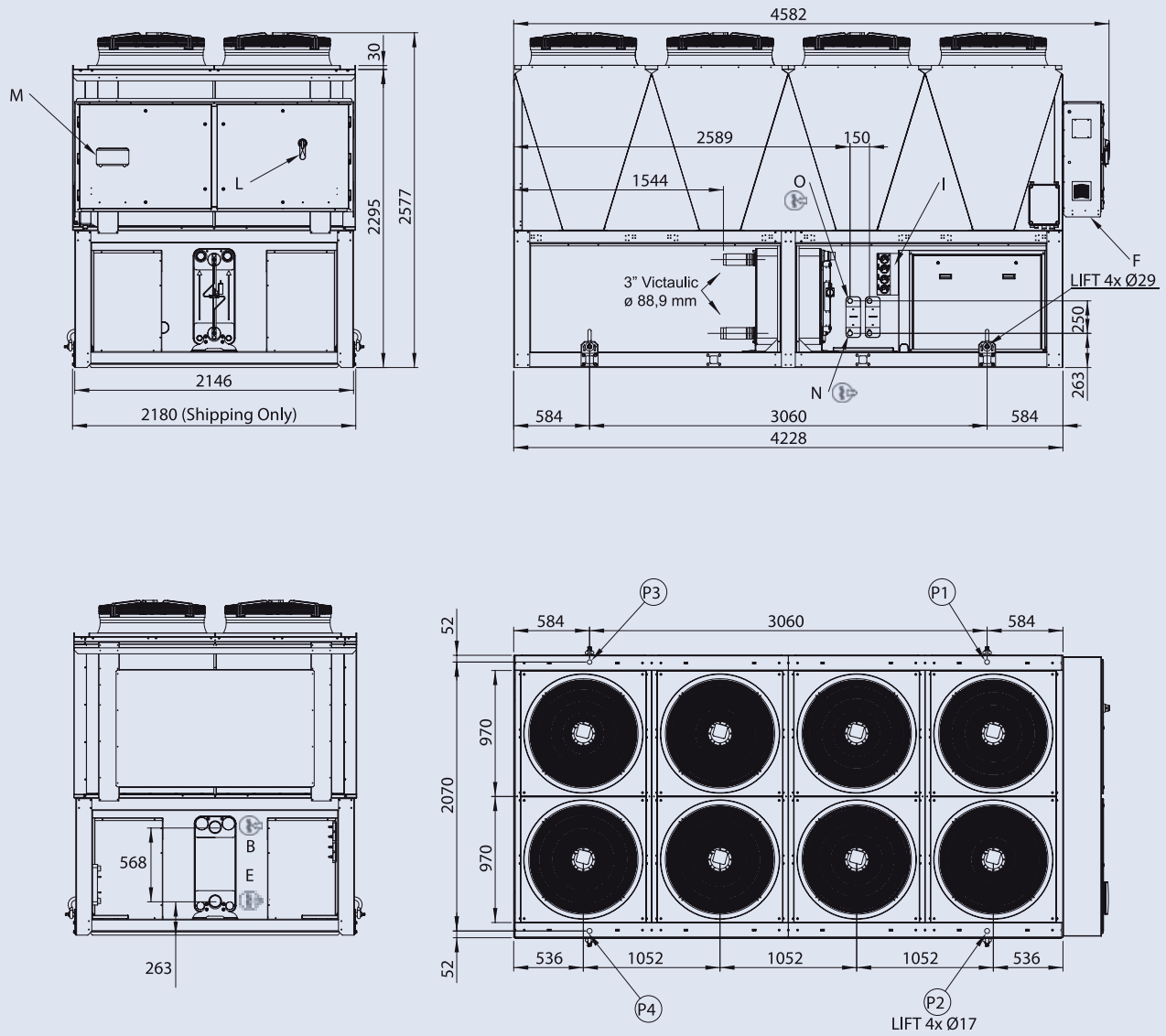
***P1, P2, P3, P4** AVM POSITION*

Size	LGH	Ø
YLRA 0200	440	2" 1/2 Victaulic Ø 76.1 mm
YLRA 0230 to 0280	344	3" Victaulic Ø 88.9 mm

Size	H1	H2
YLRA 0200	246	370
YLRA 0230 to 0280	205	520

Dimensions and hydraulic connections

YLRA 0300 and 0330



All dimensions in mm. Drawings not a scale.

NOTES:
***B, E** - WATER CONNECTION 3·GAS M Ø88.9 mm*
***F** - ELECTRICAL POWER SUPPLY*
***I** - GAUGE KIT (ACCESSORY)*
***L** - MAIN SWITCH*
***M** - CONTROL KEYPAD / DISPLAY*

OPTIONAL DESUPERHEATER
***N** - WATER INLET Ø1" GAS M*
***O** - WATER OUTLET Ø1" GAS M*

***P1, P2, P3, P4** AVM POSITION*

YLPB
Heat pump scroll compressor

Cooling capacities from 336 kW to 629 kW
Heating capacities from 344 kW to 653 kW

Features

The **YLPB** heat pump delivers premium energy efficiency, it is easy to install, quiet to run, and it is supported by a knowledgeable service force.

Efficiency
One of the highest part load cooling efficiency unit in the market, improved defrost cycle, extended operating envelope. Maximize heating efficiency and renewable energy use with the **YLPB** heat pump.

Sound
Designed for quiet operation at full and part load conditions.

Ease of installation
Quick and easy to install, compact design. Smart Equipment and Verasys™ ready.

Reliability
The **YLPB** is our third generation of fully factory tested scroll heat pumps, and thanks to our extensive service solutions, support and minimal maintenance are assured.

Options / Accessories

- Soft start
- Power Factor Correction Capacitors
- BMS Interfacing options
- Dual pressure relief valves
- Victaulic coupling
- Flow switch
- Desuperheater
- Enclosure options
- Sound attenuation options
- Anti-vibration mounts options
- VSD Single and Dual Pump Kits

Multiple scroll design enables sound reduction during part load operation by simply turning off unnecessary compressors

Heat pump scroll compressor

YLPB 0345 to 0650

Nominal capacity

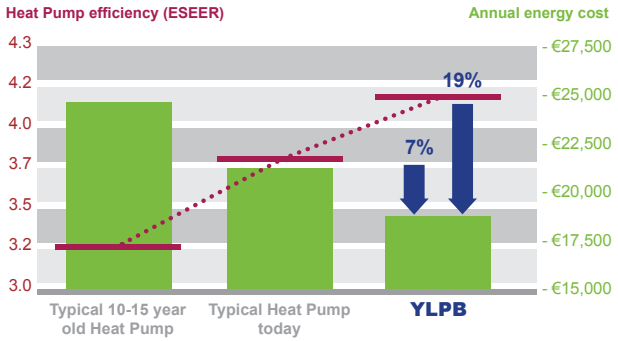
YLPB	0345	0430	0525	0575	0650
Cooling capacity (kW)	336	413	478	559	629
EER	3.03	2.97	2.90	2.98	3.03
Heating capacity (kW)	344	427	514	575	653
COP	3.07	3.07	3.03	2.99	3.01
SCOP	3.25	3.25	3.25	3.25	3.25
ηs, h	127	127	127	127	127
Sound Power Level (dBA)	96	96	97	98	99

Net values at Eurovent nominal conditions:
Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature
SCOP calculated according to EN14511 and EN14825
ηs calculated according to Ecodesign regulation for heating (813/2013)
Ecodesign figures are calculated following variable outlet approach.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Technical data

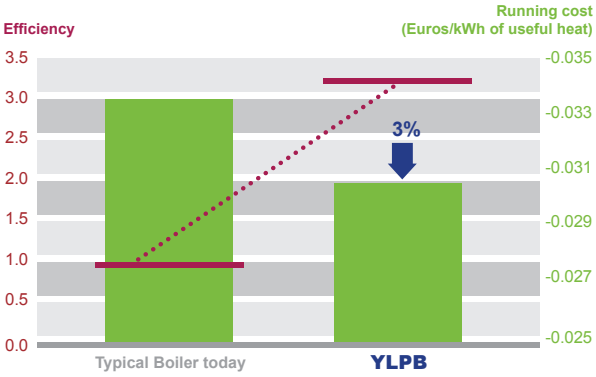
YLPB			0345	0430	0525	0575	0650
Dimensions	Length	mm	4721			5839	6958
	Width	mm	2242				
	Height	mm	2391				
Operating weight kg			3793	4043	4210	4747	5495

High Efficiency Cooling Mode



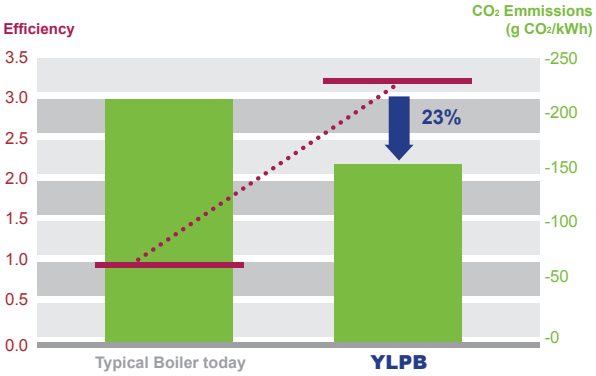
500 kW unit, 3000 operating hours, energy rate = 0.1 EUR / kWh

Additional Energy Savings in Heating Mode



Energy Rate: Electricity 0.1 EUR / kWh; Gas 0.03 EUR / kWh

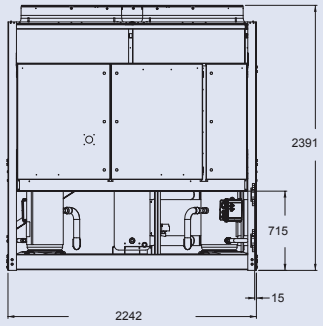
Carbon footprint in Heating Mode

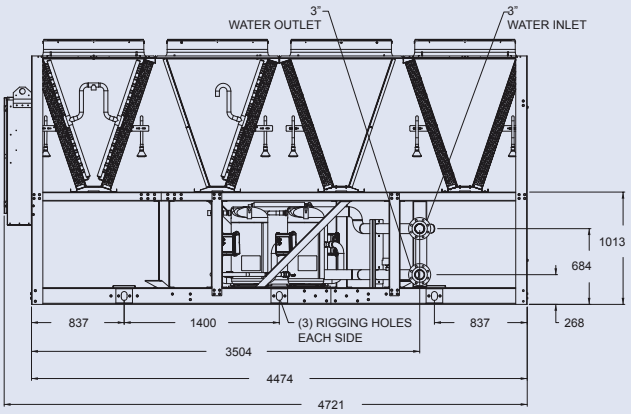


Manufacturer reserves the rights to change specifications without prior notice.

Dimensions and hydraulic connections

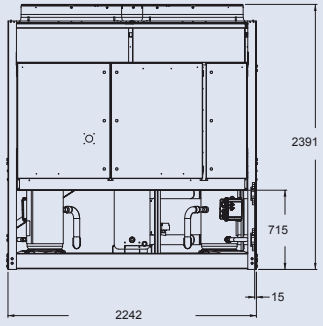
YLPB 0345 & 0430

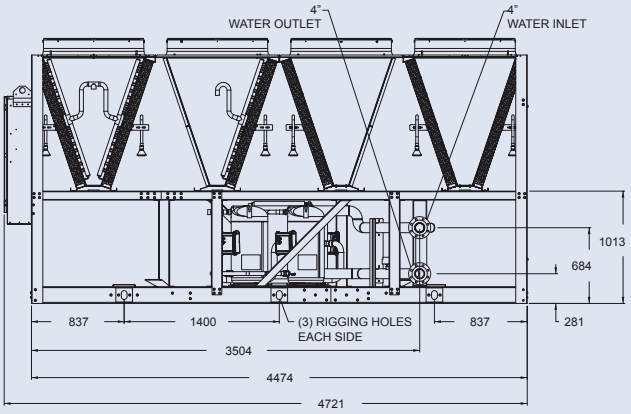




All dimensions in mm. Drawings not a scale.

YLPB 0525

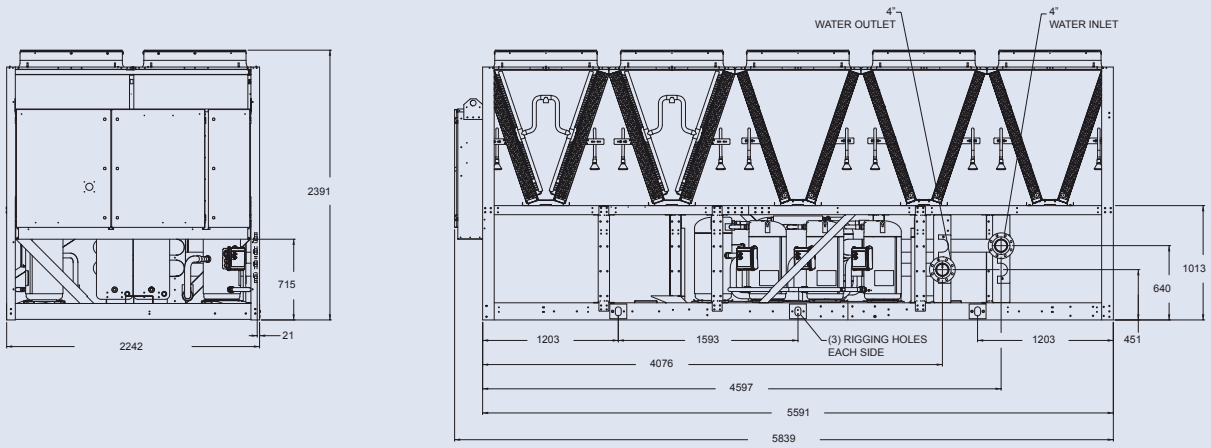




All dimensions in mm. Drawings not a scale.

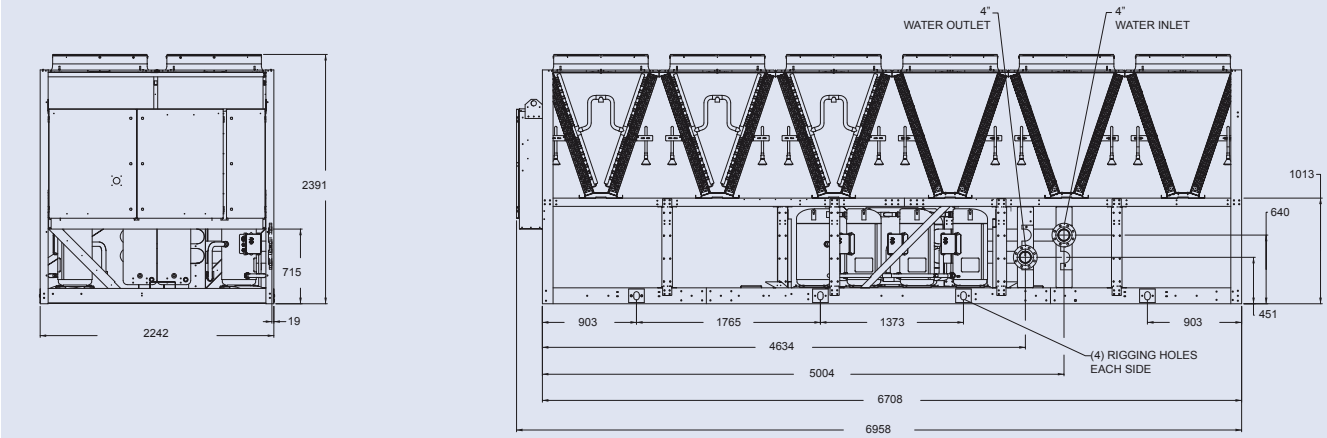
YLPB 0345 to 0650

YLPB 0575



All dimensions in mm. Drawings not a scale.

YLPB 0650



All dimensions in mm. Drawings not a scale.

YVAA
Air-cooled VSD screw chiller

Cooling capacities from 569 kW to 1654 kW

At Eurovent Standard Conditions this equipment meets A Class energy efficiency levels.

Compatible range

Note: this picture is showing aesthetics enclosures, contact your York office for additional information

Features

- Reduce your annual energy costs by as much as 30%
- Reduce your sound levels by up to 16 dBA to meet tighter regulations
- Enhance your flexibility with a variety of chiller options to fit your needs
- Minimise your environmental impact dramatically
- Lower your part load energy and night time sound levels with inverter fans and compressors
- Deliver increased motor longevity and increased chiller reliability with low starting currents
- Cut your operational expenses with a high chiller power factor at all loads
- Improve your peace of mind knowing we stand behind every chiller

Options / Accessories

- BMS Interfacing options
- Advanced Controls (Silent night™, Quick restart)
- Low temperature application options
- Dual pressure relief valves
- Flow switch
- Epoxy treatment Microchannel Coils
- Fan options
- Enclosure options
- Sound attenuation options
- Anti-vibration mounts options
- Desuperheater

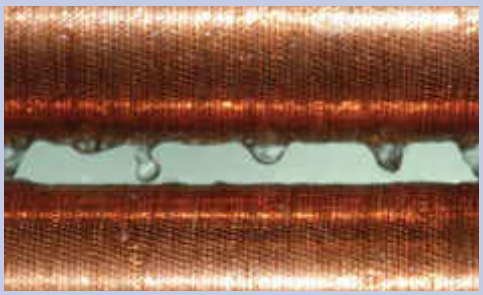
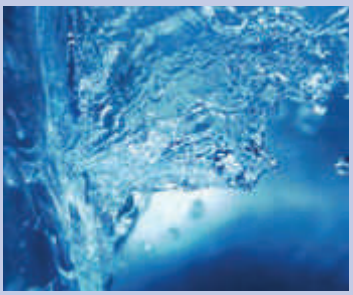


Photo courtesy of the LTCM lab of the Ecole Polytechnique Fédérale de Lausanne, Switzerland

Reduce refrigerant charges by up to 15% beyond traditional chiller designs with the YVAA's falling-film evaporator and microchannel condenser coil technology.



A more efficient chiller means less electricity generation, which reduces greenhouse gas emissions, water consumption – and your environmental footprint.
The sustainability advantages of the YVAA chiller give you the opportunity to **earn points in the LEED® and BREEAM® building certification programs.**

Air-cooled VSD screw chiller

YVAA 0588 to 1843

Application flexibility (*) example of selections

YVAA	0588	0643	0665	0688	0700	0743	0765	0788	0843	0865	0888	0943
Cooling capacity (kW)	569	573	588	639	614	658	649	738	748	768	808	812
EER	3.24	3.07	3.17	3.23	2.83	3.13	3.16	3.15	2.90	3.14	3.17	2.99
SEER	4.32	4.27	4.40	4.58	4.15	4.41	4.63	4.73	4.50	4.73	4.80	4.61
ηs, c	170	168	173	180	163	173	182	186	177	186	189	181
Sound power level (dBA)	98	96	97	98	95	97	96	98	98	98	98	99

YVAA	0960	0963	0965	0988	1015	1065	1088	1093	1143	1173	1188	1193	1215
Cooling capacity (kW)	832	867	898	933	948	971	997	964	1002	1008	1022	1017	1047
EER	3.06	3.07	3.09	3.15	3.13	3.02	3.15	2.92	2.95	2.92	3.18	3.07	3.11
SEER	4.48	4.71	4.87	5.00	4.85	4.74	4.97	4.61	4.68	4.61	5.02	4.78	4.90
ηs, c	176	186	192	197	191	187	196	181	184	182	198	188	193
Sound power level (dBA)	98	99	99	100	99	100	100	100	99	100	100	100	100

YVAA	1288	1315	1343	1388	1443	1488	1515	1543	1650	1665	1693	1700	1843
Cooling capacity (kW)	1118	1077	1221	1260	1455	1237	1346	1371	1385	1390	1545	1569	1654
EER	3.23	3.17	3.11	3.11	2.92	3.17	3.14	3.16	3.08	3.04	3.07	2.91	2.96
SEER	4.84	4.72	4.68	4.63	4.56	4.87	4.83	4.86	4.73	4.62	4.75	4.57	4.67
ηs, c	190	186	184	182	179	192	190	192	186	182	187	180	184
Sound power level (dBA)	100	100	101	100	101	101	102	102	103	102	102	103	105

Net values at Eurovent nominal conditions for models using R134a: Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature.
SEER calculated according to EN14511 and EN14825.
ηs calculated according to Ecodesign regulation for chillers comfort cooling (2016/2281). For other Ecodesign calculations, please contact your JCI representative.
(*) YVAA is a tailor and tune chiller. Its performance will be factory-adjusted to match the exact site requirements based on the specific project operating conditions.
The table above shows only a representative sample of performance points based on generic project operating conditions working with R134a refrigerant.
For R513a information contact your JCI Representative.
For tailored and tuned performance based on your specific project requirements, and for more information, please contact your Johnson Controls representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Technical data

YVAA			0588	0643	0665	0688	0700	0743	0765	0788	0843	0865	0888	0943
Dimensions	Length	mm	7397	6274	7397	8514	5741	7397	7397	8514	7397	8514	9631	8514
	Width	mm	2241											
	Height	mm	2401											
Operating weight kg			7554	6208	6551	7012	6977	6589	7668	8011	6793	8100	8445	7151
Refrigerant charge kg			204	150	164	189	186	160	204	218	182	216	228	192

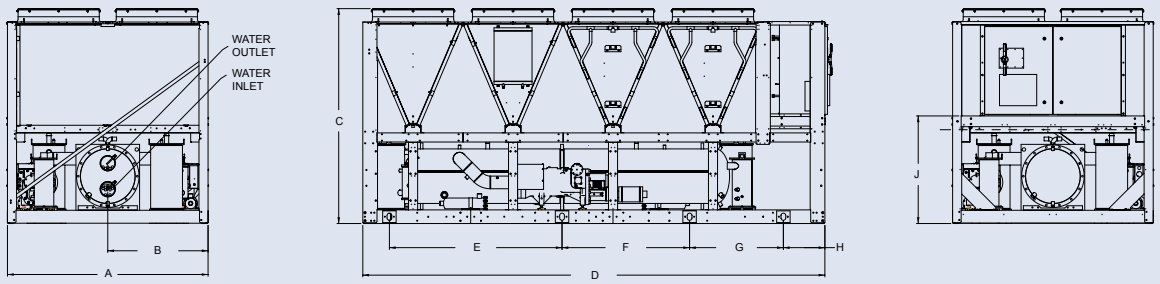
YVAA			0960	0963	0965	0988	1015	1065	1088	1093	1143	1173	1188	1193	1215
Dimensions	Length	mm	7397	8514	8514	9631	9631	10748	10748	9631	9631	10748	11865	10748	11865
	Width	mm	2241												
	Height	mm	2401												
Operating weight kg			7412	8314	8651	8996	9201	9007	9546	8665	9362	8612	9891	9704	10049
Refrigerant charge kg			228	240	242	246	261	248	268	243	268	264	277	282	286

YVAA			1288	1315	1343	1388	1443	1488	1515	1543	1650	1665	1693	1700	1843
Dimensions	Length	mm	12987	11864	11864	14104	11864	15222	14104	14104	11864	15222	15222	11865	15222
	Width	mm	2241												
	Height	mm	2401												
Operating weight kg			12435	12086	11169	12939	10558	13284	11249	12802	11287	14066	13149	12951	14066
Refrigerant charge kg			360	353	302	378	365	390	382	336	358	404	350	368	404

Dimensions and hydraulic connections

All drawings are for two pass evaporator. For other configurations, please, contact JCI.

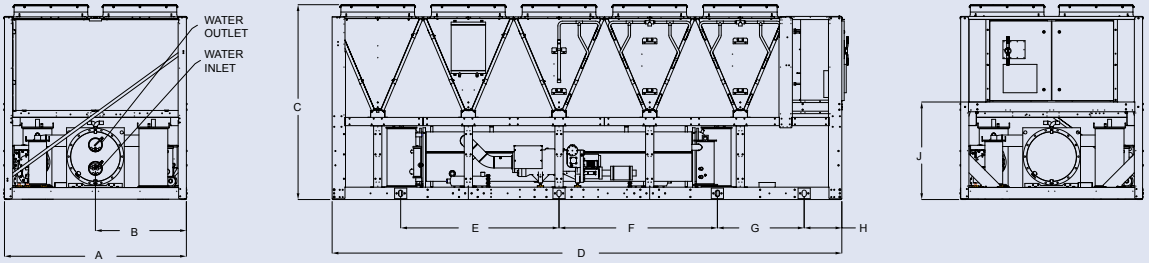
YVAA 0700



Unit frame	A	B	C	D	E	F	G	H	J
YVAA 0700	2241	1121	2401	5741	2098	1814	1054	464	1202

All dimensions in mm. Drawings not a scale.

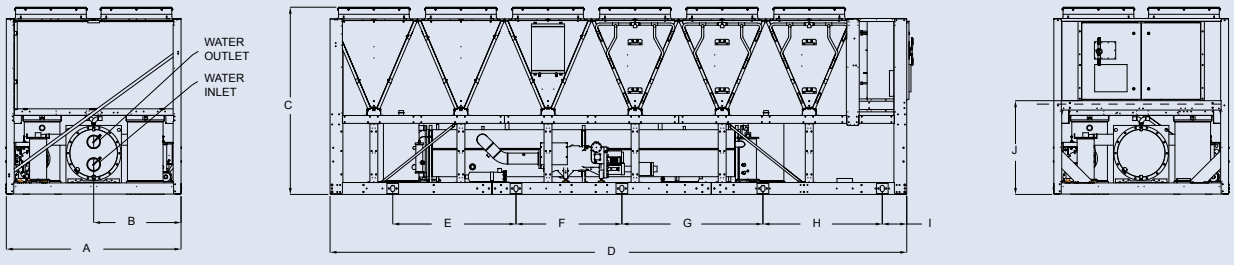
YVAA 0643



Unit frame	A	B	C	D	E	F	G	H	J
YVAA 0643	2241	1121	2400	6274	1962	2104	1069	464	1202

All dimensions in mm. Drawings not a scale.

YVAA 0588, 0665, 0743, 0765, 0843 & 0960



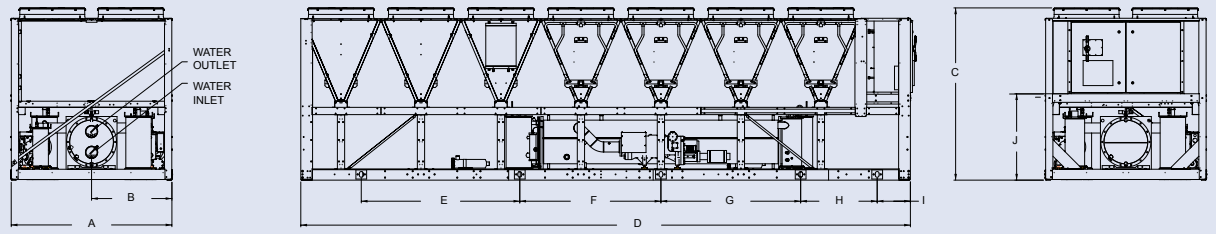
Unit frame	A	B	C	D	E	F	G	H	I	J
YVAA 0588 & 0765	2241	1121	2401	7397	1581	1358	1809	1531	314	1202
YVAA 0665 & 0743	2241	1121	2401	7397	1159	2125	2103	1069	464	1202
YVAA 0843	2241	1121	2401	7397	1464	1971	1951	1069	464	1202
YVAA 0960	2244	1122	2405	7397	1421	1358	1799	1541	314	1206

All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

All drawings are for two pass evaporator. For other configurations, please, contact JCI.

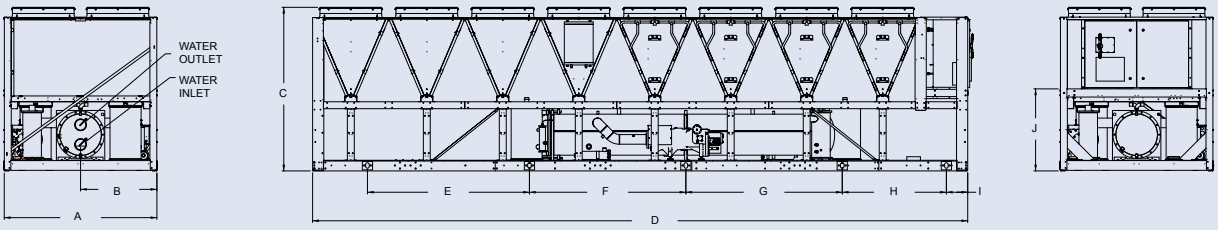
YVAA 0688, 0788, 0865, 0943, 0963 & 0965



Unit frame	A	B	C	D	E	F	G	H	I	J
YVAA 0688 & 0943	2244	1122	2405	8514	2214	1951	1952	1069	464	1206
YVAA 0788	2244	1122	2405	8514	1774	2299	2299	1531	314	1206
YVAA 0865	2244	1122	2405	8514	2129	2299	2256	1069	464	1206
YVAA 0963 & 0965	2244	1122	2405	8514	1501	2115	1529 + 1228	1531	314	1206

All dimensions in mm. Drawings not a scale.

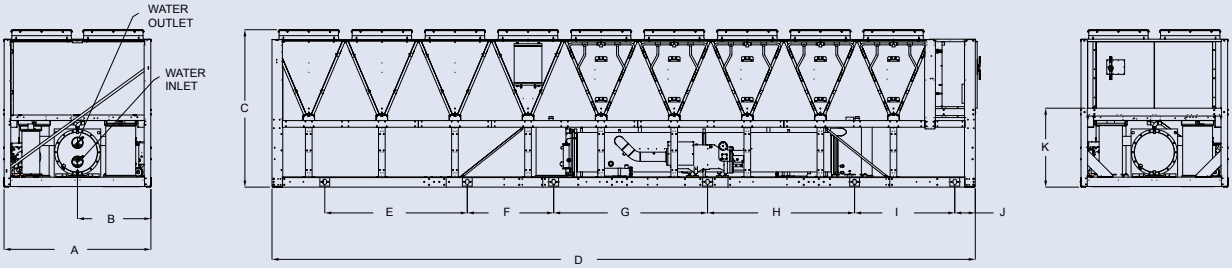
YVAA 0888, 0988, 1015, 1093, & 1143



Unit frame	A	B	C	D	E	F	G	H	I	J
YVAA 0888	2244	1122	2405	9631	2381	2299	2299	1531	314	1206
YVAA 0988 & 1143	2244	1122	2405	9631	2656	1568	1529 + 1228	1531	314	1206
YVAA 1015	2244	1122	2405	9631	1467	2807	2706	1531	314	1206
YVAA 1093	2244	1122	2405	9631	2381	2351	2247	1531	314	1206

All dimensions in mm. Drawings not a scale.

YVAA 1065, 1088, 1173, & 1193



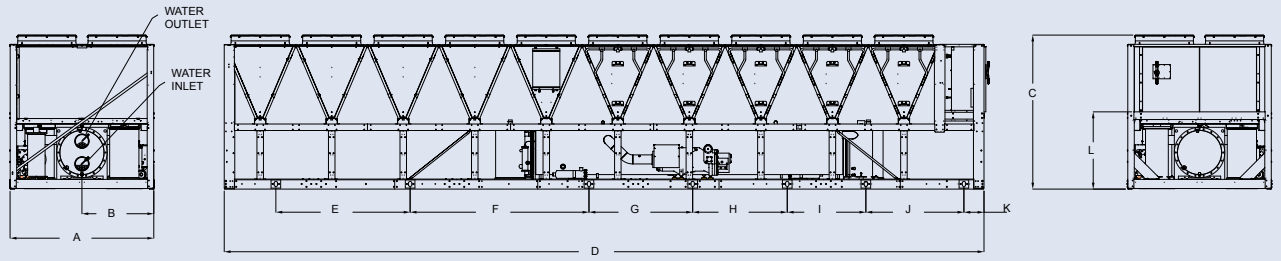
Unit frame	A	B	C	D	E	F	G	H	I	J	K
YVAA 1065	2244	1122	2405	10748	2178	1320	2351	2247	1531	314	1206
YVAA 1088	2244	1122	2405	10748	2433	1340	1620	1477 + 1228	1531	314	1206
YVAA 1173	2244	1122	2405	10748	2177	1323	2299	2299	1531	314	1206
YVAA 1193	2244	1122	2405	10748	2433	1340	1568	1529 + 1228	1531	314	1206

All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

All drawings are for two pass evaporator. For other configurations, please, contact JCI.

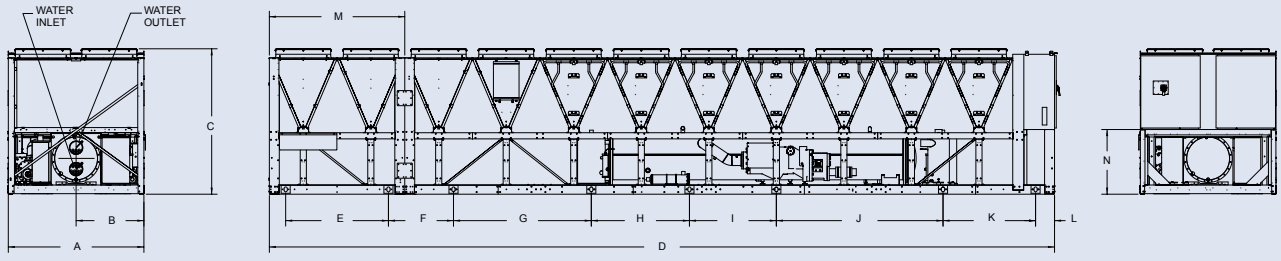
YVAA 1188, 1215, 1315, 1343, 1443, 1650 & 1700



Unit frame	A	B	C	D	E	F	G	H	I	J	K	L
YVAA 1188	2244	1122	2405	11865	2097	2793	1619	1477	1228	1531	314	1206
YVAA 1215	2244	1122	2405	11865	2097	2793	1568	1529	1228	1531	314	1206
YVAA 1315 / 1343 / 1443	2243	1122	2405	11864	3397	1623	1437	2757	-	1531	314	1070
YVAA 1650 & 1700	2243	1122	2405	11864	3701	1319	1437	2757	-	1531	314	1070

All dimensions in mm. Drawings not a scale.

YVAA 1288



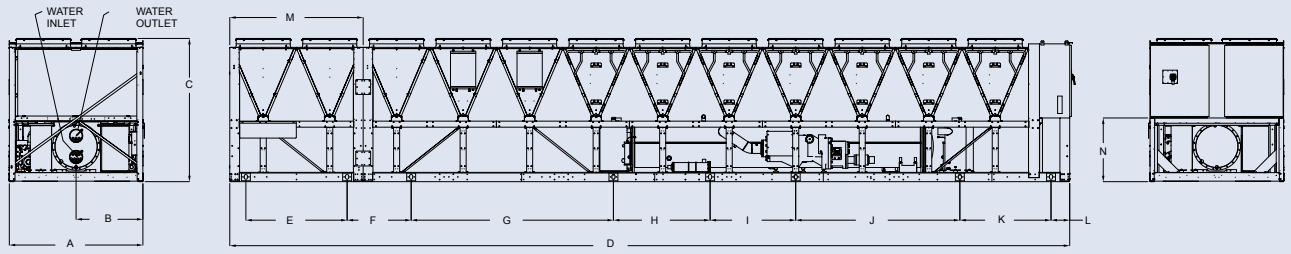
Unit frame	A	B	C	D	E	F	G	H	I	J	K	L	M	N
YVAA 1288	2243	1122	2405	12987	1700	1076	2280	1623	1437	2757	1531	314	2240	1070

All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

All drawings are for two pass evaporator. For other configurations, please, contact JCI.

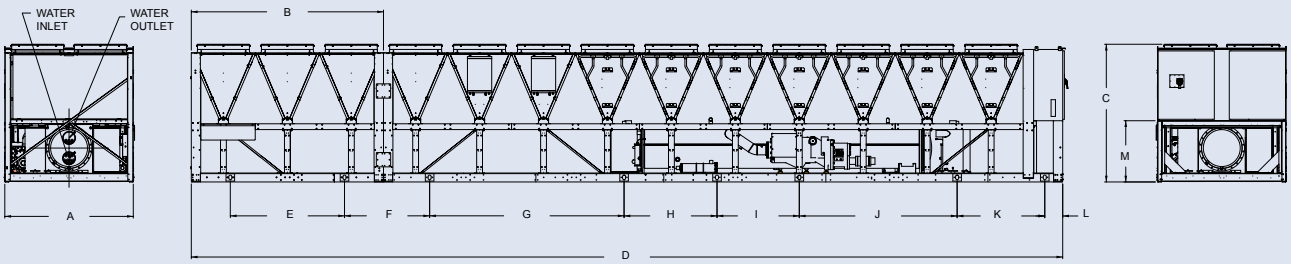
YVAA 1388, 1515 & 1543



Unit frame	A	B	C	D	E	F	G	H	I	J	K	L	M	N
YVAA 1388 / 1515	2243	1122	2405	14104	1700	1076	3397	1623	1437	2757	1531	314	2240	1070
YVAA 1543	2243	1122	2405	14104	1700	1076	3701	1319	1437	2757	1531	314	2240	1070

All dimensions in mm. Drawings not a scale.

YVAA 1488, 1665, 1693 & 1843



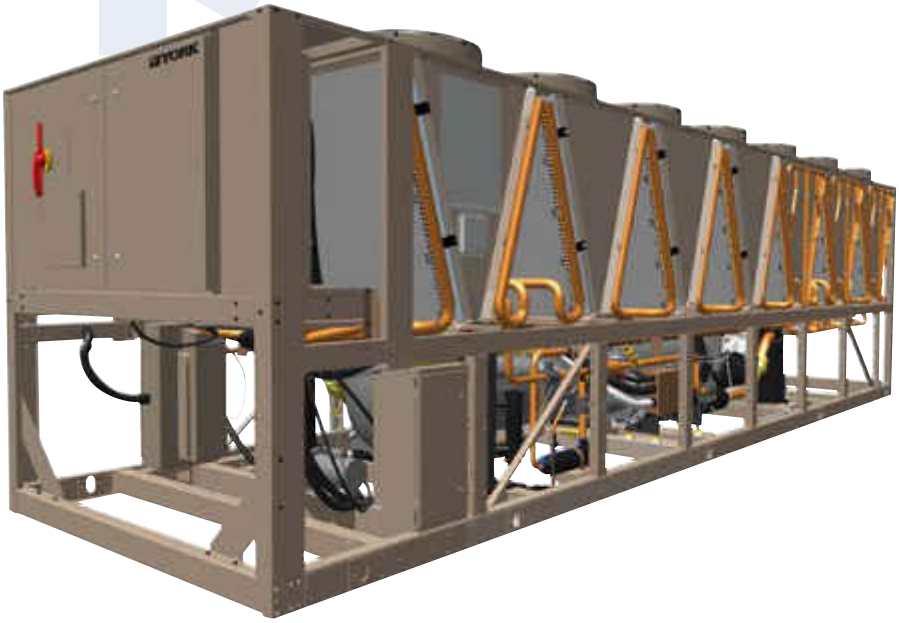
Unit frame	A	B	C	D	E	F	G	H	I	J	K	L	M
YVAA 1488	2244	3357	2405	15222	1995	1487	3397	1623	1437	2757	1531	314	1070
YVAA 1665 / 1693 / 1843	2244	3357	2405	15222	1995	1487	3701	1319	1437	2757	1531	314	1070

All dimensions in mm. Drawings not a scale.

YVFA
Air-cooled VSD screw chiller with integrated Free-cooling

Cooling capacities from 525 kW to 1575 kW

At Eurovent Standard Conditions this equipment meets A Class energy efficiency levels.



Compatible range

Features

- Available in Open and Closed (glycol free) loop configurations.
- Optimized Annual Energy Savings thanks to the unique combination of the YORK Variable Speed Drive technology expertise and the sophisticated free-cooling controls.
- Reduced installation footprint, thanks to the integration of the free-coolingcoils together with the chiller.
- Lower ambient operating range when in free-cooling mode, compared to standard units.

Options / Accessories

- BMS Interfacing options
- Advanced Controls (Silent night™, Quick restart)
- Low temperature application options
- Dual pressure relief valves
- Flow switch
- Epoxy treatment Microchannel Coils
- Fan options
- Enclosure options
- Sound attenuation options
- Anti-vibration mounts options
- Desuperheater

YVFA free-cooling chillers are available in open- or closed-loop configurations to maximize efficiency for your specific type od building

Open-loop configuration

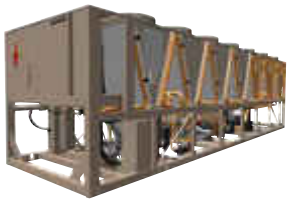
Open-loop design permits building glycol to flow through the free cooling coils directly, with the best performance and the lowest first cost.

Closed-loop configuration

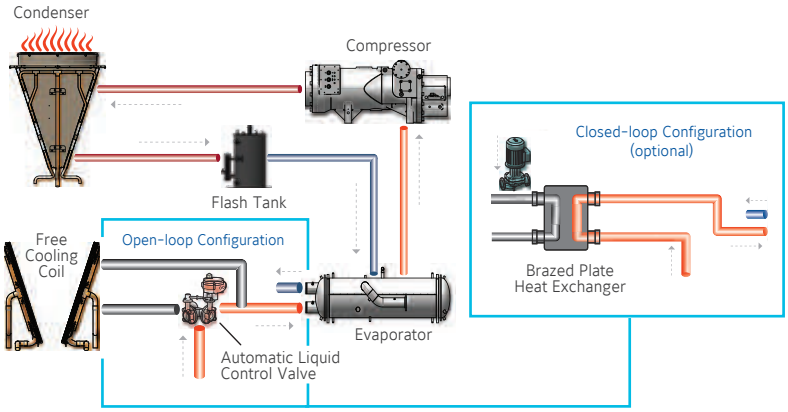
Closed-loop design integrates a brazed plate heat exchanger and pump loop. The building water loop is isolated from the free cooling coils, and the YVFA pump circulates glycol between the brazed plate heat exchanger and the free cooling coils. This provides the lowest pump pressure drop and a building loop that's glycol-free.

Air-cooled VSD screw chiller with integrated Free-cooling

YVFA

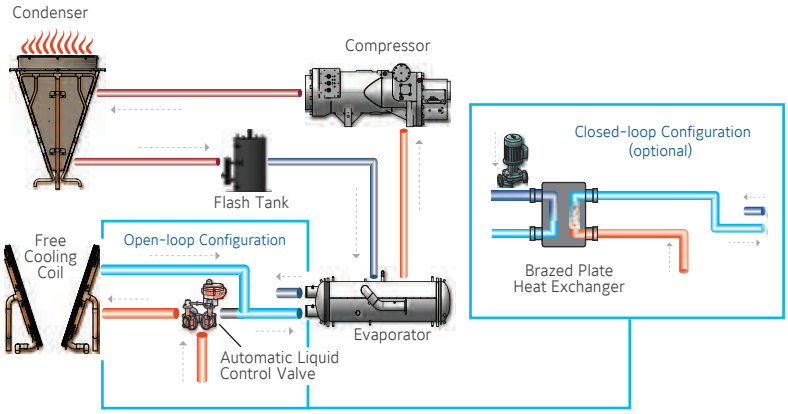


Saving energy is simple in every situation



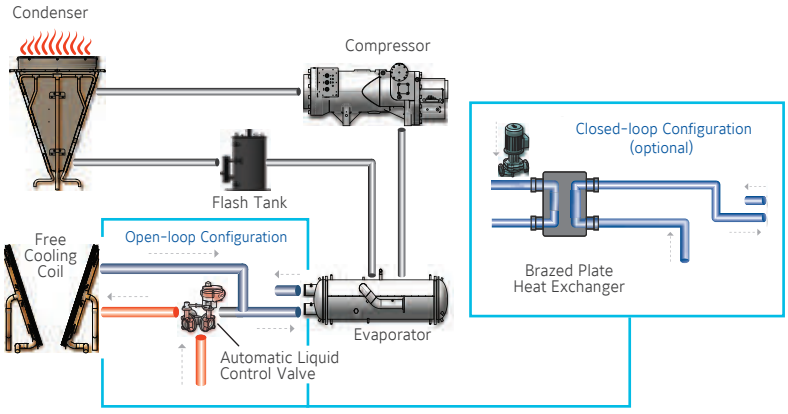
1 Mechanical Cooling Mode

When it's too warm to use ambient air for cooling, the YVFA performs as a standard chiller. The automatic flow-control valve in the open-loop configuration bypasses the free-cooling coils to reduce pump energy. When either cooling load or ambient temperature are less than full design condition, the variable-speed screw compressors and condenser fans modulate to optimize energy use. In a closed-loop configuration, the free-cooling coils are also bypassed.



2 Hybrid Cooling Mode

When ambient temperatures permit, liquid flow through the free-cooling coils is enabled. This pre-cooling reduces energy use while the compressors deliver final cooling to meet setpoint. Thanks to YORK® VSD Screw technology, at reduced ambient the compressors may draw less power than the fan motors required to move air through the free-cooling coils. Advanced controls provide the most efficient operation rather than simply shutting off compressors as quickly as possible. The Annual Energy Cost Report demonstrates the benefit of this intelligent control.



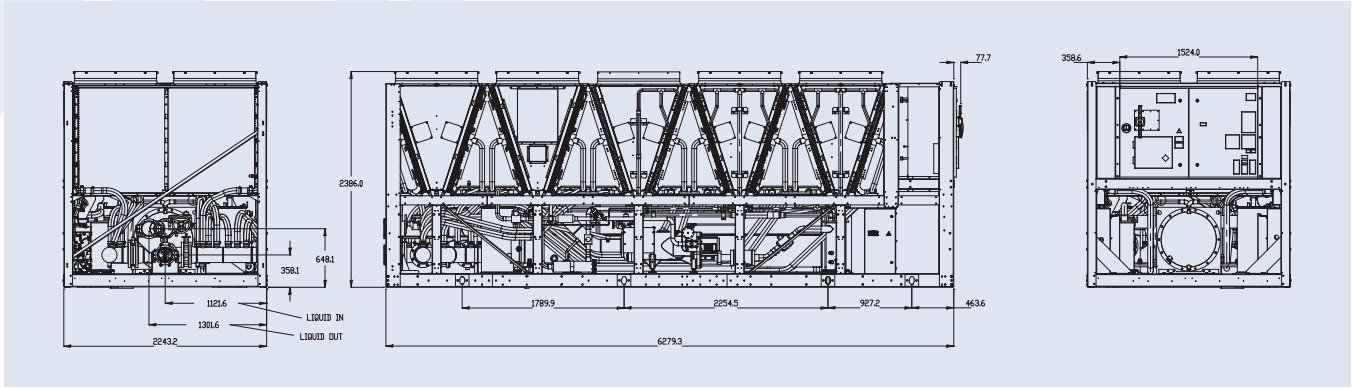
3 Free Cooling Mode

At lower ambient temperatures, full cooling load can be most efficiently delivered by the free-cooling coils. Compressors are shut off and the VSD fans are modulated to meet the cooling setpoint.

Dimensions and hydraulic connections

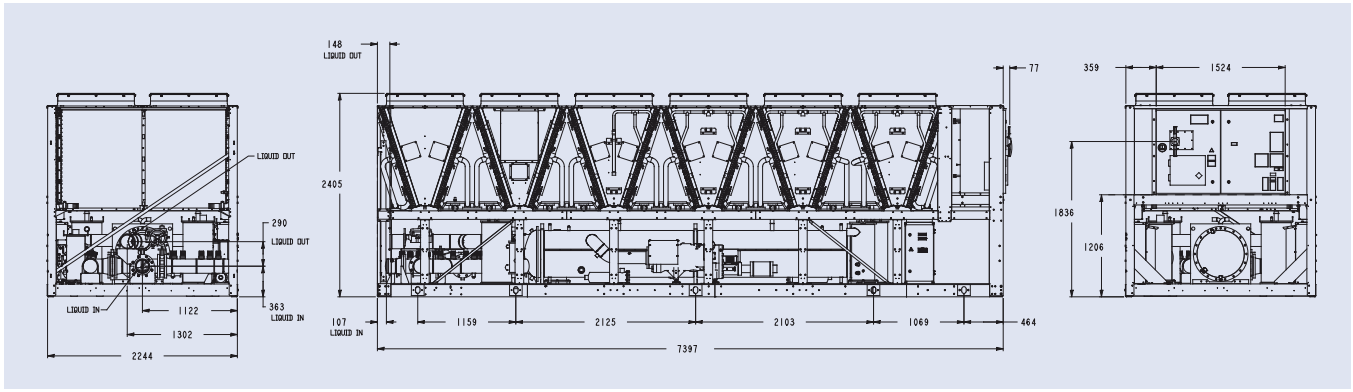
Open-loop configuration models

YVFA 0539 OL



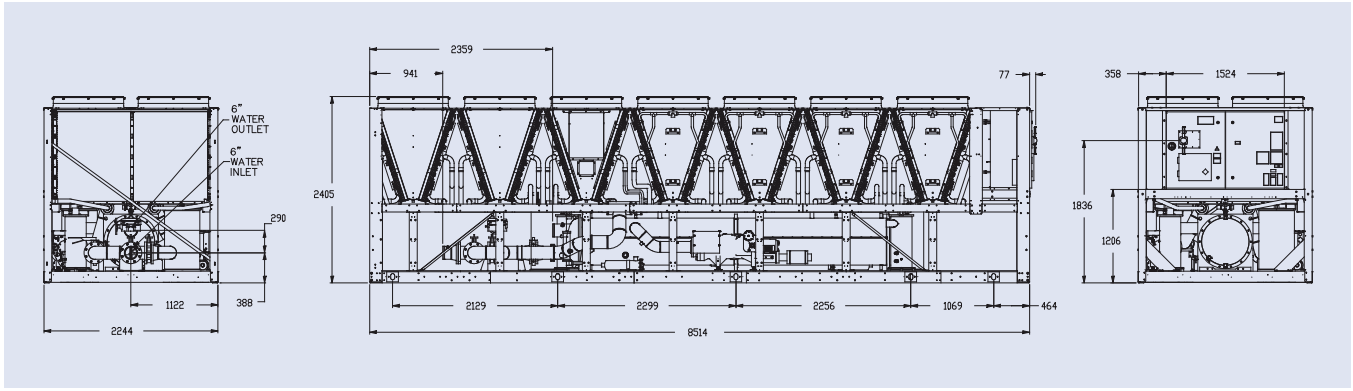
All dimensions in mm. Drawings not a scale.

YVFA 0709 OL



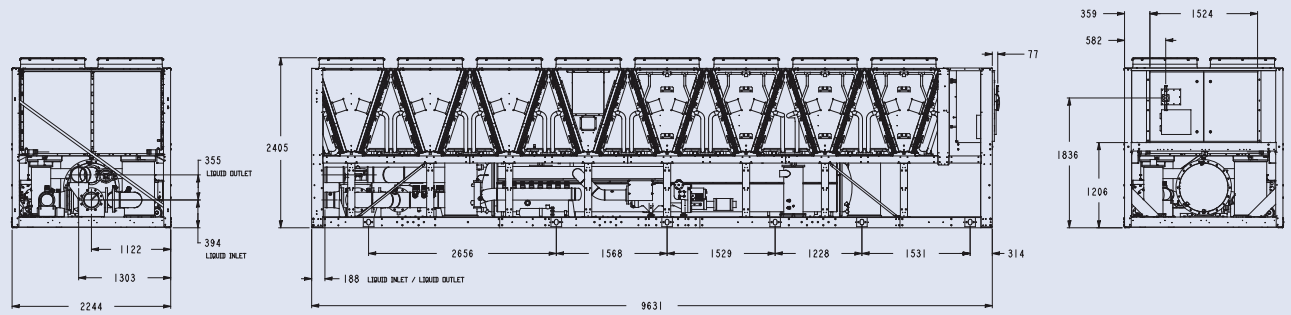
All dimensions in mm. Drawings not a scale.

YVFA 0889 OL



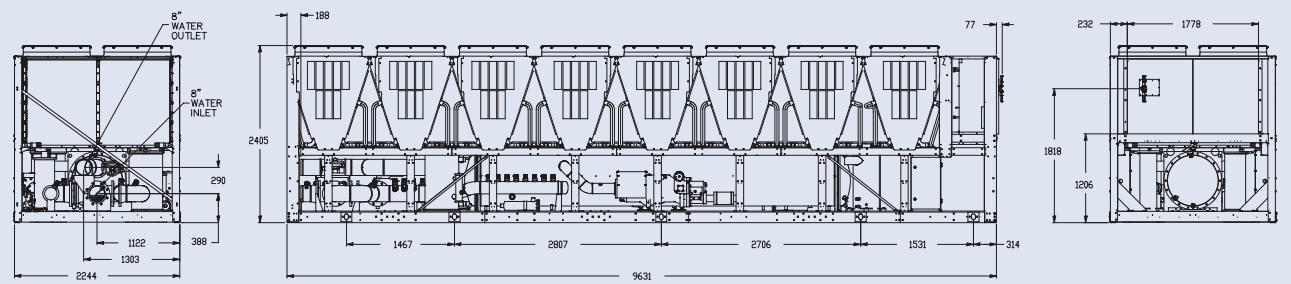
All dimensions in mm. Drawings not a scale.

YVFA 1009 OL



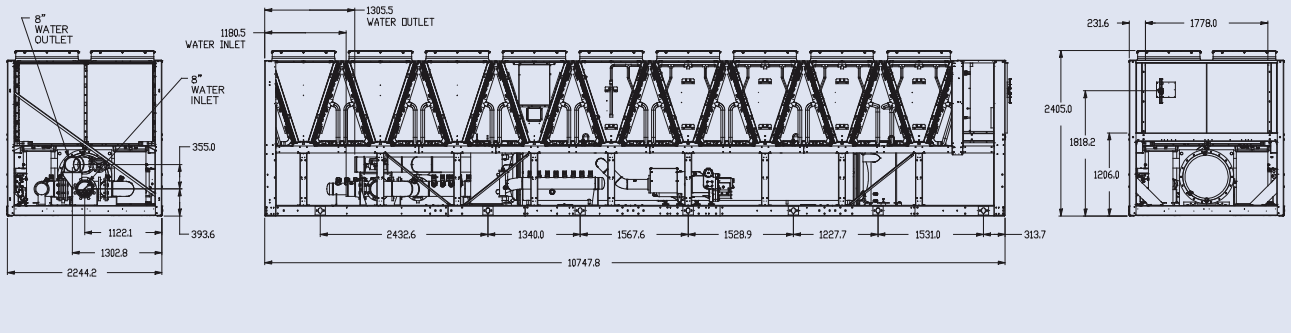
All dimensions in mm. Drawings not a scale.

YVFA 1069 OL



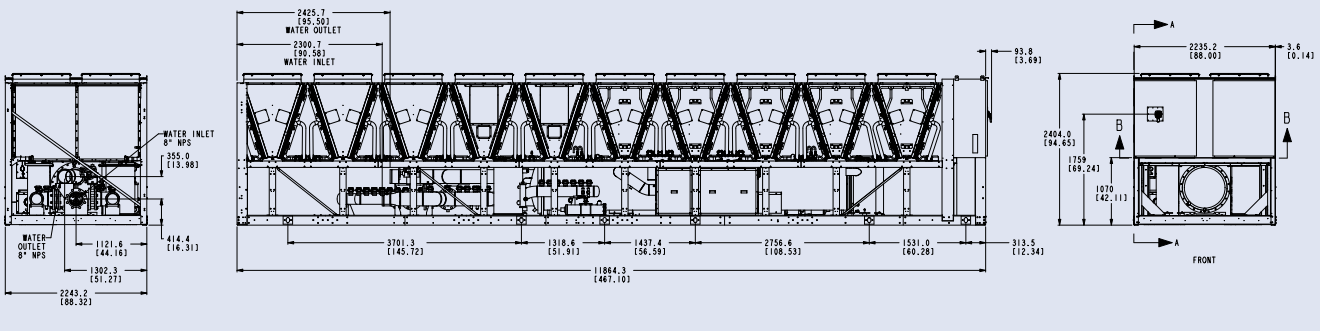
All dimensions in mm. Drawings not a scale.

YVFA 1239 OL



All dimensions in mm. Drawings not a scale.

YVFA 1419 & 1589 OL

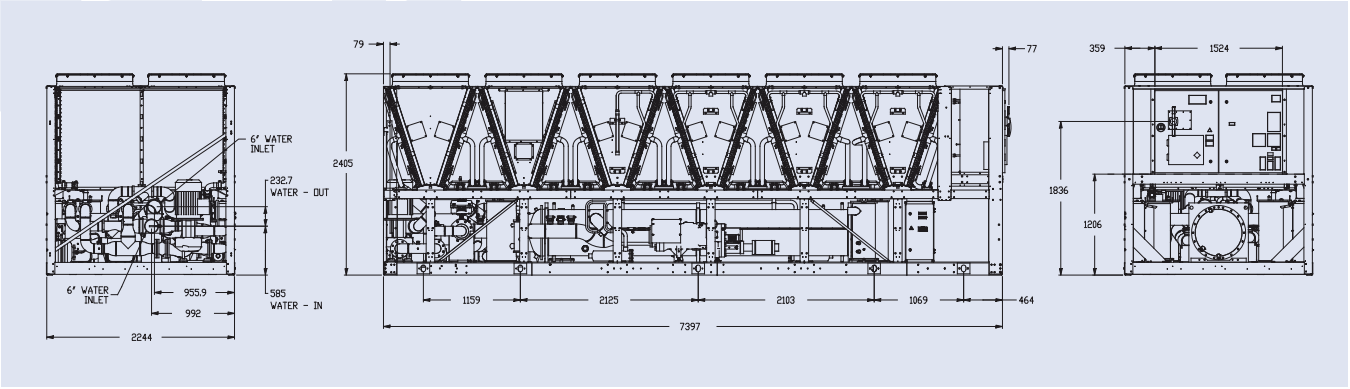


All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

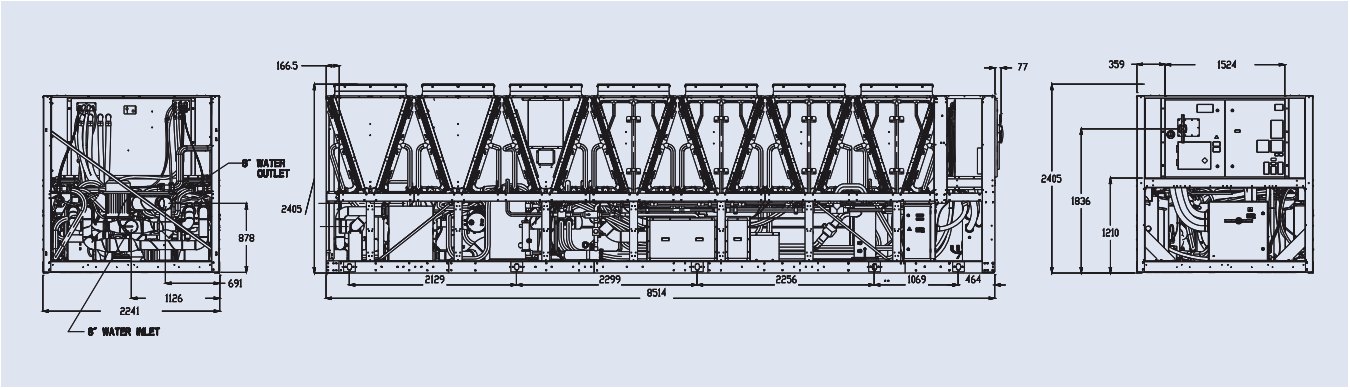
Closed-loop configuration models

YVFA 0709 CL



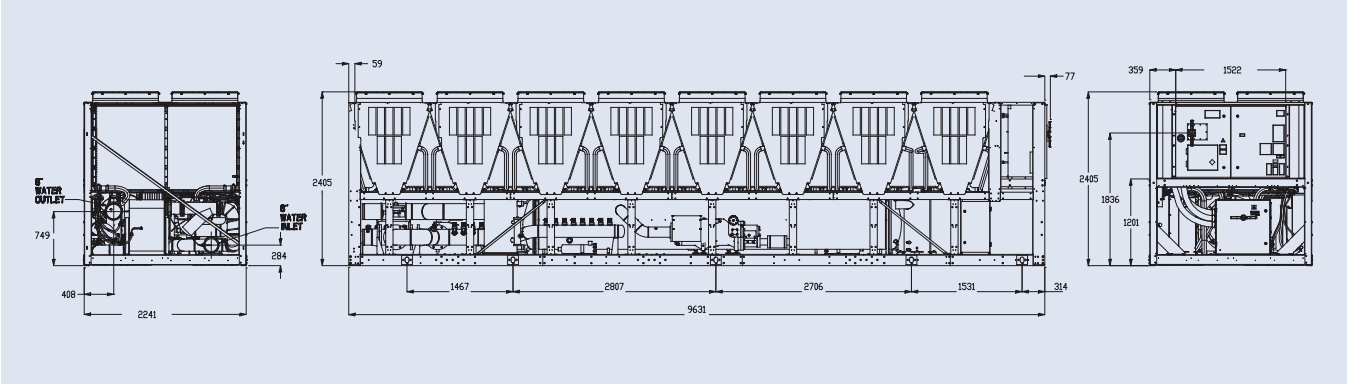
All dimensions in mm. Drawings not a scale.

YVFA 0889 CL



All dimensions in mm. Drawings not a scale.

YVFA 1069 CL

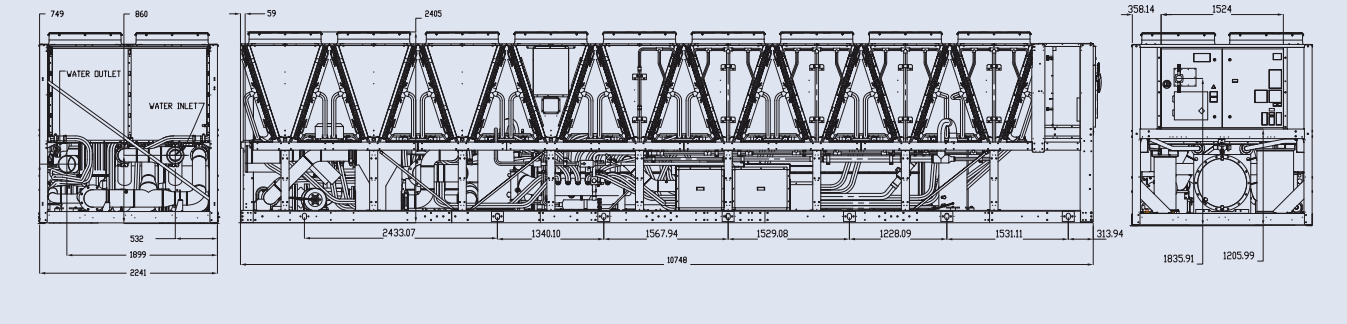


All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

Closed-loop configuration models

YVFA 1239 CL



All dimensions in mm. Drawings not a scale.

Application flexibility (*) example of selections

YVFA	0539	0709	0889	1009	1069	1239	1419	1589
Mechanical Cooling capacity (kW)	529	657	846	946	1050	1213	1378	1473
Full Load Efficiency (EER) - Mechanical	3.03	3.00	3.05	3.19	3.07	2.98	2.89	2.84
Part Load Efficiency (SEPR) - Mechanical	6.13	6.14	6.33	6.62	6.35	6.01	6.07	6.03
Sound power level (dBA) - Mechanical	103	104	106	105	106	109	110	110
Total Temperature Free-Cooling (°C)	0.5	0.2	-0.7	-0.5	-1.5	-1.8	-2.1	-2.8
Efficiency during Hybrid Mode	8-40	6-40	6-35	6-35	5-28	5-24	5-27	5-28
Efficiency during Total Free-Cooling Mode	40-115	40-125	35-125	35-135	28-125	24-125	27-125	28-115

Cooling Capacity at: entering/leaving chilled water temperature 15°C/10°C (30% Glycol), ambient temperature 35°C
Sound Pressure according to Eurovent conditions.
(*) YVFA is a tailor and tune chiller. Its peformance will be factory-adjusted to match the exact site requirements based on the specific project operating conditions.
The table above shows only a representative sample of performance points based on generic project operating conditions working with R134a refrigerant.
For R513a information contact your JCI Representative.
For tailored and tuned performance based on your specific project requirements, and for more information, please contact your Johnson Controls representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Technical data

YVFA			0539	0709	0889	1009	1069	1239	1419	1589
Dimensions	Length	mm	6280	7397	8514	9631	9631	10748	11864	
	Width	mm	2242						2243	
	Height	mm	2405						2404	
Operating weight kg			7394	8504	10396	11842	11884	12900	14131	17140
Refrigerant charge kg			172	164	216	246	262	282	365	368

YMWA / YMRA
Water-cooled cooling only, remote condenser and heat pump scroll compressor chiller

Cooling capacities from 21 kW to 193 kW

Same cabinet w/o or with factory mounted hydrokit (one or two pumps). More compact and slim.

Features

- Scroll compressors (single or tandem)
- Higher EER and COP
- 2 different frames / configurations:
  - 1 compressor / 1 circuit up to 45 kW
  - 2 compressors / 1 circuit from 50 to 190 kW
- Reduced refrigerant charge
- Condensing pressure control
- "Plug and Play" units

Available versions

14 available YMWA sizes in three versions:

1) **YMWA-CO** : Cooling only

2) **YMRA** : Remote condenser

3) **YMWA-HP** : Reversible heat pump

Nominal capacity and technical data

YMWA-CO	0020	0025	0030	0035	0040	0045	0050	0060	0075	0090	0120	0150	0170	0190
Cooling Capacity (kW)	21.2	26.2	31.1	34.8	39.2	46.6	50.9	61.1	77.3	91.1	118.4	147.1	170	192.7
EER	4.58	4.54	4.46	4.53	4.48	4.57	4.29	4.48	4.48	4.38	4.46	4.46	4.50	4.51
SEER	5.575	5.6	5.45	5.5	5.35	5.825	6.125	6.375	5.95	6.7	5.9	6.125	6.075	6.2
ηs, c	215	216	210	212	206	225	237	247	230	260	228	237	235	240
Length / Width / Height (mm)	821 / 455 / 1350						1210 / 850 / 1500							
Operating weight (kg)	162	182	179	185	191	214	352	371	392	411	597	666	701	745

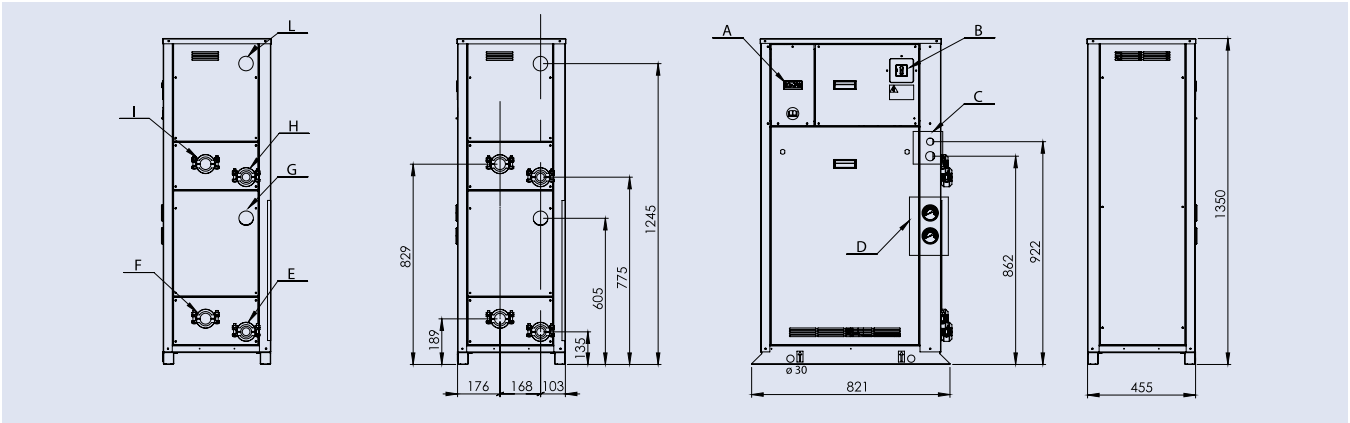
YMRA	0020	0025	0030	0035	0040	0045	0050	0060	0075	0090	0120	0150	0170	0190
Cooling Capacity (kW)	21.2	26.2	31.1	34.8	39.2	46.6	50.9	61.1	77.3	91.1	118.4	147.1	170	192.7
Length / Width / Height (mm)	821 / 455 / 1350						1210 / 850 / 1500							
Operating weight (kg)	144	164	166	166	172	172	332	344	365	376	558	612	643	674

YMWA-HP	0020	0025	0030	0035	0040	0045	0050	0060	0075	0090	0120	0150	0170	0190
Cooling Capacity (kW)	20.8	26	30.1	34	38.1	45.5	49.9	58.9	76.1	88.6	114.9	144.3	165.7	185.4
Heating Capacity (kW)	23.7	28.9	33.6	38.5	42.9	51.2	57.7	68.2	86.3	102.2	132	164.2	190.1	212.3
EER	4.45	4.47	4.28	4.35	4.33	4.39	4.15	4.24	4.36	4.20	4.26	4.33	4.34	4.28
COP	3.88	3.85	3.73	3.79	3.77	3.85	3.83	3.81	3.92	3.89	3.92	3.95	3.93	3.93
SCOP	5.03	5.03	4.85	4.95	4.88	4.74	4.99	4.94	5,22	5.09	5.17	5.27	5.23	5.22
ηs, h	193	193	186	190	187	182	192	190	201	196	199	203	201	201
Length / Width / Height (mm)	821 / 455 / 1350						1210 / 850 / 1500							
Operating weight (kg)	165	187	184	190	195	219	360	379	403	422	610	683	718	762

Net values at Eurovent nominal conditions:
YMWA-CO: Standard Eurovent LCP/W/AC conditions in cooling mode: evaporator EWT/LWT 12°C/7°C, condenser EWT/LWT 30°C/35°C
YMRA: Evaporator EWT/LWT 12°C/7°C, condensing temperature 40°C
YMWA-HP: Standard Eurovent LCP/W/AC conditions in cooling mode: evaporator EWT/LWT 12°C/7°C, condenser EWT/LWT 30°C/35°C
YMWA-HP: Standard Eurovent LCP/W/AC conditions in heating mode: evaporator EWT/LWT 10°C, condenser EWT/LWT 40°C/45°C
Ecodesign figures are calculated following variable outlet approach.
SEER and SCOP calculated according to EN14511 and EN14825
ηs calculated according to Ecodesign regulation for chillers comfort cooling and heating (813/2013, 2016/2281). For other Ecodesign calculations, please contact your JCI representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Dimensions and hydraulic connections

YMWA-CO/HP 0020-0045

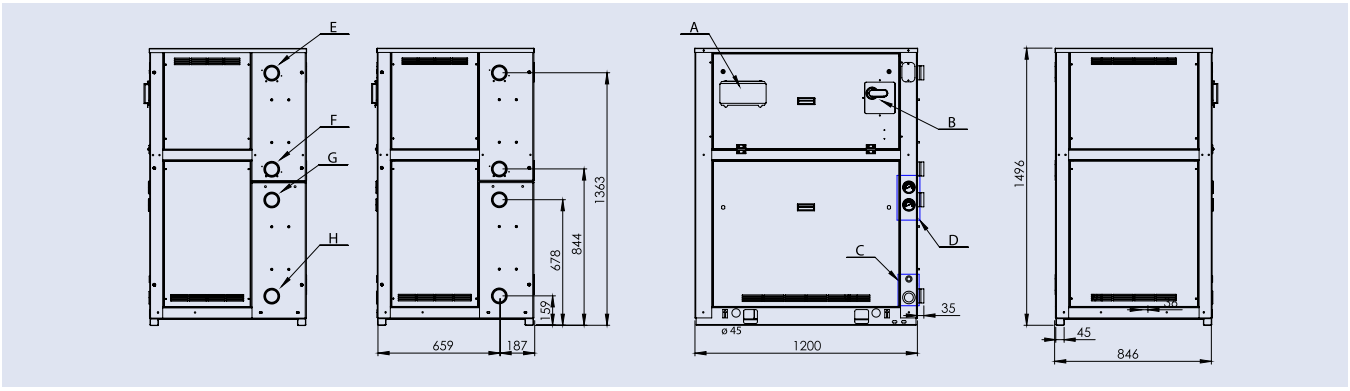


A	Control display	**D**	Gauge kit
B	Main switch	**E, F, G**	Water evaporator connections Ø 1 1/2" victaulic
C	Auxiliary lines, electrical connection	**H, I, L**	Water condenser connections Ø 1 1/2" victaulic

YMRA Sizes	In	Out
020	H Ø 5/8"	L Ø 5/8"
025-045	H Ø 5/8"	L Ø 7/8"

All dimensions in mm. Drawings not a scale.

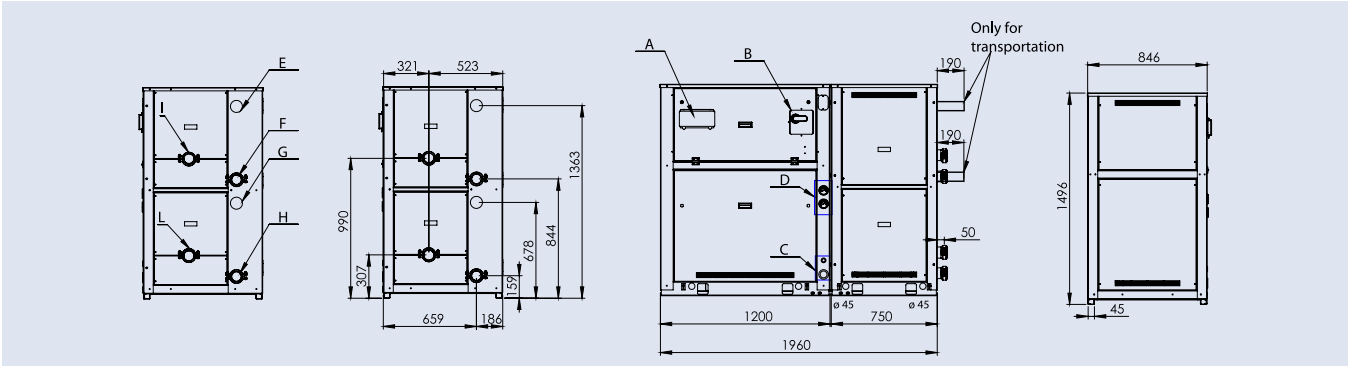
YMWA-CO/HP 0050-0190 without Hydrokit



A	Control display	**D**	Gauge kit
B	Main switch	**G, H**	Water evaporator connections Ø 1 1/2" victaulic
C	Auxiliary lines, electrical connection	**E, F**	Water condenser connections Ø 1 1/2" victaulic

All dimensions in mm. Drawings not a scale.

YMWA-CO/HP 0050-0190 with Hydrokit



A	Control display	**D**	Gauge kit
B	Main switch	**G, H, L**	Water evaporator connections Ø 1 1/2" victaulic
C	Auxiliary lines, electrical connection	**E, F, I**	Water condenser connections Ø 1 1/2" victaulic

YMRA Sizes	In	Out
050-060	F Ø 5/8"	E Ø 7/8"
075-090	F Ø 7/8"	E Ø 1 1/8"
120	F Ø 7/8"	E Ø 1 3/8"
150	F Ø 7/8"	E Ø 1 5/8"
170-190	F Ø 1 1/8"	E Ø 1 5/8"

All dimensions in mm. Drawings not a scale.

Manufacturer reserves the rights to change specifications without prior notice.

YCSE / YCRE Style C
Water-cooled or remote air-cooled screw compressor chiller

Cooling capacities from 140 kW to 249 kW

YORK® YCSE Style C chiller is designed for water or water-glycol cooling. It is designed for indoor installation in a plant room. The unit is completely factory assembled with all interconnecting refrigerant piping and wiring ready for field installation. **YCSE** unit is pressure tested, evacuated, and fully factory charged with refrigerant R134a and oil. After assembly, an operational test is performed with water flowing through the evaporator and condenser to ensure that each refrigerant circuit operates correctly.

Modular Concept for maximum installation flexibility

Features

Efficient screw compressors

Highly efficient the **YORK® YCSE Style C** offers the highest standard of reliability and economical operation utilizing twin-screw rotor technology and fully modulating compressor slide valve unloading, together with low inrush current star delta starters. To further improve the operating efficiency the leaving liquid temperature can be remotely reset.

Quiet operation

The compressor has been designed so that there is minimal external gas pulsations and integral oil separators resulting in very low sound and vibration levels.

Small footprint

The compact design is ideally suited for reduced base area locations. The unit frame is manufactured from heavy gauge galvanized steel coated with baked-on powder paint.

Extended Heating range (NEW)

Operating range in heat pump mode has been extended, YCSE Style C units are now able to provide heated water outlet up to 60°C when it's working as a heat pump.

Options / Accessories

- BMS Interface (Modbus, Bacnet)
- Compressor Circuit Breaker
- Power Meter
- Heat pump sensor kit
- Evaporator Heater
- Cable Power Routing
- High Leaving Evaporator temperature
- High Condenser Water and glycol options
- Pressure Relief Valve (single/dual)
- Dual Compressor safety valve
- Suction and/or Discharge stop valves
- Water connection flanges
- Differential Water Pressure Switch
- Water Flow Switch and Water Filter
- Anti-vibration mounts (rubber or springs)

Nominal capacity and technical data

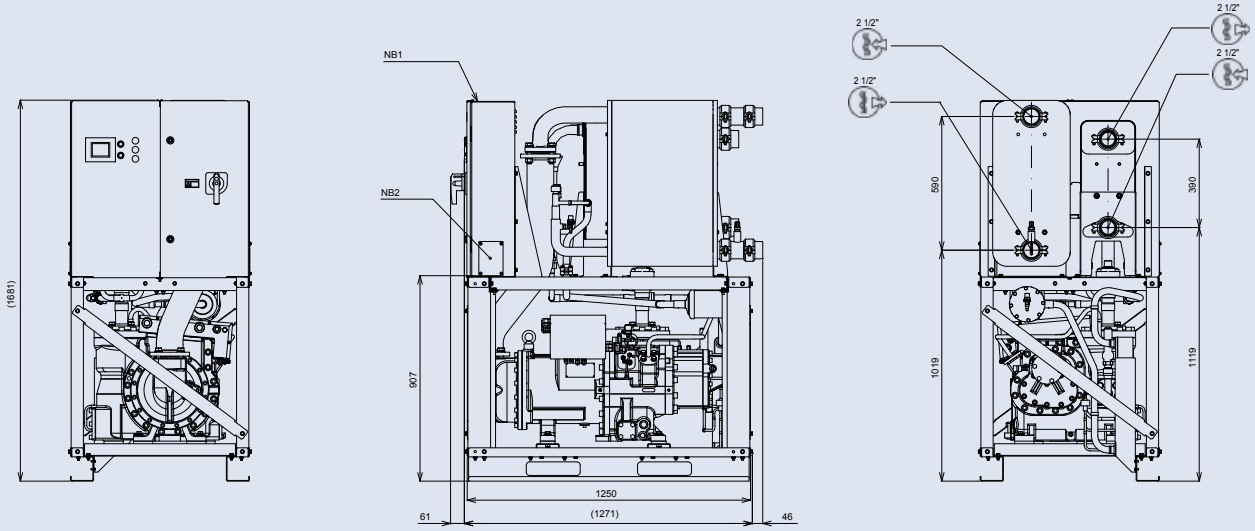
Model	YCSE				YCRE		
Size	0141	0181	0221	0241	0141	0181	0221
Cooling Capacity (kW) *	139.6	179.5	219.5	249.3	135	175	215
EER	4.84	4.80	4.71	4.72	4.22	4.19	4.10
ESEER	5.35	5.69	5.71	5.72	Not Applicable		
SEER	5.14	5.46	5.51	5.52			
$\eta_{s,c}$	203	215	217	218			
Sound power level (dBA)	88	89	90	91	88	89	90
Length / Width / Height (mm)	Base 1 378 max / 806 / 1 681						
Operating weight (kg)	860	950	1 040	1 075	765	835	900

** YCSE: At 35°C leaving condenser liquid temperature and 7°C leaving chilled liquid temperature according to EUROVENT calculation EN14511:2011*
** YCRE: At 45°C condensing temperature and 7°C leaving chilled liquid temperature*
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Dimensions and hydraulic connections

YCSE 0141 to 0241

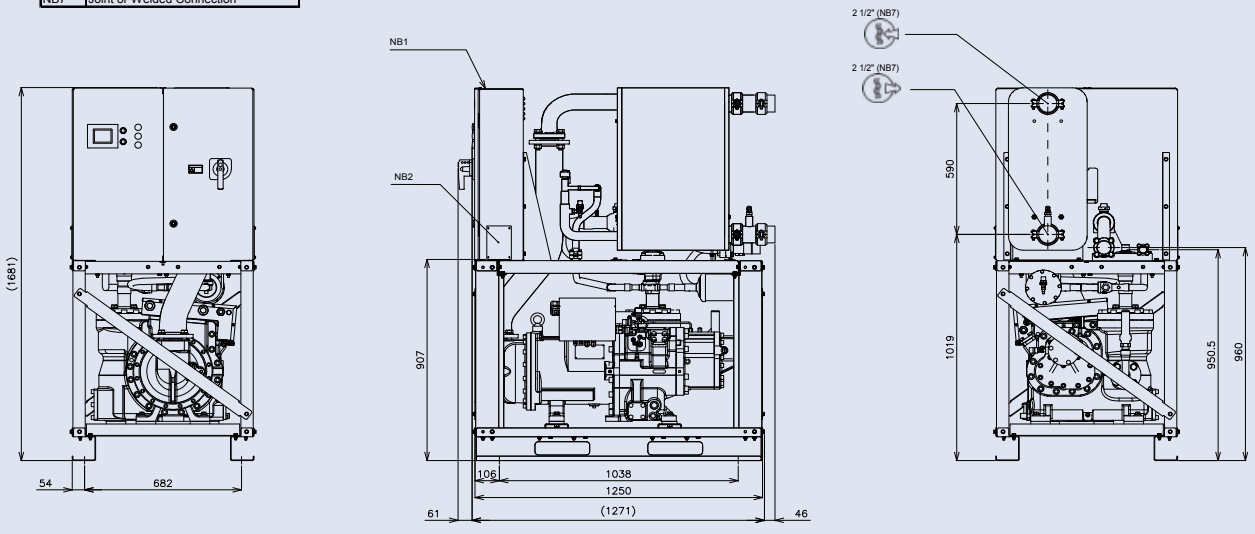
NB1	Electrical Box
NB2	Customer Wiring Entry (both sides)
NB3	2 1/2" Victaulic Connection
NB4	76.1 mm Welded Connection



All dimensions in mm. Drawings not a scale.

YCRE 0141 to 0221

NB1	Electrical Box
NB2	Customer Wiring Entry (both sides)
NB3	28.58 mm Brazing Connection
NB4	53.98 mm Brazing Connection
NB5	2 1/2" Joint Connection
NB6	76.1 mm Welded Connection
NB7	Joint or Welded Connection

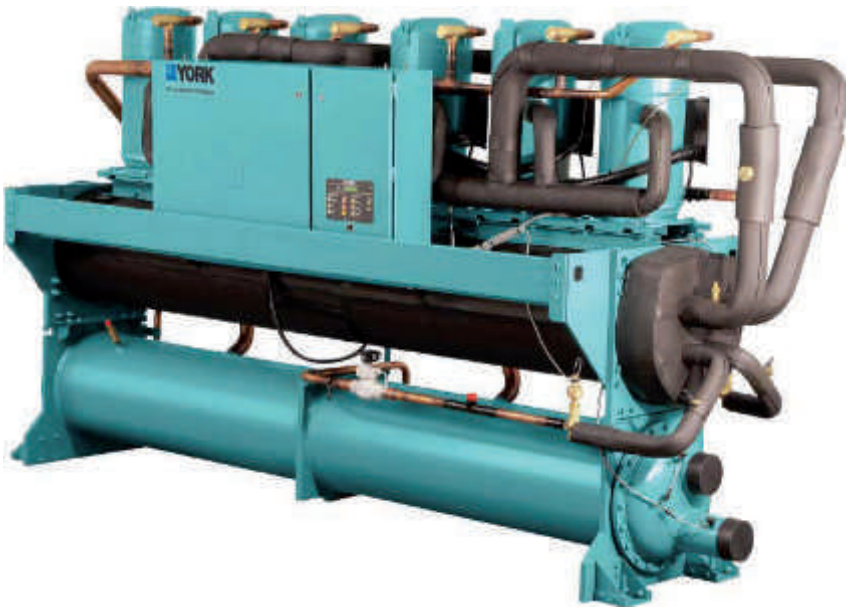


All dimensions in mm. Drawings not a scale.

YCWL / YCRL
Water-cooled or remote air-cooled scroll compressor chiller

Cooling capacities from 178 kW to 595 kW

Available configurations that meet A Class energy efficiency levels at Eurovent Standard Conditions.



R410A

SMART EQUIPMENT

Features

The **YCWL** series was designed to produce the greatest cooling capacity with the lowest sound levels. The use of scroll compressors and shell + tube heat exchangers, provides optimum efficiency at part load, up to an ESEER of 7.25. Its dimensions have been optimized to pass through a doorway 2 m high by 90 cm wide.

The **YCWL** is designed for all air conditioning applications and medium temperature process cooling. It is equipped with two independent cooling circuits and regulated by a micro-processor that optimizes chiller performance.

The **YCWL** is designed for indoor installation and each **YCWL** is fully tested before leaving our factories.

Options

- Leaving Chilled Liquid from -12 to +15°C
- Leaving Condenser Liquid from +18 to +50°C
- Compressor acoustic blankets
- Flow switch or pressure differential switch
- Soft starters
- Neoprene pads or spring isolators
- Dual relief valves kit
- Electronic regulators
- Vibration isolators

Water-cooled or remote air-cooled scroll compressor chiller

YCWL / YCRL 0201 to 0611

Nominal capacity

YCWL-SE	0292	0343	0396
Cooling capacity (kW) [1]	294	333	370
EER [1]	4.71	4.66	4.71
SEER	5.92	5.90	6
ηs, c	229	228	232
Sound Pressure (dB(A)) [2]	72	74	76

YCWL-HE	0201	0231	0261	0302	0347	0426	0447	0532	0611
Cooling capacity (kW) [1]	191	219	244	308	353	411	444	498	595
EER [1]	4.94	5.07	5.02	4.96	5	5.07	5.02	5.03	4.92
SEER	5.52	5.91	6.48	6.22	6.06	6.25	5.97	6.18	5.88
ηs, c	213	228	251	241	234	242	231	239	227
Sound Pressure (dB(A)) [2]	68	70	72	72	74	76	74	71	72

YCRL-HE	0201	0231	0261	0302	0347	0386	0447	0532	0611
Cooling capacity (kW) [3]	178	207	233	273	325	356	415	485	556
EER [3]	4.00	4.00	4.12	4.20	4.16	4.11	4.17	4.06	3.99
Sound Pressure (dB(A)) [2]	64	65	67	67	70	68	69	71	73

1: Cooling capacity and efficiancies @ Eurovent conditions evaporator entering/leaving temperature 12C/7C condenser entering/leaving temperature 30/35C EN14511:2011.
2: EN 292-1991 Sound pressure is mesured 1 meter away from the control panel and 1.5 meters above the floor.
3: Cooling capacity and efficiancies @ Eurovent conditions evaporator entering/leaving temperature 12C/7C saturated discharge temperature 45C EN14511:2007.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Technical data

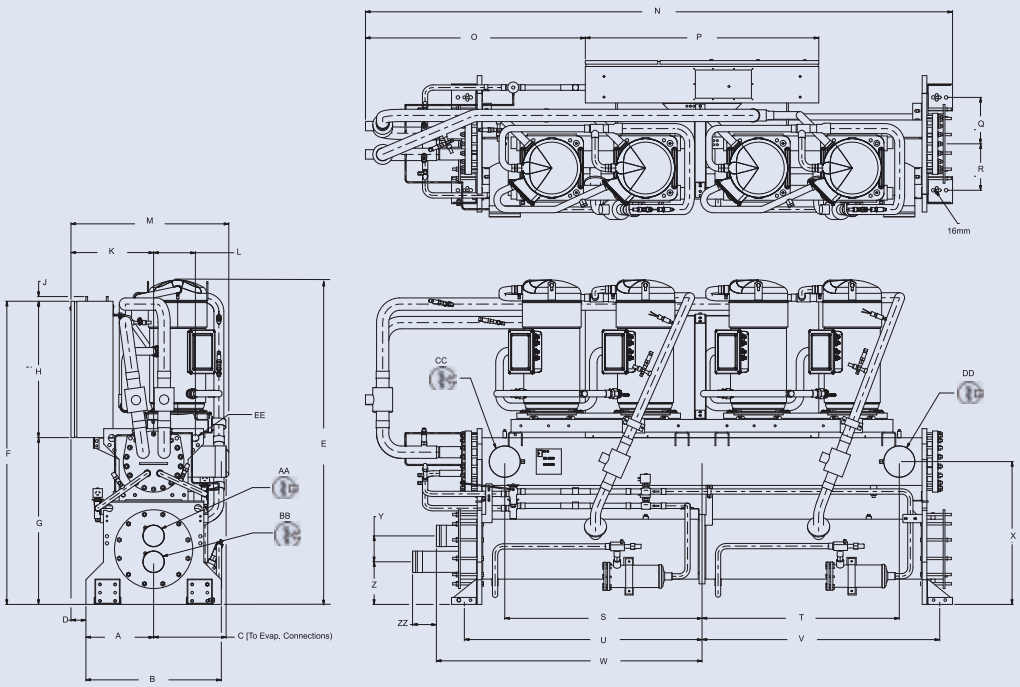
YCWL-SE			0292	0343	0396
Dimensions	Length	mm	3161	3169	3159
	Width	mm	859		
	Height	mm	1830	1819	
Operating weight		kg	2481	2494	2716

YCWL-HE			0201	0231	0261	0302	0347	0426	0447	0532	0611
Dimensions	Length	mm	3161	3098	3154	3169	3132	3133	3643		
	Width	mm	859	857	844	859		859	885		
	Height	mm	1670	1914	1820	1819	1889	1889	1946	1965	
Operating weight		kg	2218	2512	2463	2481	2808	2824	3632	3838	3999

YCRL-HE			0201	0231	0261	0302	0347	0386	0447	0532	0611
Dimensions	Length	mm	3086	3061	3076		3061	3617	3576		
	Width	mm	826	856	843		856		965		902
	Height	mm	1438	1481	1471	1593	1683	1641	1638	1641	
Operating weight		kg	1309	1481	1471	1593	1682	1947	2266	2264	2263

Dimensions and hydraulic connections

YCWL0292SE, YCWL0343SE, YCWL0396SE, YCWL0201HE, YCWL0231HE, YCWL0261HE, YCWL0302HE, YCWL0347HE, YCWL0426HE, YCWL0447HE



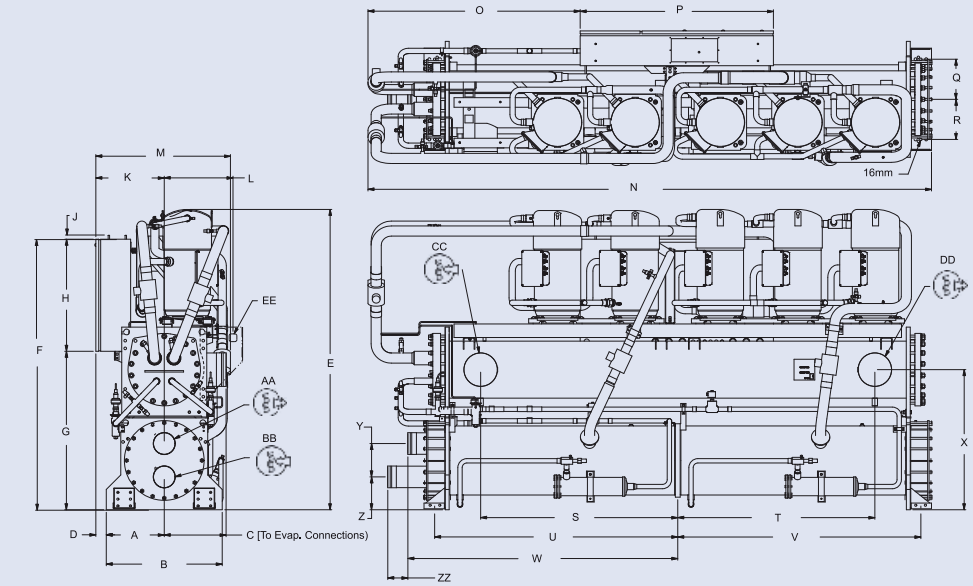
YCWL	0292SE	0343SE	0396SE	0201HE	0231HE	0261HE	0302HE	0347HE	0426HE	0447HE
Dimension	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
A	368	368	368	368	368	368	368	368	368	381
B	737	737	737	737	737	737	737	737	737	762
C	299	394	394	299	407	394	394	406	406	406
D	81	81	81	81	81	81	81	81	81	69
E	1830	1819	1819	1670	1914	1820	1819	1889	1889	1946
F	1638	1714	1714	1638	1753	1714	1714	1753	1753	1778
G	901	977	978	901	1016	977	977	1016	1016	1041
H	737	737	737	737	737	737	737	737	737	737
J	25	25	25	25	25	25	25	25	25	25
K	450	450	450	311	450	450	450	450	450	450
L	311	311	311	311	324	311	311	324	324	452
M	859	859	859	859	857	844	859	859	859	885
N	3161	3169	3159	3161	3098	3154	3169	3132	3133	3643
O	1163	1171	1155	1163	1100	1156	1171	1134	1133	1334
P	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270
Q	251	251	251	251	251	251	251	251	251	264
R	251	251	251	251	251	251	251	251	251	264
S	1080	1080	1080	1080	1054	1080	1080	1054	1054	1295
T	1080	1080	1080	1080	1054	1080	1080	1054	1054	1295
U	1293	1293	1293	1293	1293	1293	1293	1293	1293	1598
V	1293	1293	1293	1293	1293	1293	1293	1293	1293	1598
W	1445	1445	1455	1445	1445	1445	1445	1455	1455	1774
X	813	813	813	813	845	813	813	845	845	921
Y	181	181	207	181	181	181	181	207	207	219
Z	210	210	197	210	210	210	210	197	197	216
ZZ	130	130	133	130	130	130	130	133	133	132
EE Ø	38	38	38	38	38	38	38	38	38	51

All dimensions in mm. Drawings not a scale.

YCWL	0292SE	0343SE	0396SE	0201HE	0231HE	0261HE	0302HE	0347HE	0426HE	0447HE
Water Connections	in	in	in	in	in	in	in	in	in	in
AA Ø	4	4	5	4	4	4	4	5	5	5
BB Ø	4	4	5	4	4	4	4	5	5	5
CC Ø	6	6	6	6	8	6	6	8	8	8
DD Ø	6	6	6	6	8	6	6	8	8	8

Dimensions and hydraulic connections

YCWL0532HE

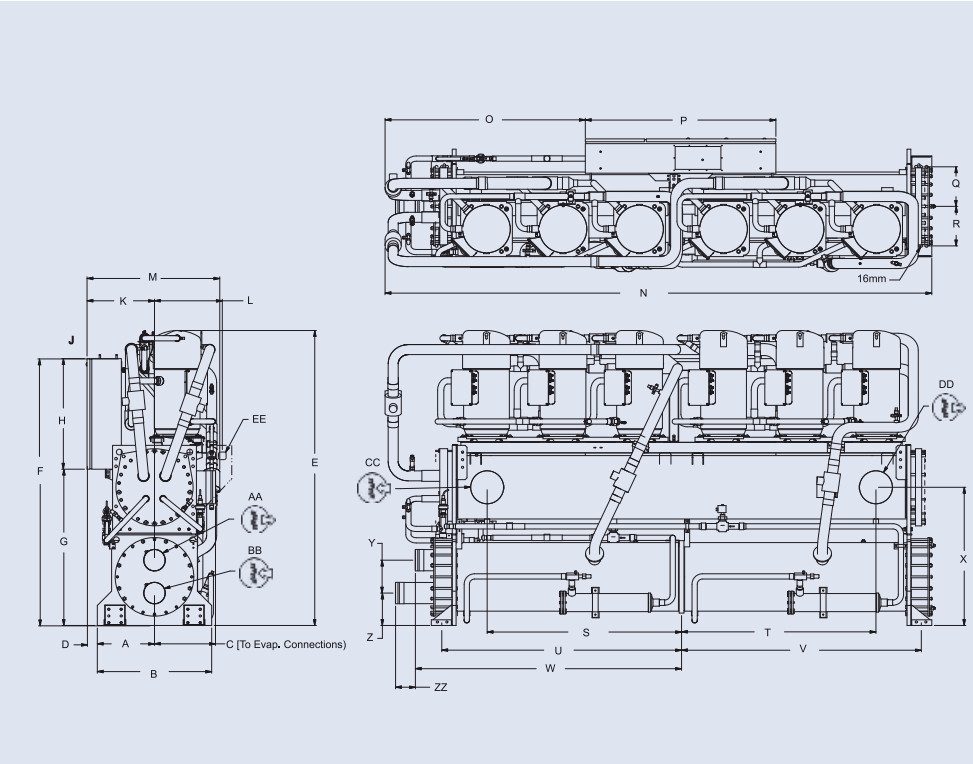


YCWL	0532HE
Dimension	mm
A	381
B	762
C	406
D	69
E	1965
F	1778
G	1041
H	737
J	25
K	450
L	452
M	885
N	3643
O	1334
P	1270
Q	263
R	263
S	1295
T	1295
U	1598
V	1598
W	1774
X	921
Y	219
Z	216
ZZ	132
EE Ø	51

All dimensions in mm.

YCWL	0532HE
Water Connections	in
AA Ø	5
BB Ø	5
CC Ø	8
DD Ø	8

YCWL0611HE



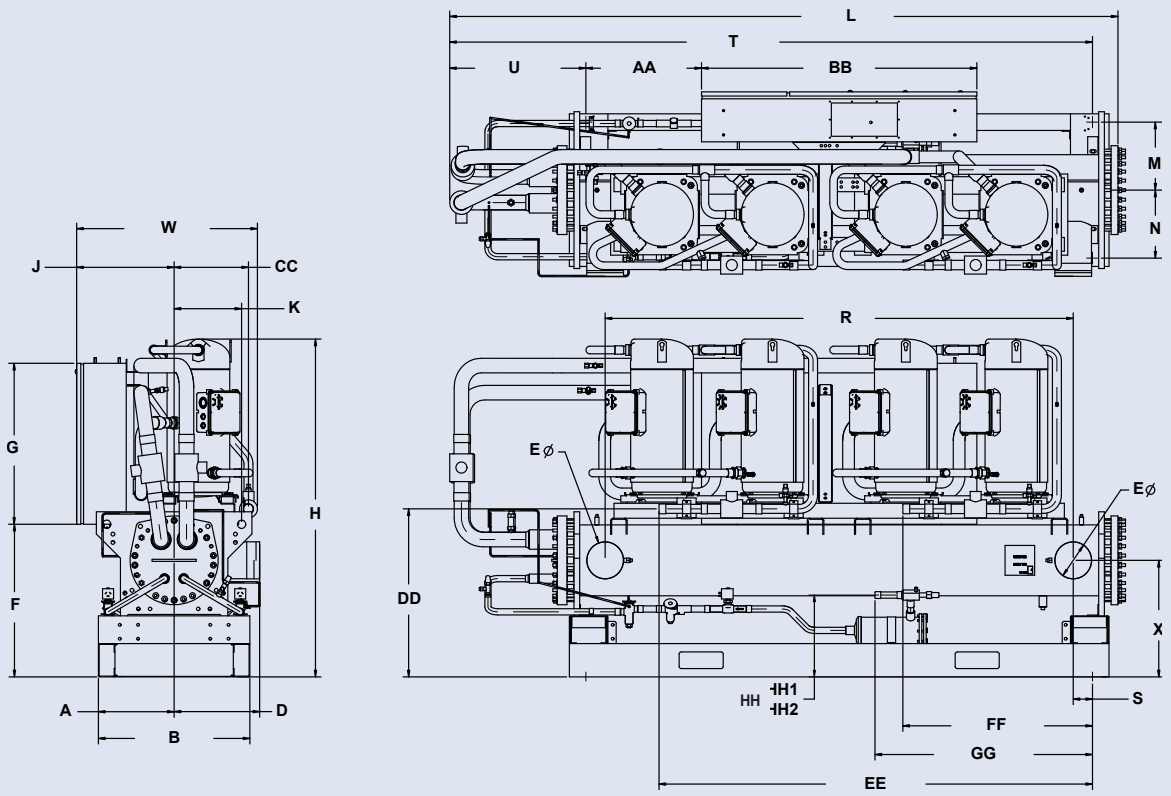
YCWL	0611HE
Dimension	mm
A	381
B	762
C	406
D	69
E	1965
F	1778
G	1041
H	737
J	25
K	450
L	452
M	885
N	3643
O	1334
P	1270
Q	264
R	264
S	1295
T	1295
U	1598
V	1598
W	1774
X	921
Y	219
Z	216
ZZ	132
EE Ø	51

All dimensions in mm.

YCWL	0611HE
Water Connections	in
AA Ø	5
BB Ø	5
CC Ø	8
DD Ø	8

Dimensions and hydraulic connections

YCRL 0201 HE to YCRL 0347 HE

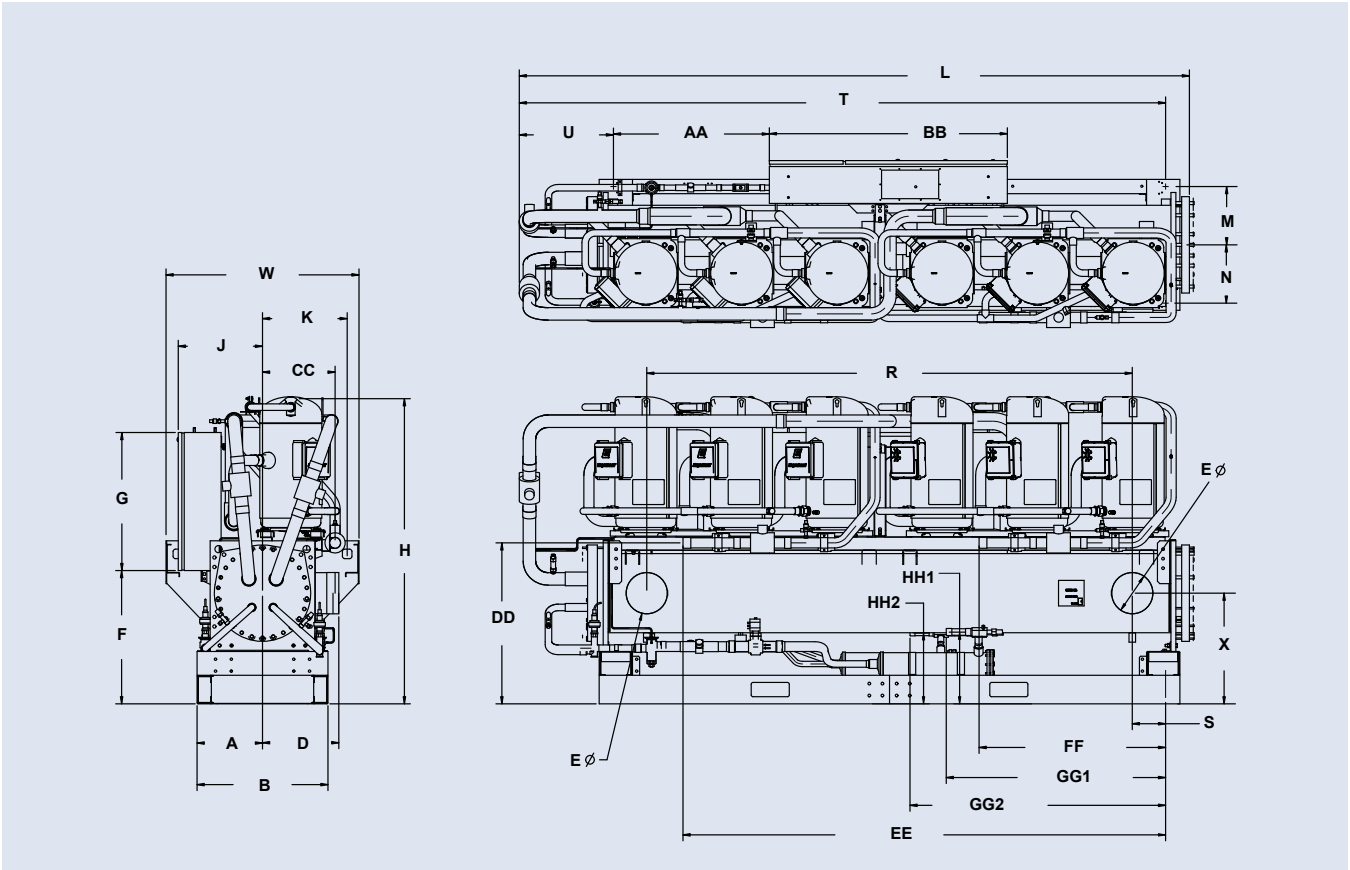


YCRL	0201 HE	0231 HE	0261 HE	0302 HE	0347 HE
W	824	834	834	834	846
H	1437	1616	1546	1544	1613
L	3085	3062	3082	3082	3062
A	349	349	349	349	349
B	699	692	699	699	699
D	299	407	394	394	407
E	219	219	168	168	219
F	622	737	699	699	737
G	737	737	737	737	737
J	450	450	450	450	450
K	311	324	311	311	324
M	311	311	311	311	311
N	311	311	311	311	311
R	2159	2108	2159	2159	2108
S	89	114	89	89	114
T	2965	2938	2965	2965	2938
U	628	601	628	628	601
X	533	565	533	533	565
AA	533	533	533	533	533
BB	1270	1270	1270	1270	1270
CC	343	343	343	343	356
DD	780	838	769	769	838
EE	2059	2085	1999	1999	2008
FF	947	886	875	875	883
GG	1003	1003	1003	965	1040
HH	466	375	375	375	378

All dimensions in mm. Drawings not a scale.

Dimensions and hydraulic connections

YCRL 0386 HE to YCRL 0611 HE



YCRL	0386 HE	0447 HE	0532 HE	0611 HE
W	1030	1030	965	902
H	1641	1628	1641	1641
L	3633	3576	3576	3576
A	349	349	349	349
B	699	692	699	699
D	406	407	407	407
E	219	219	219	219
F	711	711	711	711
G	737	737	737	737
J	450	450	450	450
K	452	452	452	452
M	311	311	311	311
N	311	311	311	311
R	2591	2591	2591	2591
S	178	178	178	178
T	3509	3449	3449	3449
U	563	502	502	502
X	591	591	592	587
AA	832	832	832	832
BB	1270	1270	1270	1270
CC	387	387	387	387
DD	859	859	859	859
EE	2499	2575	2575	2575
FF	919	995	995	995
GG-1	1466	1171	1171	1171
GG-2	1466	1364	1364	1364
HH-1	378	383	383	383
HH-2	378	379	379	379

All dimensions in mm. Drawings not a scale.

YLCS
Remote Air-Cooled and Heat Pump screw compressor

Cooling capacities from 323 kW to 1079 kW
Heating capacities from 397 kW to 1307 kW

Features

Designed to operate with leaving chilled liquid temperature from -4.5°C to +15°C and warm water ti 60°C in heat pump.

Efficient compressors
YLCS is a dual circuit chiller with industrial type semi-hermetic screw compressors. Star delta compressor starters are incorporated to reduce the inrush current.

Outstanding chiller control
An advanced microprocessor controller with, a 40 character plain language display, controls and monitors temperatures, pressures, operating hours, number of starts and start stop/holiday times.

Fast and easy installation
Evaporator water connections can be provided in a vertical or horizontal plain. Electrical power supplies enter from the top for easy drop down wiring.

Options / Accessories

- Compressor suction shut-off valves
- Companion flange kits
- Multi-point power supply
- Remote leaving liquid temperature offset
- Pressure gauges
- Closed transition star delta starters
- Power factor correction capacitors
- Heat pump control up to 60°C
- 90/10 cupro/nickel condenser

Remote Air-Cooled (AA) and Heat Pump (HA) screw compressor

YLCS 0350 to 1120

Remoate Air Cooled Chiller (Condenser less)

YLCS-AA	0350	0415	0480	0530	0575	0620
Cooling capacity (kW)	323	383	454	483	520	553
Power input (kW)	92.6	107	126.5	134	144.3	153.7
Full Load Efficiency (EER) (kW/kW)	3.49	3.58	3.59	3.6	3.61	3.6
Evap. Pressure Drop (kPa)	39.8	47.5	26.7	30	40	44.8
Sound Power (dBA)	93	93	93	95	95	95

YLCS-AA	0670	0750	0860	0980	1120
Cooling capacity (kW)	617	713	833	944	1079
Power input (kW)	153.9	175.5	196.6	219.5	250.5
Full Load Efficiency (EER) (kW/kW)	4.01	4.06	4.24	4.3	4.31
Evap. Pressure Drop (kPa)	31.1	46.1	93.4	116	76.5
Sound Power (dBA)	95	95	101	101	101

At 7°C leaving chilled water and condensing at 45°C with 5°C sub cooling.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Heat Pump Application

YLCS-HA	0350	0415	0480	0530	0575	0620
Net Heating capacity (kW)	397	469	556	590	641	681
Net Heating Power input (kW)	104.7	121.2	142.9	151	163.5	174.4
Net Heatinig COP (kW/kW)	3.79	3.87	3.89	3.91	3.92	3.91
Evap. Pressure Drop (kPa)	34.1	41.2	23.3	26.1	35.4	39.6
Cond. Pressure Drop (kPa)	39	32	44.2	34.6	40.4	33.1
Sound Power (dBA)	93	93	93	95	95	95

YLCS-HA	0670	0750	0860	0980	1120
Net Heating capacity (kW)	756	873	1013	1145	1307
Net Heating Power input (kW)	174.4	199.6	225.2	254.7	289.9
Net Heatinig COP (kW/kW)	4.34	4.37	4.5	4.5	4.51
Evap. Pressure Drop (kPa)	28.9	42.8	87.3	108.5	71.5
Cond. Pressure Drop (kPa)	40.3	31.1	41.1	69.2	89.1
Sound Power (dBA)	95	95	101	101	101

At 12-7°C leaving chilled water and condensing at 40-45°C.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

Technical data

YLCS			0350	0415	0480	0530	0575	0620
Dimensions	Length	mm	3225	3244	3274		3544	3600
	Width	mm	900					
	Height	mm	2100					
Operating weight kg			3420	4030	4170	4270	4370	4540

YLCS			0670	0750	0860	0980	1120
Dimensions	Length	mm	3565	3645	3830	3830	3830
	Width	mm	1290				
	Height	mm	2148				
Operating weight kg			4510	5010	5620	6090	6610

Manufacturer reserves the rights to change specifications without prior notice.

YVWA
Water-cooled VSD screw chiller

Cooling capacities from 451 kW to 1403 kW

At Eurovent Standard Conditions this equipment meets A Class energy efficiency levels.

Compatible range

SMART EQUIPMENT

Features

Our newest water-cooled chiller offers the following benefits:

Premium efficiency
The **YVWA** reduces operating expenses with the application of a standard variable speed drive.

Application flexibility
Tailor and tune flexilibilty makes the **YVWA** ideal for any application from thermal storage to heat pump duty.

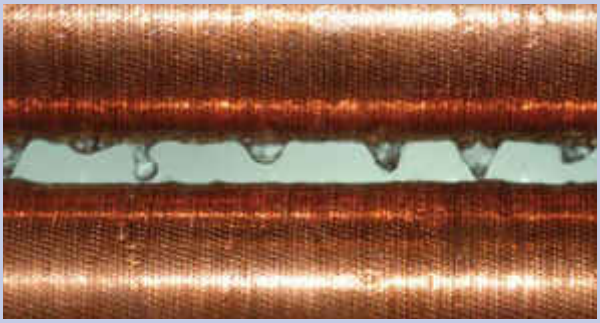
Enhanced sustainability
Achieved through high efficiency operation and low refrigerant charges.

Product confidence
Improve your peace of mind knowing our experience stands behind every chiller.

Options / Accessories

- BMS Interfacing options
- Different options of tubes and nozzle arrangements for the heat exchangers.
- Dual pressure relief valve
- Several options for flow switches
- Thermal insulation options
- Anti-vibration mounts options

Photo courtesy of the LTCM lab of the Ecole Polytechnique Fédérale de Lausanne, Switzerland



Reduce refrigerant charges by up to 15% beyond traditoinal chiller designs with the YVWA's falling film evaporator design.

The YVWA chiller can efficiently handle the high condenser pressure required for dry cooling.

Photo courtesy of Baltimore Air Coil.

Water-cooled VSD screw chiller

YVWA

Application flexibility (*) example of selections

Model	YVWABBBBFX	YVWACDCDFX	YVWABBBBGX	YVWACDCDGX	YVWAM2M2EE	YVWAM2MCEE	YVWAMBMCEE
Cooling capacity (kW)	451	525	575	650	700	750	800
EER 100%	5	5.41	4.72	5.14	4.81	5.13	5.3
SEER	6.68	7.05	6.79	7.46	6.49	6.83	7.08
ηs, c	259	274	264	291	251	265	275

Model	YVWAMDMCFE	YVWAMDMDFE	YVWAMDMEFE	YVWAMEMEFF	YVWANENEFF	YVWAUDUDGF	YVWAUEUEGG
Cooling capacity (kW)	850	900	950	1000	1070	1224.0	1403
EER 100%	5.39	5.35	5.32	5.3	5.33	5.5	5.43
SEER	7.15	7.20	7.30	7.23	7.25	7.63	7.69
ηs, c	278	280	284	281	282	297	300

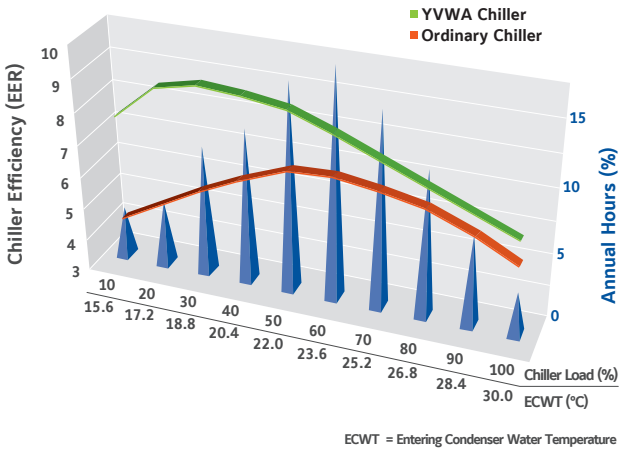
Net values at Eurovent nominal conditions for models using R134a: Cooling capacities in kW given for entering / leaving chilled water temperature 12/7 °C condenser water 30/35 °C
SEER calculated according to EN14511
ηs calculated according to Ecodesign regulation for chillers comfort cooling (813/2013). For other Ecodesign calculations, please contact your JCI representative.
(*) The taylor and tune models allow over 7000 component combinations in stepless selection capacities / operating conditions. Specific selections may achieve an operating envelope of -10 to + 16 °C evaporator liquid and from 18 to 65 °C condenser liquid. Models are using selected components from the quick ship program.
The table above shows only a representative sample of performance points based on generic project operating conditions working with R134a refrigerant.
For R513a information contact your JCI Representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects

Technical data

Model			YVWABBBBFX	YVWACDCDFX	YVWABBBBGX	YVWACDCDGX	YVWAM2M2EE	YVWAM2MCEE	YVWAMBMCEE
Compressors / Circuite(s)			1	1	1	1	2	2	2
Dimensions	Length	mm	3110	3571	3110	3720	4390	4390	4390
	Width	mm	1413	1413	1413	1413	1405	1405	1405
	Height	mm	1846	1846	1846	1846	1824	1824	1824
Operating weight (kg)			3692	4169	3822	4299	5701	5884	6032
Refrigerant charge (kg)			127	153	137	163	250	250	250

Model			YVWAMDMCFE	YVWAMDMDFE	YVWAMDMEFE	YVWAMEMEFF	YVWANENEFF	YVWAUDUDGF	YVWAUEUEGG
Compressors / Circuite(s)			2	2	2	2	2	2	2
Dimensions	Length	mm	4390	4390	4390	4390	5000	4875	4875
	Width	mm	1405	1405	1405	1405	1405	1730	1730
	Height	mm	1824	1824	1824	1824	1824	1999	1999
Operating weight (kg)			6265	6315	6421	6540	7052	9393	9746
Refrigerant charge (kg)			255	255	255	260	300	430	440

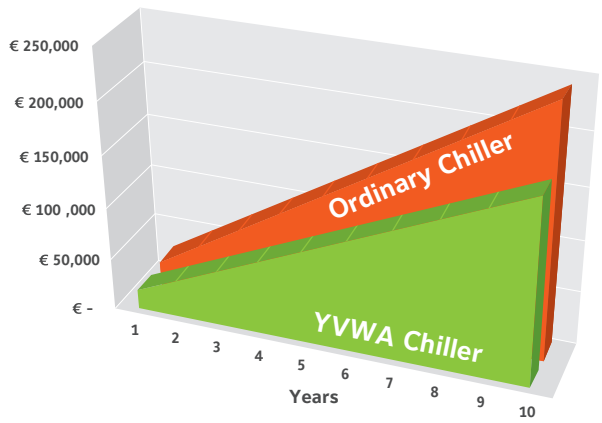
YVWA Efficiency vs. Ordinary Chiller



ECWT = Entering Condenser Water Temperature

The YVWA chiller delivers superior energy performance at all operating hours.

YVWA Energy Cost vs. Ordinary Chiller



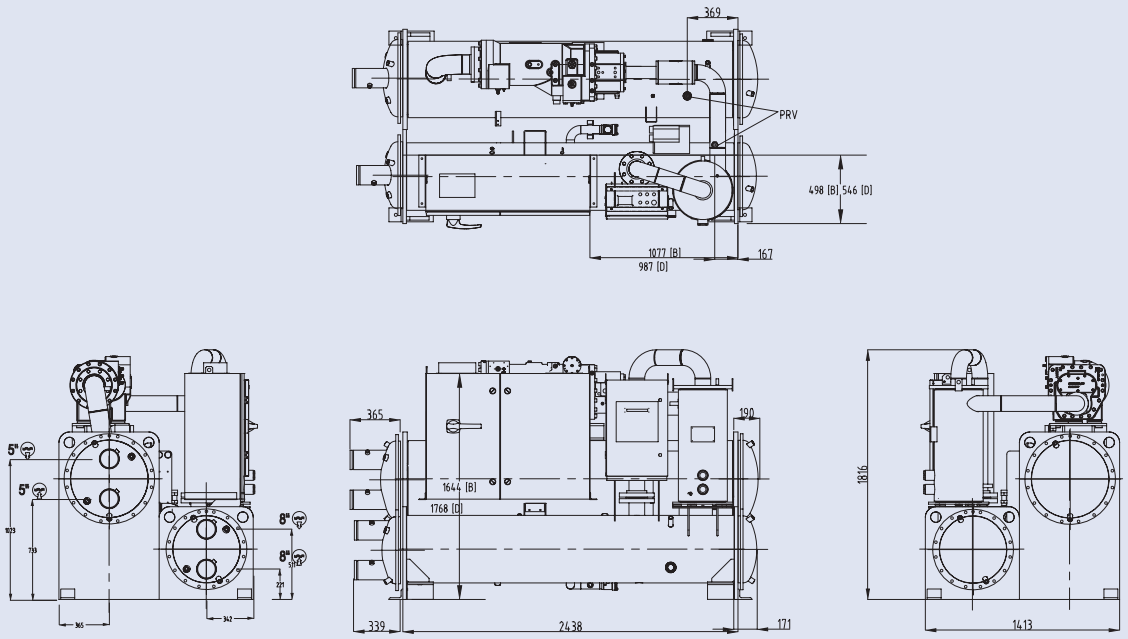
Note: 3,500 operating hours, 0.10 EUR/kWh energy rate, 800 kW design cooling load

An investment in an optimized YVWA chiller reduces energy costs by 25%.

Manufacturer reserves the rights to change specifications without prior notice.

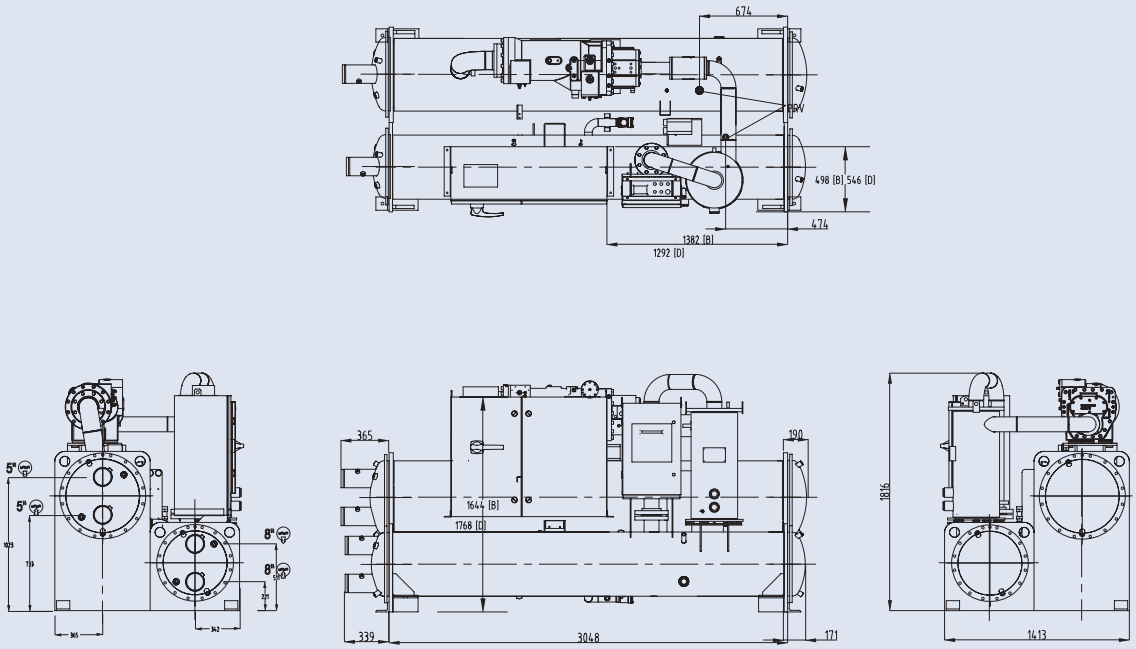
Dimensions and hydraulic connections

YVWA B models



All dimensions in mm. Drawings not a scale.

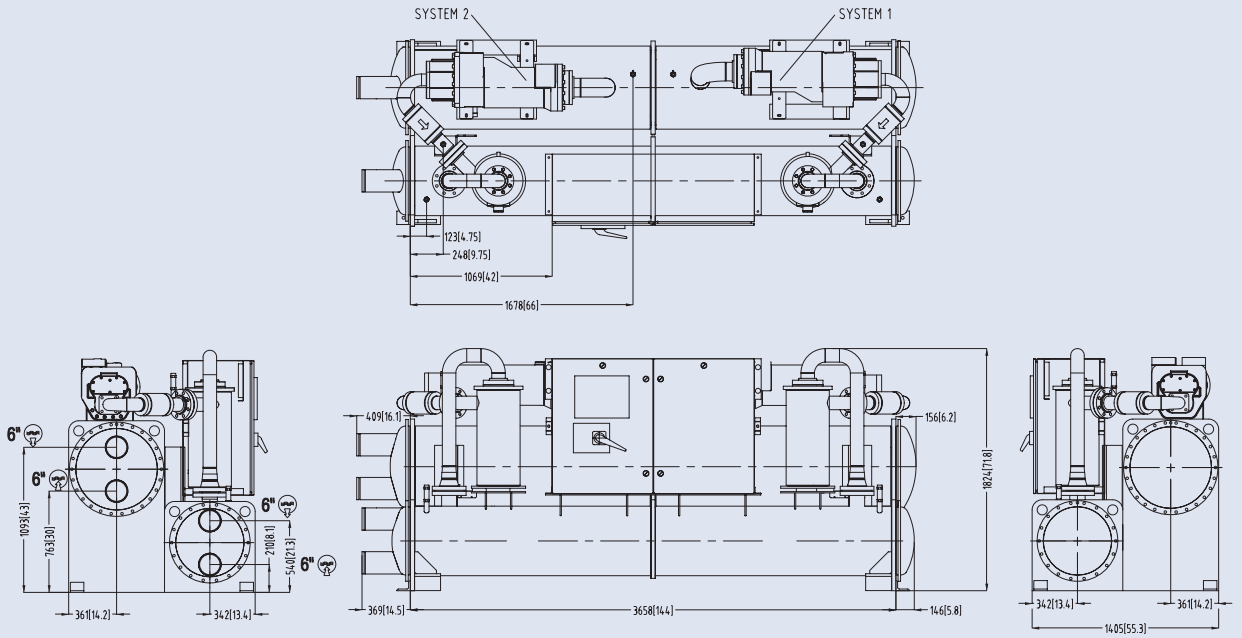
YVWA C models



All dimensions in mm. Drawings not a scale.

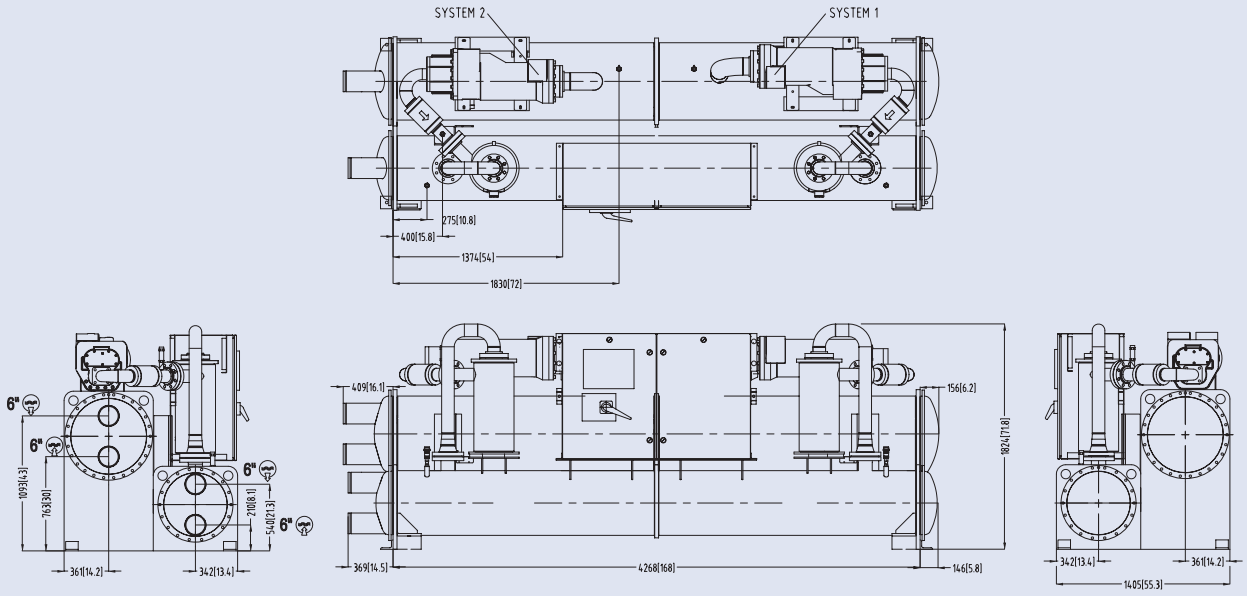
Dimensions and hydraulic connections

YVWA M models



All dimensions in mm. Drawings not a scale.

YVWA N models



All dimensions in mm. Drawings not a scale.

YZ
Magnetic bearing centrifugal chiller

Cooling capacities from 581 kW to 4747 kW

At Eurovent Standard Conditions this equipment meets A Class energy efficiency levels.

The **YORK® YZ** Magnetic Bearing Centrifugal Chiller is a revolutionary advancement that challenges everything about conventional chiller design. Built upon decades of industry-leading chiller expertise, our engineers questioned every component, analyzed every function and challenged every assumption. The result is the first chiller fully optimized for ultimate performance with a next generation low-GWP (global warming potential) refrigerant, delivering superior real-world performance, lower cost of ownership and a new definition of sustainability. It's the first chiller built to exceed every expectation – today and tomorrow.

The design premise for the **YORK® YZ** was simple: Don't just make a new chiller – make the best chiller for our customers. This was accomplished through a holistic approach to system design and engineering, optimizing every component around a carefully selected next generation refrigerant for ultimate performance.

Magnetic Driveline Superiority

The **YORK® YZ** uses an integral, variable-speed drive and advanced magnetic bearing technology to deliver extraordinary efficiency, superior durability, simplified maintenance and a wider operating envelope than any chiller using oil- or refrigerant-lubricated compressor bearings. This driveline features a single moving assembly suspended in a magnetic field that does not require lubrication. With 80% fewer moving parts than traditional oil- or refrigerant-lubricated drivelines, longevity is enhanced and maintenance is reduced.

Magnetic bearing centrifugal chiller

YZ

Proven Firsts

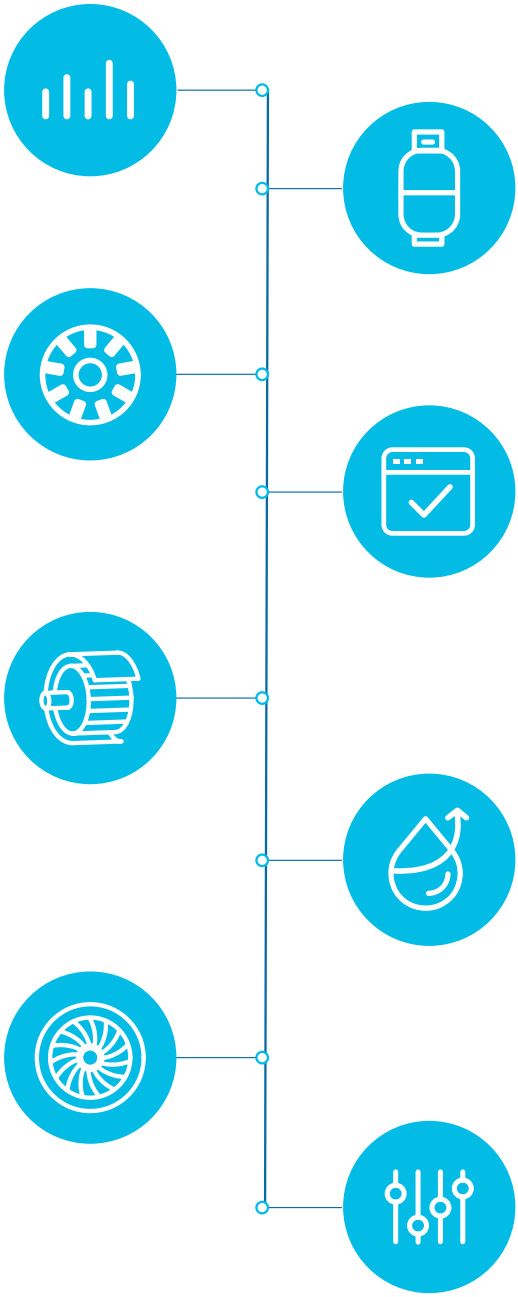
Groundbreaking YORK® innovations refined over decades of real-world use have been brought together to create a revolution in chiller design and optimization. It's everything we've learned to-date, and then some.

Variable-Speed Drive:
Four decades ago, YORK® introduced the first variable-speed drive (VSD) chiller. And we've since installed more VSD chillers than all other manufacturers combined. A VSD is standard on the YORK® YZ.

Magnetic Bearing Driveline:
In 1998, YORK® Navy Systems pioneered reliable magnetic-bearing technology to cool submarines. The same durable and efficient technology is used on the YORK® YZ.

High-Speed Hermetic Induction Motor:
YORK® was the first to combine low-maintenance, hermetically-sealed induction motors with variable-speed drives in 2004 to directly drive the compressors in air-cooled chillers. The YORK® YZ builds on this reliable, proven technology to power our latest generation of centrifugal compressors.

Optimized Compressor:
An optimized, single-stage design enables YORK® chillers to provide the best possible real-world energy efficiency. YORK® YZ compressors also lead the industry with the widest operating range at off-design conditions where systems most often operate.



Low-Pressure Chiller:
For most of the past century, the YORK® centrifugal chiller portfolio has offered low-pressure refrigerants to deliver high-efficiency chillers. The YORK® YZ is designed to maximize the efficiency of a new, low-GWP, low-pressure refrigerant.

OptiView™ Control Panel with Connected Service:
The full-color, interactive OptiView™ control panel of the YORK® YZ offers over 100 setpoints, readouts, alerts and trending reports. In addition, data can be securely connected to the cloud-based analytics platform for remote monitoring and predictive diagnostics – another innovation first brought to you in YORK® chillers.

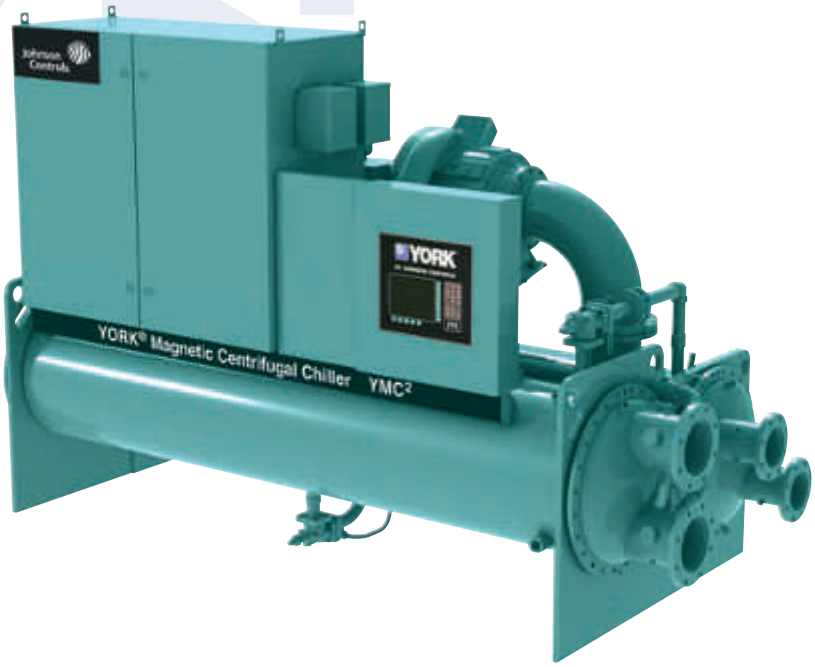
Falling Film Evaporator:
The YORK®-patented falling film design of the YORK® YZ reduces refrigerant charge up to 60%, and reduces evaporator shell size up to 20%, compared to other flooded, low-pressure refrigerant designs. The YORK® patented falling film design also eliminates the need for a refrigerant pump.

Capacity Control Logic:
This patented YORK® control technology provides rapid response to the load on the building, ensuring the YORK® YZ Chiller does not waste energy or work harder than needed.

YMC^2
Water-cooled magnetic centrifugal chiller

Cooling capacities from 800 kW to 3600 kW

At Eurovent Standard Conditions this equipment meets A Class energy efficiency levels.



Compatible range

Features

Our most advanced water-cooled chiller offers the following benefits:

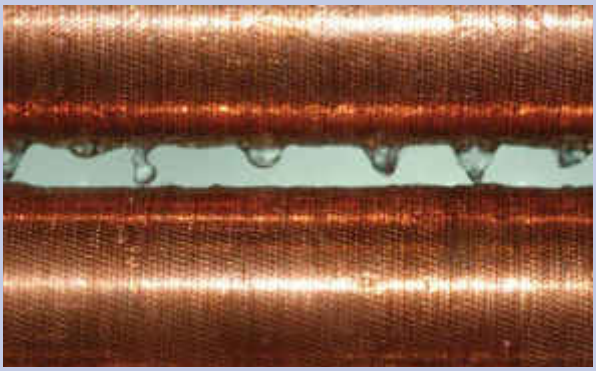
Enhanced efficiency
Achieved through application of active magnetic bearing technology with variable speed drive.

Enhanced sustainability
Achieved by leak free refrigerant design, lower refrigerant charge and falling film evaporator.

Low sound levels
Advanced technology results in sound levels as low as 75dBA.

Superior reliability
Use of active magnetic bearing technology removes friction and the need for oil resulting in a quieter and more reliable chiller.

Photo courtesy of the LTCM lab of the Ecole Polytechnique Fédérale de Lausanne, Switzerland



A falling-film evaporator is more efficient because refrigerant is sprayed over the tubes, offering improved heat transfer and reducing refrigerant charge by 30%.

To eliminate mechanical-contact losses in the driveline, the YMC2 chiller utilises a permanent-magnet motor and active magnetic-bearing technology.

Water-cooled magnetic centrifugal chiller

YMC² S0800AA to S3600AB

Nominal capacity (*)

YMC²	S0800AA	S1000AA	S1200AB	S1400AA	S1600AB	S1800AB	S2000AB
Cooling capacity (kW)	800	1000	1200	1400	1600	1800	2000
EER	6.06	6.13	6.32	6.33	6.31	6.07	6
SEER	7.58	7.83	7.92	8.34	8.59	7.83	8.16
ηs, c	295	305	309	326	335	305	318
Sound pressure at 1 m (dBA)	77	77	76	76	77	79	80

YMC²	S2200AB	S2400AB	S2600AB	S2800AB	S3000AB	S3200AB	S3400AB	S3600AB
Cooling capacity (kW)	2200	2400	2600	2800	3000	3200	3400	3600
EER	6.2	6.25	6.1	6.15	6.2	6.2	6.1	6.1
Sound pressure at 1 m (dBA)	81	82	82	82	82	82	83	83

Cooling Capacity at Eurovent Conditions, entering/leaving chilled water temperature 12°C/7°C, entering/leaving condenser water temperature 30°C/35°C
(*) YMC² is a tailor and tune chiller. Its peformance will be factory-adjusted to match the exact site requirements based on the specific project operating.
The table above shows only a representative sample of performance points based on generic project operating conditions working with R134a refrigerant.
For R513a information contact your JCI Representative.
The above data is based on Johnson Control's selection software YORKworks 18.06. Please refer to the latest version of the software for specific projects.

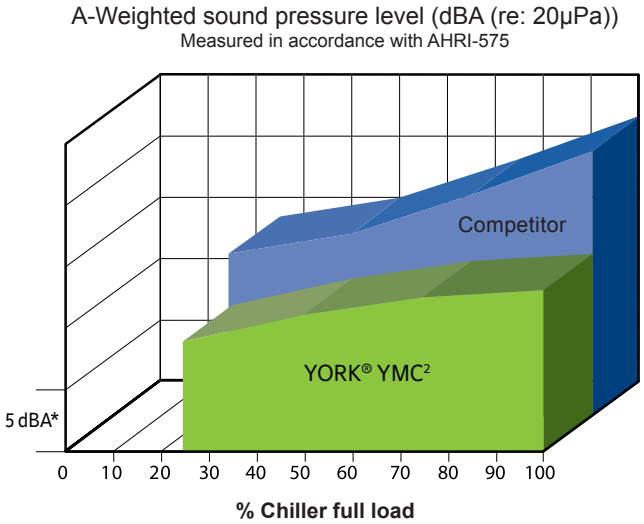
Technical data

YMC²			S0800AA	S1000AA	S1200AB	S1400AA	S1600AB	S1800AB	S2000AB
Dimensions	Length	mm	3048					4267	
	Width	mm	1880				2007		
	Height	mm	2410				2499	2573	
Shipping weight (kg)			5171		5810		6579	7809	
Refrigerant charge (kg)			278	280	423	454	445	612	656

YMC²			S2200AB	S2400AB	S2600AB	S2800AB	S3000AB	S3200AB	S3400AB	S3600AB
Dimensions	Length	mm	5154				5054			
	Width	mm	2007				2235			
	Height	mm	2573				2656			
Shipping weight (kg)			10095	10161	10255	10432	11500	11669	12048	12254
Refrigerant charge (kg)			667	666	658	647	766	760	750	750

1. *All dimensions are approximate. Certified dimensions are available on request.*
2. *Refrigerant charge quantity and shipping weights will vary based on tube count.*
3. *Shipping weights are based on fully assembled and charged units.*
4. *Refer to product drawings for detailed weight information.*

Superior sound reduction



*The YMC² chiller is so much quieter than competitive magnetic-bearing chillers, it sounds about half as loud. *Note: each segment on the Y axis = 5 dBA.*

OptiView control centre

The OptiView control centre provides complete diagnostics to speed troubleshooting.

YK
Water-cooled centrifugal chiller

Cooling capacities from 800 kW to 11250 kW

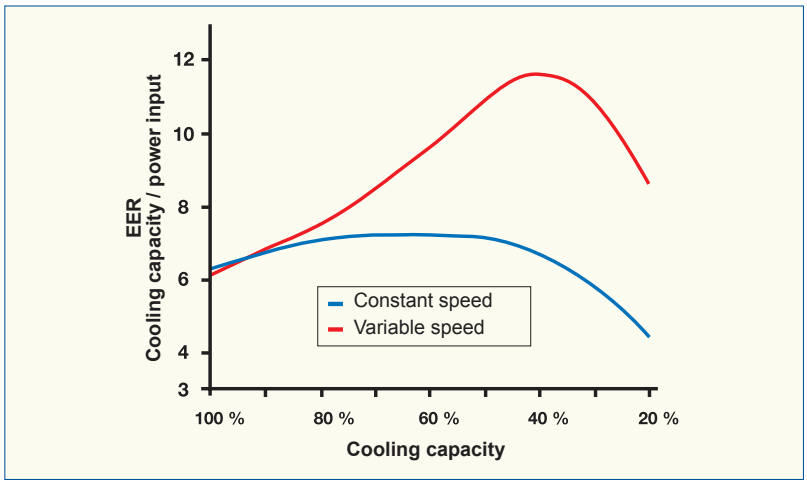
Available configurations that meet A Class energy efficiency levels at Eurovent Standard Conditions.

Compatible range

Features

- The YORK YK chiller is designed for air conditioning and process applications.
- The high efficiency single-stage centrifugal compressor is powered by an open-drive motor. This provides flexibility to operate the chiller with electricity, steam, or gas depending on utility rates.
- The YK utilizes a falling film evaporator to increase chiller efficiency and reduce refrigerant charges, which makes it ideal for LEED® building applications.
- This chiller is designed for indoor mechanical room installation and it requires a cooling tower for heat dissipation
- The inherent design flexibility of this chiller allows it to be precisely selected for any building load profile.

OptiView panel



Speed comparison

Water-cooled centrifugal chiller

YK

Nominal capacity

Model	Code	Cooling capacity kW
YK	Q3 - Q7	800 - 2100
	P7 - P9	1750 - 2800
	H9	2400 - 3800
	K1 - K7	3200 -9850
YK-EP	K7 & Q3	8800 - 11250

Cooling capacities at 7°C leaving chilled water and 30 °C entering condensed water.
The table above shows only a representative sample of performance points based on generic project operating conditions working with R134a refrigerant.
For R513a information contact your JCI Representative.

Heat Recovery

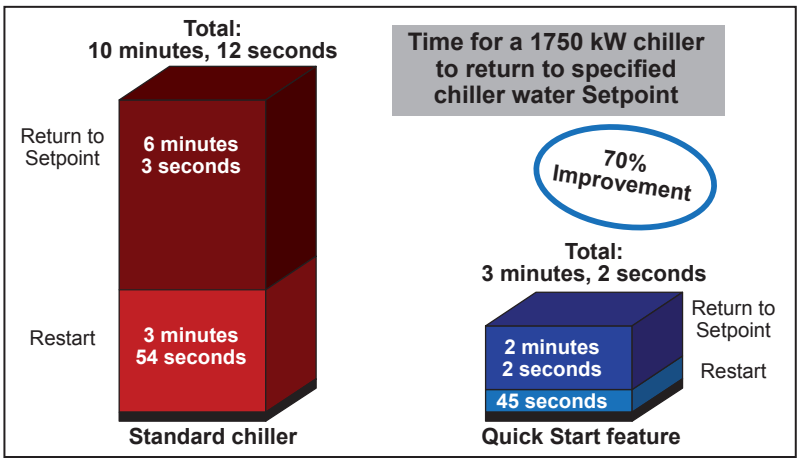
The YK Heat Recovery option can be used for domestic hot water preheat, process heat, facility air reheat, and humidity control. Heat recovery delivers operational savings, CO2 reductions, and reduced water consumption.

Medium Voltage Variable Speed Drive

YORK has a full line of unit mounted and floor mounted Variable Speed Drives, from 380V to 11,000V, to maximize operational savings at off design conditions; which typically occur 99% of the time!

Quick Start (only available for VSD units)

Utilize Quick Start technology to improve chiller starting times and get back to setpoint up to 70% faster than standard chiller designs!



Manufacturer reserves the rights to change specifications without prior notice.

YHAU CL
Single stage hot water driven absorption chiller

Cooling capacities from 105 kW to 6153 kW

Features

Flexible Operating Envelope

The **YORK YHAU-CL** Single Effect Hot Water absorption chiller provides efficiency and reliability through the use of innovative technology that is optimized to use low temperature waste heat - as low as 70°C where competitive offerings cannot operate. Common applications include comfort or industrial process cooling that use or recover waste heat from combined heat and power (CHP) systems, industrial process or other available heat sources. The **YHAU-CL** cooling capacity ranges from 105-6,153 kW / 30-1,750 TR.

The **YHAU-CL** has the unique ability to be used for applications where the

- Chilled water leaving temperature as low as 4C.
- Cooling water temperature entering temperature as high as 37C.
- Hot water temperature, driving heat source, entering temperature as low as 70C.

Refrigerant cycle

The **YORK YHAU CL** high efficiency single-stage absorption refrigeration cycle uses water as the refrigerant and lithium bromide as the absorbent. It is the strong affinity and ease of separation that these two substances have for each other that makes the cycle work. The entire process occurs in hermetic vessels in a near complete vacuum.

Single stage hot water driven absorption chiller

YHAU CL

Two Step Evaporator and Absorber Design

Efficiency, Reliability, Cost of Ownership

The innovative 2-step evaporator and absorber design is more efficient than a conventional cycle. This ingenious design splits the absorption process into two steps, similar to how a series-counter-flow arrangement splits the work between two chillers. The result of the design allows the **YHAU-CL** to perform the absorption function with lower solution concentrations than conventional designs, increasing efficiency and reliability, and decreasing cost of ownership.

Reliability is enhanced because the solution concentrations are lower leaving the absorber, which allows the entire cycle to operate at lower concentrations virtually eliminating the possibility of crystallization. Efficiency is enhanced because the **YHAU-CL** can take advantage of lower than normal hot water temperatures in the generator. This is because at lower concentrations the solution will boil at a lower temperature in the generator.

Lastly, total operating cost decreases because of the lower concentration of the solution entering the generator, a wider temperature range of hot water can be used, reducing pumping horsepower.

Full Automatic Purging System

As a standard feature, the unit has a fully automatic purging system comprising of electronic vacuum transmitter, solenoid valves and trending capability that ensures design performance and improves reliability. The operator does not have to worry about the sequence of purging for removing the non-condensable gases.

Chiller control

The **YHAU Control Center**, standard on each chiller, provides the ultimate in efficiency, monitoring, data recording, chiller protection and operating ease.

The LCD display allows graphic animated display of the chiller, chiller sub-systems and system parameters; this allows the presentation of several operating parameters at once. In addition, the operator may view a graphical representation of the historical operation of the chiller as well as the present operation. The panel is capable of communication with building management systems and is available in multiple languages.

Nominal capacity

YHAU CL Model	30EXE	40EXE	50EXE	65EXE	80EXE	100EXE	130EXE	160EXE	200EXE	255EXE	320EXE	400EXE	500EXE
Cooling Capacity kW	105	141	179	222	271	352	443	563	721	869	1125	1407	1758
COP (low temperature hot water)	0,78	0,78	0,78	0,78	0,78	0,76	0,78	0,78	0,78	0,78	0,78	0,78	0,78

YHAU CL Model	630EXW	700EXW	800EXW	900EXW	1000EXW	1120EXW	1250EXW	1400EXW	1500EXW	1600EXW	1680EXW	1800EXW	1900EXW	2000EXW
Cooling Capacity kW	1934	2110	2461	2708	3024	3411	3938	4431	4852	5134	5274	5626	5943	6153
COP (low temperature hot water)	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78

At 6°C leaving chilled water, 90°C entering generator water, and 27°C entering condenser water.

Technical data

YHAU CL Model			30EXE	40EXE	50EXE	65EXE	80EXE	100EXE	130EXE	160EXE	200EXE	255EXE	320EXE	400EXE	500EXE
Dimensions	Length	mm	1900	2200	2500	3100	2200	2600	3200	3800	4600	3300	3900	4700	5700
	Width	mm	1500				1800					2200			
	Height	mm	2100				2500					3200			
Operating weight kg			2700	3100	3600	4200	4400	5100	6100	7200	8500	10300	12200	14400	17400

YHAU CL Model			630EXW	700EXW	800EXW	900EXW	1000EXW	1120EXW	1250EXW	1400EXW	1500EXW	1600EXW	1680EXW	1800EXW	1900EXW	2000EXW
Dimensions	Length	mm	5500	6000	6700	7300	8000	6700	7300	8000	8500	9000	9500	10000	10500	11000
	Width	mm	2650					3300								
	Height	mm	3300					3900								
Operating weight kg			25800	27600	29500	32300	34700	43900	46400	49000	51200	53500	55800	58600	61300	64100

YORK® absorption chillers and heat pumps

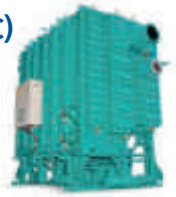
With innovative 2-step evaporation and absorption-cycle technology

DRIVING HEAT SOURCE	MODEL AND DESCRIPTION	
HOT WATER	**Single Effect Hot Water** **Model:** YHAU-CL/CH **Capacity:** 105 - 7,034 kW / 30 - 2,000 TR **Application:** Combined heat and power (CHP), commercial cooling, industrial process cooling	
LOW TEMPERATURE HOT WATER	**Single Effect Double Lift Hot Water** **Model:** YHAU-CL-DXS **Capacity:** 176 - 4,395 kW / 50 - 1,250 TR **Application:** Combined heat and power (CHP), commercial cooling, industrial process cooling	
LOW PRESSURE STEAM	**Single Effect Steam** **Model:** YHAU-C **Capacity:** 422 - 5,275 kW / 120 - 1,500 TR **Application:** Combined heat and power (CHP), commercial cooling, industrial process cooling	
MEDIUM PRESSURE STEAM	**Double Effect Steam** **Model:** YHAU-CW **Capacity:** 422 - 14,067 kW / 120 - 4,000 TR **Application:** Combined heat and power (CHP), commercial cooling, industrial process cooling	
DIRECT FIRED	**Small Double Effect Natural Gas or Light Oil *** **Model:** YHAU-CG/CA-CXR **Capacity:** 105 - 352 kW / 30 - 100 TR **Application:** Commercial cooling	
DIRECT FIRED	**Large Double Effect Natural Gas or Light Oil** **Model:** YHAU-CG/CA **Capacity:** 422 - 5,626 kW / 120 - 1,600 TR **Application:** Commercial cooling, industrial process cooling	

** Utilizes standard cycle*

YORK® absorption chillers and heat pumps

With innovative 2-step evaporation and absorption-cycle technology

DRIVING HEAT SOURCE	MODEL AND DESCRIPTION	
EXHAUST GAS	**Double Effect Direct Exhaust Gas** **Model:** YHAU-CE **Capacity:** 527 - 5,064 kW / 150 - 1,440 TR **Application:** Combined heat and power (CHP), commercial cooling	
EXHAUST GAS AND LOW TEMPERATURE HOT WATER	**Multi Energy Exhaust and Jacket Hot Water** **Model:** YHAU-CE-J **Capacity:** 527 - 5,064 kW / 150 - 1,440 TR **Application:** Combined heat and power (CHP), commercial cooling	
EXHAUST GAS AND LOW TEMPERATURE HOT WATER AND DIRECT FIRED	**Multi Energy Exhaust, Jacket Hot Water, Direct Fired** **Model:** YHAU-CGE-J **Capacity:** Custom **Application:** Combined heat and power (CHP), commercial cooling	
NATURAL GAS AND LOW TEMPERATURE HOT WATER	**Gas Gene-Link** **Model:** YHAU-CG-J **Capacity:** 422 - 5,626 kW / 120 - 1,600 TR **Application:** Combined heat and power (CHP), commercial cooling	
MEDIUM PRESSURE STEAM AND LOW TEMPERATURE HOT WATER	**Steam Gene-Link** **Model:** YHAU-CW-J **Capacity:** 422 - 14,067 kW / 120 - 4,000 TR **Application:** Combined heat and power (CHP), industrial process cooling	
HOT WATER, STEAM, DIRECT FIRED	**Low Leaving Chilled Water Temperature (Down to -5°C)** **Model:** YHAU-C-L **Capacity:** 176 - 1,758 kW / 50 - 500 TR **Application:** Industrial process cooling / refrigeration	
HOT WATER, STEAM, DIRECT FIRED	**Absorption Heat Pump (Up to 90°C))** **Model:** YHAP **Capacity:** Custom **Application:** District heating, industrial process heating	

WFC SC Single stage hot water absorption chiller

Cooling capacities from 17.6 kW to 175.8 kW

CH K & CH MG Natural gas-fired chiller/heaters

Cooling capacities from 105 kW to 703 kW
Heating capacities from 86 kW to 572 kW

Features WFC SC

WFC SC chillers from **Yazaki** are single stage hot water driven chillers. Compared to electrically driven chillers the **WFC SC** series can dramatically lower system operating costs when using waste heat. Applications particularly well suited to the **Yazaki WFC SC** absorption chiller include waste heat recovery from cogeneration or biomass, waste heat from district power station or industry as well as solar thermal. This makes absorption cooling an environmentally friendly and cost-saving alternative to conventional air-conditioning systems. A low electrical energy consumption results in low CO_2 emissions and provide a relief for electricity grids by replacing conventional cooling demand peaks. All chillers are pre-filled and ready for "plug & chill".

Driving heat source hot water
WFC SC units can operate with entering hot water temperature from 70 to 95°C.

Refrigerant cycle
The **Yazaki WFC SC** high efficiency single-stage absorption refrigeration cycle uses water as the refrigerant and lithium bromide (non-flammable, non-toxic, ecologically benign and ozone-friendly) as the absorbent. It is the strong affinity and ease of separation that these two substances have for each other that makes the cycle work. The entire process occurs in hermetic vessels in a near complete vacuum.

Features CH K & CH MG

Natural gas-fired chiller/heaters **CH K & CH MG** from **Yazaki** work with double effect thermo-cycle and may be used for both cooling or heating distribution. Compared to electrically driven chillers **CH K & CH MG** chillers can dramatically lower system operating costs.

A low electrical energy consumption results in low CO_2 emissions and provide a relief for electricity grids by replacing conventional cooling demand peaks. All chillers are pre-filled and ready for "plug & chill".

Direct fired chiller
Driving energy is provided by natural gas. Typically a COP of 1.0 or above is achievable.

Refrigerant cycle
The **Yazaki CH K & CH MG** high efficiency double-effect absorption refrigeration cycle uses water as the refrigerant and lithium bromide (non-flammable, non-toxic, ecologically benign and ozone-friendly) as the absorbent. It is the strong affinity and ease of separation that these two substances have for each other that makes the cycle work. The entire process occurs in hermetic vessels in a near complete vacuum.

Single stage hot water absorption chiller
WFC SC

Natural gas-fired chiller/heaters
CH K & CH MG

Nominal capacity WFC SC

Model				WFC SC 05	WFC SC 10	WFC SC 20	WFC SC 30	WFC SC 50
Cooling Capacity			kW	17.6	35	70	105	175.8
Sound pressure at 1 m			dB(A)	46	46	49	52	52
Cold water	Temperature	Inlet	°C	12.5	12.5	12.5	12.5	12.5
		Outlet	°C	7	7	7	7	7
Cooling water	Cooling performance		kW	42.7	85.5	171	256	427
	Temperature	Inlet	°C	31	31	31	31	31
		Outlet	°C	35	35	35	35	35
Hot water	Power consumption		kW	25.1	50.2	100.4	150.6	251
	Temperature	Inlet	°C	88	88	88	88	88
		Outlet	°C	83	83	83	83	83

Technical data WFC SC

Model			WFC SC 05	WFC SC 10	WFC SC 20	WFC SC 30	WFC SC 50
Dimensions	Length	mm	594	760	1060	1380	1785
	Width	mm	744	970	1300	1545	1960
	Height (with mounting plate)	mm	1756	1920	2030	2065	2085
Operating weight		kg	420	604	1156	1801	2650

Nominal capacity CH K & CH MG

Model				CHK 30	CHK 40	CHK 50	CHK 60	CHK 80	CHK 100	CHMG 150	CHMG 200
Cooling Capacity			kW	105	141	176	211	281	352	527	703
Heating Capacity			kW	86	115	143	172	229	286	429	572
Chilled water	Temperature	Inlet	°C	12.5	12.5	12.5	12.5	12.5	12.5	12	12
		Outlet	°C	7	7	7	7	7	7	7	7
Cooling water	Temperature	Inlet	°C	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
		Outlet	°C	35.5	35.5	35.5	35.5	35.5	35.5	34.6	34.6
Hot water	Temperature	Inlet	°C	50.5	50.5	50.5	50.5	50.5	50.5	56	56
		Outlet	°C	55	55	55	55	55	55	60	60

Technical data CH K & CH MG

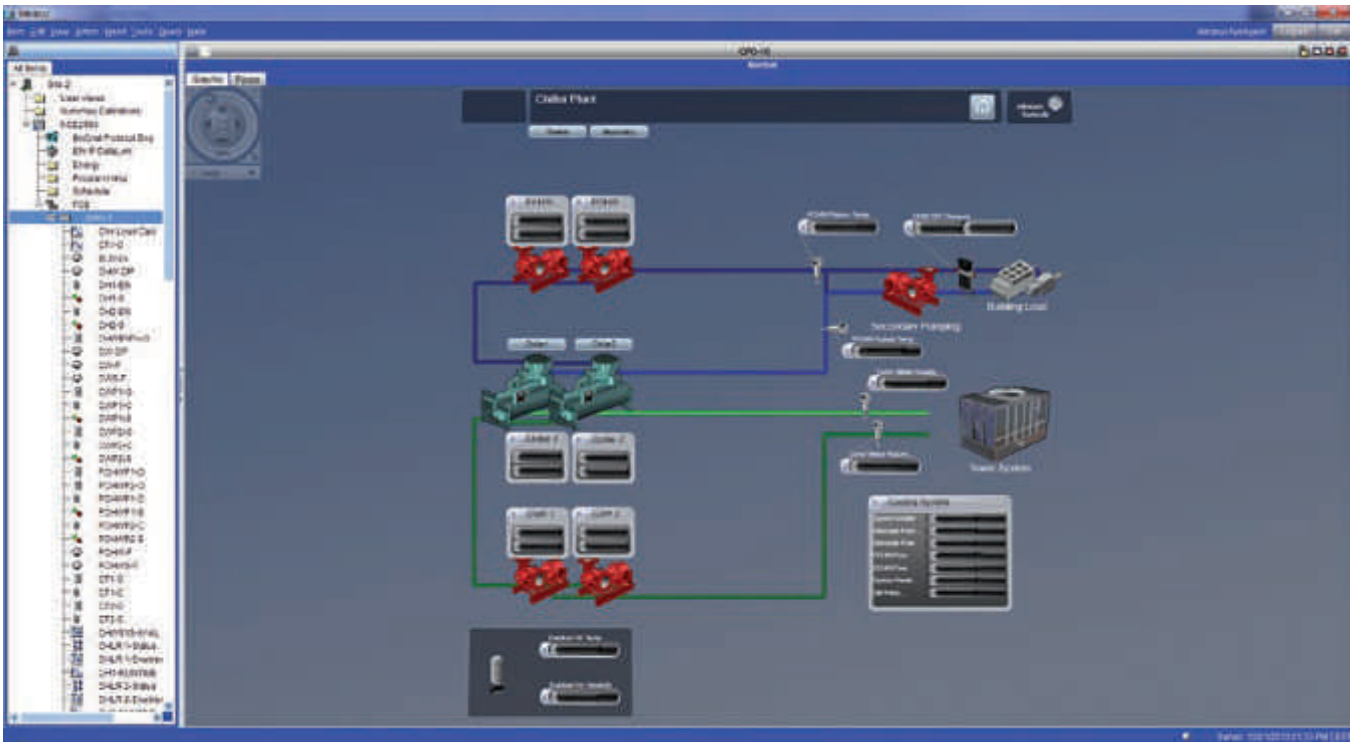
Model			CHK 30	CHK 40	CHK 50	CHK 60	CHK 80	CHK 100	CHMG 150	CHMG 200
Dimensions	Length	mm	1635	1635	1875	1875	1995	1995	3663	3735
	Width	mm	1460	1460	1780	1780	1840	1840	1951	2051
	Height (with fixed plate and vent cap)	mm	2440	2440	2440	2440	2820	2820	2763	3003
Operating weight		kg	1720	1970	2510	2770	4060	4540	6210	7340

Central Plant Optimization™ 10

A facility's central chiller plant typically uses 20% of the building's total energy. Managing this load, while still maintaining occupant comfort, is a primary strategy for overall energy management.

Johnson Controls® Central Plant Optimization™ 10 (CPO 10) provides such a strategy combining expertise from designing YORK® chillers and Metasys® controls to save energy and improve reliability in the facility.

The application uses tested best practices to select the most efficient combination of chillers, pumps and cooling towers to match the building load. It then commands the selected devices providing the necessary sequencing of pumps, isolation valves and main equipment, while observing safety and stability operation requirements.



Creating a complex program without programming

The System Selection Tool (SST) is a control program generator that relies on defining the characteristics of the chiller plant and its control strategies. The tool supports **selection and sequencing** of

- up to eight chillers of different sizes, compressor types and fixed or variable speed
- up to eight (each) primary and secondary chilled water pumps of varying pumping capacities
- up to eight condenser water pump
- of cooling towers and bypass valve, including single speed, multi-speed, and vernier control (one variable speed fan with all other tower fans at constant speed)
- up to four heat exchangers (Waterside Economizers)
- both water-cooled and air-cooled chillers

Furthermore, **control definition** for the chiller plant in a single Field Equipment Controller (FEC)/Network Controller Engine (NCE), if supported by available memory and point Input/Output (I/O), or split across multiple FECs/NCEs, is offered.

METASYS®

Flexibility, ready for use

A **variety of primary control strategies** are also available, including

- measuring building chilled-water flow and differential temperature
- chiller load (kW)
- flow through a decoupler pipe in a primary/secondary system
- differential temperature only, in a constant speed chilled water pump system

It is also possible to select **dozens of secondary strategies**, such as

- open loop control of the cooling towers (as defined by the American Society of Heating, Refrigerating and Air-Conditioning Engineers)
- closed loop control of condenser-water setpoint

After making the selections, SST **generates a complete program** by linking together appropriate software modules. This process removes the variability commonly found in totally custom-generated programs using a traditional software program editor.

Once the software modules are linked, the tool allows the entry of all equipment parameters. The resulting program can also be run in a simulator mode to verify proper operation before downloading it into Metasys®.

CE

Heat Pump Solutions

According to the Environmental Protection Agency (EPA), it is estimated that 5% of the world's daily energy consumption is expended on fuel for heating water. Additionally, in Western European countries, 25 % of primary energy used is for cooling and heating applications. As pressure continues on natural resources and energy bills continue to rise, we must seek new, environmentally friendly solutions.

One smart option is to improve the energy utilization of your facility's heating and cooling system by recycling heat energy that would otherwise be rejected. This can be accomplished with a Johnson Controls heat pump.

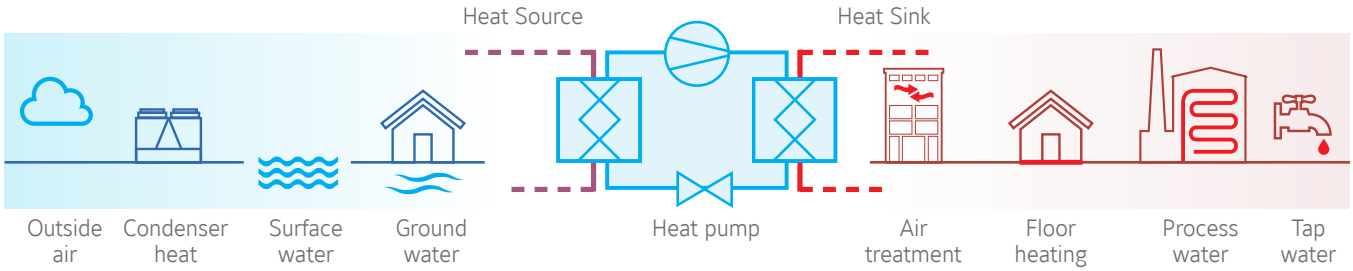
At Johnson Controls we set standards without compromising our core principles: and when passion and innovation come together, great things happen!

What is a Heat Pump?

Heat pumps are designed to produce hot water at a specified temperature. Heat is extracted from a low-temperature source such as air, ground water, or waste process heat, and its temperature is raised to a level where it can be used in alternative processes.

There are 4 primary system designs for heat pumps:

1) **Air-source** – An example of this is the heat pump you may have in your home.
2) **Ground-source** – This system uses the ground as the heat source, often used in residential or light commercial applications.
3) **Water-source** – This system uses a building's water supply to transfer heat. This is the most commonly used system.
4) **Cascade-source** – The system uses heat from existing refrigerant systems or any available waste heat source.



Traditionally, chillers are used to provide a building's required cooling load (rejecting heat to atmosphere via cooling towers) and boilers supply hot water to meet the building's heating needs. Using a Heat Pump gives increased system efficiency and lowers operating expense as they can supplement or even replace existing heating systems, and can also operate in reverse cycle to provide cooling during the summer. There are also processes in which cooling and heating functions perform simultaneously. Again, heat pumps are an ideal solution to this challenge.

Benefits of using heat pumps

Traditional systems used to heat water for hydronic heating and domestic hot water are not energy efficient. Heat pumps offer a number of advantages when compared to fossil-fuel water heaters:

- Higher COPs offer **energy cost-savings above 50%.**
- Thanks to their efficiency and short amortization period, they represent an environmentally compatible and economically attractive alternative to conventional heating systems. **Potential payback of the heat pump can be less than 2 years.**
- **Low operating-cost supplement** to water heaters where total heating requirement exceeds heat pump capacity.
- **Heat pumps can also be used as water chillers**, which means lower first-costs, as one item of equipment performs cooling and heating.
- **Life cycle of over 20 years.**

Johnson Controls heat pumps offer additional benefits by using environmentally friendly HFC and natural refrigerants, with **zero ozone depletion potential, and low global warming potential.**

Reduced operating costs

The best way to compare the efficiency of a heat pump and a water heater is to do a COP analysis. COP equals the energy output (useful heat generated) divided by the energy input (energy supplied to the equipment).

Accordingly, the higher the COP, the more efficient the system – and the lower your running costs!

As an example we can take a 1800 kW water-cooled heat pump as the one showed in chart and compare it to a natural gas boiler. When you compare the efficiency of a boiler to a heat pump, the heat pump comes out way ahead.

In the example given it's possible to save up to 53% in the energy bill vs the traditional natural gas boiler!

Hot Water Requirement	Energy Source	Efficiency	Energy Consumption	Cost of Source*	Cost of Hot Water Requirement	HP Saving vs Gas Boiler
1 kWh	Natural Gas Boiler	Average efficiency **COP=0.9**	1 kWh / 0.9 **1.11 kWh**	European Avg. Gas Cost **0.041 €/kWh**	1.11 kWh x 0.041€/ kWh **4.5 c€**	-
1 kWh	Air cooled Heat Pump	Average efficiency **COP=3.2**	1 kWh / 3.2 **0.31 kWh**	European Avg. Electricity Cost **0.12 €/kWh**	0.31 kWh x 0.12€/ kWh **3.7 c€**	**18%**
1 kWh	Water cooled Heat Pump	Average efficiency **COP=5.5**	1 kWh / 5.5 **0.18 kWh**	European Avg. Electricity Cost **0.12 €/kWh**	0.18 kWh x 0.12€/ kWh **2.1 c€**	**53%**

* Cost of Source: Eurostat Statistics web site.

CO_2 footprint reductions

Another benefit that offers heat pump technology is the reduction in CO_2 emissions from fossil fuel use. Heat pumps are a highly efficient electric alternative.

If we refer to the same example with a 1800 kW water-cooled heat pump and compare it to a natural gas boiler, the reduction in CO_2 emissions is impressive.

In fact 1322 tons of CO_2 annually can be saved, which is the equivalent of removing about 278 cars* from the road!

** www.epa.gov/cleanrgy/energy-resources/calculator.html*

Hot Water Requirem.	Energy Source	Efficiency	Energy Consumption	CO_2 Source Emissions*	Carbon Footprint	HP CO_2 footprint reduction vs Gas Boiler
1 kWh	Natural Gas Boiler	Average efficiency **COP=0.9**	1 kWh / 0.9 **1.11 kWh**	CO_2 Emissions **204 g CO_2 / kWh**	1.11 kWh x 204g CO_2/kWh **226 g CO_2**	-
1 kWh	Air cooled Heat Pump	Average efficiency **COP=3.2**	1 kWh / 3.2 **0.31 kWh**	CO_2 Emissions **541 g CO_2 / kWh**	0.31 kWh x 541g CO_2/kWh **167 g CO_2**	**26%**
1 kWh	Water cooled Heat Pump	Average efficiency **COP=5.5**	1 kWh / 5.5 **0.18 kWh**	CO_2 Emissions **541 g CO_2 / kWh**	0.18 kWh x 541g CO_2/kWh **97 g CO_2**	**57%**

* CO_2 Source Emissions: UK Department of Energy, Food and Rural Affairs and carbonindependent web site

Reduced water and chemical consumption

When a heat pump is operating we are keeping heat within the building and not rejecting heat to the atmosphere. In other words, we're saving condenser water from evaporating.

So when we look at our same 1800 kW water-cooled heat pump example again, how much water are we saving by not expelling heat to the atmosphere from the cooling tower?

Over 26 million litres anually!

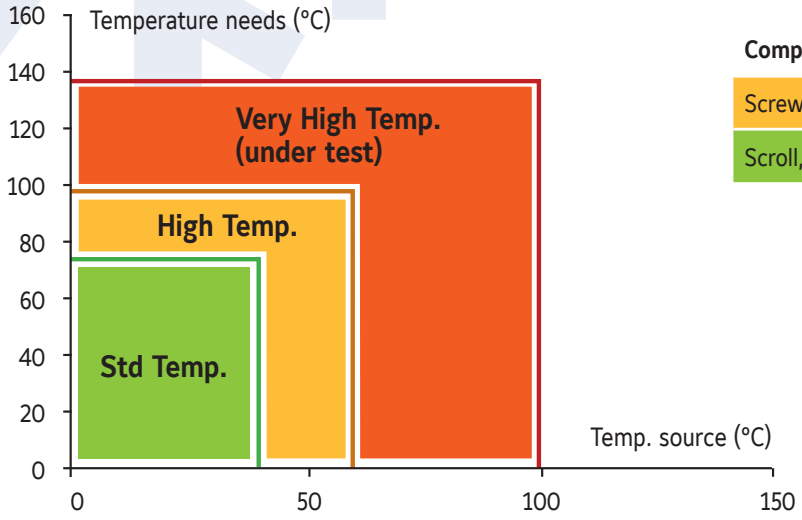
LEED points

Heat pumps will help you and your customers get LEED points. LEED is one of the most recognizable bodies that certifies building designs to demonstrate leadership in environmental impact.

The use of a heat pump also helps accreditation for BREEAM and other similar schemes.

Heat Pumps solutions

We do have a wide range of industrial heat pumps for several capacities and at different temperature levels.



Compressor type	Refrigerant
Screw, centrifugal	R717, R245fa
Scroll, reciprocating, screw	R717, R134a, R410A

Heat pumps with standard temperature

YVAG
Air to water HP
Scroll compr. / R410A
Hot water up to **52°C**
Heating capacity:
10.9 to 18.4 kW

YMPA
Air to water HP
Scroll compr. / R410A
Hot water up to **55°C**
Heating capacity:
50 to 254 kW

YHME
Air to water HP
Twin screw / R134a
Hot water up to **55°C**
Heating capacity:
145 to 186 kW

YLRA
Air to water HP
Scroll compr. / R410A
Hot water up to **55°C**
Heating capacity:
200 to 327 kW

YLPB
Air to water HP
Scroll compr. / R410A
Hot water up to **52°C**
Heating capacity:
344 to 653 kW

YMWA
Water to water HP
Scroll compr. / R410A
Hot water up to **55°C**
Heating capacity:
24 to 212 kW

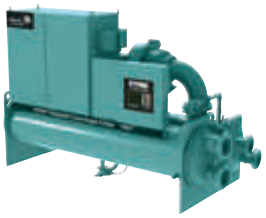
YCSE
Water to water HP
Screw compr. / R134a
Hot water up to **55°C**
Heating capacity:
170 to 300 kW

YCWL
Water to water HP
Scroll compr. / R410A
Hot water up to **52°C**
Heating capacity:
210 to 675 kW

YLCS
Water to water HP
Twin screw / R134a
Hot water up to **70°C**
Heating capacity:
397 to 1307 kW

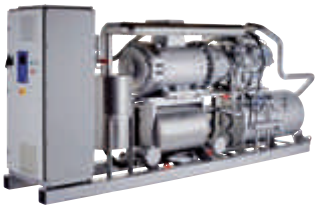
YVWA
Water to water heat pump

Screw compressor / R134a
Hot water up to **65°C**
Heating cap.: 650 to 1250 kW



YMC²
Water to water heat pump

Variable speed centrif. compr. Magnetic bearings / R134a
Hot water up to **65°C**
Heating cap.: 1600 to 3000 kW



HeatPAC recip
Variable-Speed Drive

Reciprocating compr. / R717
Hot water up to **70°C**
Heating capacity up to 1200 kW at 40°C source

YK HP
Water to water heat pump

Centrifugal compr. / R134a
Hot water up to **50°C (Std)**
Hot water up to **70°C (HP)**
Heating cap.: 1000 to 9000 kW

Heat pumps with high temperature

HeatPAC HPX recip
Variable-Speed Drive

Reciprocating compr. / R717
Hot water up to **90°C**
Heating capacity up to 600 kW at 40°C source

HeatPAC
Variable-Speed Drive

Screw compressor / R717
Hot water up to **90°C**
Heating capacity up to 1600 kW at 40°C source

SHP
Water to water heat pump

Screw VSD compr. / R134a
Hot water up to **80°C**
Heating cap.: 700 to 3000 kW

YHAP-C
Single stage absorption

Steam, Gas or Hot Water driven / R718
Hot water up to **95°C**
Heating cap.: 900 to 40000 kW

Customized Heat Pumps

HeatPAC Custom
Two-stage cascade VSD

Screw compressor / R717
Hot water up to **90°C**

Reciprocating compressor / R717
Hot water up to **70°C**
Heating cap. up to +3000 kW at 40°C source

CYK HP
Water to water heat pump

Dual-Centrifugal compressors, Series-Arrangement / R134a
Hot water up to **70°C**
Heating capacity from 2500 to 7000 kW

Titan OM HP
Water to water heat pump

Multi-stage Centrifugal, electric, steam or gas driven / R134a
Hot water up to **90°C**
Heating capacity from 5000 to 20000 kW

HVAC Fundamentals
Water Systems

Chilled water systems

Air conditioning system designs normally use supply chilled water temperatures of 5°C to 8°C. Some systems, such as chilled ceilings or beams, may use higher temperatures up to 14°C or 15°C.

If leaving temperatures less than 4.5°C are requires brine solutions are used to prevent freezing. This is specially the case with Ice Storage Systems that can have temperatures as low as minus 7°C.

The cooling capacity of a Chiller increases with rising leaving chilled temperatures. A temperature difference, between flow and return, of 5°C to 8°C is normal.

The water flow volume is dependent on the cooling capacity and chilled water temperature difference in the following formula:

$$\text{Water Flow Volume (Litres per Second)} = \frac{\text{COOLING CAPACITY (kW)}}{\text{Density (kg/m}^3\text{) x Specific Heat (kJ/kg°C) x Temperature Difference °C} \times 1000}$$

The resulting water flow must be checked agains the flow limitations of the Chiller. This can be found in the "Limitations Table" for each type of Chiller or heat pump (data is not in this catalogue).

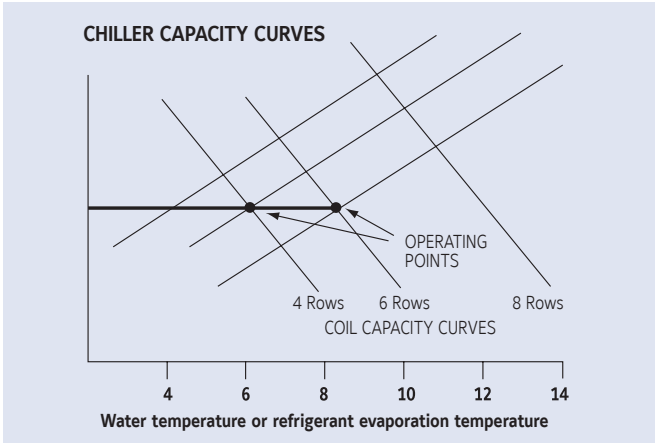
A small temperature difference achieves a low MEAN WATER TEMPERATURE which will generally allow the selection of smaller cooling coils in Air Handling Units and Fan Coil Units etc. Conversely water flow volume will be high resulting in a larger circulating pump and increased pressure drop through the Chiller and coiling coils and a consequent increase in operating costs.

The pressure drop varies as the square of the flow and is defined in the following formula:

H2/H1 = $(W2/W1)^2$
H1 = Pressure Drop kPa at final condition
H2 = Pressure Drop kPa at original condition
W2 = Flow rate L/s at final condition
W1 = Flow rate L/s at original condition

Selecting the optimum temperature difference is therefore a compromise between operating costs and equipment size and the capital cost of such equipment. Primary chilled water temperature differences are normally between 5°C and 6°C. Generally a minimum system flow volume will provide the least expensive system in both capital and operating costs.

An Air Conditioning system in a building comprises a variety of components, such as Chillers, Air Handling Units, Diffusers, Ductwork, Pipework, Controls, Electrical Wiring, etc.



An optimisation of the system price, function and efficiency must consider all components and their interaction. It starts with the load calculation. A floating temperature setpoint in the comfort range area will save energy and reduce operating costs. Capital costs can be reduced by balancing the selection of Chillers, Air Handling Units, Ductwork sizes, etc. It is important to determine the optimum operating point that balances the selection of the Chiller leaving water temperature and the Air Handling Unit cooling coil. A temperature rise of 1°C in water temperature yields approximately 3% more capacity for the Chiller and reduces the absorbtion input power typically by 1.5%. However the coil capacity reduces with temperature rise and requires larger heat exchange surfaces (more rows and/or a lower fin spacing).

If the leaving water temperature of the Chiller is raised it is possible that one Chiller size smaller can be selected.

The capital cost for the larger coil is comparatively small and the cost savings of a smaller Chiller can be considerable.

Increasing the leaving chilled water temperature will also increase the air temperature leaving the Air Handling Unit coil and this may in turn decrease the supply and return air temperature difference.

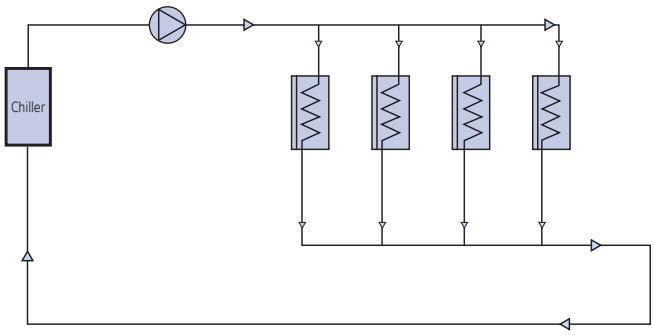
The Air Volume is determined by the following formula:

$$\text{Air Volume m}^3\text{/s} = \frac{\text{HEAT GAIN (kW)}}{\text{Density (kg/m}^3\text{) x Specific Heat (kJ/kg°C) x Temperature Difference °C}}$$

A smaller air temperature difference will increase the air volume and therefore the duct sizes and resultant cost of the ductwork. It is therefore important to consider the total impact on all the components of the air conditioning system. Lower supply air temperatures will reduce the size of both ductwork and Air Handling Units and specially designed air diffusers can be used to ensure that the lower supply air temperatures have no adverse effect on the building occupants.

Piping system design

On larger air conditioning systems it is generally recommended that "Reverse Return" piping arrangements are used to ensure balanced flow rates.



Minimum system water volume

To allow the Chiller or Heat Pump to operate smoothly at low load capacities sufficient thermal storage is required in the primary water circuit to give at least 5 minutes operation when the machine is not running. This will ensure that the equipment will not continuously stop and start at low load conditions and consequantly cause undue wear on the compressor.

The following formula will satisfy the toral required thermal storage volume:

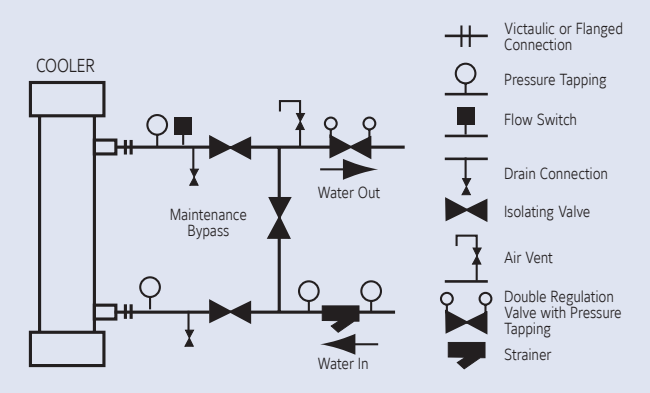
$$V = \frac{(N \times 60 \times Z)}{4.18 \times dt}$$

V = Total system water content (Litres)(4.18 x dt)
N = Capacity of the Chillers first capacity step (kW)(4.18 x dt)
Z = Minimum allowable running time (minimum 5 min.)
dt = Temp. difference at the minimum partload condition

V = 35.88 x S x Q

S = Minimum capacity step (at lowest operating ambient)
Q = Full capacity at nominal conditions

Chiller cooler connection



In order to ensure a trouble-free operation of the cooling water pump during startup of the system, the entire cooling water piping should be as far as possible below the operating level of an open circuit cooling tower. This prevents emptying of the cooling water lines in the cooling tower trough.

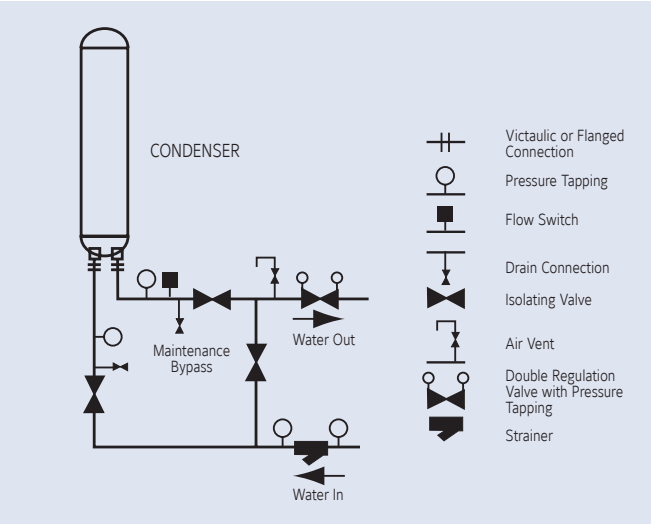
If multiple cooling towers are used in a common cooling water circuit, compensation pipes must be installed between the cooling tower tanks in order to keep the cooling water in all cooling towers at the same level. If more than one water entry into the cooling tower is required, install throttle valves to balance the flow between circuits. Check that the pressure of the spray nozzles and the pressure of the make-up water are not exceeded.

Warm water system

The leaving water temperature from a Heat Recovery Chiller or a Heat Pump is normally between 45°C and 60°C depending on the refrigerant that the machine is charged with. For Heat Pumps more heating capacity and higher operating efficiency is available with lower leaving water temperatures. Water temperatures of 45°C to 50°C are quite adequate for the selection of heating coils in Air Handling Units and Fan Coils.

Refrigerant to water condensers are limited in the volume of water that can be passed through them and it is necessary that this limitation is considered during the system design process. This may result in a larger water temperature differences than those used in a normal Boiler fed low temperature hot water system. The water temperature can be increased from a Boiler but measures must be taken to ensure that the return water to the Chiller or Heat pump cannot ever exceed 60°C.

Chiller condenser connection



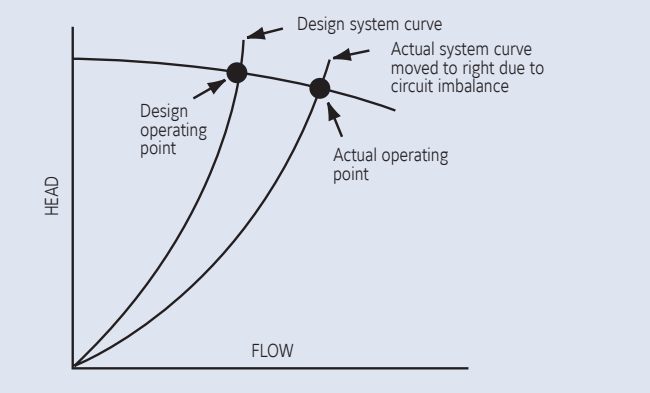
Chiller condenser water systems

To ensure satisfactory pump operation at start-up and to prevent overflowing of the Cooling Tower sump all condenser piping, and as much tower piping as possible, should be installed below the operating level of the tower. If multiple towers are used on a common system equalising lines should be installed between the sumps of the separate Cooling Towers to ensure balanced water level in all the towers. If more than one inlet connection is required to a tower balancing valves should be installed to give the required flow to each circuit.

Check that the maximum spray water and make-up water pressures are not exceeded.

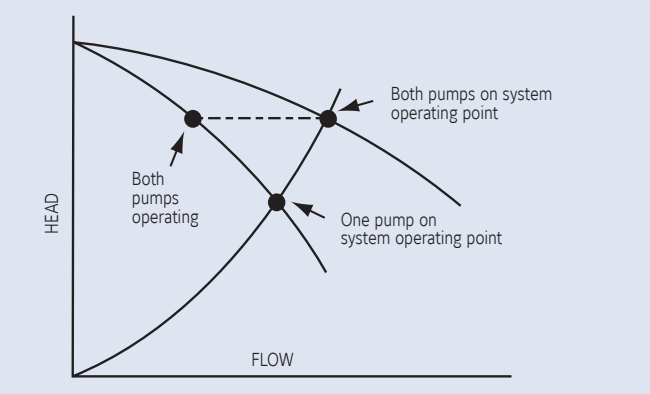
Circulating pump selection

Pumps should have a flat characteristic and should operate near to the left of the maximum point of efficiency on the curve to allow for any deviation in the position of the actual system curve from that estimated in the design process. This will ensure satisfactory pump operation with no overloading of water volume or reduction in available head.



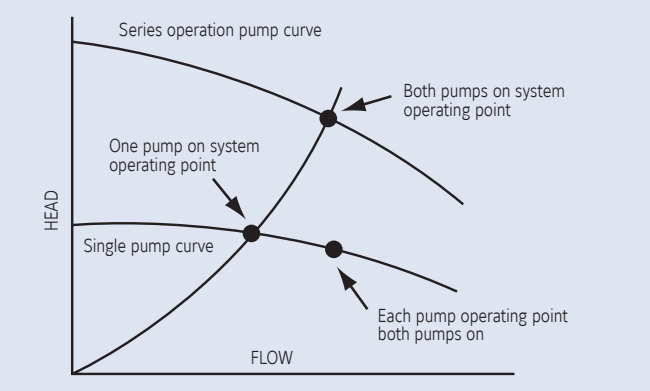
Parallel pumps

When two pumps, of equal flow, are used in parallel they operate at the same head and share the total system flow. When only one of the two pumps is in operation the flow volume can be as much as 80% of total flow resulting in a very good performance for stand-by in case of pump failure.



Series pumps

When two pumps, of equal flow, are used in series they operate at the same flow and share the total system head. When only one of the two pumps is in operation the flow volume can be as much as 80% of total flow resulting in a very good performance for stand-by in case of pump failure.



System pressurisation

A diaphragm expansion tank, pre-charged to the system fill pressure and sized to accept the expansion of the water, is normally used in larger water circulating systems. The air charge and the water are permanently separated by a diaphragm that eliminates corrosion and noise caused by air in the system.

Water treatment

Water system problems can be recognised from the following symptoms:

1. A reduction in heat transfer, which is a sign of insulating deposits on heat transfer surfaces reducing the cooling or heating efficiency of the equipment. This can be caused by scale or biological growths.
2. A reduction in water flow which is generally caused by a restriction in pipework, condenser or evaporator tubes or other components due to a build-up of scale. Bacterial and algae accumulate in Cooling Towers and can radically reduce water flow and are a major cause of corrosion. As the water evaporates in a Cooling Tower the dissolved solids originally present in the water remain in the system and suspended solids scrubbed from the air can also contribute to the blockage and corrosion of condenser water pipework and the Chillers condenser tubes.
3. Corrosion of materials or undue wear to pumps ,shafts ,seals etc. Unless a Cooling Tower is regularly cleaned and protected with adequate water treatment biological contaminants, including Legionella, may be introduced into the re-circulating water.

   A water treatment program must be employed to control all possible contaminants. It must be compatible with all the materials of construction and the pH of the circulating water must be maintained between 7 and 9. Biological contamination can be controlled by the use of biocides.

The proper control of water treatment is dependent on the proportional addition of the relevant chemicals to maintain the correct concentration at all times. The relevant chemical treatment of water systems is a complicated matter and it is therefore important that a specialist water treatment company is involved early in the design stage of the project.

Mechanical filtration

A Filter, with a 40 mesh screen, must be installed as close as possible to the water inlet of both the cooler of air cooled and water cooled Chillers and Heat Pumps and the condenser of water cooled equipment. A means of local isolation should be provided. The Filters will also protect the circulating pumps in the system.

Sound

Noise is a major comfort criterion and has considerable effect on the well being of human beings. Noise is generated by friction due to moving parts, compression, explosion etc,. Mechanical forces create vibration of components which radiate noise in the frequencies of the mechanical source. Deep frequencies cause rumbling which is transported via the structural elements of a building and can be experienced by the sense of touch and body vibrations. Higher frequencies are transported by air. The vibration compresses and expands the air around the noise source and the varying pressure waves are transmitted in all directions.

Sound pressure Lp

Sound pressure is the noise emmitted from an object in a series of high frequency pressure waves which move through the air in a similar pattern to the water ripples caused when a stone is thrown into a pond. It radiates outwards from the sound source and is reflected from objects and surfaces in its path.

The magnitude of a sound pressure wave is measured in pascals (N/m^2) but in order to correspond with the human perception of sound. A logorithmic scale is used with decibel (dB) units. Most internationally accepted scales use zero decibels as a sound pressure wave of 0.00002 pascals in height which is approximately the threshold of human hearing. As this is a logarithmic scale each time the size of the pressure wave increases by a factor of ten the decibel scale increases by the number ten, ie., 70 dB represents a pressure wave 1000 times greater than 40dB. This corresponds to the human perception of sound which would also rate the 1000 times increase in sound pressure as a 30 times increase in loudness.

Sound pressure is given the symbol Lp.

$Lp = n\ dB\ re\ 2 \times 10^{-5}\ Pa$

The human ear can normally detect sound to as low as 2×10^{-5} Pa.

Sound pressure is projected at a specific distance from the source and is effected by the surroundings.

Sound power Lw

Energy is required to generate a sound pressure wave and the size of the wave is directly related to the amount of energy used.

A continuous sound will only be produced if continuous power is available. Sound power can be measured in watts but it is more convenient to use a logarithmic scale and decibel units. As a basis for the sound power scale 1 picowatt is generally taken to be 0 dB. In order to find a measure for noise a ratio is taken between the sound power and a reference sound power of $P_0 = 10^{-12}$Watts

Sound power is NOT distance dependant.

SOUND POWER IS THE PROPERTY OF THE NOISE EMMITTING OBJECT AND SOUND PRESSURE IS USED TO MEASURE THE PRESSURE WAVES WHICH CARRY THE SOUND TO THE EAR.

Sound power is given the symbol Lw.

$Lw = n\ dB\ re\ 10^{-12}W$

Example:
The human voice has an average sound power of 10^{-6}W.

$Lw = 10^{-6} / 10^{-12} = 10^{6}$

Translated into logarithmic figures:
$Lw = 10 \times \log 10^{-6} = 10 \times 6 = 60\ dB$

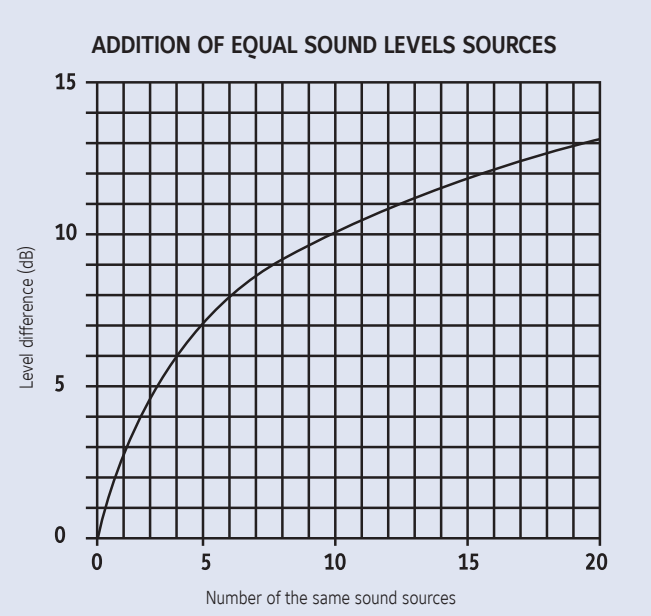
If two sound sources of equal power (60 dB or 10 W each) were active their added sound level would be as follows:
$(10^{-6} + 10^{-6})/10^{-12} = 2 \times 10^{-6} / 10^{-12} = 2 \times 10^{-6} = 2 \times 10^{-6}$

$Lw = 10 \log (2 \times 10^{-6}) = 63\ dB$

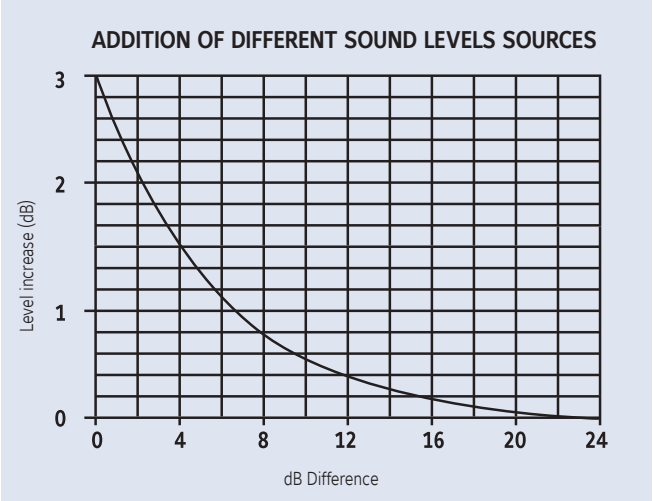
Therefore: 60 dB + 60 dB = 63 dB.

Therefore if two sound sources have the same sound power add 3 dB.

For several sound sources of having the same sound level refer to the following graph.



When sound sources of differing sound levels are to be added refer to the following table.



Weighting scales dB(A)

The human ear detects the single frequencies with different intensity and it has therefore been necessary to establish a method that simulates human hearing. In order that a single overall sound output value of an object may be determined a weighted or averaged value, that assimulates human hearing, can be taken of the sound level in each frequency of the frequency band between, the lowest and the highest, which can be heard.

The generally accepted bands are centred on 62.5Hz which is then doubled each time to a peak of 8000Hz (8kHz). These are the octave bands . The most commonly used weighting curve is the "dBA" scale. Weighted dB differences are subtracted from the source frequency band values and the resulting dB(A) value will therefore be lower than the unweighted.

The ratio sound pressure/sound power

The relationship between sound pressure waves and the sound power of the object producing them depends on the nature of the area around the object and the location of the person effected by the sound.

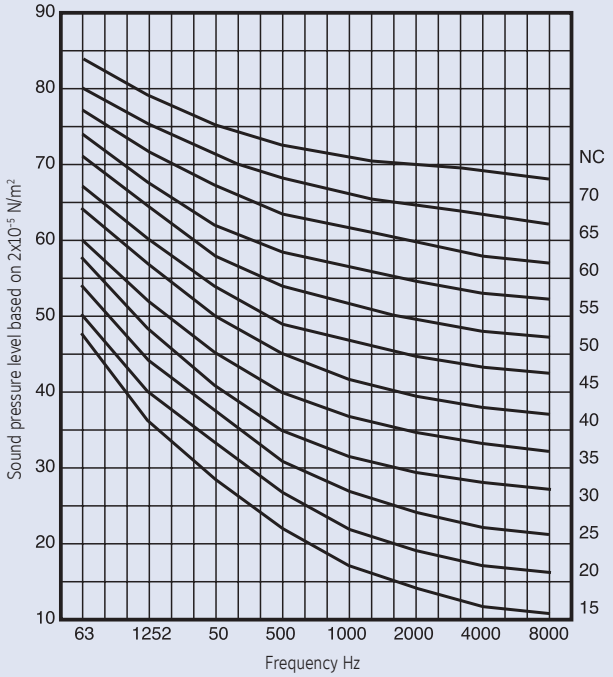
In order to take accurate sound measurements it is preferable to have a "Free Field" environment. This is an area having constant properties, free of boundaries or objects or any other sound source which could effect measurements. The sound waves radiate outwards in concentric hemispheres from the source getting weaker as the distance increases. The average sound level at the surface of one of these hemispheres is directly related to the sound power of the machine which is assumed to be generated at a point at the geometric centre of the machine. If an object is large, relative to the distance from which sound measurements are taken, the sound cannot be considered to be coming from a single point and the sound level will depend on where the subject is standing. The sound level can vary considerably with a small change in position and it is not therefore possible to relate sound pressure to sound power using Near Field measurements.

Site installations are seldom a free field environment . Adjacent buildings, walls etc, affect the sound pressure waves and a wall in close proximity can increase the sound level on the opposite side of the machine by reflecting the sound back in that direction.

Noise criteria (NC) curves

The ear can only perceive the pressure variations of air pressure not the sound power itself. The radiated sound power is transformed into sound pressure, part of which is absorbed by the environment and such objects as carpets, clothes etc, that may be situated within the wave pattern, and the intensity decreases with distance. This effect is called "Room Effect".

The difference between the sound power and the received sound pressure can be read from a diagram. The noise dB curve at the single frequencies is plotted and compared with reference curves. The value of the highest reference line that touches the noise curve is the NC value.



Chiller sound measurement

Chiller sound power

Sound Power is the property of the chiller only and can be used directly to compare the Sound Power of the chillers of one manufacturer against another. Most Sound Power data is quoted with reference to standard ISO 3744 which is entitled 'Sound Power Levels of noise Sources' and is sub-titled 'Engineering methods of determination of sound power levels for sources in free field conditions over a reflective plane'. This standard refers only to Sound Power values.

Sound power values are not distance-dependant

The basic method described by the standard involves averaging a number of sound pressure measurements taken all over an imaginary surface around a chiller in free field conditions.

Providing that background noises are within prescribed limits all of the sound measured at the surface must be coming from the chiller and the sound output (power) can be calculated as follows:

$Lw = Lp + 10 \times Log_{10}(S)$

Where:

Lw = Sound power in dB (reference value: 10^{-12}W)
Lp = Average value of the sound pressure measurements in dB (Reference value: 2×10^{-5} Pa)
S = Measuring area in square meters

Chiller sound pressure

Chiller manufacturers use the parallelepiped method (rectangular box) of constant distance D from the surface of the chiller to measure the Sound Pressure. The use of this shape does not change the calculated Sound Power for the chiller.

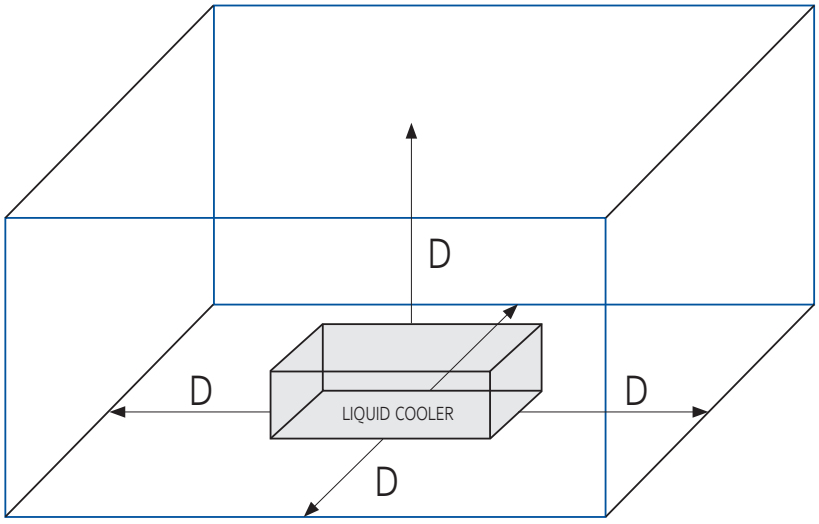
For example to calculate the sound pressure at 10 metres for a chiller with an 'A' weighted overall **Sound Power of 107dB(A) re 10^{-12}W** and a rectangular surface area at 10 metres distance of 1778 m^2 using the parallelepiped surface:

Sound pressure at a distance of 10 meters = 107 - 10 x $\log_{10}$ (1778 m^2) = 107 - 32.5 **= 74.5 dB(A) (reference value 2 x 10^{-5} Pa)**

Some manufacturers quote sound Pressure levels at a distance of one metre. When a chiller can be anything up to 10 metres in length this distance is illogical, as the sound level will change depending upon the position along the unit. That is near to the compressor will be noisier than near to the control panel etc, Even a distance of 5 metres is too close in the case of very large chillers.

DEDUCTION FROM SOUND POWER LEVEL TO OBTAIN SOUND PRESSURE LEVELS AT VARIOUS DISTANCES FROM A CHILLER

Distance "D" in meters	5	10	25	50
Deduction from sound power	-28	-32	-39	-45



ECODESIGN LABEL REGULATION

Our commitment to the environment

At Johnson Controls, we've been dedicated to protecting the environment since our invention of the electric thermostat in 1885, which provided 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.

This commitment is in line with the targets of the European climate and energy package for 2020:

The 5 targets for the EU in 2020

1. Employment
- 75% of the 20-64 year-olds to be employed

2. R&D
- 3% of the EU's GDP to be invested in R&D

3. Climate change and energy sustainability
- **greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990**
- **20% of energy from renewables**
- **20% increase in energy efficiency**

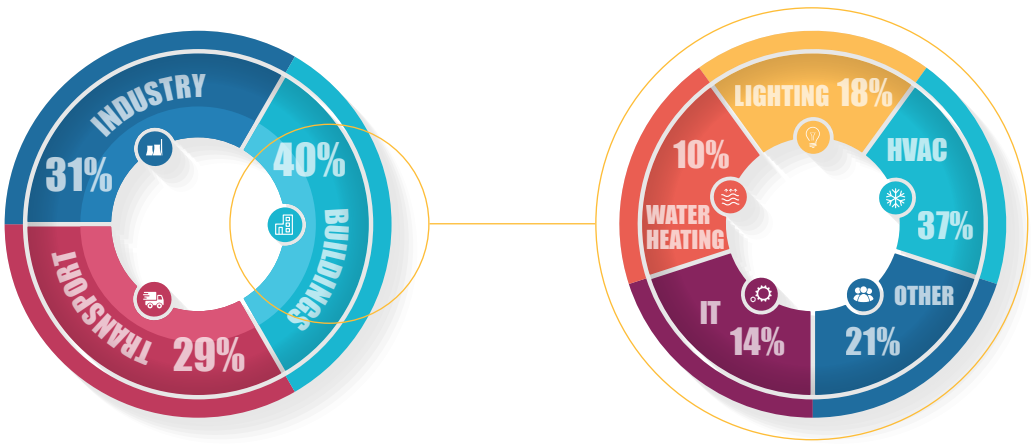
4. Education
- Reducing the rates of early school leaving below 10%
- at least 40% of 30-34-year-olds completing third level education

5. Fighting poverty and social exclusion
- at least 20 million fewer people in or at risk of poverty and social exclusion

Source: http://ec.europa.eu/europe2020/index_en.htm

Energy Efficiency Improvement Targets strongly influence the HVAC Market

Buildings today are the largest consumers of energy, and HVAC systems account for a significant portion of a building's energy consumption. Providing customers with energy efficient solutions is a key development opportunity for the HVAC industry.



Total Energy Consumption | Building Energy Consumption

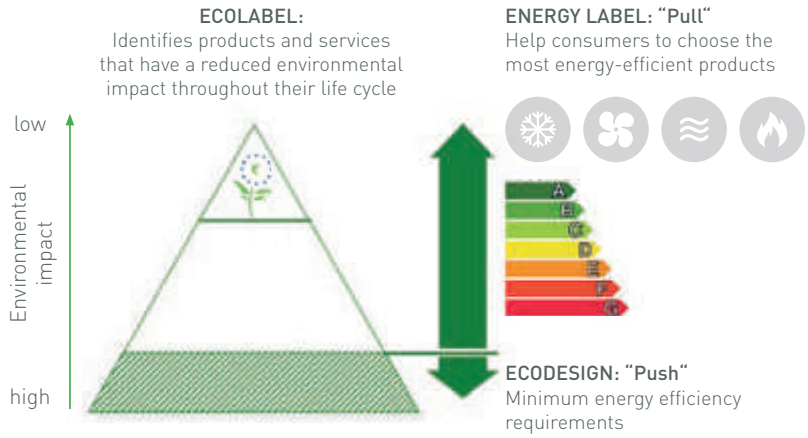
The Regulatory Response

The European Union has developed two directives (Ecodesign Directive 2009/125/EC and Energy Labeling Directive 2010/30/EC) to address the environmental impact of all Energy related Products (ErP) beginning at the earliest stages of design. YORK Chillers and Heat Pumps are currently affected by these directives or will be affected moving forward.

What is Ecodesign Directive?

Ecodesign Directive is a framework that regulates the environmental impact of all products using energy (excluding products in the transport sector). Application of Ecodesign Directive for Chillers and Heat Pumps is enforced through regulations specific to various products and operating ranges. Once a regulation is published and active, products affected must comply with the minimum efficiency performance, sound emissions, etc., to receive a CE mark.

The EU framework for Energy Efficient products' "push and pull effect" on the market



Source: EPEE (https://www.epeeglobal.org/energy-efficiency/)

Which Products are affected by Ecodesign?

Ecodesign directive affects different types of Energy related Products (ErP) including: TVs, washing machines, lights and HVAC products and components. Energy related Products are grouped into "Lots" and the following Lots are applicable to HVAC products.

- **ENER Lot 1: Space Heaters (Heat pumps)**
- **ENTR Lot 1: Professional refrigeration (Process Chillers brine)**
- **ENER Lot 21: Central heating and cooling products (Chillers)**

How and when will Ecodesign Directive affect YORK Chillers and Heat Pumps?

Minimum Efficiency Performance Standards (MEPS) are minimum performance requirements, implemented in 2 steps (Tiers), as shown in the table below.

ECODESIGN
EU Framework Directive 2009 / 125 / EC
Sets the General Rules

		2015	2016	2017	2018	2019	2020	2021
ENER Lot 1 Reg 813/2013	Heat Pumps	T1 Oct15		T2 Oct17				
ENTR Lot 1 Reg 1095/2015	Process Chillers Brine		T1 Jul16		T2 Jul18			
ENER Lot 21 Reg 2016/2281	Process Chillers High Temperature and Comfort Chillers				T1 Jan18			T2 Jan21

ENER Lot 1 - Space Heaters (Heat Pumps)

Published regulation 813/2013 affects all Heat Pumps (both air and water cooled) with a rated heating output below 400kW (measured at -10°C ambient).

The heat pumps affected by this regulation are classified as Low Temperature if heating outlet fluid temperature can not be supplied at 52°C (measured at -7°C ambient).

A new KPI

Ecodesign regulation 813/2013 introduces a new Key Performance Indicator (KPI) for seasonal primary energy efficiency ($\eta_{s,h}$), that allows product efficiency comparison with different energy sources.

$$\eta_{s,h}(\%) = 1/CC \times SCOP - \sum F_i$$

SCOP – Seasonal Coefficient of Performance

Ratio between the annual heating demand and the annual electrical input energy over the entire heating season.

SCOP is calculated using standard EN14825, which takes the following into account:

- Seasonal efficiency while the compressor is running (SCOPon)
- Electrical consumption when the compressor is not running: crankcase heater, standby or OFF mode
- Backup heater required to achieve the defined heating design load

CC – Conversion Coefficient

European average coefficient that represents the amount of primary energy required to obtain electricity.

CC is defined by the regulation with a constant value of 2,5.

$\sum F_i$ – Correction Factors

Air source heat pumps

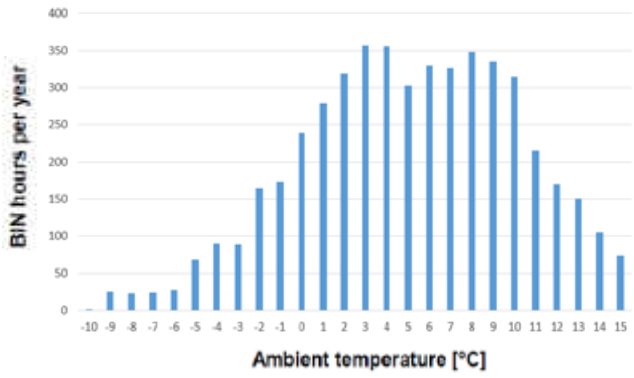
$$\sum F_i = 3\%$$

Water source heat pumps

$$\sum F_i = 8\%$$

A better Indicator

$\eta_{s,h}$ and SCOP are better indicators than full load COP for heating efficiency, as they take into account a representative set of operating hours and real world conditions.



Easy to Compare

$\eta_{s,h}$ is the Seasonal PRIMARY Energy Efficiency value and is used to compare heating products using different energy sources.

Eco-Design Requirements for Space Heaters (Heat Pumps)
MEPS - Minimum Efficiency Performance Standards = $\eta_{s,h}$

	TIER 1 (Oct'15)	TIER 2 (Oct'17)
	$\eta_{s,h}$	$\eta_{s,h}$
Heat Pump	100%	110%
Low Temperature Heat Pump < 400 kW	115%	125%

ENTR Lot 1 – Professional Refrigeration (Process Chillers brine)

Published regulation 1095/2015 affects all Process Chillers operating at design capacity that can generate outlet fluid temperature of -25°C (Low Temperature) or -8°C (Medium Temperature).

High Temperature Process Chillers operating at design capacity that can generate outlet fluid temperature of 7°C are part of ENER Lot 21.

A new KPI

Ecodesign regulation 1095/2013 introduces a new indicator called Seasonal Energy Performance Ratio (SEPR), which is the ratio of annual cooling demand to annual electrical energy consumption.

At this time there is no EN specification to base the SEPR calculation on. The calculation is currently based on the "Transitional method for determination of SEPR for industrial process chillers", published with the regulation.

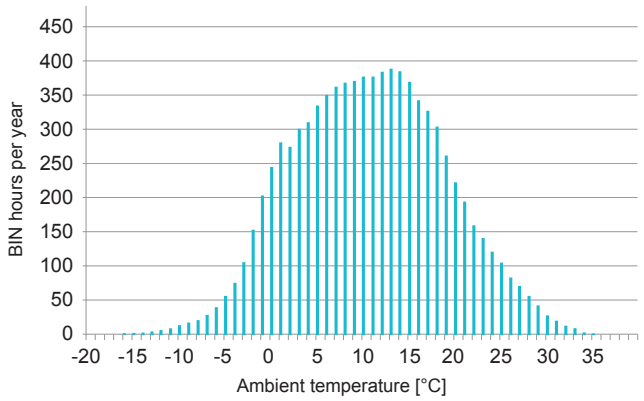
SEPR is calculated from an average climate reference with ambient temperature ranging from -19°C up to 38°C, and with corresponding operating hours at each temperature bin. For Process Cooling, the operating load ranges from 100% down to 80%.

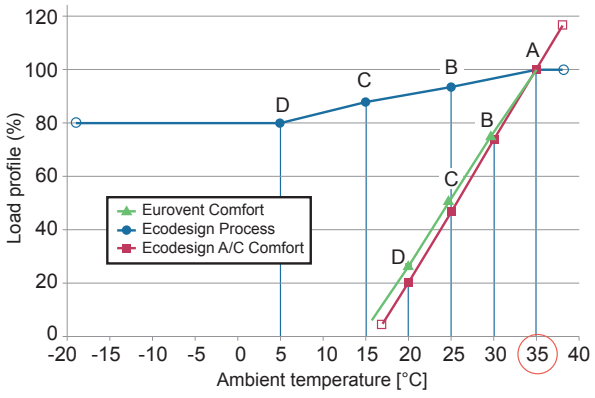
A better Indicator

SEPR is a better performance indicator for process cooling, as it accounts for year round, high load profile operation typical of process cooling applications.

The graph on the left and below displays the distribution of temperature bins and hours used by the regulation as a climate reference. This climate reference is based on weather data from cities throughout central Europe.

The graph on the right and below displays rating points that are part of the SEPR and SEER calculations. Note that SEPR is focused on high loads (typical of process cooling applications) and SEER is focused on variable loads (typical of comfort applications).





Bonus for units using Low Global Warming Potential (GWP) refrigerants

As detailed in the table below, regulation 1095/2015 adjusts the Minimum Energy Performance Standard (MEPS) based on the GWP of the refrigerant used.

Eco-Design Requirements for Process Chillers Medium Temperature
MEPS - Minimum Efficiency Performance Standards = SEPR

EFFICIENCY	1st July 2016		1st July 2018	
	SEPR		SEPR	
	GWP>150	GWP<150	GWP>150	GWP<150
Air to water < 300kW	2.24	2.02	2.58	2.32
Air to water > 300kW	2.80	2.52	3.22	2.90
Water to water < 300kW	2.86	2.57	3.29	2.96
Water to water > 300kW	3.80	3.42	4.37	3.93

ENER Lot 21 - Central Heating and Cooling products (Comfort Chillers, High Temperature Process Chillers)

Regulation 2016/2281 affects High Temperature Process Chillers and Comfort Cooling Chillers with rated cooling capacity below 2.000 kW. For Comfort Cooling Chillers, compliance is based on either Fan Coil application or Cooling Floor application. The manufacturer's technical datasheet is to specify application(s) in compliance.

A new KPI

Ecodesign regulation introduces new Minimum Energy Performance Standards for Comfort Cooling Chillers (SEER), and Process Cooling Chillers (SEPR). In the case of SEPR it will be calculated in a similar way as for process chillers brine. In the case of ($\eta_{s,c}$), it will be calculated in a similar way to $\eta_{s,h}$, used for comfort heating applications.

$$\eta_{s,c}(\%) = 1/CC \times SEER - \sum F_i$$

SEER – Seasonal Energy Efficiency Ratio

Ratio between the annual cooling demand and the annual electrical input energy over the entire cooling season.

SEER is calculated using standard EN14825, which takes the following into account:

- Seasonal efficiency while the compressor is running (SEERon)
- Electrical consumption when the compressor is not running: crankcase heater, standby or OFF mode

CC – Conversion Coefficient

European average coefficient that represents the amount of primary energy required to obtain electricity.

CC is defined by the regulation with a constant value of 2,5.

$\sum F_i$ – Correction Factors

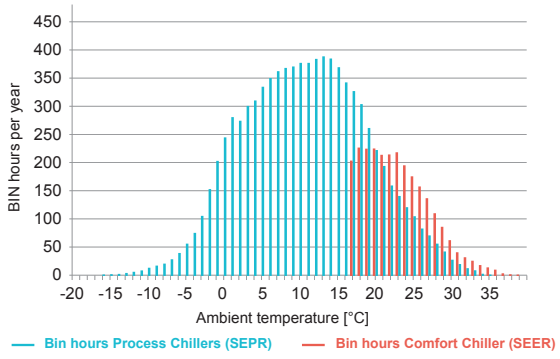
Air-cooled chillers $\sum F_i = 3\%$

Water-cooled chillers $\sum F_i = 8\%$

A better Indicator

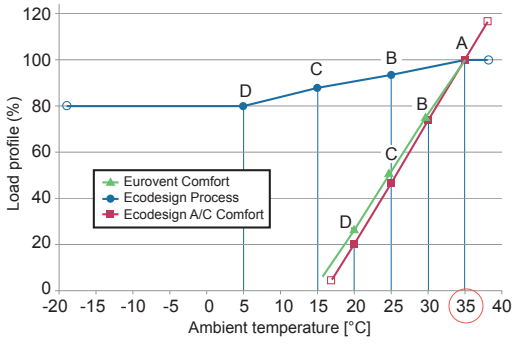
$\eta_{s,c}$ and SEER and SEPR are better performance indicators for cooling, as they take into account temperature bins and hours based on weather data from cities throughout central Europe.

As displayed on the chart below, Process Chillers (SEPR) account for a wider range of temperatures than Comfort Chillers (SEER), which only consider temperatures down to 15°C.



Similar to current ESEER

Seasonal Energy Efficiency Ratio (SEER) is calculated similar to Eurovent Seasonal Energy Efficiency Ratio (ESEER). SEER however uses a different set of ambient temperatures and different weighting as a reference. As a result, SEER values are ALWAYS less than ESEER values.



Eco-Design Requirements for Process Chillers High Temperature
MEPS - Minimum Efficiency Performance Standards = SEPR

		Minimum SEPR value	Minimum SEPR value	Minimum $\eta_{s,c}$ value	Minimum $\eta_{s,c}$ value
Heat transfer medium at the condensing side	Rated refrigeration capacity	TIER 1 (Jan'18)	TIER 2 (Jan'21)	TIER 1 (Jan'18)	TIER 2 (Jan'21)
Air	P_A < 400 kW	4.5	5.0	149	161
	P_A ≥ 400 kW	5.0	5.5	161	179
Water	P_A < 400 kW	6.5	7.0	196	200
	400 kW ≤ P_A < 1 500 kW	7.5	8.0	227	252
	P_A ≥ 1 500 kW	8.0	8.5	245	272

Product Information

Manufacturers are to provide to installers and end users instruction and access to a website that makes available (for free) a new "Technical Data Sheet" document summarizing the values used for the MEPS ($\eta_{s,c}$, SEPR or $\eta_{s,h}$) calculation.

Below is an example of the "Technical Data Sheet" as it appears in regulation 2016/2281:

Information requirements for comfort chillers							
Model(s): Information to identify the model(s) to which the information relates:							
Outdoor side heat exchanger of chiller: (select which: air or water/brine)							
Indoor side heat exchanger chiller: (default: water)							
Type: compressor driven vapour compression or sorption process							
If applicable: driver of compressor: (electric motor or fuel driven, gaseous or liquid fuel, internal or external combustion engine)							

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	$P_{rated,c}$	x,x	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	x,x	%
Declared cooling capacity for part load at given outdoor temperature T_j				Declared energy efficiency ratio or gas utilisation efficiency/auxiliary energy factor for part load at given outdoor temperature T_j			
T_j = + 35°C	Pdc	x,x	kW	T_j = + 35°C	EER_d or $GUE_{c,bin}/AEF_{c,bin}$	x,x	%
T_j = + 30°C	Pdc	x,x	kW	T_j = + 30°C	EER_d or $GUE_{c,bin}/AEF_{c,bin}$	x,x	%
T_j = + 25°C	Pdc	x,x	kW	T_j = + 25°C	EER_d or $GUE_{c,bin}/AEF_{c,bin}$	x,x	%
T_j = + 20°C	Pdc	x,x	kW	T_j = + 20°C	EER_d or $GUE_{c,bin}/AEF_{c,bin}$	x,x	%
Degradation coefficient for chillers (*)	C_{dc}	x,x	-				

Power consumption in modes other than "active mode"							
Off mode	P_{OFF}	x,xxx	kW	Crankcase heater mode	P_{CK}	x,xxx	kW
Thermostat off mode	P_{TO}	x,xxx	kW	Standby mode	P_{SB}	x,xxx	kW

Other items							
Capacity control	fixed / staged / variable			For air-to-water comfort chillers: air flow rate, outdoor measured	-	x	m^3/h
Sound power level, outdoor	L_{WA}	x,x/x,x	dB	For air-to-water comfort chillers: air flow rate, outdoor measured	-	x	m^3/h
Emissions of nitrogen oxides (if applicable)	NO_x (**)	x	mg/kWh input GCV				
GWP of the refrigerant			kg $CO_{2\ eq}$ (100 years)				
Standard rating conditions used: (low temperature application/medium temperature application)							
Contact details	Name and address of the manufacturer or of its authorised representative						

(*) If C_{dc} is not determined by measurement then the default degradation coefficient of chillers shall be 0.9.
(**) From 26 September 2018

General Information: Unit name, Air/Water cooled, type compressor

Mode "On" information: Capacity, efficiency at different temperatures for partial load points A,B,C and D

Mode "Off" information: Power input Auxiliaries (crankcase heater, stand-by mode, etc)

Other information: Sound, GWP, flow rates, application:
- Floor heating/fancoils
- Fancoils/Chilled beams

Compliance

All YORK products on the EU market comply with applicable Ecodesign regulations. In many cases YORK products offer significantly better energy efficiency than required by regulation, resulting in an attractively low cost of operation and lighter environmental footprint.

Air Handling Systems & Terminal Devices

AIR HANDLING UNITS

FAN COIL UNITS

CLOSE CONTROL UNITS

SMARTPAC – FACTORY PACKAGED CONTROLS

Johnson Controls

So why choose YORK® Air Handling Units?

We recognise that your reputation depends on the quality of the products you choose and how well they are installed. That's why we work hard to make selecting, installing and operating our products as easy as possible. Our comprehensive range includes a number of additional options that make YORK® Air Handling Units the professional's choice. Additionally, our Air Handling Units comply with requirements of EU Commission Regulation No. 1253/2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for ventilation units.

Factory Packaged controls

Save money and time avoiding to mount controls on-site. Johnson Controls offers YORK® Air Handling Units complete with Metasys® factory packaged controls so it is ready connect to the site network when it arrives.

Our Factory Packaged controls undergo a detailed testing process at the factory to ensure that all wiring is installed correctly, and that all control panels and end devices work appropriately before the AHU is shipped.

BACnet

METASYS

LonMark INTEROPERABILITY ASSOCIATION

Factory Packaged Controls option

- AHUs Metasys® factory packaged controls specified option available.
- Panel Power wiring, Controls wiring and the Variable Speed Drive are included. The pre-engineered controller and required peripheral devices are all supplied factory fitted and tested.
- Guaranteed compliance with European installation regulations.
- Simplified final commissioning through the units' keypad and display.

Energy recovery options

The exhaust air stream from an AHU represents another opportunity to save energy. A **heat recovery 'thermal' wheel** can economically transfer heat and moisture between the exhaust-air and outside-air paths, reducing the cost of conditioning the supply air.

For the simplest form of heat recovery, you can take advantage of **"free" cooling** with mixing box sections. During spring and autumn operation, cool/dry outside air cools and dehumidifies the facility, reducing the need for mechanical cooling.

Alternatively, you can use **recuperative plate heat exchangers**. These also allow free cooling in summer by use of face and bypass dampers which by-pass the air around the exchanger so that it is not warmed by the extracted air.

We can also offer **refrigerant heat pipe** and **heat recovery coils** on your AHU to maximise energy savings. All heat recovery devices installed are compliant with latest ErP regulations.

Heat-recovery wheels reduce the cost of conditioning supply air.

Reduce fan operating costs

In an AHU, the fan is traditionally the largest source of energy consumption. We can help reduce this by offering a range of **energy-saving options**.

- High- or premium-efficiency motors can be specified.
- Direct-drive plenum fans eliminate belt-and-pulley energy losses.
- If the air system is designed for variable-air volume (VAV), YORK® AHUs fitted with variable speed drives offer the most efficient method of VAV fan control.
- Factory-mounting a variable speed drive reduce jobsite labour costs, unit energy consumption and unit Life Cycle Costs.

Introducing the YMA range of Air Handling Units

The YORK® YMA range encompasses our extensive knowledge of air-handling, offering a highly reliable, economical and energy efficient product capable of addressing all of your needs.

Features

The YMA family of air handling units consists of a range of models having air volumes ranging from 0.25 m^3/s to 50 m^3/s and total static pressures as high as 2000 Pascal: to ensure maximum flexibility and the best solution for your application, units are available in increments of 40mm in height and 50mm in width.

YMA Air Handling Units can be manufactured in varied configurations, with a wide selection of components, to meet customer requirements. Units are also available in line with the requirements of hospital sector specifications.

Dimensional flexibility. Space constraints are a reality on most construction projects. YORK® AHU's design is based on variable aspect ratios, so the unit can be specified to fit the application and space.

Material flexibility. Different environments require different materials so we offer a number of construction materials, including galvanized steel, pre-coated steel, stainless steel, and aluminium.

Component flexibility. To meet any AHU requirement, our units offer every available air-handling component. And as applicable technology creates new capabilities, Johnson Controls will apply this to our product range.

Over the past 50 years we have supplied air handling units for:

- **Commercial space:** office buildings, cinemas, concert halls
- **Institutional space**: schools, universities, churches
- **Industrial manufacturing:** automotive, aerospace, chemical, petrochemical
- **Hygienic systems:** hospitals, life sciences, R&D facilities, food processing, clean rooms
- **Process manufacturing:** pharmaceutical, electronics, semiconductor

Equipment Life Cycle. Each YMA unit has a designated suffix ('S', 'T', or 'R') that identifies the factory of origin. This makes it easier to identify and locate production and technical data to assist in advising on spare parts, as well as supporting the customer with any post installation modifications or upgrades that may be requested during the life of the unit.

YMA
Custom Air Handling Units

A complete range from 0.25 m^3/s to 50 m^3/s

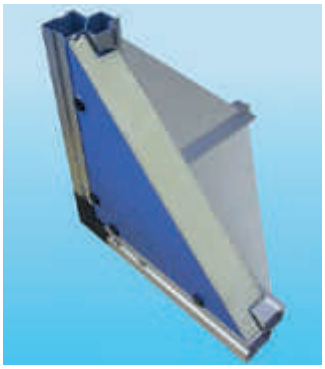
Features

The YMA family of air handling units consists of a range of models having air volumes ranging from 0.25 m^3/s to 50 m^3/s and total static pressures as high as 2000 Pascal: to ensure maximum flexibility and the best solution for your application, units are available in increments of 40mm in height and 50mm in width.
YMA Air Handling Units can be manufactured in varied configurations, with a wide selection of components, to meet customer requirements.
Units are also available in line with the requirements of hospital sector specifications.

Units may include combinations of any of the following:
- Single or double decked units.
- Indoor or outdoor applications - Outdoor units are available with a flat or sloping roof, louvres, rainhoods, birdscreens and special finishes.
- Site assembled units.
  Where space constraints restrict the size of a single item modules can easily be aligned and locked together by gaskets and stainless steel bolts inserted into factory predrilled assembly holes.
- Air mixing boxes and various filter options.
- Gas fired burners.
- Cooling and heating coils.
- Humidifiers
- Heat recovery systems.
- UV sterilising lamps.
- Dessicant and thermal wheels.
- Sound attenuation.
- ATEX Certification.
- Factory fitted controls and sensors with YORK SmartPAC Factory Packaged Controls.
  These include all necessary piping, wiring, controls and refrigeration equipment to provide a complete central air conditioning plant.
- Hygienic construction option for hygiene sensitive environments.

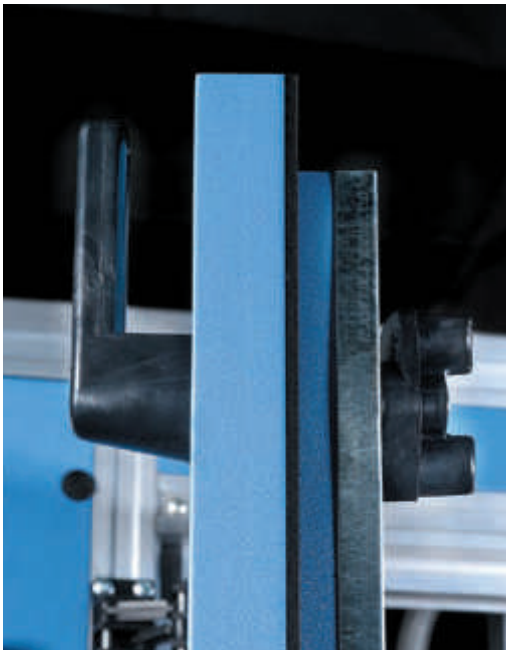
The Frame

- Low weight, corrosion resistant, marine aluminium alloy twin box section profile, designed to provide strenght and stability
- Gaskets between the frameworks' panels and profiles, to allow efficient cleaning and prevent trapping and harmful bacteria growth
- Optional thermal bridge free profile
- Unit sections mounted on a 3mm thick galvanized steel bolted base frame



Standard Construction

Cold Bridge Free Construction



Panels

- Standard 60mm thick (40mm optional) double skinned galvanized panels
- 0.7mm internal and external skins with 40kg/m³ density pressure injected polymerised polyurethane foam insulation
- Returned "K" value of 0.2W/m C
- Optional panels manufacturing from pre-plastic coated steel, pre-painted metal or stainless steel
- Mineral wool infill panel of 100kg/m3 density available
- 88mm panels available upon request

Access

- Fully removable panels
- Access doors equipped with half turn nylon handles and cam locks
- Fibreglass reinforced plastic hinges with stainless steel pivots
- Double glazed viewing portholes (optional)

Mechanical characteristics- prEN 1886:2007*

***EUROVENT DIPLOMA 05.02.314 YMA(S) APPLIES**

MODEL	CASING STRENGTH CLASS	CASING AIR LEAKAGE CLASS AT 400 Pa	CASING AIR LEAKAGE CLASS AT 700 Pa	THERMAL LEAKAGE CLASS	FILTER BYPASS TRANSMITTANCE CLASS	THERMAL BRIDIGING FACTOR CLASS
PU6055ST	D1(M)	L1(M)	L1(M)	F9(M)	T2	TB3
PU6040TB	D1(M)	L1(M)	L1(M)	F9(M)	T1	TB2
RW6055ST	D2(M)	L2(M)	L2(M)	F9(M)	T2	TB3
RW6055TB	D1(M)	L1(M)	L2(M)	F9(M)	T2	TB2
PU6055TB	D1(M)	L1(M)	L1(M)	F9(M)	T1	TB2

YMB / YPS
Modular Air Handling Units

A complete range from 0.28 m^3/s to 28 m^3/s

Our YMB and YPS range are DIN1946-4 certified

Building and indoor climate requirements are constantly evolving. They can be influenced by many factors: energy legislation, occupancy churn, lighting, IT infrastructures... all important reasons that highlight the need for reliable, efficient Air Handling units.

Suitable for use in either new building developments or upgrades and refitting of existing buildings, our **YMB** range of AHU is a range of modular, Fixed Aspect Ratio units designed with efficiency and cost in mind to meet the needs of more 'commercial' installations.

Our knowledge, flexibility and commitment to the customer address four primary requirements of building owners and designers–efficiency, flexibility, sustainability, and confidence.




YMBS / YMBD Modular Air Handling Unit characteristics

Available sizes	12	
Airflow range (m^3/h)	1 000 ~ 100 000	
Application	· housing and retail construction industry · public utility buildings · industrial facilities construction · leisure facilities	
Basic options	· G4 class filters · F5, F7, F9 class filters · heat recovery · water / steam / glycol / electric heater · water / glycol / freon cooler · humidification, fan and attenuation section	
Additional options	· sub-assemblies manufactured as explosion-proof · swimming pool version · hygienic version · YORK® SmartPAC Factory Packaged Controls	
Heat recovery	· recirculation · cross-flow heat exchanger · rotary heat exchanger	· heat pipe · glycol recovery system · heat pump
Installation type	indoors (YMBS) / outdoors (YMBD)	

CE

YPS Modular Air Handling Unit characteristics

Available sizes	4
Airflow range (m³/h)	500 ~ 5 100
Application	· in suspended ceilings and wherever building construction limitations do not allow other systems to be implemented, e.g. in: · industrial workshops · warehouses · wholesale establishments · workshops · offices, etc
Basic options	· G4 class filters · F5, F7, F9 class filters · heat recovery · water / steam / glycol / electric heater · water / glycol / freon cooler · humidification, fan and attenuation section
Additional options	· sub-assemblies manufactured as explosion-proof · automation module · automation module designed to cooperate with intelligent BMS system · YORK® SmartPAC Factory Packaged Controls
Heat recovery	· cross-flow heat exchanger · recirculation
Installation type	indoors

YMBS/YMBD and YPS performances

YMBS/YMBD*				
Unit size	Airflow range [m³/h]	Width B	Height H1	Height H2
Insulation 50 mm				
1	1 000 - 3 000	690	600	1 280
2	2 600 - 4 100	740	700	1 480
3	3 900 - 6 100	980	700	1 480
4	6 000 - 9 400	980	1 010	2 100
5	8 000 - 12 600	1 290	1 050	2 100
6	9 600 - 15 100	1 290	1 250	2 500
5-BIS	11 000 - 17 000	1 580	1 050	2 100
6-BIS	13 200 - 21 000	1 580	1 250	2 500
7	13 500 - 21 300	1 580	1 370	2 740
7-BIS	18 000 - 28 000	1 885	1 370	2 740
8	21 300 - 33 700	1 885	1 670	3 340
9	26 000 - 41 000	1 885	2 020	4 040
8-BIS	30 000 - 46 000	2 400	1 670	3 340
10	34 000 - 53 000	2 400	2 020	4 040
8A-BIS	38 000 - 59 000	3 000	1 670	3 340
11	43 000 - 69 000	2 400	2 500	5 000
10-BIS	46 000 - 71 500	3 000	2 020	4 040
12	57 000 - 90 000	3 000	2 500	5 000
12-BIS	68 000 - 106 000	4 800	2 020	-

* YMBD only in 50 mm thick insulation (optionally, YMBS and YMBD in 70 mm thick insulation)

YPS			
Unit size	Airflow range [m³/h]	Width B	Height H
Insulation 40 mm			
1	500 - 3 000	760	395
2	1 100 - 4 500	1 070	395
3	800 - 3 600	760	525
4	1 700 - 5 100	1 070	525

YMBS/YMBD

YPS

YBV
“Plug and Play” Air Handling Units

A complete range from 400 m^3/h to 5000 m^3/h

Introducing the new YBV series of self contained Air Handling Units from YORK®. YBV units are a range of compact Air Handling units offering true Plug and Play capability using our Verasys™ BMS system – Their ready-to-use control functions are provided for accessories such as cooling units and heating coils and wiring is done by means of cables with quick connectors. Additionally, energy-saving fans and efficient heat recovery devices offer full control of temperatures, airflows and operating times to give you optimal operational economy.

For ease of maintenance, inspection doors are large for easy component access and all major components are side removable. **YBV series** units can be selected and ordered quickly and easily, and have a short lead time – offering you a space saving, time saving, cost saving, energy saving solution!

The **YBV** range comprises the following models:

- **YBVS series**, with counter flow or cross flow heat exchanger
- **YBVR series**, as per YBVS series but with rotary wheel heat exchanger
- **YBVD series** – compact, low capacity range with counter flow or cross flow heat exchanger

YBVS Air Handling Unit characteristics

Available sizes	4
Airflow range (m^3/h)	400 ~ 3 800
Application	· offices · kindergatrens · houses, shops · public utility buildings, etc
Basic options	· G4 class filter · heat recovery · water / electric heater · 2 axial-flow centrifugal fans · by-pass · SMART EQUIPMENT™ automation module
Additional options	· EC fans · automation module designed to cooperate with any BMS system
Heat recovery	· counter-flow heat exchanger (in size 1) · cross-flow heat exchanger (in sizes 2, 3, 4)
Installation type	· indoors
Other features	· self-supporting housing structure · plug&play inistallation type · ducts connected from the top · low noise level

SMART EQUIPMENT

CE

System advantages

- Easy and simple installation (plug&play)
- Reduced cost of operation due to high-effinciency heat exchanger (91% recovery - YBVS-1)
- Low noise level
- A by-pass integrated with the cross-flow heat exchanger allows for operation without heat recovery
- Self-supporting housing structure - without aluminium profiles
- Attractive and minimalistic style
- Ensured supply of a suitable volume of fresh and additionally cleaned air
- Ensured high quality air and good effect on the health of people staying rooms
- Automatic components supplied with Johnson Controls Factory Packaged Controls

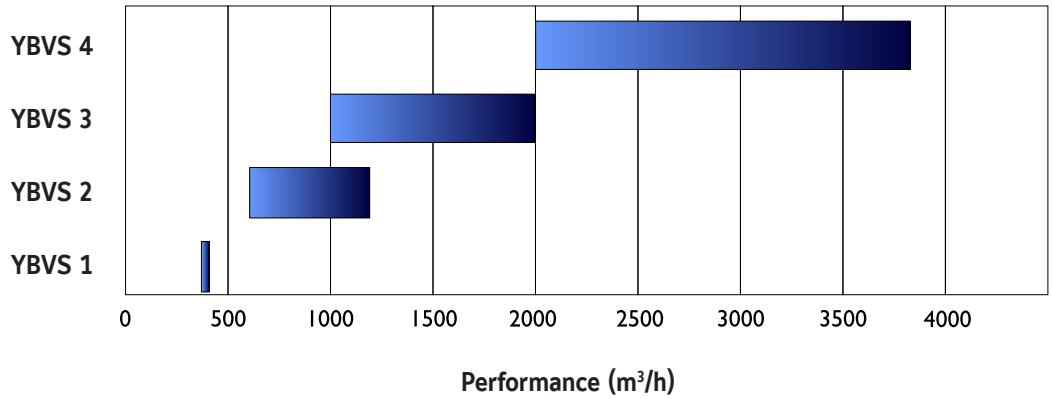
The **YBVS 2, 3, 4** unit has two axial-centrifugal fans. Supply fan removes contaminated warm air from the room and the exhaust fan, transports cold feed air.

Both streams are decontaminated on filters and pass through the cross-flow heat exchanger, where heat is exchanged between the streams. Additionally, fresh air, after passing through the cross-flow exchanger, is heated by an electrical or water heater to the required temperature of the supplied air.

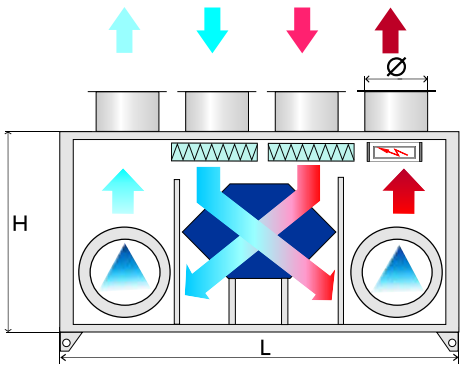
The unit has an integrated by-pass.

Functions:

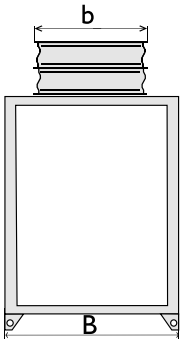
- Night cooling of rooms during summer by bypassing the cross-flow exchanger, when the outdoor temperature is lower than the indoor temperature.
- Defrosting of the heat exchanger

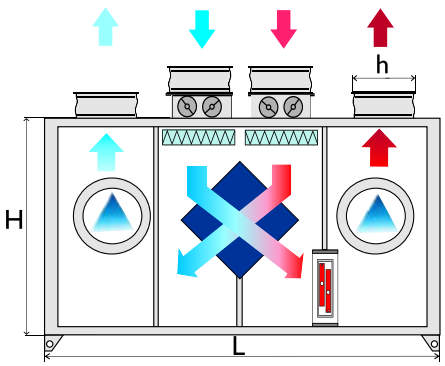


Unit size	Weight [kg]	Dimensions [mm] Width B	Height H	Length L	Flexible connections, dampers B x H	Airflow range [m³/h] min	max	Max heat recovery [%]
1	85	550	600	1 100	fi 160	400	400	91
2	180	750	850	1 300	400 x 200	600	1 200	72
3	240	800	1 000	1 600	500 x 315	1 000	2 000	78
4	380	880	1 300	2 200	630 x 400	2 000	3 800	70



YBVS 1





YBVS 2, 3, 4

YBVR Air Handling Unit characteristics

Available sizes	4
Airflow range (m³/h)	500 ~ 5 000
Application	· offices, houses, shops · kindergatrens · public utility buildings, etc
Basic options	· G4, M5, F7 class filters · heat recovery – rotary heat exchanger · water / electric heater · 2 EC fans modules · SMART EQUIPMENT™ automation module
Additional options	· cooling section · automation module designed to cooperate with a larger BMS system
Heat recovery	· rotary heat exchanger
Installation type	· indoors
Other features	· self-supporting housing structure · ducts connected from the top · plug&play inistallation type · low noise level

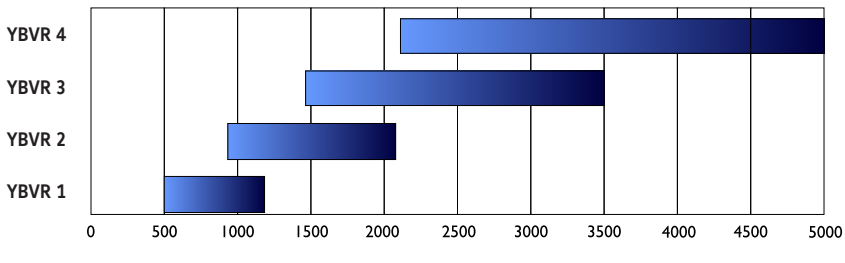
SMART EQUIPMENT

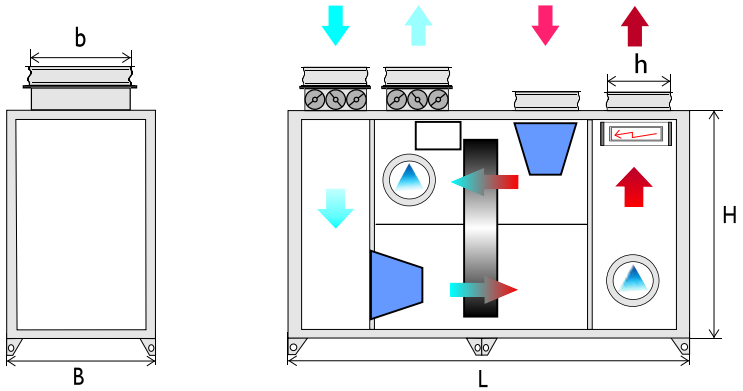
System advantages

- Easy and simple installation (plug&play)
- Reduced cost of operation due to high-effinciency heat exchanger with 90% recovery
- Low noise level
- Attractive and minimalistic style
- Ensured supply of a suitable volume of fresh and additionally cleaned air
- Ensured high quality air and good effect on the health of people staying rooms
- Automatic components supplied with Johnson Controls Factory Packaged Controls

The **YBVR** unit has fans with EC motors. Supply fan removes contaminated warm air from the room and the exhaust fan, transports cold feed air.

Both streams are decontaminated on filters and pass through the rotary wheel heat exchanger, where heat is exchanged between the streams. Additionally, fresh air, after passing through the rotary wheel exchanger, is heated by an electrical or water heater to the required temperature of the supplied air.





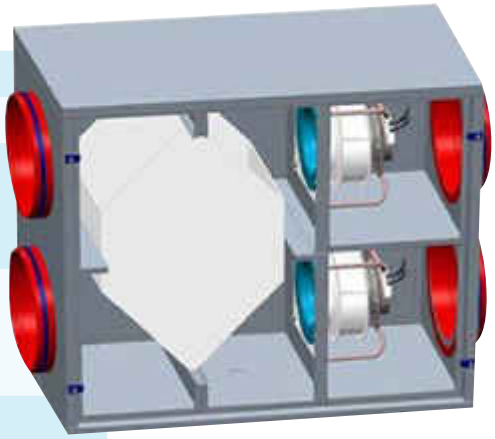
Unit size	Weight [kg]	Dimensions [mm] Width B	Height H	Length L	Flexible connections, dampers B x H	Airflow range [m³/h] min	max
1	180	750	900	1 400	300 x 200	500	1 200
2	270	900	1 100	1 700	400 x 200	900	2 100
3	360	1 100	1 250	1 800	600 x 300	1 450	3 500
4	440	1 200	1 400	2 050	800 x 400	2 100	5 000

CE

Manufacturer reserves the rights to change specifications without prior notice.

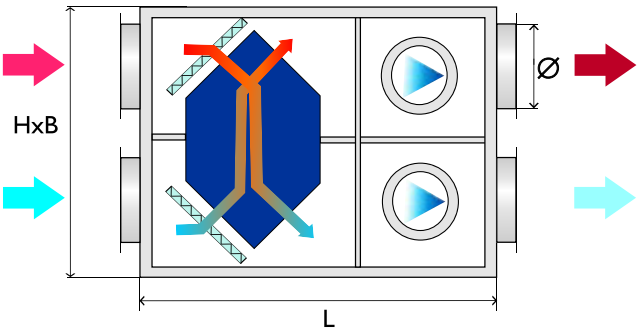
YBVD Air Handling Unit characteristics

Available sizes	2
Airflow range (m³/h)	800 ~ 1 200
Application	· offices · kindergatrens · houses, shops · public utility buildings, etc
Basic options	· G4 class filter · heat recovery - counter-flow/cross-flow heat exchanger · 2 EC fans modules · SMART EQUIPMENT™ automation module
Additional options	· cooling section · automation module designed to cooperate with a larger BMS system
Heat recovery	· counter-flow heat exchanger · cross-flow heat exchanger
Installation type	· indoors
Other features	· self-supporting housing structure · plug&play inistallation type · low noise level

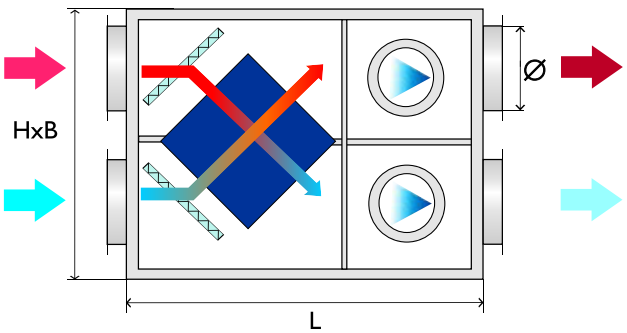


Unit size	Weight [kg]	Width B	Height H	Length L	Flexible connections, dampers Ø mm	Airflow range [m³/h]	Max efficiency [%]
			Dimensions [mm]				
Counter-flow exchanger							
1	150	560	1 009	1 459	350	800	90
2	180	760	1 009	1 459	350	1 200	90
Cross-flow exchanger							
1	130	560	1 009	1 213	350	800	82
2	170	860	1 009	1 213	350	1 200	82

YBVD
with counter-flow exchanger



YBVD
with cross-flow exchanger



CE Manufacturer reserves the rights to change specifications without prior notice.

YTA
Adiabatic Air Handling Unit

YTA series units utilise free cooling with adiabatic cooling to ensure high system energy savings.

The YTA series units are the ideal solution to cool air in systems where environmental sustainability and energy savings are priorities, such as large, best-of-breed data centers, ensuring a performance similar to direct **FREE COOLING** without however contaminating air-conditioned premises, with air contains pollutants, dust, and humidity.

The units are designed to be installed outdoors, typically on the roof, and consist of two treatment sections, one for inside air and another for outside air, physically separated and with two filtering, ventilating and completely independent sections.

Features

- EUROVENT certified Plate Heat Exchanger
- OXYVAP® evaporative panel
- White RAL 9010 metal structure
- Panels with 50-mm thermal and acoustic insulation
- G4-class efficiency air filters with dirty filter alert
- Electronic EC FANS
- Electric panel complete with control and safety devices
- Control microprocessor with graphic display
- Unit shutdown system for the presence of fire
- RS485 Modbus® RTU slave card
- RJ45 ethernet card

Indirect free cooling with adiabatic cooling

The indirect FREE COOLING system with adiabatic cooling includes both the technology of air-to-air heat recovery and that of adiabatic cooling, in which some water is evaporated to cool down outside air.

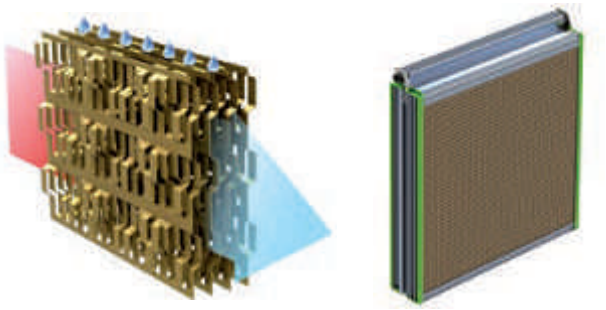
Being able to exploit the **FREE COOLING system even at temperatures of 30°C/35%Rh, these units achieve very high energy efficiency, offering energy savings of up to 80% compared to a comparative to a mechanical cooling system.**

An innovative evaporative panel

In order to maximise the system efficiency, an innovative evaporative panel is used that allows **saturation efficiency greater than 90% using more than 60% less water.**

Thanks to the **OXYVAP® system**, formed by special **formed and treated aluminium fins**, it is possible to:

- **Use drinkable water**. No expensive water demineralisation systems are required.
- **Cut down on water consumption**. Over 60% water reduction with respect to conventional evaporative panels and spraying systems.
- **Eliminate the risk of mould, algae and pathogenic organism formation.** The surface treatment of aluminium fins and the absence of a collection and water circulation tank eliminates the risk of pathogenic organism formation.



Available accessories

Direct expansion:

- Direct expansion, supplementary post cooling circuit with DC inverter compressors
- Power supply line for remote condenser
- Power supply line with speed regulator for remote condenser
- Condensing regulation with 0-10V signal for remote condenser with EC fans
- "LT Kit" for operation with low temperature outside air with remote condenser
- Oversize liquid receiver
- Check valves on the supply and liquid pipes
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature adjustment valve
- "HT Kit" for operation at high condensing temperatures

Chilled water:

- Chilled water, supplementary post cooling circuit with adjustment two-way valve
- Three-way control valves
- Inlet and outlet water temperature sensors
- "Power valve" kit

Mechanical and structural:

- Condensate drain and adiabatic panel discharge pump
- Outside air flow motorised dampers
- Inside air flow motorised dampers
- Motorised damper for environment overpressure management
- M5 efficiency class air filters

Electrical:

- Alternative voltages available: 460V/3ph/60Hz - 380V/3ph/60Hz - 230V/3ph/60Hz
- Electrical supply line without neutral
- Automatic transfer switch (ATS), "Basic" version
- Automatic transfer switch (ATS), "Advanced" version

Regulation:

- Constant air flow control
- Constant pressure control
- Local network set up and connection cable
- User terminal for remote installation
- Flooding detection system

YORK® Fan Coil units

Driven by innovative trends and modern technology, the YORK® Fan Coil Units have been designed around a platform of models, versions and accessories, which have been independently tested and certified by Eurovent. The YORK® Fan Coil range meets today's demanding requirements of performance, size, acoustics, low energy, ease of installation and maintenance.

An extensive offering

- One of the **most versatile** ranges of fan coils on the market today. Wall and ceiling mounted units, exposed or concealed with centrifugal fan, are included, and with cooling capacities ranging from 0.6 kW to 9.7 kW.

- Dramatic **electrical consumption reduction** of up to 40% comparative to previous models. This is achieved thanks to the supply of all YORK® Fan Coil Units equipped with centrifugal fans and electric motors, and with 6 speed motors as standard to offer greater flexibility in the selection of products.

- **Energy saving brushless motor** technology option available. Its combination with a dedicated frequency inverter and unit controller to regulate the fan speed enables higher efficiencies, even at low rotational speeds, lower unit noise, constant speed characteristics and an increase in motor lifetime expectancy. In comparison to the traditional units equipped with asynchronous three-speed-motors, units with brushless motors can obtain a considerable energy saving, by reducing the power consumption by up to 70%.

- A full range of **factory fitted Johnson Controls valve and pre-configured control options** is offered. This in addition to a patented 'wireless' control option - offering greater flexibility in the installation of units, with the highest precision in monitoring and maintaining the desired comfort conditions.

- Many of our ranges our available configured for use with 60Hz voltage, and specially designed cooling coils for **District Cooling applications.**

- **High pressure 'Blower' units** are also available. They can offer up to 29.4 kW of cooling at External Static Pressures of up to 250Pa, and are complemented with a full range of options and accessories covering items such as electrical heating battery, air inlet/outlet diffusers and condensate pumps.

SMART EQUIPMENT

Iconography

Infrared or Wired control	Wired control	Dry mode	Timer	Auto Restart	Sleep mode	Auto Sweep	Ducted Installation	4 Way Air Flow	Air Filter

YFCN Fan Coil Unit centrifugal fan

2 & 4 pipe system

A complete range from 0.7 kW to 7.4 kW

Wired controls

JWC-3V
Remote three speeds controller

JWC-T
JWC-3V + Electronic thermostat and Summer/Winter switch

JWC-AU
Automatic JWC-T

JTM-B
Digital Automatic Remote controller

WM-503
Digital Automatic Remote controller to be mounted in the standard light wall box

Infrared control

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

SMART EQUIPMENT

YFCN is a range of Fan Coil Units that continues the YORK® tradition based on high reliability and low noise levels. It is the result of great commitment in terms of energy and resouces to offer a more modern product from every angle, while still delivering the convenience of easy access to the filters in all models.

Moreover each version has the same internal structure, identical in both horizontal and vertical models, in order to standardise production and guarantee a greater flexibility in distribution and installation.

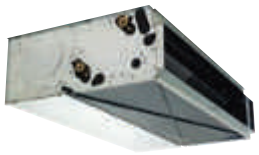
Features

- New casing, improved aesthetics, suitable for any modern indoor ambient
- Full range for all needs: 9 sizes suitable for horizontal or vertical mounting with or without casing
- Low noise operation
- 3 fan speeds (possible choice between 6 fan speeds)
- Single piece discharge grid
- Several coil choices. Single: 3 or 4 rows; Dual: 3 rows cooling & 2 rows heating
- Electrical heater optional
- Suction and discharge plenum optional
- Factory fitted valve (on/off or modulating) and controller packages
- Painted back panel option
- 4 available versions in all range:
  VC = Vertical Discharge with Casing
  VCB = Vertical Discharge with Casing (floor installation)
  HC = Horizontal Discharge with Casing
  CD = Concealed unit without Casing
- EUROVENT Certified

Selection software

YFCN Fan Coil Unit centrifugal fan

0.7 to 7.4 kW



Technical features

Model			140	240	340	440	540	640	740	840	940
Total cooling capacity [kW]	(1)	max	1.20	1.78	2.53	3.08	4.03	4.71	5.48	6.34	7.42
		med	1.00	1.41	1.87	2.25	3.21	3.81	4.56	5.63	6.41
		min	0.65	1.00	1.63	1.81	2.17	2.79	3.51	3.97	4.79
Sensible cooling capacity [kW]	(1)	max	0.94	1.35	1.86	2.30	3.01	3.52	4.13	4.93	5.87
		med	0.77	1.05	1.36	1.65	2.36	2.81	3.39	4.33	4.98
		min	0.49	0.73	1.18	1.32	1.58	2.03	2.57	2.98	3.63
Water flow in cooling [l/h]	(1)	max	212	311	442	537	703	824	960	1 113	1 307
		med	175	246	325	392	559	664	798	986	1 125
		min	115	174	284	315	377	487	612	693	839
Pressure drop in cooling [kPa]	(1)	max	5.6	13.9	11.5	15.5	31.3	36.2	27.7	32.2	23.2
		med	4	9.1	6.7	9	20.8	24.8	20	26.0	17.8
		min	1.9	4.9	5.3	6.1	10.4	14.4	12.5	14.0	10.6
Heating capacity 2 pipes [kW]	(2)	max	1.31	1.83	2.59	3.14	4.01	4.92	5.59	7.20	8.52
		med	1.07	1.43	1.87	2.27	3.16	3.90	4.62	6.27	7.18
		min	0.69	0.99	1.62	1.80	2.10	2.82	3.49	4.26	5.23
Water flow in heating 2 pipes [l/h] *	(2)	max	212	311	442	537	703	824	960	1 113	1 307
		med	175	246	325	392	559	664	798	986	1 125
		min	115	174	284	315	377	487	612	693	839
Pressure drop in heating 2 pipes [kPa]	(2)	max	5.3	11.8	9.8	12.8	25.2	31.8	23.2	31.7	23.7
		med	3.7	7.6	5.4	7.2	16.6	21.1	16.6	24.9	17.6
		min	1.7	4.0	4.2	5.0	8.1	11.9	10.1	12.8	10.0
Heating capacity 4 pipes [kW]	(3)	max	0.91	1.33	1.99	2.33	3.00	3.33	4.20	4.75	5.46
		med	0.77	1.09	1.56	1.81	2.50	2.79	3.59	4.26	4.79
		min	0.55	0.83	1.40	1.52	1.84	2.19	2.89	3.16	3.71
Water flow in heating 4 pipes [l/h] *	(3)	max	78	114	171	200	258	287	361	408	470
		med	66	94	134	156	215	240	309	366	412
		min	47	71	120	131	158	188	249	272	319
Pressure drop in heating 4 pipes [kPa]	(3)	max	1.3	3.1	7.8	10.3	3.2	3.8	6.7	8.3	10.7
		med	1.0	2.2	5.1	6.6	2.3	2.8	5.1	6.9	8.5
		min	0.5	1.3	4.2	4.9	1.3	1.8	3.5	4.1	5.4
Air flow [m3/h]		max	220	295	385	485	650	760	925	1 200	1 500
		med	175	220	270	335	495	590	735	1 020	1 210
		min	105	145	235	265	315	415	535	655	830
Sound power level [dB(A)]		max	45	47	49	47	48	52	56	60	64
		med	39	40	40	39	41	46	51	56	58
		min	32	30	36	33	31	37	42	45	50
Sound pressure level [dB(A)]	(4)	max	36	38	40	38	39	43	47	51	55
		med	30	31	31	30	32	37	42	47	49
		min	23	21	27	24	22	28	33	36	41
Power supply [V-ph-Hz]			230 / 1 / 50 + E								
Power input [W]		max	33	40	49	57	61	88	103	130	176
Absorbed current [A]		max	0.16	0.18	0.23	0.26	0.27	0.39	0.47	0.58	0.78
Dimensions **	Height	mm	530	530	530	530	530	530	530	530	530
	Width	mm	670	770	985	985	1 200	1 200	1 415	1 415	1 415
	Depth	mm	225	225	225	225	225	225	225	255	255

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C.
(2) Room temperature 20°C - Water temperature 45/40 °C. (3) Room temperature 20°C - Water temperature 65/55 °C.
(4) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.
** Water flow values as Cooling, accordingly to the EUROVENT standards and UNI ENV 1397.*
*** Dimensions refer to the units with casing.*
Data shown is for 4 row cooling version, 2 pipe system.
For performance of 3 row cooling version please contact your local Johnson Controls sales office.

Manufacturer reserves the rights to change specifications without prior notice.

ECM Technology

Running costs. Energy consumption. Life cycle.

These are 3 issues that are becoming more and more important in the choice of Fan Coil Units. With these criteria in mind, Johnson Controls offers the ECM range of FCU.

ECM technology comprises a **brushless motor** combined to a **dedicated electronic device** (inverter). In comparison to conventional units equipped with asynchronous three-speed motors, the fancoil and cassette units with brushless motors can obtain a considerable energy saving, by **reducing power consumption up to 70%**.

Air flow rate can be varied in continuous by means of a 1-10 V signal generated both by our controls or by independent controls systems. The continuous air flow control improves the **acoustic comfort** and allows a more punctual reply to the variation of the thermal loads, enhancing the **stability of ambient temperature**.

Technology

ECM technology consists of a brushless motor combined with an inverter managed by specific regulators. The controller uses a 0-10 VDC modulating signal to regulate the fan speed.

The brushless electric motor is composed of a rotor having permanent magnets, whose magnetic fields interact with the ones produced by the stator winding. The **transfer of current is no longer by mechanical commutator** (sliding contacts) **but by an electronic commutation system**: one electronic controller (inverter) powers the motor's stator and generates rotating magnetic fields, that in turn determine the rotor's speed.

Brusless motor develop much less heat than the traditional brushed motors and they have much lower mechanical resistance than the standard asynchronous maintenance. The absence of brushes eliminates also the main source of electromagnetic noise.

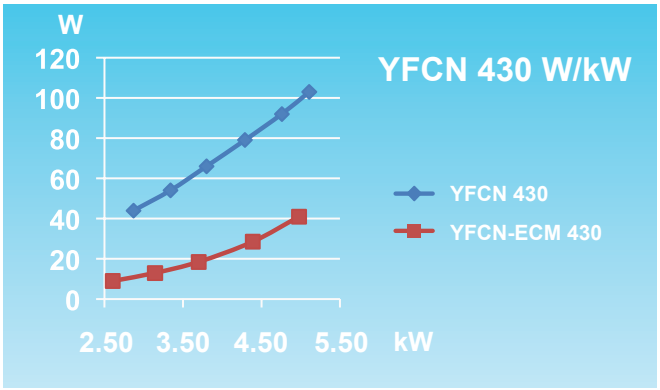
Features

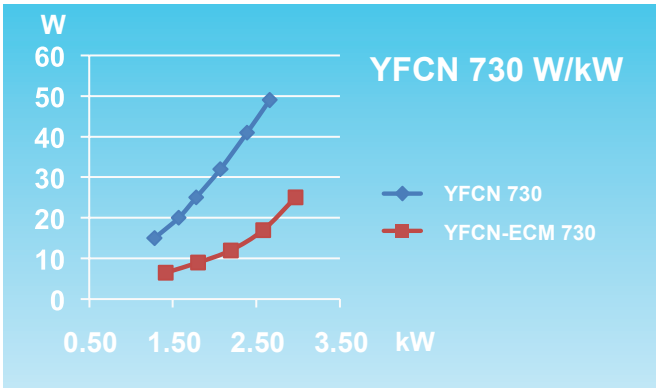
- Brushless motor with inverter.
- 0-10VDC control signal.
- Low mechanical resistance and heat gain
- Continuous regulation of the fan speed.
- Specifically designed electronic and digital regulators, also for BMS systems.
- Possibility to manually set the desired three fan speeds (MIN/MED/MAX).
- Available for fan coil and cassette units.

Advantages (compared to traditional brushed motors)

- Energy saving: electrical absorption reduced up to 70%.
- Higher efficiency: possibility to adapt the air volume and the capacities accordingly to the actual room loads.
- Higher comfort: reduced variation of the temperature and relative humidity in the room.
- Extremely quiet operation.
- Reduced wear and higher reliability.
- Longer life expectancy of the motor.

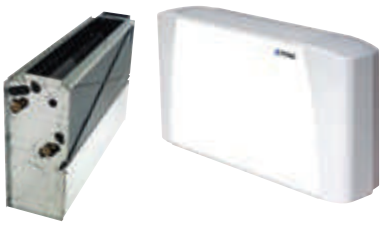
Power consumption: YFCN versus YFCN-ECM (W/kW)





YFCN-ECM Fan Coil Unit Inverter with centrifugal fan

0.7 to 7.1 kW



Technical features

Model			230	240	430	440	630	640	730	740	930	940
Total cooling capacity [kW]	(1)	max 10v	1.59	1.86	2.95	3.17	3.96	4.51	4.94	5.30	6.26	7.04
		med 5v	1.18	1.32	2.18	2.27	2.93	3.19	3.68	3.82	4.82	5.21
		min 1v	0.73	0.77	1.41	1.43	1.96	2.05	2.60	2.61	3.45	3.59
Sensible cooling capacity [kW]	(1)	max	1.28	1.42	2.26	2.39	3.08	3.38	3.80	3.99	5.10	5.53
		med	0.92	0.98	1.64	1.67	2.22	2.34	2.77	2.82	3.79	3.99
		min	0.55	0.56	1.03	1.03	1.46	1.48	1.92	1.90	2.63	2.69
Water flow in cooling [l/h]	(1)	max	277	323	511	549	686	781	857	918	1 094	1 228
		med	205	229	377	392	506	550	636	660	836	903
		min	127	134	244	248	339	354	449	451	597	621
Pressure drop in cooling [kPa]	(1)	max	8.6	14.8	28.9	16.1	19	33	32.6	25.6	25.9	20.8
		med	5.1	8	17	8.9	11.1	17.8	19.4	14.3	16.1	12.1
		min	2.2	3.2	7.9	4	5.5	8.2	10.5	7.3	8.9	6.3
Heating capacity 2 pipes [kW]	(2)	max	1.80	1.98	3.14	3.32	4.14	4.68	5.08	5.43	7.38	7.93
		med	1.29	1.37	2.26	2.30	3.00	3.23	3.72	3.84	5.41	5.63
		min	0.77	0.78	1.42	1.42	1.96	2.02	2.56	2.57	3.74	3.76
Water flow in heating 2 pipes [l/h] *	(2)	max	277	323	511	549	686	781	857	918	1 094	1 228
		med	205	229	377	392	506	550	636	660	836	903
		min	127	134	244	248	339	354	449	451	597	621
Pressure drop in heating 2 pipes [kPa]	(2)	max	7.0	13.6	26.7	13.7	17.0	29.1	28.3	22.0	24.2	20.9
		med	3.9	7.1	14.9	7.3	9.6	15.1	16.4	12.0	14.0	11.4
		min	1.6	2.6	6.6	3.1	4.5	6.6	8.5	5.9	7.3	5.6
Heating capacity 4 pipes [kW]	(3)	max	1.43	-	2.41	-	3.22	-	4.06	-	5.24	-
		med	1.08	-	1.85	-	2.45	-	3.12	-	4.05	-
		min	0.71	-	1.29	-	1.76	-	2.33	-	2.99	-
Water flow in heating 4 pipes [l/h]	(3)	max	140	-	236	-	317	-	398	-	514	-
		med	106	-	181	-	241	-	306	-	397	-
		min	70	-	126	-	172	-	228	-	292	-
Pressure drop in heating 4 pipes [kPa]	(3)	max	3.5	-	11.0	-	3.6	-	6.3	-	9.9	-
		med	2.1	-	6.9	-	2.2	-	4.0	-	6.3	-
		min	1.0	-	3.6	-	1.2	-	2.4	-	3.7	-
Air flow [m3/h]		max	330	325	515	505	735	720	890	875	1 395	1 365
		med	220	210	350	340	495	475	610	585	945	910
		min	120	115	210	200	305	290	400	380	605	575
Sound power level [dB(A)]		max	51	51	51	51	54	54	57	57	64	64
		med	41	41	42	42	44	44	48	48	55	55
		min	30	30	30	30	33	33	37	37	44	44
Sound pressure level [dB(A)]	(4)	max	42	42	42	42	45	45	48	48	55	55
		med	32	32	33	33	35	35	39	39	46	46
		min	21	21	21	21	24	24	28	28	35	35
Power supply [V-ph-Hz]			230 / 1 / 50 + E									
Power input [W]		max	21	21	25	25	32	32	41	41	99	99
Absorbed current [A]		max	0.18	0.18	0.22	0.22	0.28	0.28	0.34	0.34	0.81	0.81
Dimensions **	Height	mm	530	530	530	530	530	530	530	530	530	530
	Width	mm	770	770	985	985	1 200	1 200	1 415	1 415	1 415	1 415
	Depth	mm	225	225	225	225	225	225	225	225	255	255

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water temperature 45/40 °C
(3) Room temperature 20°C - Water temperature: 65/55°C
(4) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.
** Water flow values as Cooling, accordingly to the EUROVENT standards and UNI ENV 1397 ** Dimensions refer to the units with casing*

Manufacturer reserves the rights to change specifications without prior notice.

Options / Accessories

Compatibility table / Codes

Model	YFCN AC motor + Standard control devices		
Versions	**VC/VCB mod. - Vertical with casing**	**HC mod. - Horizontal with casing**	**CD mod. - Without casing**
Controls for style VC (supplied with separate packaging)			
Three speed control BL (1)	9060130	-	-
Three speed control + electronic thermostat and S/W switch TMV-S (2)	9060140	-	-
Three speed control + electronic thermostat and centralized S/W - TLC (2)	9060133	-	-
Automatic speed control with electronic thermostat and S/W switch ATL (2)	9066139	-	-
Controls for style HC/CD (supplied with separate packaging)			
Remote three speed control JWC-3V (1) (4)	-	9066642	9066642
Remote three speed control + electronic thermostat JWC-T and manual S/W switch (2)	-	9066630K	9066630K
Remote three speed control + electronic thermostat and centralized/manual S/W switch JWC-TQR (2) (3)	-	9066631K	9066631K
Automatic speed control with electronic thermostat and S/W switch - JWC-AU (to be used with JPF-AU and JP-AU only) (2) (3)	-	9066632K	9066632K
Automatic remote control with electronic thermostat, S/W switch and liquid crystall display JTM-B (to be used with JPF-AU and JP-AU only) (2) (3)	-	9066331E	9066331E
Automatic speed control with electronic thermostat to be mounted in the light wall box WM-503 (to be used with UP-503 only)	-	9066676E	9066676E
Electromechanical thermostat T2T (4) (5)	-	9060174	9060174
Power unit JPF-AU for JWC-AU and JTM-B remote controls, fitted on the unit	9066641	9066641	9066641
Power unit JP-AU for JWC-AU and JTM-B remote controls, not fitted on the unit	9066640	9066640	9066640
Power unit UP-503 for WM-503 remote control only, not fitted on the unit	9066677	9066677	9066677
Controls accessories for all versions (supplied with separate packaging)			
Low temperature cut-out for controls TLC	3021091	3021091	3021091
Low temperature cut-out for controls TMV-S, JWC-3V and JWC-T	9053048	9053048	9053048
Low temperature cut-out for controls ATL, ATL-E, JWC-TQR, WM-503 and JP-AU power unit	3021090	3021090	9053049
T2 sensor to be used as Change-over for controls ATL, ATL-E and JP-AU power unit	9025310	9025310	9025310
Change-over 15-25 for control TLC and JWC-TQR	9053049	9053049	9053049
Receiving speed selector for centralized control (slave) style VC RECV	9060136	9060136	9060136
Receiving speed selector for centralized control (slave) style HC/CD SEL-CR	9066311	9066311	9066311
Terminal board adaptor kit KIT	9060103	-	-
Controls for style VC + additional electric resistance (supplied with separate packaging)			
Three speed control with electronic thermostat and S/W switch TMV-R-IAQ	9063006	-	-
Automatic speed control with electronic thermostat and S/W switch ATL-E (2) (3)	9066643	-	-
Controls for style HC/CD + additional electric resistance (supplied with separate packaging)			
Remote three speed control + electronic thermostat and centralized/manual S/W switch JWC-TQR (2) (3)	-	9066631K	9066631K
Automatic speed control with electronic thermostat and centralized S/W - JWC-AU (2) (3)	-	9066632K	9066632K
Automatic remote control with electronic thermostat, S/W switch and liquid crystall display JTM-B (2) (3)	-	9066331E	9066331E

WARNING
(1) Not to be used with valves. (2) Can be used with valves and/or low temperature cut-out. (3) Can be used with Change Over.
(4) Not suitable with -E electric heater. (5) To be used with valve and not to be used with low temperature cut-out.

Options / Accessories

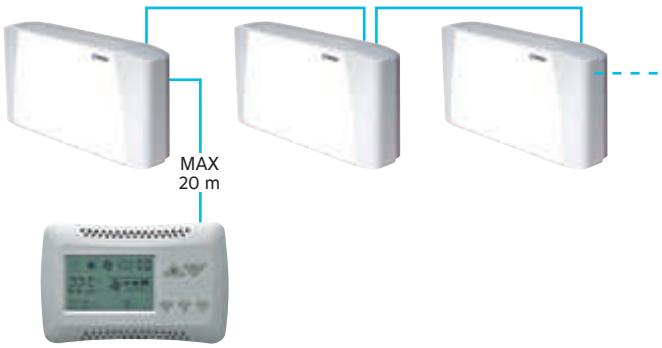
Compatibility table / Codes

Model	YFCN AC motor + MB control devices
Versions	**ALL VERSIONS: VC/VCB - Vertical w. casing + HC - Horizontal with casing + CD without casing** **ALL VERSIONS: VC/VCB + HC + CD with electric heater**
Controls and accessories for all versions	
Mounted power unit MB-M	9066332
Not mounted power unit MB-S	9066333
Wall control JTM-B	9066331E
IR remote control and mounted IR receiver RM-RT03	9066336
IR remote control and not mounted IR receiver RS-RT03	9066337
IR remote control RT03	3021203
Mounted IR receiver RM	9066339
Not mounted IR receiver RS	9066338
Multifunction wall control up to 60 units PSM-DI	3021293
T2 sensor (to be used as Change-over or minimum temp. Sensor)	9025310
Management system for a network of fan coils with MB electronic board	
Hardware/software supervisory system (to be used with MB board only) NET	9079118
Router-S for NET (default) or for BMS systems no provided by YORK	3021290
Relay output board SIOS	3021292

With T-MB wall control

One control for each unit
(Maximum length of the connection cable = 20 m)

One control for more units (20 units max.)
(Maximum total length of the connection cable = 800 m)



With RT03 Infra-red remote control

One control for each unit

One control for more units (20 units max.)
(Maximum total length of the connection cable = 800 m)

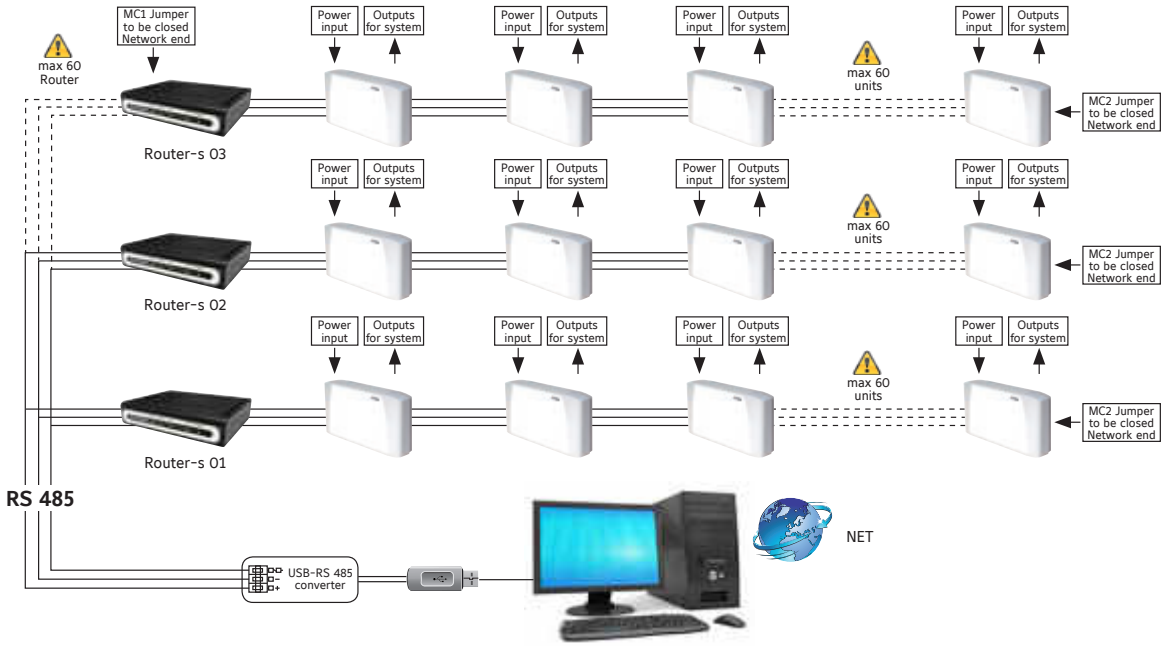
Options / Accessories

Compatibility table / Codes

Model	YFCN ECM motor + Standard control devices		
Versions	**VC/VCB mod. - Vertical with casing**	**HC mod. - Horizontal with casing**	**CD mod. - Without casing**
Controls accessories for all versions (supplied with separate packaging)			
Low temperature cut out NTC for control TMV-T-ECM, WM-S-ECM and JP-AU power unit	3021090		
T2 sensor to be used as Change -over for JP-AU power unit	9025310		
Change over CH 15-25 for control TMV-T-ECM	9053049		

Model	YFCN ECM motor + MB control devices		
Versions	**VC/VCB mod. - Vertical with casing**	**HC mod. - Horizontal with casing**	**CD mod. - Without casing**
Controls for style VC (supplied with separate packaging)			
Continuous fan speed control with electronic thermostat and S/W switch TMV-T-ECM	9060141	-	-
Controls for style HC/CD (supplied with separate packaging)			
JWC-AU Automatic speed control with electronic thermostat and centralized S/W switch (1) (2)	-	9066632K	9066632K
JTM-B Automatic remote control with electronic thermostat, S/W switch and liquid crystall display (1) (2)	-	9066331E	9066331E
WM-S-ECM Continuous fan speed control with S/W switch and liquid crystall display	-	9066644	9066644
JPF-AU power unit for JWC-AU and JTM-AU remote controls, fitted on the unit	9066641	9066641	9066641
JP-AU power unit for JWC-AU and JTM-AU remote controls, not fitted on the unit	9066640	9066640	9066640
Accessories of controls for VC, HC-VCB and CD models (supplied with separate packaging)			
MB-ECM-M mounted power unit for ECM fan coil	9066334	9066334	9066334
MB-ECM-S not mounted power unit for ECM fan coil	9066335	9066335	9066335
Wall control JTM-B	9066331E	9066331E	9066331E
IR remote control and mounted IR receiver RM-RT03	9066336	9066336	9066336
IR remote control and not mounted IR receiver RS-RT03	9066337	9066337	9066337
IR remote control RT03	3021203	3021203	3021203
Mounted IR receiver RM	9066339	9066339	9066339
Not mounted IR receiver RS	9066338	9066338	9066338
Multifunction wall control up to 60 units PSM-DI	3021293	3021293	3021293
T2 sensor (to be used as Change-over or minimum temperature Sensor)	9025310	9025310	9025310
Management system for a network of fan coils with MB electronic board			
Hardware / software supervisory system Net	9079118	9079118	9079118
Router-S for NET (default) or for BMS systems no provided by YORK	3021290	3021290	3021290
Relay output board SIOS	3021292	3021292	3021292

(1) Can be used with valves and/or low temperature cut-out. (2) Can be used with Change Over.



Options / Accessories

Compatibility table / Codes

Model	YFCN General accessories								
Sizes	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
Valves all versions									
3 way double valve kit for 4 tube installation and single coil + kit fitted on the unit	9066572W								
3 way double valve kit for 4 tube installation and single coil + kit not fitted on the unit	9066562W								
Kit 3 way valve mounted	9066561					9060471			
Kit 3 way valve additional battery mounted	9060472								
Kit 3 way valve not mounted	9066560					9060474			
Kit 3 way valve additional battery not mounted	9060475								
Kit 2 way valve primary and/or additional battery mounted	9060476					-			
Kit 2 way valve primary battery mounted	-					9060477			
Kit 2 way valve primary and/or additional battery not mounted	9060478					-			
Kit 2 way valve primary battery not mounted	-					9060479			
2 way DN 10 balance valve for main coil + kit fitted on the unit	9066660			-					
2 way DN 15 balance valve for main coil + kit fitted on the unit	-			9066661				-	
2 way DN 20 balance valve for main coil + kit fitted on the unit	-							9066662	
2 way DN 10 balance valve for additional coil + kit fitted on the unit	9066663					-			
2 way DN 15 balance valve for additional coil + kit fitted on the unit	-					9066664			
2 way DN 10 balance valve for main coil + kit not fitted on the unit	9066650			-					
2 way DN 15 balance valve for main coil + kit not fitted on the unit	-			9066651				-	
2 way DN 20 balance valve for main coil + kit not fitted on the unit	-							9066652	
2 way DN 10 balance valve for additional coil + kit not fitted on the unit	9066653					-			
2 way DN 15 balance valve for additional coil + kit not fitted on the unit	-					9066654			
Valves CD versions only	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
Semplified 3-way valve kit for CD version fitted	9066571					9060484			
Semplified 3-way valve kit for CD version not fitted	9066570					9060481			
Semplified 3-way valve kit for CD version not fitted - additional battery	9060480								
Electric heater VC/VCB/CH version	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
El. resistance and relays fitted on the unit (650 W) VC/HC	9066491E	-							
El. resistance and relays fitted on the unit (400 W) VC/HC	-	9066472E	-						
El. resistance and relays fitted on the unit (600 W) VC/HC	-	9066482E	9066473E		-				
El. resistance and relays fitted on the unit (750 W) VC/HC	-			9066475E		-			
El. resistance and relays fitted on the unit (900 W) VC/HC	-		9066483E		-				
El. resistance and relays fitted on the unit (1000 W) VC/HC	-	9066492E	-			9066477E			
El. resistance and relays fitted on the unit (1250 W) VC/HC	-			9066485E		-			
El. resistance and relays fitted on the unit (1500 W) VC/HC	-		9066493E	-		9066487E			
El. resistance and relays fitted on the unit (2000 W) VC/HC	-			9066495E		-			
El. resistance and relays fitted on the unit (2500 W) VC/HC	-					9066497E			
Electric heater CD version	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
El. resistance and relays fitted on the unit (700 W) CD	9066611	-							
El. resistance and relays fitted on the unit (400 W) CD	-	9066592	-						
El. resistance and relays fitted on the unit (600 W) CD	-	9066602	9066593		-				
El. resistance and relays fitted on the unit (750 W) CD	-			9066595		-			
El. resistance and relays fitted on the unit (900 W) CD	-		9066603		-				
El. resistance and relays fitted on the unit (1000 W) CD	-	9066612	-			9066597			
El. resistance and relays fitted on the unit (1250 W) CD	-			9066605		-			
El. resistance and relays fitted on the unit (1500 W) CD	-		9066613	-		9066607			
El. resistance and relays fitted on the unit (2000 W) CD	-			9066615		-			
El. resistance and relays fitted on the unit (2500 W) CD	-					9066617			

Options / Accessories

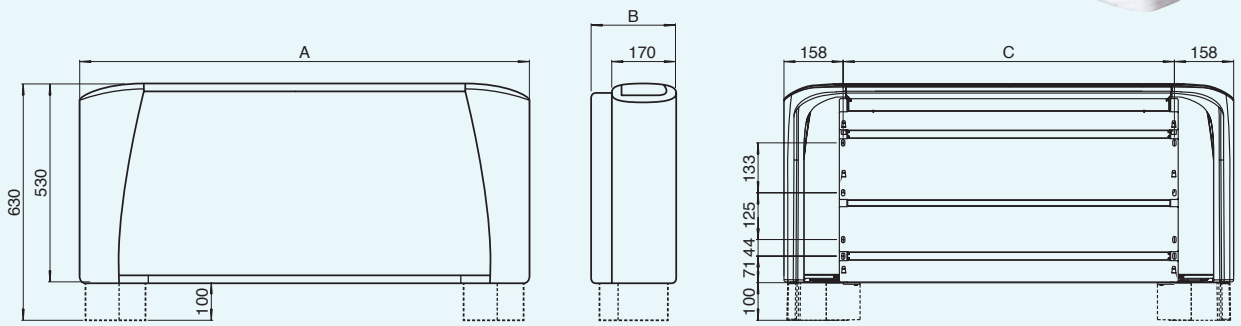
Compatibility table / Codes

Model	YFCN General accessories								
Sizes	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
Accessories for all versions	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
Pair feet	9060150							9060151	
Vertical auxiliary condensate tray	6060400								
Horizontal auxiliary condensate tray for HC (left connections)	6060402								
Horizontal auxiliary condensate tray for HC (right connections)	6060403								
Horizontal auxiliary condensate tray for CD	6066039								
Condensate pump for VC - VCB - CD fitted on the unit auxiliary condensate collection tray included (vertical installation)	9066297								
Condensate pump for VC - VCB - CD not fitted on the unit auxiliary condensate collection tray included (vertical installation)	9066296								
Condensate pump for HD fitted on the unit auxiliary condensate collection tray to be ordered separately (horizontal installation)	9066295								
Condensate pump for CD not fitted on the unit auxiliary condensate collection tray included (horizontal installation)	9066180								
Condensate drain pipe	6060420								
Damper	9066531	9066532	9066533		9066535		9066537	9066538	
Kit breeze	-	9076452	9076453		9076455		-		
Recessed box	-	9076462	9076463		9076465		-		
Rear closing panel VC	9062005	9060180	9060181		9060182		9060183		
Rear closing panel HC	9060187	9060190	9060191		9060192		9060193	9060194	
Frontal air intake CD mounted	9066501	9066502	9066503		9066505		9066507	9066508	
Intake grid for VC	9060229	9060230	9060231		9060232		9060233		
Adaptor for terminal board VC for remote control	9060103								
Accessories only for concealed version CD	**130/140**	**230/240**	**330/340**	**430/440**	**530/540**	**630/640**	**730/740**	**830/840**	**930/940**
Outlet flange 90° FM90	9066381	9066382	9066383		9066385		9066387	9066388	
Inlet flange 90° FR90	9066441	9060710	9060711		9060712		9060713	9060714	
Straight inlet flange FRD	9066451	9060720	9060721		9060722		9060723	9060724	
Straight outlet flange FMD	9066371	9066372	9066373		9066375		9066377	9066378	
Outlet spigot diffuser PMC	9066361	9066362	9066363		9066365		9066367	9066368	
Air outlet grid BMA	9066411	9060750	9060751		9060752		9060753		
Air inlet grid GRAG	9066431	9060764	9060765		9060766		9060767		
Air inlet grid GRAP	9066421	9060760	9060761		9060762		9060763		
Air inlet spigot plenum PRC	9066461	9066462	9066463		9066465		9066467	9066468	
Intake grid with filter (to be used in combination with inlet flange 90°) GRAFP	9066391	9060770	9060771		9060772		9060773		
Intake grid with filter (to be used in combination with straight inlet flange) GRAFG	9066401	9060774	9060775		9060776		9060777		
NEW Silencer Plenum BXS	-	-	9069081		9069082		9069083		
NEW Hotel box kit for concealed installation for horizontal model (frontal return and air supply) CHK	-	-	9066783		9066785		9066787	-	-

Dimensions

YFCN / YFCN-ECM 130 to 940 (with casing)

VC, VCB and HC models

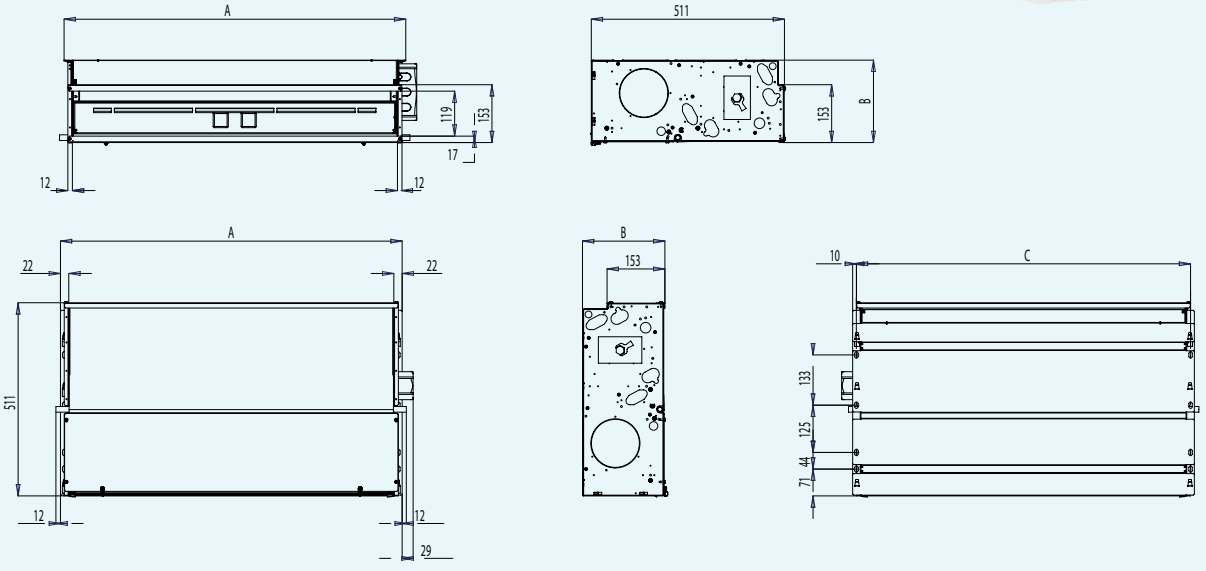


All dimensions in mm. Drawings not a scale.

Model	130 / 140	230 / 240	330 / 340	430 / 440	530 / 540	630 / 640	730 / 740	830 / 840	930 / 940
A	670	770	985	985	1 200	1 200	1 415	1 415	1 415
B	225	225	225	225	225	225	225	255	255
C	354	454	669	669	884	884	1 099	1 099	1 099

YFCN / YFCN-ECM 130 to 940 (without casing)

CD models



All dimensions in mm. Drawings not a scale.

Model	130 / 140	230 / 240	330 / 340	430 / 440	530 / 540	630 / 640	730 / 740	830 / 840	930 / 940
A	374	474	689	689	904	904	1 119	1 119	1 119
B	218	218	218	218	218	218	218	248	248
C	354	454	669	669	884	884	1 099	1 099	1 099

LASER & LOW BODY Fan Coil Units

2 & 4 pipe system

A complete range from 0.6 kW up to 9.7 kW

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

CSL00 (Built in)
CSR00 (Wall mounted)
Fan speed selector

CML00 (Built in)
CMR00 (Wall mounted)
Thermostat with manual fan speed and S/W change over

CEL00 (Built in)
CER00 (Wall mounted)
Thermostat with manual fan speed and automatic change over

CEL20 (Built in)
CER20 (Wall mounted)
Thermostat with auto. fan speed and automatic change over

CEL30 (Built in)
CER30 (Wall mounted)
Thermostat with auto. fan speed and automatic change over for modulating valve

LASER fan coil units are simple and elegant, discreet in their design. High standards of quality and reliability, combined with a wide range of accessories ensure a total solution for all comfort cooling and heating requirements.

LOW BODY units are part of the LASER Fan Coils Units family. The reduced height cabinet makes them the ideal solution for new or replacement applications where dimensional limitations apply.

Features

- 6 speed fan
- Cabinet factory fitted
- Valve factory fitted
- Electrical heater factory fitted
- Thermal or modulating valve
- Service valve
- Option front air intake (LASER)
- Optional plenum (LASER)
- ECM inverter option available
- Option for district cooling coil
- EUROVENT Certified

Selection software

LASER & LOW BODY Fan Coil Units

0.6 to 9.7 kW

Technical features

Model			LASER: YLV, YLV-AF, YLH, YLH-AF, YLIV, YLIV-AF, YLIH, YLIH-AF									
Sizes			**110**	**112**	**114**	**216**	**218**	**220**	**222**	**224**	**226**	**328**
Total cooling capacity [kW]	(1)	max	1.11	1.59	2.14	3.30	3.50	4.44	5.07	6.43	7.25	9.73
		med	0.95	1.31	1.88	2.67	2.99	3.68	4.39	5.75	6.67	8.75
		min	0.76	1.07	1.57	2.20	2.46	2.94	3.84	4.62	5.50	6.36
Sensible cooling capacity [kW]	(1)	max	0.93	1.25	1.90	2.46	3.06	3.53	4.42	5.06	5.70	8.04
		med	0.78	0.99	1.64	1.95	2.51	2.84	3.74	4.44	5.18	7.15
		min	0.61	0.79	1.33	1.56	2.00	2.20	3.20	3.45	4.15	5.03
Water flow in cooling [l/h]	(1)	max	191	274	368	568	602	764	873	1107	1248	1675
		med	164	225	324	460	515	633	756	990	1148	1506
		min	131	184	270	379	423	506	661	795	947	1095
Pressure drop in cooling [kPa]	(1)	max	3.4	7.1	5.8	14.8	13.6	24.1	28.4	18.8	21.0	74.6
		med	2.8	5.0	4.6	12.5	9.8	17.4	21.8	15.5	18.1	61.5
		min	2.0	3.4	3.3	8.5	6.7	11.6	17.2	10.5	12.8	30.8
Heating capacity 2 pipes [kW]	(2)	max	1.37	1.83	2.60	3.46	4.17	4.80	6.04	6.60	7.86	10.54
		med	1.13	1.46	2.07	2.90	3.51	3.89	5.11	5.84	7.17	9.64
		min	0.87	1.14	1.70	2.31	2.83	3.01	4.41	4.58	5.76	6.73
Water flow in heating 2 pipes [l/h]	(2)	max	236	315	448	596	718	826	1040	1136	1353	1814
		med	194	251	356	499	604	669	879	1004	1233	1658
		min	150	196	292	397	487	518	759	788	991	1158
Pressure drop in heating 2 pipes [kPa]	(2)	max	4.9	6.0	6.5	14.7	16.0	23.4	27.7	18.9	25.3	82.4
		med	4.6	6.0	5.1	10.5	11.7	16.3	21.1	15.3	21.6	67.7
		min	3.0	4.1	4.0	6.9	8.1	10.8	16.4	10.3	14.9	29.7
Heating capacity 4 pipes [kW]	(3)	max	0.91	1.31	1.93	2.79	3.20	4.33	4.92	6.16	6.30	8.00
		med	0.83	1.13	1.85	2.40	2.81	3.67	4.33	5.55	5.98	7.43
		min	0.71	0.95	1.51	2.06	2.38	2.99	3.84	4.55	5.03	5.83
Water flow in heating 4 pipes [l/h]	(3)	max	78	113	166	240	275	373	423	530	542	688
		med	71	97	159	207	242	316	373	478	515	639
		min	61	82	130	177	205	257	330	391	433	501
Pressure drop in heating 4 pipes [kPa]	(3)	max	1.3	3.4	6.7	14.7	7.1	10.3	11.7	33.0	31.7	46.5
		med	1.1	2.6	5.8	10.5	5.7	7.7	9.5	23.0	28.9	40.6
		min	0.9	1.8	5.2	9.4	4.0	5.4	7.7	16.3	21.4	24.7
Air flow [m3/h]		max	243	317	432	606	754	961	1115	1307	1507	2010
		med	181	253	352	488	616	776	928	1106	1318	1687
		min	136	185	279	377	486	594	742	779	986	1107
Sound power level [dB(A)]		max	48	50	54	53	55	54	60	60	63	67
		med	42	45	49	47	50	48	56	55	60	63
		min	36	38	42	40	43	40	50	47	53	52
Sound pressure level [dB(A)]	(4)	max	39	41	45	44	46	45	51	51	54	58
		med	33	36	40	38	41	39	47	46	51	54
		min	27	29	33	31	34	31	40	38	44	43
Power supply [V-ph-Hz]			230 / 1 / 50 + E									
Power input [W]		max	46	48	57	61	76	90	117	140	162	213
Absorbed current [A]		max	0.21	0.21	0.25	0.27	0.33	0.39	0.52	0.64	0.71	0,95
Dimensions	Height	mm	538	538	538	538	538	614	614	614	614	614
	Width	mm	648	773	898	1023	1148	1273	1273	1523	1523	1773
	Depth	mm	224	224	224	224	224	254	254	254	254	254

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C
(3) Room temperature 20°C - Water inlet temperature: 65/55°C.
(4) Sound pressure level in a 100 m3 room, at 1.5 m distance and riverberating time of 0.3 s. max = speed 2, med = speed 3, min = speed 5 when using selection software

LASER & LOW BODY Fan Coil Units

0.6 to 9.7 kW

Technical features

Model			LOW BODY: YLVR, YLIVR				
Sizes			**110**	**112**	**114**	**216**	**218**
Total cooling capacity [kW]	(1)	max	0.98	1.21	1.87	2.74	3.23
		med	0.81	1.02	1.61	2.35	2.81
		min	0.64	0.80	1.37	1.84	2.37
Sensible cooling capacity [kW]	(1)	max	0.90	1.09	1.62	2.32	2.71
		med	0.73	0.92	1.39	1.97	2.34
		min	0.56	0.71	1.15	1.54	1.95
Water flow in cooling [l/h]	(1)	max	166	207	318	519	614
		med	139	175	274	442	531
		min	109	137	233	346	446
Pressure drop in cooling [kPa]	(1)	max	2.5	3.5	8.4	7.1	10.2
		med	1.9	2.6	6.5	5.4	7.9
		min	1.3	1.8	5.0	3.6	5.9
Heating capacity 2 pipes [kW]	(2)	max	1.18	1.53	2.22	3.16	3.78
		med	0.95	1.29	1.9	2.67	3.25
		min	0.76	1.02	1.58	2.18	2.71
Water flow in heating 2 pipes [l/h]	(2)	max	204	265	384	595	717
		med	163	224	328	501	612
		min	130	176	273	405	506
Pressure drop in heating 2 pipes [kPa]	(2)	max	2.5	4.2	9.3	7.3	11.8
		med	1.7	3.2	7.1	5.4	8.9
		min	1.2	2.1	5.2	3.7	6.4
Heating capacity 4 pipes [kW]	(3)	max	1.12	1.79	1.87	2.54	3.83
		med	0.93	1.54	1.65	2.22	3.37
		min	0.77	1.25	1.42	1.89	2.88
Water flow in heating 4 pipes [l/h]	(3)	max	98	157	165	224	338
		med	81	135	145	196	297
		min	68	109	125	167	254
Pressure drop in heating 4 pipes [kPa]	(3)	max	1.8	4.8	6.5	11.8	5.9
		med	1.3	3.7	5.2	9.4	4.7
		min	1.0	2.5	4.0	7.1	3.6
Air flow [m3/h]		max	243	317	432	606	754
		med	181	253	352	488	616
		min	136	185	279	377	486
Sound power level [dB(A)]		max	47	50	53	51	55
		med	41	44	49	45	50
		min	34	38	42	39	43
Sound pressure level [dB(A)]	(4)	max	37	40	44	42	46
		med	31	35	39	36	41
		min	25	29	33	29	34
Power supply [V-ph-Hz]			230 / 1 / 50 + E				
Power input [W]		max	46	48	57	61	76
Absorbed current [A]		max	0.21	0.21	0.25	0.27	0.33
Dimensions	Height	mm	430	430	430	430	430
	Width	mm	648	773	898	1023	1148
	Depth	mm	254	254	254	254	224

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C
(3) Room temperature 20°C - Water inlet temperature: 65/55°C.
(4) Sound pressure level in a 100 m3 room, at 1.5 m distance and riverberating time of 0.3 s. max = speed 2, med = speed 3, min = speed 5 when using selection software

Manufacturer reserves the rights to change specifications without prior notice.

Options / Accessories

Compatibility table / Codes

Model		LASER										LOW BODY				
Sizes		**110**	**112**	**114**	**216**	**218**	**220**	**222**	**224**	**226**	**328**	**110**	**112**	**114**	**216**	**218**
With Cabinet																
YLV-YLH	2/3/4 rows	•	•	•	•	•	•	•	•	•	•					
YLV-YLH/AF Front air intake	2/3/4 rows	•	•	•	•	•	•	•	•	•	•					
YLVR	2/3 rows											•	•	•	•	•
Without Cabinet																
YLIV-YLIH	2/3/4 rows	•	•	•	•	•	•	•	•	•	•					
YLIV-YLIH/AF Front air intake	2/3/4 rows	•	•	•	•	•	•	•	•	•	•					
YLIVR	2/3 rows											•	•	•	•	•
Options (Factory fitted)																
Coil and heaters																
1 row heating	BA1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Kit electrical heater (with relay and safety switch)	KREL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Built in thermostat																
Fan speed selector	CSL00								•							
Thermostat with manual fan speed and S/W change over	CML00								•							
Thermostat with manual fan speed, dead band, automatic change over	CEL00								•							
Thermostat with automatic fan speed, dead band, automatic change over	CEL20								•							
Thermostat with automatic fan speed, dead band, automatic change over for modulating valve	CEL30								•							
Parallel connection																
For ON/OFF valve one/FCU	CBL20								•							
For modulating valve one/FCU	CBL30								•							
3 way valve factory fitted																
For 2 pipe systems ON/OFF	J3A2 (2p)								•							
For 4 pipe systems ON/OFF	J3A2 (4p)								•							
3 way modulating valve factory fitted																
For 2 pipe systems Modulating	J3AM (2p)								•							
For 4 pipe systems Modulating	J3AM (4p)								•							
Shut off valves factory fitted																
For 2 pipe systems	DT (2p)								•							
For 4 pipe systems	DT (4p)								•							
Condensate pump	PC								•							
WS sensor change over for CEL/CER	WS								•							
Minimum temperature thermostat	TM								•							
Accessories (Supplied loose)																
Remote controllers and thermostat (wall mounted)																
Fan speed selector	CSR00								•							
Thermostat with manual fan speed and S/W change over	CMR00								•							
Thermostat with manual fan speed, dead band, automatic change over	CER00								•							
Thermostat with automatic fan speed, dead band, automatic change over	CER20								•							
Thermostat with automatic fan speed, dead band, automatic change over for modulating valve	CER30								•							
Feet and panel (1)																
Set of painted feet	CP1	•	•	•	•	•	•	•	•	•	•					
Set of painted feet + frontal socle	ZL1	•	•	•	•	•	•	•	•	•	•					
Vertical painted back panel	PPV1	•	•	•	•	•	•	•	•	•	•					
Horizontal painted back panel	PPH1	•	•	•	•	•	•	•	•	•	•					
Plenums and air intake (1)																
Air intake plenum	PA	•	•	•	•	•	•	•	•	•	•					
Air intake plenum with collars	PAS	•	•	•	•	•	•	•	•	•	•					
90° air intake plenum	PA90	•	•	•	•	•	•	•	•	•	•					
Air intake duct fitting	RCA	•	•	•	•	•	•	•	•	•	•					
Air delivery plenum with collars	PM	•	•	•	•	•	•	•	•	•	•					
90° air delivery plenum	PM90	•	•	•	•	•	•	•	•	•	•					

(1) for check compatibility with the models of FCU see compatibility table

Dimensions & Weights

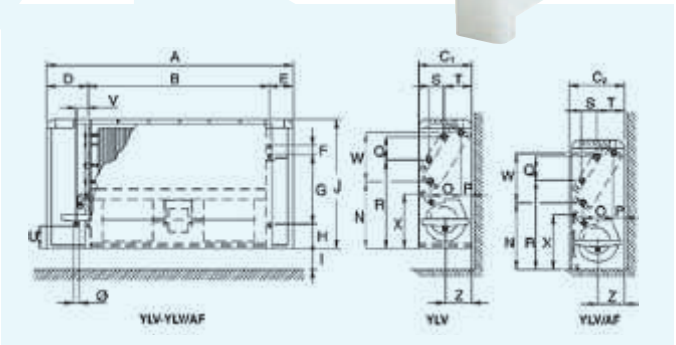
YLV & YLH
- V= vertical
- H= horizontal

YLV-AF & YLH-AF
- AF= front air intake
- V= vertical
- H= horizontal

YLVR
- R= low body
- V= vertical

LASER: YLV - YLV/AF

VERTICAL

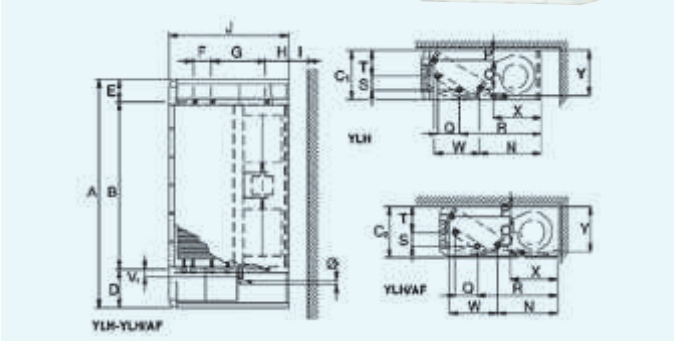


Dim	110	112	114	216	218	220	222	224	226	328
A	648	773	898	1023	1148	1273	1273	1523	1523	1773
B	374	499	624	749	874	999	999	1249	1249	1499
C1	224	224	224	224	224	254	254	254	254	254
C2	233	233	233	233	233	263	263	263	263	263
D	174	174	174	174	174	174	174	174	174	174
E	100	100	100	100	100	100	100	100	100	100
F	40	40	40	40	40	40	40	40	40	40
G	280	280	280	280	280	356	356	356	356	356
H	101	101	101	101	101	101	101	101	101	101
I	85	85	85	85	85	85	85	85	85	85
J	538	538	538	538	538	614	614	614	614	614
N	266	266	266	266	266	299	299	299	299	299
O	113	113	113	113	113	138	138	138	138	138
P	48	48	48	48	48	53	53	53	53	53
Q	87	87	87	87	87	87	87	87	87	87
R	355	355	355	355	355	409	409	409	409	409
S	50	50	50	50	50	50	50	50	50	50
T	117	117	117	117	117	135	135	135	135	135
U	90	90	90	90	90	116	116	116	116	116
V	47	47	47	47	47	47	47	47	47	47
V 1	28	28	28	28	28	28	28	28	28	28
W	195	195	195	195	195	238	238	238	238	238
X	219	219	219	219	219	252	252	252	252	252
Y	205	205	205	205	205	235	235	235	235	235
Z	109	109	109	109	109	122	122	122	122	122
Ø	20	20	20	20	20	20	20	20	20	20
kg1	18	20	23	28	31	41	44	52	52	58
kg2	19	21	24	30	32	43	46	54	54	61

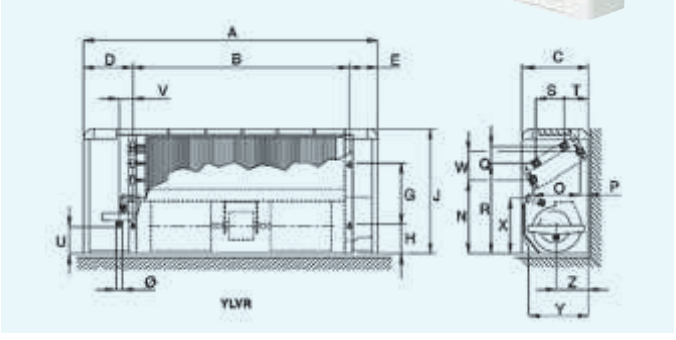
Notes: 1=YLV / YLH - 2=YLV/AF / YLH/AF (All dimensions in mm)

LASER: YLH - YLH/AF

HORIZONTAL



LOW BODY: YLVR



Dim	110	112	114	216	218
A	648	773	898	1023	1148
B	374	499	624	749	874
C	254	254	254	254	254
D	174	174	174	174	174
E	100	100	100	100	100
G	170	170	170	170	170
H	101	101	101	101	101
J	430	430	430	430	430
N	245	245	245	245	245
O	154	154	154	154	154
P	31	31	31	31	31
Q	47	47	47	47	47
R	304	304	304	304	304
S	88	88	88	88	88
T	87	87	87	87	87
U	65	65	65	65	65
V	47	47	47	47	47
W	84	84	84	84	84
X	214	214	214	214	214
Z	109	109	109	109	109
ø	20	20	20	20	20
kg	15	17	22	23	26

(All dimensions in mm)

Dimensions & Weights

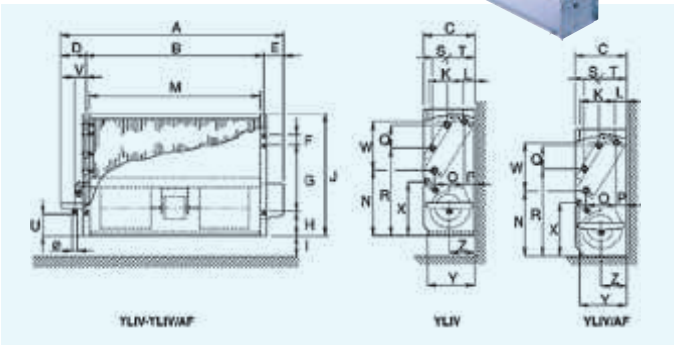
YLIV & YLIH
- V= vertical
- H= horizontal
- I= without cabinet

YLIV-AF & YLIH-AF
- AF= front air intake
- V= vertical
- H= horizontal
- I= without cabinet

YLIVR
- R= low body
- V= vertical
- I= without cabinet

LASER: YLIV - YLIV/AF

VERTICAL

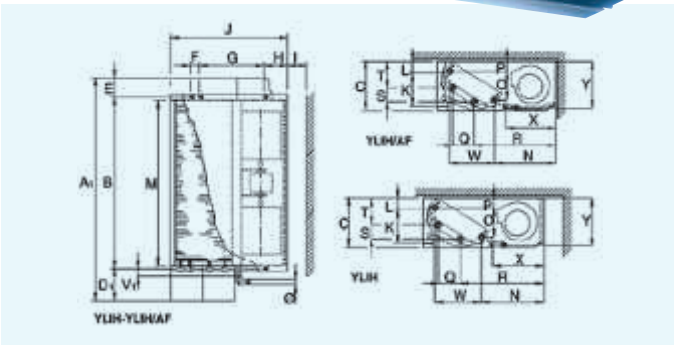


Dim	110	112	114	216	218	220	222	224	226	328
A	555	680	805	930	1055	1180	1180	1430	1430	1680
A 1	574	699	824	949	1074	1199	1199	1449	1449	1699
B	374	499	624	749	874	999	999	1249	1249	1499
C	215	215	215	215	215	245	245	245	245	245
D	109	109	109	109	109	109	109	109	109	109
D 1	128	128	128	128	128	128	128	128	128	128
E	72	72	72	72	72	72	72	72	72	72
F	40	40	40	40	40	40	40	40	40	40
G	280	280	280	280	280	356	356	356	356	356
H	101	101	101	101	101	101	101	101	101	101
I	85	85	85	85	85	85	85	85	85	85
J	505	505	505	505	505	581	581	581	581	581
K	110	110	110	110	110	125	125	125	125	125
L	55	55	55	55	55	60	60	60	60	60
M	349	474	599	724	849	974	974	1224	1224	1474
N	266	266	266	266	266	299	299	299	299	299
O	113	113	113	113	113	138	138	138	138	138
P	48	48	48	48	48	53	53	53	53	53
Q	87	87	87	87	87	87	87	87	87	87
R	355	355	355	355	355	409	409	409	409	409
S	50	50	50	50	50	50	50	50	50	50
T	117	117	117	117	117	135	135	135	135	135
U	90	90	90	90	90	116	116	116	116	116
V	47	47	47	47	47	47	47	47	47	47
V 1	28	28	28	28	28	28	28	28	28	28
W	195	195	195	195	195	238	238	238	238	238
X	219	219	219	219	219	252	252	252	252	252
Y	200	200	200	200	200	230	230	230	230	230
Z	109	109	109	109	109	122	122	122	122	122
Ø	20	20	20	20	20	20	20	20	20	20
kg	10	13	16	19	22	29	31	38	38	42

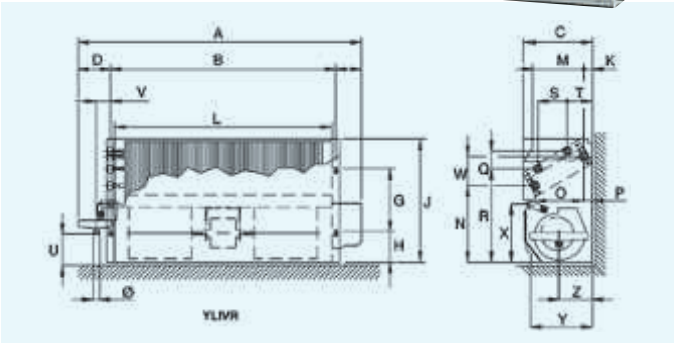
(All dimensions in mm)

LASER: YLIH - YLIH/AF

HORIZONTAL



LOW BODY: YLIVR



Dim	110	112	114	216	218
A	555	680	805	930	1055
B	374	499	624	749	874
C	230	230	230	230	230
D	108	108	108	108	108
E	73	73	73	73	73
G	170	170	170	170	170
H	101	101	101	101	101
J	395	395	395	395	395
K	61	61	61	61	61
L	349	474	599	724	849
M	127	127	127	127	127
N	245	245	245	245	245
O	154	154	154	154	154
P	31	31	31	31	31
Q	47	47	47	47	47
R	304	304	304	304	304
S	88	88	88	88	88
T	87	87	87	87	87
U	65	65	65	65	65
V	47	47	47	47	47
W	84	84	84	84	84
X	214	214	214	214	214
Y	201	201	201	201	201
Z	109	109	109	109	109
ø	20	20	20	20	20
kg	9	11	14	16	19

(All dimensions in mm)

LASER & LOW BODY Fan Coil Units

Compatibility tables

CSL00 (Built in)
CSR00 (Wall mounted)
Fan speed selector

CEL00 (Built in)
CER00 (Wall mounted)
Thermostat with manual fan speed and automatic change over

CEL20 (Built in)
CER20 (Wall mounted)
Thermostat with auto. fan speed and automatic change over

CML00 (Built in)
CMR00 (Wall mounted)
Thermostat with manual fan speed and S/W change over

CEL30 (Built in)
CER30 (Wall mounted)
Thermostat with auto. fan speed and automatic change over for modulating valve

Features CEL/CER

- Dead band for change over 5°C or 2°C (factory set 2°C)
- Manual fan speeds or automatic (models 20 and 30)
- Thermostated fan control or continuous fan running
- Option water sensor WS for change over on coil (for 2 pipes)
- Led indicated status summer, winter or dead band
- Temperature setting for 7 to 30°C (comfort 20-25°C)
- Plastic pins for limiting temperature range
- Input for window contact
- Input for Economy/ occupancy mode
- Output for remote alarm
- Filter alarm 600 or 1200 running hours (factory set 1200 hours)
- With electrical heater post ventilation
- With Air sensor in the air intake destratification function (CEL only)

Compatibility table Thermostats / Valves / Heaters / Parallel connection / Water sensor / Minimum temperature thermostat

Factory fitted thermostat (built in)		Valves for 2 pipes		Valves for 4 pipes		Heaters	Parallel connection		Water sensor	Min. Temp. Thermostat
							ON/OFF	Modulating		
		J3A2 (2p)	J3AM (2p)	J3A2 (4p)	J3AM (4p)	KREL	CBL20	CBL30	WS	TM
CSL00	Fan speed selector						•			•
CML00	Thermostat with manual fan speed and S/W change over	•		•			•			•
CEL00	Thermostat with manual fan speed, dead band, automatic change over	•		•		•	•		•	•
CEL20	Thermostat with automatic fan speed, dead band, automatic change over	•		•		•	•		•	•
CEL30	Thermostat with automatic fan speed, dead band, automatic change over for modulating valve		•		•			•	•	•
Remote controllers and thermostats (wall mounted)										
CSR00	Fan speed selector						•			•
CMR00	Thermostat with manual fan speed and S/W change over	•		•			•			•
CER00	Thermostat with manual fan speed, dead band, automatic change over	•		•		•	•		•	•
CER20	Thermostat with automatic fan speed, dead band, automatic change over	•		•		•	•		•	•
CER30	Thermostat with automatic fan speed, dead band, automatic change over for modulating valve		•		•			•	•	•

• *Compatible* ☐ *Not compatible*

LASER & LOW BODY Fan Coil Units

Compatibility tables

Compatibility Options / Accessories / Models

		STANDARD								LOW BODY	
		LASER				CONCEALED					
Code	Designation	YLV	YLH	YLV-AF	YLH-AF	YLIV	YLIH	YLIV-AF	YLIH-AF	YLVR	YLIVR
Coils and heaters**											
BA1**	Additional 1 row heating	•	•	•	•	•	•	•	•	•	•
KREL**	Kit electrical heater with safety thermostat and relay	•	•	•	•	•	•	•	•		
Factory fitted thermostat (built in)											
CSL00	Fan speed selector (buit in)	•		•		•		•		•	•
CML00	Thermostat with manual fan speed and S/W change over	•		•		•		•		•	•
CEL00	Thermostat with manual fan speed, dead band, automatic change over	Compatible with electrical heaters								•	•
CEL20	Thermostat with automatic fan speed, dead band, automatic change over	Compatible with electrical heaters								•	•
CEL30	Thermostat with automatic fan speed, dead band, automatic change over for modulating valves	•		•		•		•		•	•
CBL20	Parallel connection for ON/OFF valve	•	•	•	•	•	•	•	•	•	•
CBL30	Parallel connection for modulating valve	•	•	•	•	•	•	•	•	•	•
Remote controllers and thermostats (wall mounted)											
CSR00	Fan speed selector (wall mounted)	•	•	•	•	•	•	•	•	•	•
CMR00	Thermostat with manual fan speed and S/W change over	•	•	•	•	•	•	•	•	•	•
CER00	Thermostat with manual fan speed, dead band, automatic change over	Compatible with electrical heaters								•	•
CER20	Thermostat with automatic fan speed, dead band, automatic change over	Compatible with electrical heaters								•	•
CER30	Thermostat with automatic fan speed, dead band, automatic change over for modulating valves	•	•	•	•	•	•	•	•	•	•
Valves / Condensate pump / Water sensor / Minimum temperature thermostat (Factory fitted)											
J3A2 (2p)	3-way 4-ports on/off valves for 2-pipe systems	•	•	•	•	•	•	•	•	•	•
J3A2 (4p)	3-way 4-ports on/off valves for 4-pipe systems	•	•	•	•	•	•	•	•	•	•
J3AM (2p)	3-way 4-ports modulating valves for 2-pipe systems	•	•	•	•	•	•	•	•	•	•
J3AM (4p)	3-way 4-ports modulating valves for 4-pipe systems	•	•	•	•	•	•	•	•	•	•
DT (2p)	Shut-off valves for 2-pipe systems (in addition to J3A2/J3AM valves)	•	•	•	•	•	•	•	•	•	•
DT (4p)	Shut-off valves for 4-pipe systems (in addition to J3A2/J3AM valves)	•	•	•	•	•	•	•	•	•	•
PC	Condensate pump	•	•	•	•	•	•	•	•	•	•
WS	Water sensor	Compatible with CEL/CER									
TM	Minimum temperature thermostat	•	•	•	•	•	•	•	•	•	•
Feet and panels											
CP1	Set of painted feet	•				•					
ZL1	Set of feet + frontal socle	•									
PPV1	Vertical painted back panel	•		•						•	
PPH1	Horizontal painted back panel		•		•						
External air intake											
PA	Air intake plenum						•				
PAS	Air intake plenum collars						•				
PA90	90° air intake plenum						•				
RCA	Air intake duct fitting						•				
PM	Air delivery plenum with collars					•	•	•	•		•
PM90	90° air delivery plenum					•	•	•	•		•

• *Compatible*
Compatible with conditions
Not compatible
** *Maximum of rows is indicated in the documentation, the maximum number of rows includes the heating row or electrical heater.*

LASER ECM and LOW BODY ECM

0.6 to 9.2 kW

Technical features

Model			LASER ECM							LOW BODY ECM		
Sizes		**(*)**	**512**	**514**	**516**	**520**	**522**	**524**	**528**	**512**	**514**	**516**
Total cooling capacity [kW]	(1)	max ...v	1.98	2.56	3.81	5.05	5.81	7.47	9.18	1.56	2.37	3.40
		med ...v	1.43	1.81	2.53	3.86	4.42	5.64	6.94	1.18	1.78	2.34
		min ...v	0.74	0.93	1.51	2.72	3.05	4.07	4.89	0.61	1.29	1.53
Sensible cooling capacity [kW]	(1)	max	1.65	2.12	3.14	3.79	4.32	6.09	7.51	1.42	2.09	2.93
		med	1.16	1.48	2.01	2.78	3.16	4.42	5.50	1.04	1.54	1.96
		min	0.54	0.78	1.21	1.92	2.11	3.13	3.74	0.53	1.09	1.25
Water flow in cooling [l/h]	(1)	max	341	441	656	869	1000	1286	1580	265	404	644
		med	246	312	435	664	761	971	1194	200	304	440
		min	127	160	260	468	525	701	842	104	220	286
Pressure drop in cooling [kPa]	(1)	max	9.6	9.2	14.6	16.9	36.2	16.8	31.3	8.2	12.6	10.3
		med	5.4	4.8	8.5	10.6	22.0	10.0	18.5	5.1	7.8	5.4
		min	1.7	1.6	3.9	5.6	11.1	5.5	9.7	1.8	4.5	2.6
Heating capacity 2 pipes [kW]	(2)	max	2.05	3.04	4.40	5.76	6.53	8.43	10.4	2.07	2.85	4.00
		med	1.47	2.18	3.05	4.44	4.84	6.22	7.67	1.50	2.09	2.66
		min	0.78	1.15	1.87	3.11	3.37	4.50	5.38	0.8	1.49	1.77
Water flow in heating 2 pipes [l/h]	(2)	max	353	523	757	991	1124	1451	1790	358	495	763
		med	253	375	525	757	833	1071	1320	260	362	499
		min	134	198	322	535	580	775	926	138	258	325
Pressure drop in heating 2 pipes [kPa]	(2)	max	10.8	10.3	17.3	21.8	40.0	17.2	32.2	9.7	14.4	11.2
		med	6.0	5.5	8.6	13.0	23.5	9.8	18.0	5.6	8.4	5.3
		min	2.0	2.0	4.2	6.6	11.5	5.3	9.0	1.9	4.7	2.6
Heating capacity 4 pipes [kW]	(3)	max	1.84	2.39	3.20	5.00	5.55	6.46	7.90	2.19	2.29	3.06
		med	1.37	1.76	2.40	4.12	4.35	5.19	6.30	1.66	1.78	2.22
		min	0.87	1.09	1.77	3.22	3.29	4.09	4.94	0.97	1.36	1.60
Water flow in heating 4 pipes [l/h]	(3)	max	158	206	275	430	478	556	680	194	201	271
		med	118	151	207	355	374	447	542	146	157	196
		min	75	94	152	277	283	352	425	84	119	141
Pressure drop in heating 4 pipes [kPa]	(3)	max	4.7	9.3	15.6	23.3	21.5	36.0	46.2	6.9	9.2	16.5
		med	2.8	5.4	11.0	15.9	14.0	24.2	30.7	4.2	6.0	9.3
		min	1.2	2.4	5.6	9.8	7.7	15.4	19.5	1.0	3.7	5.3
Air flow [m3/h]		max	456	574	792	1082	1304	1567	1995	437	608	833
		med	298	373	489	757	904	1080	1370	284	400	486
		min	138	170	287	504	568	715	876	129	259	290
Sound power level [dB(A)]		max	55	59	60	57	62	63	69	55	53	56
		med	44	48	47	48	51	53	59	42	42	44
		min	29	29	33	37	39	43	48	30	33	30
Sound pressure level [dB(A)]	(4)	max	46	50	51	48	53	54	60	46	44	46
		med	35	39	38	37	42	44	50	33	32	34
		min	21	21	24	26	30	34	39	20	24	20
Power supply [V-ph-Hz]			230 / 1 / 50 + E									
Power input [W]		max	31	54	42	46	76	89	168	35	60	38
Dimensions	Height	mm	623	623	623	699	699	699	699	395	395	395
	Width	mm	773	898	1023	1273	1273	1523	1773	680	805	930
	Depth	mm	224	224	224	254	254	254	254	230	230	230

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C
(3) Room temperature 20°C - Water inlet temperature: 65/55°C.
(4) Sound pressure level in a 100 m³ room, at 1.5 m distance and riverberating time of 0.3 s.
(*) 512 - 514 (3v-6v-9v)
(*) 516 (2v-5v-10v)
(*) 520 - 522 - 524 - 528 (3v-6v-10v)

Manufacturer reserves the rights to change specifications without prior notice.

LASER ECM and LOW BODY ECM

Compatibility tables

Compatibility Options / Accessories / Models

		STANDARD								LOW BODY-ECM	
		LASER-ECM				CONCEALED-ECM					
Code	**Designation**	**YLV**	**YLH**	**YLV-AF**	**YLH-AF**	**YLIV**	**YLIH**	**YLIV-AF**	**YLIH-AF**	**YLVR**	**YLIVR**
Coils and heaters**											
BA1**	Additional 1 row heating	•	•	•	•	•	•	•	•	•	•
KREL**	Kit electrical heater with safety thermostat and relay	•	•	•	•	•	•	•	•		
Factory fitted thermostat (built in)											
EDCL	Microprocessor control for ECM units	•		•		•		•		•	•
OBV11-ODC711	Omnibus control for ECM units + Analogue Plus console	•		•		•		•		•	•
OBV11-ODC211	Omnibus control for ECM units + Display console	•		•		•		•		•	•
Remote controllers and thermostats (wall mounted)											
EDCR	Microprocessor control for ECM units, for wall installation	•	•	•	•	•	•	•	•	•	•
OBV10+ODC716	Omnibus control for ECM units + Remote Analogue Plus console	•	•	•	•	•	•	•	•	•	•
OBV10+ODC216	Omnibus control for ECM units + Remote Display console	•	•	•	•	•	•	•	•	•	•
Valves / Condensate pump / Water sensor / Minimum temperature thermostat (Factory fitted)											
J3A2 (2p)	3-way 4-ports on/off valves for 2-pipe systems	•	•	•	•	•	•	•	•	•	•
J3A2 (4p)	3-way 4-ports on/off valves for 4-pipe systems	•	•	•	•	•	•	•	•	•	•
J3AM (2p)	3-way 4-ports modulating valves for 2-pipe systems	•	•	•	•	•	•	•	•	•	•
J3AM (4p)	3-way 4-ports modulating valves for 4-pipe systems	•	•	•	•	•	•	•	•	•	•
DT (2p)	Shut-off valves for 2-pipe systems (in addition to J3A2/J3AM valves)	•	•	•	•	•	•	•	•	•	•
DT (4p)	Shut-off valves for 4-pipe systems (in addition to J3A2/J3AM valves)	•	•	•	•	•	•	•	•	•	•
PC	Condensate pump	•	•	•	•	•	•	•	•	•	•
WS	Water sensor	Compatible with all the above listed controllers									
Feet and panels											
CP1	Set of painted feet	•				•					
ZL1	Set of feet + frontal socle	•									
PPV1	Vertical painted back panel	•		•						•	
PPH1	Horizontal painted back panel		•		•						
External air intake											
PA	Air intake plenum						•				
PAS	Air intake plenum collars						•				
PA90	90° air intake plenum						•				
RCA	Air intake duct fitting						•				
PM	Air delivery plenum with collars					•	•	•	•		•
PM90	90° air delivery plenum					•	•	•	•		•

• *Compatible*
Compatible with conditions
Not compatible
** *Maximum of rows is indicated in the documentation, the maximum number of rows includes the heating row or electrical heater.*

YEFB Hydro Blower

2 & 4 pipe system

A complete range from 4.3 kW up to 28.9 kW

CSR00 (Wall mounted)
Fan speed selector

CMR00 (Wall mounted)
Thermostat with manual fan speed and S/W change over

CER00 (Wall mounted)
Thermostat with manual fan speed and automatic change over

CER20 (Wall mounted)
Thermostat with auto. fan speed and automatic change over

CER30 (Wall mounted)
Thermostat with auto. fan speed and automatic change over for modulating valve

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

SMART EQUIPMENT

YEFB Blower units are available in 6 sizes for horizontal concealed installations: thanks to their high ESP fans that can handle up to 250Pa, they are the ideal solution for air conditioning large spaces.

Selection software

Features

- 6 unit sizes for horizontal mounting
- Handles high external static pressure up to 250Pa
- Choice of 2 or 4 pipe systems
- Twin centrifugal fans
- Horizontal air return
- Air distribution plenum
- Electric heater option
- Optional paint finish
- F5 grade filter option
- 5 Row cooling coil option on sizes 060, 070
- EUROVENT Certified

YEFB Hydro Blower

4.3 to 28.9 kW

Unit performance at different Pa external static pressure, with 4 row cooling coil

Model YEFB			020-4	030-4	040-4	050-4	060-4	070-4*
Total cooling capacity [kW]	(1)	max	6.95	9.49	11.77	13.72	23.83	28.99
		med	5.90	8.23	10.35	12.6	21.59	26.64
		min	4.30	7.11	8.91	11.36	17.15	24.28
Sensible cooling capacity [kW]	(1)	max	4.99	7.91	9.94	11.80	18.89	23.75
		med	4.14	6.7	8.61	10.60	16.84	21.50
		min	2.98	5.68	7.17	9.44	12.93	19.14
Water flow in cooling [l/h]	(1)	max	1195	1632	2024	2360	4099	4974
		med	1015	1416	1780	2167	3714	4571
		min	740	1223	1533	1954	2950	4167
Pressure drop in cooling [kPa]	(1)	max	17.4	31.5	30.6	40.4	28.0	39.2
		med	12.2	24.1	23.3	33.8	23.2	33.1
		min	6.5	18.4	17.9	28.3	15.1	28.2
Heating capacity 2 pipes [kW]	(2)	max	7.08	11.40	14.32	17.4	28.08	35.01
		med	6.20	9.62	12.19	15.53	24.95	32.16
		min	4.55	8.20	10.4	13.85	18.9	28.84
Water flow in heating 2 pipes [l/h]	(2)	max	1219	1962	2465	2727	4495	5555
		med	1067	1656	2098	2673	4034	4926
		min	783	1411	1788	2392	3047	4330
Pressure drop in heating 2 pipes [kPa]	(2)	max	13.3	34.0	36.1	51.0	30.2	47.2
		med	10.3	25.7	26.9	41.3	23.5	40.3
		min	4.8	19.2	20.0	33.4	14.6	32.8
Heating capacity 2 pipes [kW]	(3)	max	13.49	19.31	30.3	28.47	49.17	60.88
		med	9.8	14.51	22.93	24.81	41.75	55.4
		min	5.87	12.66	18.12	21.99	32.27	50.21
Water flow in heating 2 pipes [l/h]	(3)	max	1177	1688	2638	2492	4287	5305
		med	854	1266	1994	2169	3639	4827
		min	510	1104	1574	1921	2813	4374
Pressure drop in heating 2 pipes [kPa]	(3)	max	12.3	23.2	43.4	31.2	23.9	38.5
		med	7.1	14	26.5	24.5	17.9	32.6
		min	2.9	11.0	17.6	19.8	11.4	27.4
Air flow [m3/h]		max	1145	1910	2680	3250	4120	5493
		med	920	1520	2130	2870	3610	4926
		min	620	1205	1655	2470	2580	4330
Sound power level [dB(A)]		max	64.0	65.0	69.0	72.0	77.0	79.0
		med	58.0	61.0	63.0	68.0	74.0	76.9
		min	48.0	57.0	57.0	65.0	65.1	74.4
Sound pressure level [dB(A)]	(4)	max	53.0	54.0	58.0	61.0	66.0	67.0
		med	47.0	50.0	52.0	57.0	63.0	65.0
		min	37.0	46.0	46.0	54.0	54.0	63.0
Power supply [V-ph-Hz]			230 / 1 / 50					
Power input [W]		max	171	352	451	588	1007	1 767
Absorbed current [A]		max	0.74	1.62	2.05	2.83	4.47	8.08
Dimensions	Height	mm	407.6	407.6	407.6	407.6	517.6	517.6
	Width	mm	902	902	902	902	1 160	1 160
	Depth	mm	989.6	989.6	1 239.6	1 239.6	1 634.6	1 634.6

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C
(3) Room temperature 20°C - Water inlet temperature: 65/55°C at 50 Pascal ESP
(4) Sound pressure level in a 100 m³ room, at 1 m distance and riverberating time of 0.3 s.
4 pipe system not available with 4R heating coil
** Performances are out of scope Eurovent FCP.*

YEFB Hydro Blower

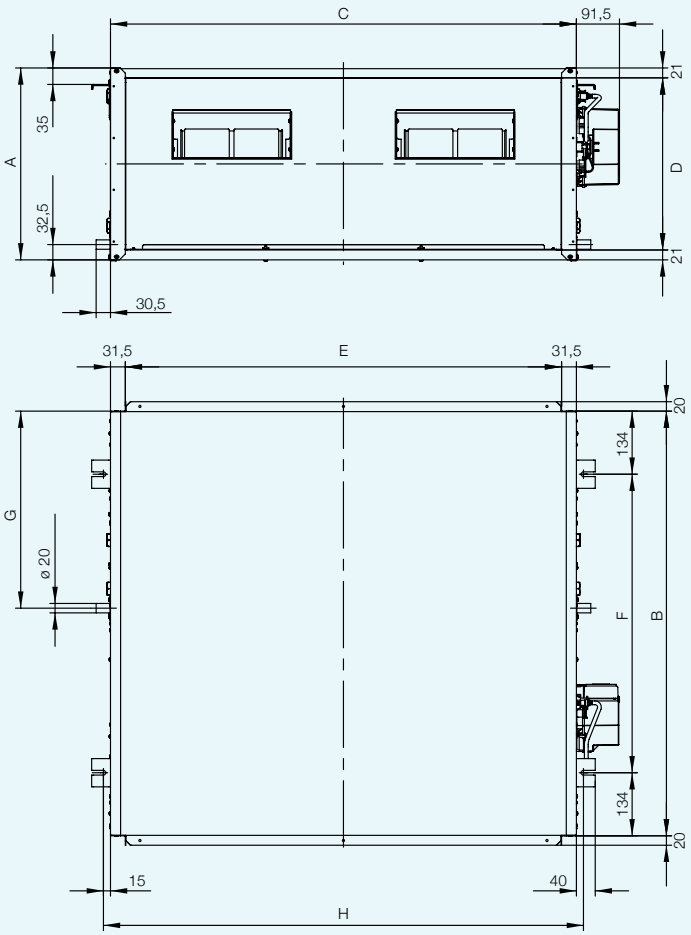
Compatibility tables

Compatibility Options / Accessories / Models

		YEFB					
Code	**Designation**	**020**	**030**	**040**	**050**	**060**	**070**
Coils and heaters**							
BA2**	Additional 2 row heating	•	•	•	•	•	•
BA3**	Additional 3 row heating	•	•	•	•	•	•
KREL**	Kit electrical heater with safety thermostat and relay	•	•	•	•	•	•
Factory fitted electric box							
CBL10	Transformer 230/24V	•	•	•	•	•	•
CBL20	Parallel connection for ON/OFF valve	•	•	•	•	•	•
CBL30	Parallel connection for modulating valve	•	•	•	•	•	•
Remote controllers and thermostats (wall mounted)							
CSR00	Fan speed selector (wall mounted)	•	•	•	•	•	•
CMR00	Thermostat with manual fan speed and S/W change over	•	•	•	•	•	•
CER00	Thermostat with manual fan speed, dead band, automatic change over	Compatible with electrical heaters					
CER20	Thermostat with automatic fan speed, dead band, automatic change over	Compatible with electrical heaters					
CER30	Thermostat with automatic fan speed, dead band, automatic change over for modulating valves	•	•	•	•	•	•
OPT10+OC716	Omnibus control for YEFB units + Remote Analogue Plus	•	•	•	•	•	•
OPT10+OC216	Omnibus control for YEFB units + Remote Display console	•	•	•	•	•	•
Valves (Supplied loose) / Condensate pump / Water sensor (Factory fitted)							
J3B2 (2p)	3-way 4-ports on/off valves for 2-pipe systems	•	•	•	•		
J3B2 (4p)	3-way 4-ports on/off valves for 4-pipe systems	•	•	•	•		
J3C2 (2p)	3-way 4-ports on/off valves for 2-pipe systems					•	•
J3C2 (4p)	3-way 4-ports on/off valves for 4-pipe systems					•	•
J3BM (2p)	3-way 4-ports modulating valves for 2-pipe systems	•	•	•	•		
J3BM (4p)	3-way 4-ports modulating valves for 4-pipe systems	•	•	•	•		
J3CM (2p)	3-way 4-ports modulating valves for 2-pipe systems					•	•
J3CM (4p)	3-way 4-ports modulating valves for 4-pipe systems					•	•
DT (2p)	Shut-off valves for 2-pipe systems supplied loose in addition to J3B2 and J3BM valves (in addition to J3A2/J3AM valves)	•	•	•	•	•	•
DT (4p)	Shut-off valves for 4-pipe systems (in addition to J3A2/J3AM valves)	•	•	•	•	•	•
PC	Condensate pump	•	•	•	•	•	•
WS	Water sensor	Compatible with CEL/CER					
External air intake							
PAS	Air intake plenum collars	•	•	•	•	•	•
PM	Air delivery plenum with collars	•	•	•	•	•	•
PM + Grill	Air delivery plenum painted with air outlet grill	•	•	•	•	•	•

• *Compatible*
Compatible with conditions
Not compatible
** *Maximum of rows is indicated in the documentation, the maximum number of rows includes the heating row or electrical heater.*

Dimensions & Weights



Model YEFB		020-4	030-4	040-4	050-4	060-4	070-4
A	min	407.6	407.6	407.6	407.6	517.6	517.6
B	mm	902	902	902	902	1160	1160
C	mm	989.6	989.6	1239.6	1239.6	1634.6	1634.6
D	min	365.6	365.6	365.6	365.6	475.6	475.6
E	mm	926.6	926.6	1176.6	1176.6	1571.6	1571.6
F	min	634	634	634	634	892	892
G	mm	418.5	418.5	418.5	418.5	446.5	446.5
H	mm	1019.6	1019.6	1269.6	1269.6	1664.6	1664.6
Weight (3R - 3 rows)	kg	64.3	64.3	79.3	79.3	126.0	126.0

		(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4-5 rows)	(2-3-4-5 rows)
Weight of the coil	kg	1.2 - 2.0 - 2.6	1.2 - 2.0 - 2.6	1.9 - 2.9 - 3.7	1.9 - 2.9 - 3.7	3.4 - 4.6 - 6.3 - 9.0	3.4 - 4.6 - 6.3 - 9.0
Water connection		G1/2" F	G1/2" F	G1/2" F	G1/2" F	G1" M	G1" M

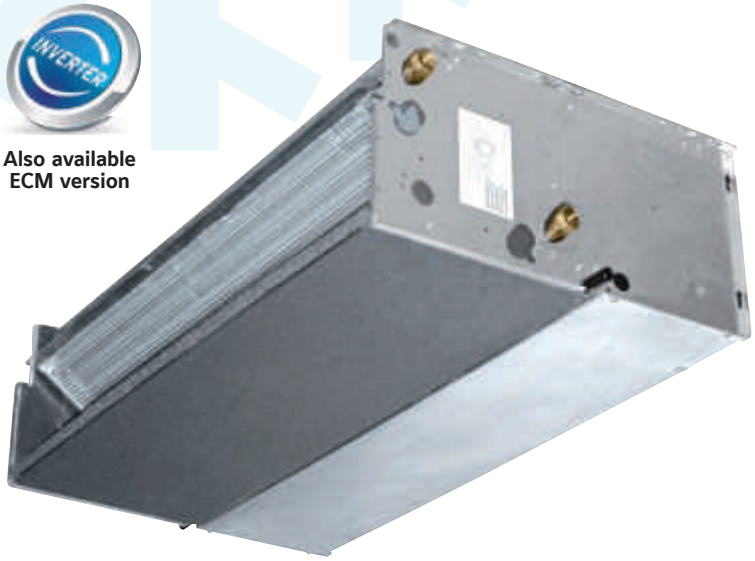
		(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4-5 rows)	(2-3-4-5 rows)
Water content	l	1.4 - 2.2 - 2.9	1.4 - 2.2 - 2.9	1.9 - 2.8 - 3.8	1.9 - 2.8 - 3.8	3.4 - 5.0 - 6.7 - 8.4	3.4 - 5.0 - 6.7 - 8.4

YHP-O High Static Pressure Blower

YHP-O 130-430 · 2 & 4 pipe system

A complete range from 3 kW to 12 kW

Also available ECM version



Wired controls

JWC-3V
Remote three speeds controller

JWC-T
JWC-3V + Electronic thermostat and Summer/Winter switch

JWC-AU
Automatic JWC-T

JTM-B
Digital Automatic Remote controller

TMO 503 SV2
Digital Automatic Remote controller to be mounted in the standard light wall box

Infrared control

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

SMART EQUIPMENT

The YHP-O blower units includes 4 airflow range (from 595 up to 2200 m3/h), each built-in 3 or 4 row coils and with the possibility to add an additional 1 or 2 row coil for 4 pipe system.

A complete range, perfect to satisfy all air conditioning needs in working environments such as offices, shops, restaurants and hotel rooms, for duct installations with available static pressure up to 80 Pa.

Features

- 12 models
- From 3020 to 12500 w cooling
- Horizontal or vertical version
- Low noise operation
- 5 speed fan
- A wide range of thermostats and accessories
- Available with left or right connections

Optionally the main valve, auxiliary valve (4 tubes), controller and wiring can be assembled from factory, for an easy installation in a centralized management system.

Selection software

YHP-O High Static Pressure Blower

3 to 12 kW

Technical features 2 pipe system

Model			YHP-O 130	YHP-O 140	YHP-O 230	YHP-O 240	YHP-O 330	YHP-O 340	YHP-O 430	YHP-O 440
Cooling capacity *		kW	2.94	3.42	4.87	5.69	6.50	7.22	10.33	11.80
Sensible cooling capacity *		kW	2.27	2.58	3.91	4.29	5.30	5.61	8.35	9.15
Heating capacity *		kW	5.28	5.95	8.76	9.97	12.04	13.13	18.91	20.40
Nominal water flow		l/s	0.15	0.18	0.26	0.30	0.34	0.38	0.55	0.62
Power supply		V.ph.Hz	230.1.50							
Nominal airflow		m3/h	595	595	1040	1040	1415	1415	2220	2220
Fan		W	76	76	140	140	174	174	256	256
Available static pressure		Pa	80	80	80	80	80	80	80	80
Water connections diameter		Inch	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Pressure drop in cooling		kPa	28.7	19.0	27.7	51.2	27.8	21.2	25.1	35.9
Pressure drop in heating		kPa	17.6	12.0	16.9	31.3	19.8	13.3	16.0	25.2
Sound pressure level **		dB(A)	50	50	50	50	55	55	57	57
Dimensions	Height	mm	218	218	248	248	248	248	248	248
	Width	mm	689	689	904	904	1119	1119	1570	1570
	Depth	mm	511	511	511	511	511	511	511	511
Weight		kg	18	18	22	22	33	33	45	45

Technical features 4 pipe system

Model			YHP-O 130+1	YHP-O 230+1	YHP-O 330+1	YHP-O 430+1
Cooling capacity *		kW	2.94	4.87	6.50	10.33
Sensible cooling capacity *		kW	2.27	3.91	5.30	8.35
Heating capacity *		kW	3.04	4.76	6.16	9.63
Nominal water flow additional coil		l/s	0.07	0.11	0.15	0.23
Power supply		V.ph.Hz	230.1.50			
Nominal airflow		m3/h	595	1040	1415	2220
Fan		W	76	140	174	256
Available static pressure		Pa	80	80	80	80
Water connections diameter		Inch	1/2"	1/2"	1/2"	1/2"
Pressure drop in cooling		kPa	28.7	27.7	27.8	25.1
Pressure drop in heating		kPa	15.8	9.4	12.7	37.9
Sound pressure level **		dB(A)	50	50	55	57
Dimensions	Height	mm	218	248	248	248
	Width	mm	689	904	1119	1570
	Depth	mm	511	511	511	511
Weight		kg	23	27	41	56

Referred data at maximum speed fan and 0 Pa available static pressure.

** Cooling capacity: Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C.*
Heating capacity: Room temperature 20°C - Water inlet temperature: 70/60°C (4 pipes), 60/50° C (2 pipes).

*** Sound pressure level in a 100 m³ room, at 1 m distance and riverberating time of 0.5 s*

YHK Hydro Cassette

2 & 4 pipe system

A complete range from 1.3 kW to 11.1 kW

Coloured versions available as an option

Wired controls

JWC-3V
Remote three speeds controller

JWC-T
JWC-3V + Electronic thermostat and Summer/Winter switch

JWC-AU
Automatic JWC-T

JTM-B
Digital Automatic Remote controller

WM-503
Digital Automatic Remote controller to be mounted in the standard light wall box

Infrared control

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

SMART EQUIPMENT

YHK Hydro Cassette units are simple and elegant, discreet in their design. High standards of quality and reliability, combined with a wide range of accessories ensure a total solution for all comfort cooling and heating requirements.

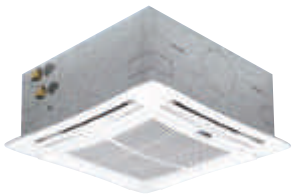
Selection software

Features

- Cooling duty from 1.3 to 11.1 kW
- 2 & 4 pipes systems in all range
- 2 sizes: 600 x 600 & 800 x 800
- Possible choice between 6 fan speeds
- Condensate pump integrated in all range
- 2/3 way valves fitted or supplied loose in all range
- Coloured versions, possible to change the colour of the grill and the frame
- Possible to select a complete range of controls
- Electric heater fitted as an option for all range (2 pipe only)
- All metal parts insulated to avoid condensations
- EUROVENT Certified

YHK Hydro Cassette

1.3 to 11.1 kW



Technical features

Model YHK -2 pipes			20-2	25-2	40-2	50-2	65-2	95-2	110-2
Total cooling capacity 2 Pipes [kW]	(1)	max	1.92	2.64	4.26	4.93	6.08	9.39	10.93
		med	1.60	2.31	3.30	3.82	4.86	6.72	8.36
		min	1.25	1.82	2.23	2.91	4.18	5.27	5.27
Sensible cooling capacity 2 Pipes [kW]	(1)	max	1.58	2.00	3.11	3.65	4.51	6.36	8.08
		med	1.29	1.72	2.35	2.75	3.53	4.42	6.00
		min	0.99	1.33	1.55	2.05	3.00	3.42	3.67
Water flow in cooling 2 Pipes [l/h]	(1)	max	340	461	745	863	1 060	1 636	1 909
		med	280	402	574	667	845	1 166	1 453
		min	219	316	387	506	724	913	913
Pressure drop in cooling 2 Pipes [kPa]	(1)	max	10	9.7	20.9	19.7	21.6	26.9	35.6
		med	7	7.6	13.0	12.4	14.3	14.7	21.8
		min	4.5	4.9	6.4	7.5	10.9	9.4	9.4
Heating capacity 2 pipes [kW]	(2)	max	2.24	2.80	4.37	5.15	6.50	9.23	11.72
		med	1.80	2.42	3.28	3.85	5.03	6.40	8.55
		min	1.38	1.85	2.12	2.85	4.27	4.92	5.12
Water flow in heating 2 pipes [l/h] *	(2)	max	340	461	745	863	1 060	1 636	1 909
		med	280	402	574	667	845	1 166	1 453
		min	219	316	387	506	724	913	913
Pressure drop in heating 2 pipes [kPa]	(2)	max	10.7	9.0	10.2	17.8	15.0	22.0	33.8
		med	7.2	6.9	6.1	10.6	9.4	11.4	19.2
		min	4.4	4.3	2.8	6.2	7.0	7.1	7.6
Heating capacity 2 pipes [kW]	(3)	max	4.6	5.7	9.3	10.6	13.1	19.8	23.7
		med	3.7	4.9	7	8.3	10.7	13.4	17.3
		min	2.8	4.2	4.9	6.1	8.6	10.3	10.3
Water flow in heating 2 pipes [l/h]	(3)	max	393	488	795	914	1 130	1 699	2 037
		med	315	422	598	709	874	1 155	1 484
		min	240	360	415	524	741	882	882
Pressure drop in heating 2 pipes [kPa]	(3)	max	9.9	8.4	12.5	16	17.5	20.9	28.9
		med	6.5	6.4	7.6	10	11.3	10.6	16
		min	4	4.8	4	5.9	8.4	6.7	6.7
Water content (2 pipes) [l]			0.8	1.4	2.1	2.1	3.0	4.0	4.0

Model YHK -4 pipes			20-4	25-4	40-4	40-6	50-4	50-6	65-4	95-4	95-6	110-4	110-6
Total cooling capacity 4 Pipes [kW]	(1)	max	2.27	2.66	3.27	3.86	3.72	4.44	6.26	7.59	8.65	8.72	9.69
		med	1.93	2.33	2.61	3.02	2.96	3.47	4.98	5.60	6.27	6.84	7.75
		min	1.49	1.83	1.83	2.07	2.33	2.69	4.11	4.48	4.95	4.48	4.95
Sensible cooling capacity 4 Pipes [kW]	(1)	max	1.84	1.94	2.49	2.88	2.88	3.37	4.61	5.71	6.37	6.67	7.26
		med	1.52	1.68	1.94	2.20	2.23	2.56	3.60	4.09	4.49	5.09	5.64
		min	1.13	1.32	1.32	1.47	1.72	1.94	2.93	3.21	3.49	3.21	3.49
Water flow in cooling 4 pipes [l/h]	(1)	max	401	464	574	664	655	764	1 090	1 326	1 488	1 529	1 667
		med	337	406	456	519	519	597	865	974	1 078	1 192	1 333
		min	260	318	318	355	406	462	712	777	851	777	851
Pressure drop in cooling 4 pipes [kPa]	(1)	max	13.5	8.8	13.4	10.5	17	14.0	18.9	26.9	25.0	34.7	32.0
		med	10	6.9	8.8	7.0	11.2	9.0	12.5	15.4	14.0	22.1	20.0
		min	6	4.6	4.6	4.0	7.2	6.0	8.8	10.3	9.0	10.3	9.0
Heating capacity 4 pipes [kW]	(4)	max	2.66	3.04	3.86	2.91	4.19	3.29	8.02	9.66	7.50	11.16	9.48
		med	2.23	2.66	3.04	2.71	3.33	2.66	6.33	7.15	5.63	8.80	6.78
		min	1.72	2.13	2.13	1.73	2.61	2.14	5.21	5.69	4.59	5.69	4.59
Water flow in heating 4 pipes [l/h]	(4)	max	261	298	378	250	426	283	783	946	645	1 092	815
		med	219	260	298	233	341	229	618	697	484	858	583
		min	169	209	209	149	267	184	508	555	395	555	395
Pressure drop in heating 4 pipes [kPa]	(4)	max	11.4	8.7	13.3	6.7	15.0	8.4	17.2	24.0	11.8	31.2	15.0
		med	8.3	6.8	8.7	4.6	9.9	5.7	11.2	14.0	7.0	20.3	9.9
		min	5.2	4.6	4.6	2.6	6.4	3.9	7.9	9.3	4.9	9.3	4.9
Air flow [m3/h]		max	610	520	710	710	880	880	1 140	1 500	1 500	1 820	1 730
		med	420	420	500	500	610	610	820	970	970	1 280	1 225
		min	310	310	320	320	430	430	630	710	710	710	710
Sound power level [dB(A)]		max	49	45	53	53	59	59	48	53	53	58	58
		med	40	40	45	45	49	49	40	40	40	48	48
		min	33	33	33	33	41	41	33	34	34	34	34
Sound pressure level [dB(A)]	(5)	max	40	36	44	44	50	50	39	44	44	49	49
		med	31	31	36	36	40	40	31	31	31	39	39
		min	24	24	24	24	32	32	24	25	25	25	25
Power supply [V-ph-Hz]			230 /1 /50										
Power input [W]		max	69.5	56.5	80.5	80.5	102.5	102.5	89.5	132.5	132.5	182.5	182.5
Absorbed current [A]		max	0.40	0.35	0.45	0.45	0.60	0.60	0.50	0.65	0.65	0.90	0.90
Cooling water content (4 pipes) [l]			1.0	1.4	1.4	1.7	1.4	1.7	3.0	3.0	3.6	3.0	3.6
Heating hater content (4 pipes) [l]			0.6	0.7	0.7	0.5	0.7	0.5	1.4	1.4	1.0	1.4	1.1
Dimensions	Height	mm	275	275	275	275	275	275	303	303	303	303	303
	Width	mm	575	575	575	575	575	575	820	820	820	820	820
	Depth	mm	575	575	575	575	575	575	820	820	820	820	820

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C *(2) Room temperature 20°C - Water temperature: 45/40 °C*
(3) Room temperature 20°C - Water inlet temperature: 70/60°C *(4) Room temperature 20°C - Water inlet temperature: 65/55°C*
(5) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.
** Water flow values as Cooling, accordingly to the EUROVENT standards and UNI ENV 1397*

Manufacturer reserves the rights to change specifications without prior notice.

YHK-ECM Inverter Hydro Cassette

2 & 4 pipe system

A complete range from 1.8 kW to 15.1 kW

Wired control

JTM-B
Wall control with display that allows controlling one or more units in Master/Slave mode. The control is equipped with internal sensor to detect the room temperature, which can be defined as a priority compared to the return air sensor on the fan coil.

Infrared control

Coloured versions available as an option

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

SMART EQUIPMENT

YHK ECM water cassette is the result of significant technical and design research focused on providing an avant-garde product in terms of performance, low noise and control flexibility. YHK ECM series uses an innovative brushless electric motor controlled by an inverter card that varies the air flow continuously by means of a 1-10 V signal. The extreme efficiency, also at a low speed, makes it possible to greatly reduce electrical consumption (more than 75% less in comparison to a traditional motor) with absorption values, under normal operating conditions, that are no greater than 10 Watt in the entire range.

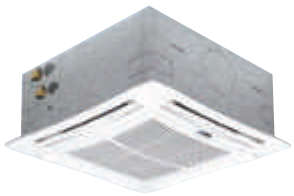
Features

- Cooling duty from 1.8 to 15.1 kW
- YHK: models with infrared control (standard)
- YHK-MP: models with wired control (accessory)
- 2 (-2) & 4 (-4 or -6) pipes systems
- 3 sizes: 600 x 600, 800 x 800 & 870 x 870
- Condensate pump integrated in all range
- 2/3 way valves fitted or supplied loose in all range
- Coloured versions, possible to change the colour of the grid and the frame
- All metal parts insulated to avoid condensations
- Inverter fan motor for a very quiet operation
- Electrical consumption reduced by up to 75%
- Specific range of controllers with master-slave function
- EUROVENT Certified

Selection software

YHK-ECM Inverter Hydro Cassette

1.8 to 15.1 kW



Technical features

Model -2 pipes			YHK-ECM 25-2	YHK-ECM 40-2	YHK-ECM 50-2	YHK-ECM 65-2	YHK-ECM 95-2	YHK-ECM 125-2	YHK-ECM 150-2
Total cooling capacity 2 Pipes [kW]	(1)	max 10v	2.73	4.30	4.96	6.30	10.69	12.60	15.13
		med 5v	2.16	3.04	3.85	5.13	7.69	9.43	11.38
		min 1v	1.84	2.24	2.55	4.20	5.28	6.36	7.86
Sensible cooling capacity 2 Pipes [kW]	(1)	max	2.07	3.15	3.68	4.69	7.83	9.31	11.41
		med	1.60	2.16	2.79	3.75	5.50	6.77	8.30
		min	1.35	1.57	1.80	3.02	3.68	4.45	5.58
Water flow in cooling 2 Pipes [l/h]	(1)	max	473	744	864	1 089	1 848	2167	2602
		med	373	524	666	885	1 328	1622	1957
		min	317	385	441	723	909	1094	1352
Pressure drop in cooling 2 Pipes [kPa]	(1)	max	10.1	15.1	19.7	22.7	33.0	22.7	31.8
		med	6.6	9.4	12.4	15.6	18.5	13.4	18.8
		min	4.9	4.6	5.9	10.9	9.4	6.6	9.6
Heating capacity 2 pipes [kW]	(2)	max	2.87	4.36	5.15	6.70	10.56	13.39	16.40
		med	2.22	2.98	3.85	5.30	7.34	9.59	11.86
		min	1.85	2.12	2.46	4.27	4.90	6.18	7.82
Pressure drop in heating 2 pipes [kPa]	(2)	max	9.4	13.2	17.8	21.6	28.1	21.5	31.0
		med	5.9	6.6	10.6	14.2	14.6	11.8	17.3
		min	4.3	3.6	4.7	9.6	7.0	5.4	8.2

Model -4 pipes			YHK-ECM 25-4	YHK-ECM 40-6	YHK-ECM 50-6	YHK-ECM 65-4	YHK-ECM 95-6	YHK-ECM 125-4	YHK-ECM 150-4
Total cooling capacity 4 Pipes [kW]	(1)	max	2.75	3.90	4.47	6.48	9.76	11.61	13.59
		med	2.17	2.81	3.51	5.29	7.14	8.86	10.59
		min	1.85	2.09	2.37	4.29	4.97	6.07	7.45
Sensible cooling capacity 4 Pipes [kW]	(1)	max	2.06	2.92	3.40	4.80	7.29	8.87	10.68
		med	1.59	2.03	2.60	3.82	5.17	6.53	7.96
		min	1.34	1.49	1.70	3.07	3.51	4.33	5.4
Water flow in cooling 4 pipes [l/h]	(1)	max	476	676	779	1 120	1 697	1997	2337
		med	375	483	608	908	1 233	1524	1821
		min	318	359	409	740	856	1044	1281
Pressure drop in cooling 4 pipes [kPa]	(1)	max	9.5	10.3	13.1	19.8	30.1	22.6	30.4
		med	6.2	5.6	8.4	13.6	17.0	13.8	19.1
		min	4.6	3.3	4.1	9.4	8.8	7.0	10.1
Heating capacity 4 pipes [kW]	(3)	max	3.18	2.91	3.29	8.24	8.33	10.55	12.17
		med	2.51	2.20	2.66	6.65	6.27	8.4	9.8
		min	2.13	1.73	1.92	5.41	4.58	6.01	7.19
Water flow in heating 4 pipes [l/h]	(3)	max	311	288	326	805	818	907	1047
		med	245	217	263	649	616	722	843
		min	209	170	189	528	449	517	618
Pressure drop in heating 4 pipes [kPa]	(3)	max	9.4	6.7	8.4	18.1	14.3	19.9	25.7
		med	6.1	4.1	5.7	12.3	8.6	13.2	17.4
		min	4.6	2.6	3.2	8.5	4.9	7.2	10.0
Air flow [m3/h]		max	535	710	880	1 165	1 770	1 905	2480
		med	380	445	610	870	1 130	1 290	1 650
		min	310	310	360	630	710	790	1 025
Sound power level [dB(A)]		max	47	54	60	48	57	58	64
		med	39	43	50	39	47	49	55
		min	33	33	37	33	34	38	44
Sound pressure level [dB(A)]	(4)	max	38	45	51	39	48	49	55
		med	30	34	41	30	38	40	46
		min	24	24	28	24	25	29	35
Power supply [V-ph-Hz]			230 /1 /50						
Power input [W]		max	28.5	44.0	81.0	43.5	126.0	105.0	195.0
Water content (2 pipes) [l]			1.4	2.1	2.1	3.0	4.0	4.6	4.6
Absorbed current [A]		max	0.25	0.40	0.70	0.40	1.10	0.80	1.30
Dimensions	Height	mm	275	275	275	303	303	304	304
	Width	mm	575	575	575	820	820	869	869
	Depth	mm	575	575	575	820	820	869	869

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water temperature: 45/40 °C
(3) Room temperature 20°C - Water inlet temperature: 65/55°C
(4) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.
** Water flow values as Cooling, accordingly to the EUROVENT standards and UNI ENV 1397*

Condensate pump integrated in all sizes

Metal parts insulated to avoid condensation

2 or 3 way valves fitted or supplied loose in all sizes

Outer casing as an option to integrate the water cassette into any enviroment

Manufacturer reserves the rights to change specifications without prior notice.

Compatibility table / Codes

Model with AC motor (without air diffuser)		YHKY 20	YHKY 25	YHKY 40	YHKY 50	YHKY 65	YHKY 95	YHKY 110	-	-
Cassette YHKY	2 pipe system	0079100K	0079000K	0079001K	0079002K	0079003K	0079004K	0079005K	-	-
	4 pipe system	0079110K	0079010K	0079011K	0079012K	0079013K	0079014K	0079015K	-	-
Cassette YHKY-MP (IR remote control and sensor NOT included)	2 pipe system	0079170K	0079171K	0079172K	0079173K	0079174K	0079175K	0079176K	-	-
	4 pipe system	0079180K	0079181K	0079182K	0079183K	0079184K	0079185K	0079186K	-	-
Cassette YHKY-E - with electric resistance	2 pipe system	-	0079060K	0079061K	0079062K	0079063K	0079064K	0079065K	-	-
Cassette YHKY-MP-E - with electric resistance	2 pipe system	-	0079191K	0079192K	0079193K	0079194K	0079195K	0079196K	-	-
Cassette YHKY-REB with remote electric board	2 pipe system	0079120K	0079020K	0079021K	0079022K	0079023K	0079024K	0079025K	-	-
	4 pipe system	0079130K	0079030K	0079031K	0079032K	0079033K	0079034K	0079035K	-	-
Model with ECM motor (without air diffuser)		**-**	**YHKY 25**	**YHKY 40**	**YHKY 50**	**YHKY 65**	**YHKY 95**	**-**	**YHKY 125**	**YHKY 150**
Cassette YHKY-ECM - basic model	2 pipe system	-	0079801K	0079802K	0079803K	0079804K	0079805K	-	0079807K	0079808K
	4 pipe system	-	0079811K	0079812K	0079813K	0079814K	0079815K	-	0079817K	0079818K
Cassette YHKY-MP- ECM (IR remote control and sensor NOT included)	2 pipe system	-	0079911K	0079912K	0079913K	0079914K	0079915K	-	0079917K (6)	0079918K (6)
	4 pipe system	-	0079921K	0079922K	0079923K	0079924K	0079925K	-	0079927K (6)	0079928K (6)
Cassette YHKY-ECM-E - with electric resistance	2 pipe system	-	0079841K	0079842K	0079843K	0079844K	0079845K	-	0079847K	0079848K
Cassette YHKY-ECM-MP-E - with electric resistance	2 pipe system	-	0079901K	0079902K	0079903K	0079904K	0079905K	-	0079907K	0079908K
Mandatory accessories (units cannot work without them)										
Air diffuser - intake grid, frame and louvres in RAL 9003 white colour		AKPA 600				AKPA 800			AKPA 900	
Accessories (factory fitted)										
Valves (220V On/Off)										
3 way valve + mounting kit for 2 pipe models (factory fitted)		9079510				9079511			9079923	
3 way valve + mounting kit for 4 pipe models (factory fitted)		9079512				9079513			9079933	
2 way valve + mounting kit for 2 pipe models (factory fitted)		9079515				9079516			9079921	
2 way valve + mounting kit for 4 pipe models (factory fitted)		9079517				9079518			9079931	
2 way DN 15 balance valve for main coil + connection kit (fact. fitted) *		9079771				9079791	-		-	
2 way DN 20 balance valve for main coil + connection kit (fact. fitted) *		-					9079792		-	
2 way DN 15 balance valve for additional coil + connection kit (fact. fitted) *		9079773				9079793			-	
Accessories (supplied loose)										
Air diffusers / Panels										
Air diffuser - other colours (*)		Contact Johnson Controls								
Valves (220V On/Off)										
3 way valve + mounting kit for 2 pipe models (not fitted)		9079500				9079501			9079922	
3 way valve + mounting kit for 4 pipe models (not fitted)		9079502				9079503			9079932	
2 way valve + mounting kit for 2 pipe models (not fitted)		9079505				9079506			9079920	
2 way valve + mounting kit for 4 pipe models (not fitted)		9079507				9079508			9079930	
2 way DN 15 balance valve for main coil + connection kit (not fitted) *		9079761				9079781	-		-	
2 way DN 20 balance valve for main coil + connection kit (not fitted) *		-					9079782		-	
2 way DN 15 balance valve for additional coil + connection kit (not fitted) *		9079763				9079783			-	
Other type of valves		Contact Johnson Controls								
Other Accessories										
Outer casing OCA 600		9079240				-			-	
Outer casing OCA 800		-				9079250			-	
3 way valve + mounting kit for units with outer casing OCA (not fitted)		9079155				9079221			-	
Fresh air duct FAD		6078005				-			-	
Fresh air kit 1 way not suitable for units with outer casing OCA - FAK 600		9079230				-			-	
Fresh air kit 1 way not suitable for units with outer casing OCA - FAK 800		-				9079231			-	
NEW Fresh air kit 1 way not suitable for units with outer casing OCA - FAK 900		-				-			9079235	
MD-600 Metal Grid		9079420				-			-	
MD-800 Metal Grid		-				9079417			-	
CONTROLS for YHKY (AC versions)										
Remote three speed control JWC-3V (1) (4)		9066642								
Remote three speed control + electronic thermostat and manual S/W switch JWC-T (2)		9066630K								
Remote three speed control + electronic thermostat and centralized/ manual S/W switch JWC-TQR (2) (3)		9066632K								
Automatic speed control with electronic thermostat and S/W switch - JWC-AU (to be used with JPF-AU and JP-AU only) (2) (3)		9066331E								
Automatic speed control with electronic thermostat to be mounted in the light wall box WM-503 (to be used with UP-503 only)		9066676								
Electromechanical thermostat T2T (4) (5)		9060174								
Power unit JPF-AU for JWC-AU and JTM-B remote controls, fitted on the unit		9066641								
Power unit JP-AU for JWC-AU and JTM-B remote controls, not fitted on the unit		9066640								
Power unit UP-503 for WM-503 remote control only, not fitted on the unit		9066677								
Control accessories for all versions (supplied with separate packaging)										
Low temperature cut-out for control JWC-T		9053048								
Low temperature cut-out for controls JWC-TQR, WM-503 and JP-AU power unit		3021090								
T2 sensor to be used as Change-over for JP-AU power unit		9025310								
Change-over 15-25 for control JWC-TQR		9053049								
Receiver SEL2M		9079109								

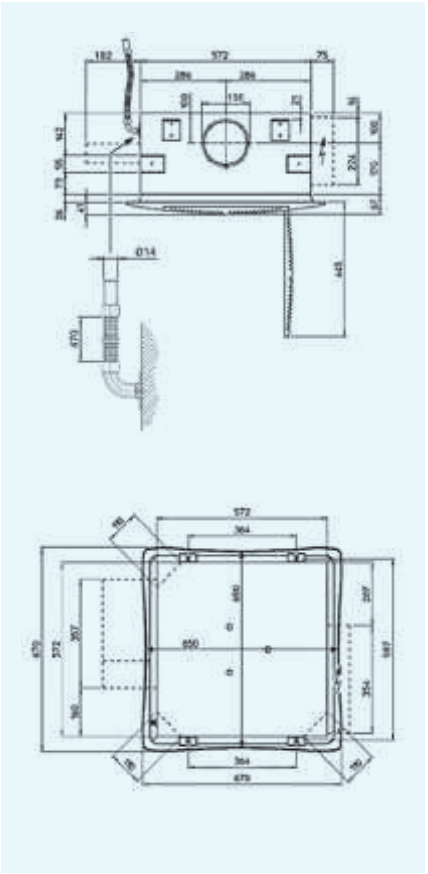
** For 4 pipes unit must consider both the valve for main coil than the valve for additional coil.*
(1) Not to be used with valves. (2) Can be used with valves and/or low temperature cut-out.
(3) Can be used with Change Over. (4) Not suitable with -E electric heater. (5) Not to be used with low temperature cut-out. (6) Receiver included.

Compatibility table / Codes

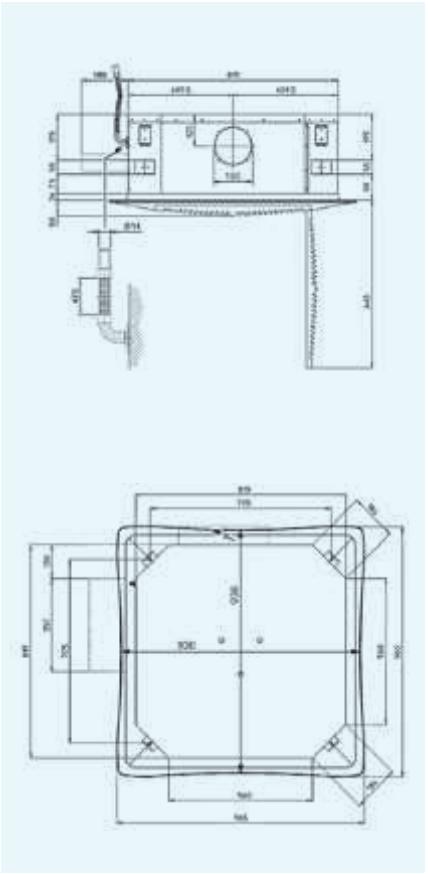
CONTROLS for YHKY-MP (AC versions)	YHKY 20	YHKY 25	YHKY 40	YHKY 50	YHKY 65	YHKY 95	YHKY 110	YHKY 125	YHKY 150
Wall control JTM-B	9066331E							-	
Wire, receiver and IR remote control kit RCS-RT03	9079117							-	
Infra red remote control RT-03	3021203							-	
Wire and receiver kit RCS	9079116							-	
Receiver for IR remote control for metal grid MD600 and MD800 RS	9066338				9066338			-	
Multifunction control PSM-DI	3021293								
T2 sensor (to be used as change over or min.temp. sensor) T2	9025310								
CONTROLS for YHKY-ECM (ECM motor)									
Automatic speed control with electronic thermostat and S/W switch - JWC-AU (to be used with JPF-AU and JP-AU only) (2) (3)	9066632K				9066632K			9066632K	
Automatic remote control with electronic thermostat, S/W switch and liquid crystall display JTM-B (to be used with JPF-AU and JP-AU only) (2) (3)	9066331E				9066331E			9066331E	
WM-S-ECM Continuous fan speed control with electronic thermostat, summer/winter switch and LCD display	9066644								
Power unit JPF-AU for JWC-AU and JTM-B remote controls, fitted on the unit	9066641								
Power unit JP-AU for JWC-AU and JTM-B remote controls, not fitted on the unit	9066640								
Control accessories for all versions (supplied with separate packaging)									
Low temperature cut-out for JP-AU power unit	3021090								
T2 sensor to be used as Change-over for JP-AU power unit	9025310								
CONTROLS for YHKY-MP-ECM (ECM motor)									
Wall control JTM-B	9066331E								
Wire, receiver and IR remote control kit RCS-RT03	9079117							-	
Infra red remote control RT-03	3021203								
Wire and receiver kit RCS	9079116								
Receiver for IR remote control for metal grid MD600 and MD800 RS	9066338							-	
Multifunction control PSM-DI	3021293								
T2 sensor (to be used as change over or min.temp. sensor) T2	9025310								
Management system for a network of fan coils with MB electronic board									
Hardware / software supervisory system Net	9079118								
Router-S for NET (default) or for BMS systems no provided by YORK	3021290								
Relay output board SIOS	3021292								

Dimensions

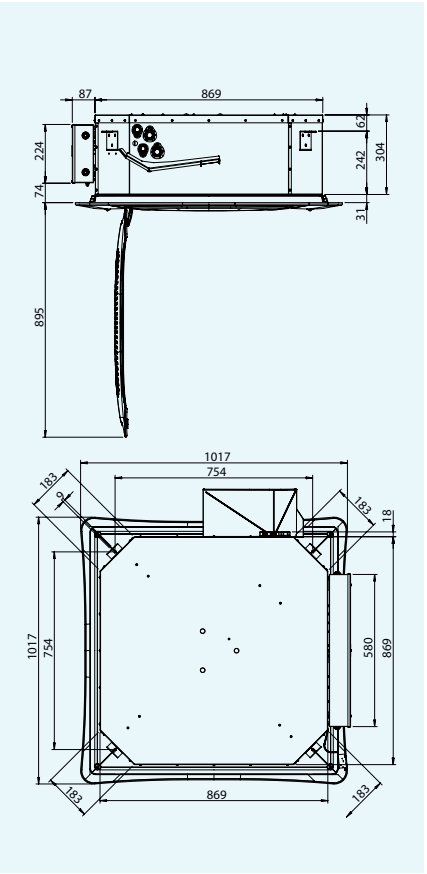
Sizes 20 to 50 (Version 600 x 600)



Sizes 65 to 110 (Version 800 x 800)



Sizes 125 to 150 (Version 870 x 870)



All dimensions in mm. Drawings not a scale.

YHVP & YHVP-ECM Hydro High Wall

2 pipe system

A range from 1.17 to 3.81 kW

JWC-T. Wired Control
Remote three speeds controller, electronic thermostat and Summer/Winter switch

JWC-AU. Wired Control
Automatic JWC-T

Electronic Infrared Control

TUC03+ Terminal unit controller
BacNET and N2 Metasys network compatible

Features

- Available with standard AC motors or low energy EC motors
- Wired control or infrared control
- Automatic air sweep (-T and –MB variants only)
- Choice of 2 or 3 way valves fitted
- Condensate collection tray
- Air filter included
- Heat exchange coil
- EUROVENT Certified

2 Way Valve ON/OFF
with thermoelectric actuator.
Suitable for the connection with Ø 12 mm pipes

Wired control (YHVP)

- 4 operation modes (Cool/Heat/Auto/Fan)
- Room temperature and setting
- Fan speed selector (Auto, low, medium and high)

Infrared control (YHVP-T)

- Wireless
- 5 operation modes (Cool/Heat/Auto/Dry/Fan)
- Sleep Mode
- Room Temperature setting
- Fan speed selection
- Timer
- Air flow direction setting
- LCD display

Note: model shown is –T variant with automatic air sweep function

YHVP & YHVP-ECM Hydro High Wall

1.17 to 3.81 kW

Technical features

Model			YHVP 1	YHVP 2	YHVP 3	YHVP 4
Total cooling capacity [kW]	(1)	max	1.85	2.16	3.00	3.76
		med	1.49	1.82	2.30	3.23
		min	1.23	1.42	1.87	2.60
Sensible cooling capacity [kW]	(1)	max	1.44	1.73	2.24	2.93
		med	1.13	1.41	1.67	2.44
		min	0.91	1.06	1.33	1.91
Heating capacity [kW]	(2)	max	2.18	2.62	3.23	4.28
		med	1.68	2.13	2.37	3.53
		min	1.34	1.58	1.89	2.73
Air flow [m3/h]		max	375	480	545	790
		med	270	365	375	610
		min	205	250	280	440
Sound power level [dB(A)]		max	48	53	48	57
		med	41	47	40	51
		min	35	39	35	43
Sound pressure level [dB(A)]	(3)	max	39	44	39	48
		med	32	38	31	42
		min	26	30	26	34
Power supply [V-ph-Hz]			230V/1ph/50Hz			
Power input [W]		max	30	32	46	48
Absorbed current [A]		max	0.16	0.16	0.23	0.23
Dimensions	Height	mm	322	322	322	322
	Width	mm	880	880	1 185	1 185
	Depth	mm	212	212	212	212

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C.
(3) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

Technical features

Model			YHVP-ECM 1	YHVP-ECM 2	YHVP-ECM 3	YHVP-ECM 4
Total cooling capacity [kW]	(1)	max 10v	1.98	2.24	3.27	3.72
		med 5v	1.57	1.86	2.52	3.03
		min 1v	1.16	1.46	1.82	2.33
Sensible cooling capacity [kW]	(1)	max	1.56	1.81	2.48	2.89
		med	1.19	1.45	1.85	2.27
		min	0.85	1.09	1.30	1.69
Heating capacity [kW]	(2)	max	2.35	2.74	3.57	4.20
		med	1.78	2.18	2.63	3.26
		min	1.26	1.63	1.83	2.40
Air flow [m3/h]		max	415	510	620	770
		med	290	375	420	550
		min	190	260	270	375
Sound power level [dB(A)]		max	52	55	53	57
		med	46	47	45	49
		min	35	40	37	43
Sound pressure level [dB(A)]	(3)	max	43	46	44	48
		med	37	38	36	40
		min	26	31	28	34
Power supply [V-ph-Hz]			230V/1ph/50Hz			
Power input [W]		max	15	21	20	30
Absorbed current [A]		max	0.14	0.19	0.18	0.26
Dimensions	Height	mm	322	322	322	322
	Width	mm	880	880	1 185	1 185
	Depth	mm	212	212	212	212

(1) Room temperature 27°C d.b., 19°C w.b. - Water temperature 7/12 °C
(2) Room temperature 20°C - Water inlet temperature: 45/40°C.
(3) The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

Codes high wall fan coil units YHVP

Unit without IR control without valve	**YHVP 1**	**YHVP 2**	**YHVP 3**	**YHVP 4**
Unit codes	0025001K	0025002K	0025003K	0025004K
Unit without IR control with 2 way valve	**YHVP-2V 1**	**YHVP-2V 2**	**YHVP-2V 3**	**YHVP-2V 4**
Unit codes	0025101K	0025102K	0025103K	0025104K
Unit without IR control with 3 way valve	**YHVP-3V 1**	**YHVP-3V 2**	**YHVP-3V 3**	**YHVP-3V 4**
Unit codes	0025201K	0025202K	0025203K	0025204K
Unit with IR control without valve	**YHVP-T 1**	**YHVP-T 2**	**YHVP-T 3**	**YHVP-T 4**
Unit codes	0025021K	0025022K	0025023K	0025024K
Unit with IR control with 2 way valve	**YHVP-T-2V 1**	**YHVP-T-2V 2**	**YHVP-T-2V 3**	**YHVP-T-2V 4**
Unit codes	0025121K	0025122K	0025123K	0025124K
Unit with IR control with 3 way valve	**YHVP-T-3V 1**	**YHVP-T-3V 2**	**YHVP-T-3V 3**	**YHVP-T-3V 4**
Unit codes	0025221K	0025222K	0025223K	0025224K
Unit with MB board without valve	**YHVP-MB 1**	**YHVP-MB 2**	**YHVP-MB 3**	**YHVP-MB 4**
Unit codes	0025011K	0025012K	0025013K	0025014K
Unit with MB board with 2 way valve	**YHVP-MB-2V 1**	**YHVP-MB-2V 2**	**YHVP-MB-2V 3**	**YHVP-MB-2V 4**
Unit codes	0025111K	0025112K	0025113K	0025114K
Unit with MB board with 3 way valve	**YHVP-MB-3V 1**	**YHVP-MB-3V 2**	**YHVP-MB-3V 3**	**YHVP-MB-3V 4**
Unit codes	0025211K	0025212K	0025213K	0025214K
Unit without IR control without valve with electrical coil	**YHVP-E 1**	**YHVP-E 2**	**YHVP-E 3**	**YHVP-E 4**
Unit codes	0025031K	0025032K	0025033K	0025034K
Unit without IR control with 2 way valve with electrical coil	**YHVP-E-2V 1**	**YHVP-E-2V 2**	**YHVP-E-2V 3**	**YHVP-E-2V 4**
Unit codes	0025131K	0025132K	0025133K	0025134K
Unit without IR control with 3 way valve with electrical coil	**YHVP-E-3V 1**	**YHVP-E-3V 2**	**YHVP-E-3V 3**	**YHVP-E-3V 4**
Unit codes	0025231K	0025232K	0025233K	0025234K
Unit with IR control without valve with electrical coil	**YHVP-T-E 1**	**YHVP-T-E 2**	**YHVP-T-E 3**	**YHVP-T-E 4**
Unit codes	0025041K	0025042K	0025043K	0025044K
Unit with IR control with 2 way valve with electrical coil	**YHVP-T-E-2V 1**	**YHVP-T-E-2V 2**	**YHVP-T-E-2V 3**	**YHVP-T-E-2V 4**
Unit codes	0025141K	0025142K	0025143K	0025144K
Unit with IR control with 3 way valve with electrical coil	**YHVP-T-E-3V 1**	**YHVP-T-E-3V 2**	**YHVP-T-E-3V 3**	**YHVP-T-E-3V 4**
Unit codes	0025241K	0025242K	0025243K	0025244K
Unit with MB board without valve with electrical coil	**YHVP-MB-E 1**	**YHVP-MB-E 2**	**YHVP-MB-E 3**	**YHVP-MB-E 4**
Unit codes	0025051K	0025052K	0025053K	0025054K
Unit with MB board with 2 way valve with electrical coil	**YHVP-MB-E-2V 1**	**YHVP-MB-E-2V 2**	**YHVP-MB-E-2V 3**	**YHVP-MB-E-2V 4**
Unit codes	0025151K	0025152K	0025153K	0025154K
Unit with MB board with 3 way valve with electrical coil	**YHVP-MB-E-3V 1**	**YHVP-MB-E-3V 2**	**YHVP-MB-E-3V 3**	**YHVP-MB-E-3V 4**
Unit codes	0025251K	0025252K	0025253K	0025254K

Controls

JWM-3V Wall control	9066642
JWC-T Wall control	9066630K
JWC-TQR Wall control	9066631K
T2T Wall control	9060174
JTM-B Wall control (to be used with MB board only)	9066331E
RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)	9025301
RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	3021203
Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	9025300
PSM-DI Multifunction control (to be used with MB board only)	3021293
SEL-CVP Speed switch for controls: JWC-T and JWC-TQR	9025302
Electronic control accessories	
NTC low temperature cut-out thermostat for control JWC-TQR	3021090
TMM low temperature cut-out thermostat for control JWC-T	9053048
Change-Over CH 15-25 for control JWC-TQR	9053049
T2 Sensor (to be used as change-over or low temperature cut-out - for MB only	9025310
Management system for a network of fan coils with MB electronic board	
Hardware / software supervisory system Net	9079118
Router-S for NET (default) or for BMS systems no provided by YORK	3021290
Relay output board SIOS	3021292

Codes high wall fan coil units YHVP-ECM

Unit without IR control without valve	**YHVP-ECM 1**	**YHVP-ECM 2**	**YHVP-ECM 3**	**YHVP-ECM 4**
Unit codes	0025501K	0025502K	0025503K	0025504K
Unit without IR control with 2 way valve	**YHVP-ECM-2V 1**	**YHVP-ECM-2V 2**	**YHVP-ECM-2V 3**	**YHVP-ECM-2V 4**
Unit codes	0025601K	0025602K	0025603K	0025604K
Unit without IR control with 3 way valve	**YHVP-ECM-3V 1**	**YHVP-ECM-3V 2**	**YHVP-ECM-3V 3**	**YHVP-ECM-3V 4**
Unit codes	0025701K	0025702K	0025703K	0025704K
Unit with IR control without valve	**YHVP-ECM-T 1**	**YHVP-ECM-T 2**	**YHVP-ECM-T 3**	**YHVP-ECM-T 4**
Unit codes	0025521K	0025522K	0025523K	0025524K
Unit with IR control with 2 way valve	**YHVP-ECM-T-2V 1**	**YHVP-ECM-T-2V 2**	**YHVP-ECM-T-2V 3**	**YHVP-ECM-T-2V 4**
Unit codes	0025621K	0025622K	0025623K	0025624K
Unit with IR control with 3 way valve	**YHVP-ECM-T-3V 1**	**YHVP-ECM-T-3V 2**	**YHVP-ECM-T-3V 3**	**YHVP-ECM-T-3V 4**
Unit codes	0025721K	0025722K	0025723K	0025724K
Unit with MB board without valve	**YHVP-ECM-MB 1**	**YHVP-ECM-MB 2**	**YHVP-ECM-MB 3**	**YHVP-ECM-MB 4**
Unit codes	0025511K	0025512K	0025513K	0025514K
Unit with MB board with 2 way valve	**YHVP-ECM-MB-2V 1**	**YHVP-ECM-MB-2V 2**	**YHVP-ECM-MB-2V 3**	**YHVP-ECM-MB-2V 4**
Unit codes	0025611K	0025612K	0025613K	0025614K
Unit with MB board with 3 way valve	**YHVP-ECM-MB-3V 1**	**YHVP-ECM-MB-3V 2**	**YHVP-ECM-MB-3V 3**	**YHVP-ECM-MB-3V 4**
Unit codes	0025711K	0025712K	0025713K	0025714K
Unit without IR control without valve with electrical coil	**YHVP-ECM-E 1**	**YHVP-ECM-E 2**	**YHVP-ECM-E 3**	**YHVP-ECM-E 4**
Unit codes	0025531K	0025532K	0025533K	0025534K
Unit without IR control with 2 way valve with electrical coil	**YHVP-ECM-E-2V 1**	**YHVP-ECM-E-2V 2**	**YHVP-ECM-E-2V 3**	**YHVP-ECM-E-2V 4**
Unit codes	0025631K	0025632K	0025633K	0025634K
Unit without IR control with 3 way valve with electrical coil	**YHVP-ECM-E-3V 1**	**YHVP-ECM-E-3V 2**	**YHVP-ECM-E-3V 3**	**YHVP-ECM-E-3V 4**
Unit codes	0025731K	0025732K	0025733K	0025734K
Unit with IR control without valve with electrical coil	**YHVP-ECM-T-E 1**	**YHVP-ECM-T-E 2**	**YHVP-ECM-T-E 3**	**YHVP-ECM-T-E 4**
Unit codes	0025541K	0025542K	0025543K	0025544K
Unit with IR control with 2 way valve with electrical coil	**YHVP-ECM-T-E-2V 1**	**YHVP-ECM-T-E-2V 2**	**YHVP-ECM-T-E-2V 3**	**YHVP-ECM-T-E-2V 4**
Unit codes	0025641K	0025642K	0025643K	0025644K
Unit with IR control with 3 way valve with electrical coil	**YHVP-ECM-T-E-3V 1**	**YHVP-ECM-T-E-3V 2**	**YHVP-ECM-T-E-3V 3**	**YHVP-ECM-T-E-3V 4**
Unit codes	0025741K	0025742K	0025743K	0025744K
Unit with MB board without valve with electrical coil	**YHVP-ECM-MB-E 1**	**YHVP-ECM-MB-E 2**	**YHVP-ECM-MB-E 3**	**YHVP-ECM-MB-E 4**
Unit codes	0025551K	0025552K	0025553K	0025554K
Unit with MB board with 2 way valve with electrical coil	**YHVP-ECM-MB-E-2V 1**	**YHVP-ECM-MB-E-2V 2**	**YHVP-ECM-MB-E-2V 3**	**YHVP-ECM-MB-E-2V 4**
Unit codes	0025651K	0025652K	0025653K	0025654K
Unit with MB board with 3 way valve with electrical coil	**YHVP-ECM-MB-E-3V 1**	**YHVP-ECM-MB-E-3V 2**	**YHVP-ECM-MB-E-3V 3**	**YHVP-ECM-MB-E-3V 4**
Unit codes	0025751K	0025752K	0025753K	0025754K

Controls

WM-S-ECM continuous fan speed control with S/W switch and liquid crystall display	9066644
JTM-B Wall control (to be used with MB board only)	9066331E
RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)	9025301
RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	3021203
Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	9025300
PSM-DI Multifunction control (to be used with MB board only)	3021293
Electronic control accessories	
T2 Sensor (to be used as change-over or low temperature cut-out - for MB only	9025310
Management system for a network of fan coils with MB electronic board	
Hardware / software supervisory system Net	9079118
Router-S for NET (default) or for BMS systems no provided by YORK	3021290
Relay output board SIOS	3021292

YEPR
Heat Recovery Units

A complete range from 300 up to 2,600 m³/h

Introduction

The high-efficiency heat recovery units of the **YEPR** series have been designed to ensure energy savings in ventilation systems of public and private premises such as bars, restaurants, offices, shops, etc., making it possible to recover heat from the exhaust air and transferring it to the air released into the room.

The heat exchange between the exhaust air and the intake air takes place through a static heat exchanger with countercurrent flow, sized to obtain a heat recovery up to 94%.

The **YEPR** series includes 4 sizes suitable for horizontal installation and covers a range of flow rates from 300 to 2600 m3/h. The units are available both in the version for installation on ceilings and floors.

Construction features

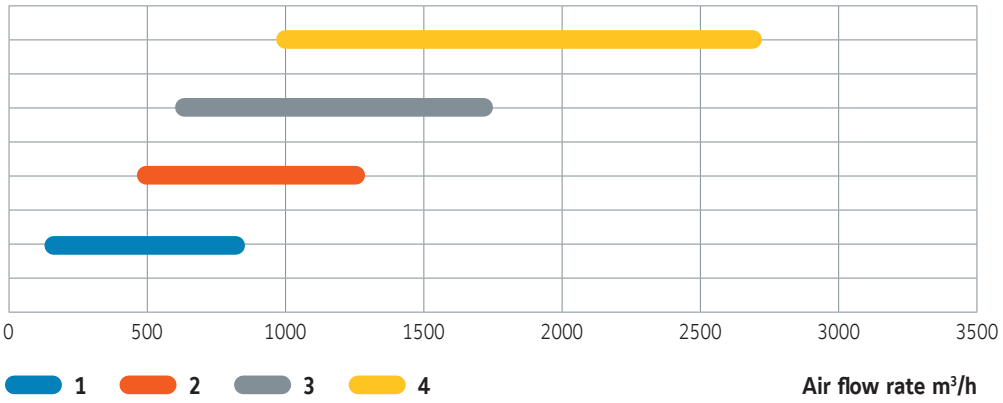
The **YEPR** are supplied in 2 versions:

- for ceiling installation **(YEPR 1-C, YEPR 2-C, YEPR 3-C, YEPR 4-C)**
- for floor installation **(YEPR 1-F, YEPR 2-F, YEPR 3-F, YEPR 4-F)**

and they are equipped with centrifugal fans, featuring backward-inclined blades, and a continuous modulation electronic motor which ensure variable flow control, so as to reduce power consumption to the minimum necessary.

The YEPR units are ERP 2018 and therefore comply with the regulatory requirements of the European Ecodesign Directive (EU Regulation 1253/14). The checks concern both the energy performance relating to heat recovery and the intrinsic energy consumption parameter SFPint in the nominal conditions declared by the manufacturer.

YEPR range



YEPR Heat Recovery Units

YEPR 1 to 4

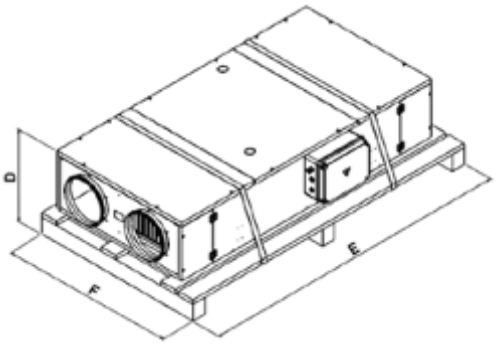
Technical features

Model		YEPR 1	YEPR 2	YEPR 3	YEPR 4
Maximum supply and return air flow rate	m^3/h	720	1150	1700	2600
	m^3/h	0.20	0.32	0.47	0.72
Supply and return rated available static pressure	Pa	170	220	250	250
Minimum supply and return air flow rate	m^3/h	270	300	600	690
Thermal efficiency EU regulation 1253/14 (1)	%	80	80	80	85
Total thermal output recovered (1)	kW	3.9	6.2	9.1	14.8
Maximum recovery efficiency (2)	%	90	90	90	94
Total thermal output recovered (2)	kW	6.5	10.5	15.4	24.5
Total number of fans	-	2	2	2	2
Rated absorbed electrical power (3)	W	330	770	1060	1460
Maximum total absorbed current (3)	A	2.8	3.4	4.7	6.5
Unit power supply (3)	V-Ph	230-1 + N / 50Hz	230-1 + N / 50Hz	230-1 + N / 50Hz	230-1 + N / 50Hz
Protection rating with machine installed	-	IP20	IP20	IP20	IP20
Unit weight	kg	90	140	170	320

1) Air conditions: EAT = 5°C and t_i = 25°C, no condensate
2) Air conditions: EAT = -10°C and t_i = 20°C, RHi 50% RH
3) Basic version

Overall dimensions of the packaged unit

Model			YEPR 1	YEPR 2	YEPR 3	YEPR 4
Dimensions	D	mm	469	510	595	735
	E	mm	1845	1845	2245	2345
	F	mm	1030	1030	1430	1880
Weight		kg	119	165	198	370



Thermal performances - Internal conditions: ti = 20°C - RHi = 50%

Model	Q_v	EAT: 10°C			EAT: 5°C			EAT: 0°C			EAT: -5°C			EAT: -10°C		
		P_h	ε_t	m_w	P_h	ε_t	m_w	P_h	ε_t	m_w	P_h	ε_t	m_w	P_h	ε_t	m_w
	m3/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h
YEPR 1	100	0.30	90.4	0.00	0.46	90.5	0.15	0.62	91.7	0.26	0.79	94.3	0.36	0.97	96.5	0.44
	150	0.44	88.2	0.00	0.67	88.3	0.21	0.90	89.8	0.38	1.17	92.7	0.53	1.44	95.4	0.65
	300	0.85	84.6	0.00	1.28	84.7	0.42	1.74	86.4	0.72	2.26	90.0	1.03	2.81	93.2	1.25
	450	1.25	82.6	0.00	1.87	82.7	0.62	2.55	84.5	1.09	3.34	88.4	1.52	4.16	91.9	1.85
	600	1.63	81.2	0.00	2.45	81.3	0.81	3.35	83.2	1.43	4.39	87.3	2.01	5.49	90.9	2.47
	750	2.01	80.1	0.00	3.03	80.2	0.96	4.13	82.2	1.71	5.43	86.4	2.43	6.80	90.1	3.01
YEPR 2	200	0.60	89.4	0.00	0.90	89.5	0.29	1.22	90.8	0.51	1.57	93.5	0.70	1.93	96.0	0.86
	250	0.74	88.2	0.00	1.11	88.3	0.36	1.50	89.7	0.63	1.94	92.7	0.88	2.40	95.3	1.08
	500	1.42	84.6	0.00	2.13	84.7	0.69	2.90	86.4	1.20	3.77	90.0	1.72	4.69	93.2	2.08
	750	2.08	82.5	0.00	3.12	82.6	1.04	4.25	84.5	1.81	5.56	88.4	2.52	6.93	91.8	3.09
	1000	2.72	81.1	0.00	4.08	81.2	1.35	5.57	83.1	2.38	7.31	87.2	3.35	9.14	90.8	4.12
	1250	3.35	80.0	0.00	5.04	80.1	1.68	6.88	82.1	2.85	9.04	86.3	4.05	11.32	90.0	5.00
YEPR 3	300	0.89	88.4	0.00	1.34	88.5	0.43	1.81	89.9	0.76	2.34	92.9	1.06	2.88	95.5	1.31
	400	1.17	86.9	0.00	1.75	87.0	0.56	2.38	88.5	1.00	3.08	91.8	1.37	3.81	94.6	1.69
	800	2.24	83.4	0.00	3.36	83.5	1.10	4.57	85.2	1.91	5.97	89.0	2.66	7.44	92.4	3.36
	1200	3.27	81.4	0.00	4.92	81.5	1.64	6.71	83.4	2.88	8.79	87.4	3.90	10.99	91.0	4.97
	1650	4.42	79.8	0.00	6.63	79.9	2.20	9.06	81.9	3.88	11.91	86.1	5.31	14.92	89.9	6.57
	2000	5.29	78.9	0.00	7.95	79.0	2.53	10.87	81.0	4.54	14.31	85.4	6.49	17.95	89.2	8.05
YEPR 4	400	1.28	95.3	0.00	1.92	95.4	0.63	2.58	96.1	1.10	3.27	97.5	1.50	3.97	98.7	1.75
	550	1.72	93.5	0.00	2.59	93.6	0.84	3.49	94.5	1.49	4.44	96.4	1.98	5.42	98.0	2.43
	1100	3.31	89.7	0.00	4.97	89.8	1.61	6.72	91.1	2.82	8.65	93.8	3.89	10.64	96.1	4.74
	1700	4.98	87.4	0.00	7.48	87.5	2.45	10.14	89.0	4.34	13.13	92.1	5.87	16.23	94.9	7.25
	2300	6.62	85.8	0.00	9.94	85.9	3.22	13.50	87.5	5.77	17.53	90.9	7.90	21.74	93.9	9.83
	2900	8.23	84.6	0.00	12.36	84.7	4.02	16.81	86.4	6.97	21.88	90.0	9.99	27.19	93.2	12.09

t_i = *Internal air temperature*
RH_i = *Internal relative humidity*
EAT = *External air temperature*
Q_v = *Intake air flow rate*
Q_r = *Return air flow rate*
P_h = *Thermal recovery on the intake flow*

ε_t = *Recovery efficiency with balanced flow rates*
m_w = *Condensate production*
b = *Unbalance percentage*
ε_t* = *Recovery efficiency with unbalanced flow rates*
F_T = *Correction coefficient according to EAT variation*
F_Q = *Correction coefficient according to Qv variation*

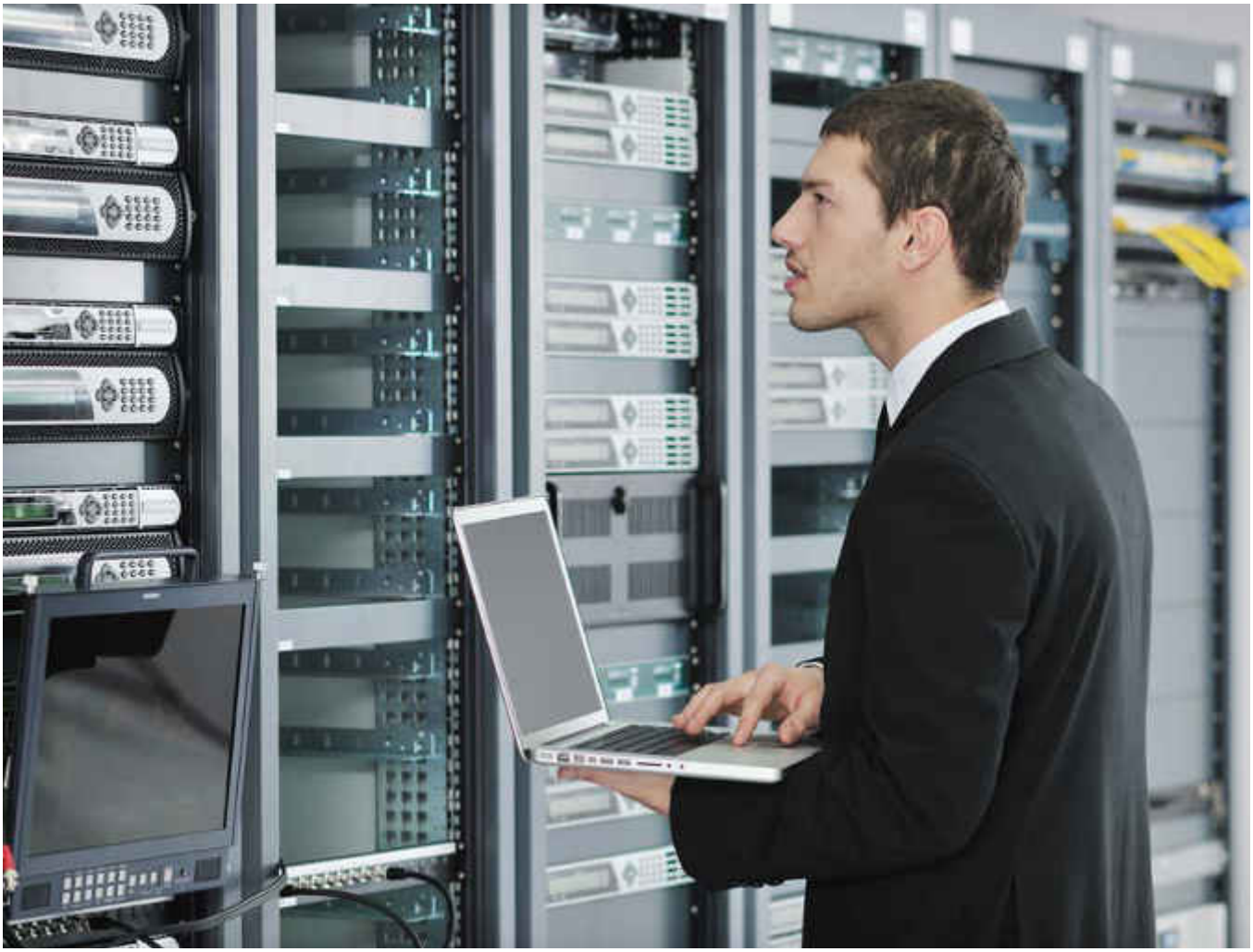
$$\varepsilon_t = \frac{2980\ P_h}{Q_v\ (t_i - TAE)}$$

$$b = Q_r / Q_v$$

$$\varepsilon_t^* = \varepsilon_t\ b\ F_r\ F_Q$$

YORK® Close Control units

Maintaining a constant temperature, purity and humidity of air is essential for ensuring a stable environment for critical electronic and computer equipment, this is why there is the need for close control air conditioning. Unlike comfort air conditioning, close control systems must operate constantly 24/7 requiring high reliability and minimal power consumption. Johnson Controls knows that no two close control requirements are the same, this is why the YORK® range of custom close control units offers quiet, compact and energy efficient equipment that can be configured to needed requirements.



An extensive offering

- cooling capacities of **up to 160kw (chilled water) or 94kw (direct expansion)** with optional free cooling models. Up flow or down flow configuration, either as self-contained packaged units or suitable for connection to remote condensers, are also available
- **optional direct expansion units** fitted with scroll compressors, which have much lower noise and energy consumption than reciprocating compressors
- **R410a** refrigerant units available
- optional **Free Cooling coil** to reduce energy consumption required through use of mechanical cooling
- plug fan with **Electronically Commuted 'EC' fans** option, to allow fully modulating control of airflow
- **low component face velocities**, for a lower total pressure drop and reduced energy consumption
- **minimised dimensions**, enabling one of the market's greatest ratios between sensible cooling capacity and base foot print

YORK® YC-P Series
Close Control Air Conditioners

A complete range from 7.8 kW up to 160.3 kW

High energy efficiency and minimum environmental impact

"P" Series air conditioners for close control applications are specialised machines with design and operating features which clearly differentiate them from standard air conditioning units.

The **"P" Series** air conditioners offer very high energy efficiency values in all operating conditions which translates into less CO_2 emissions and particularly low running costs. Though optimised for use in data centers and telephone exchanges, they are equally valid in special applications such as measurement laboratories, TV recording studios, museums, control rooms for electricity power stations and railway junctions and other areas where there are prevalent sensible thermal loads and crowding is negligible.

Their application is also ideal in widely varied industrial sectors: optics, electronics, electromedical equipment, electronic equipment production, musical instrument production etc.

Optimal efficiency

Johnson Controls' **"P" Series** design offers the highest sensible cooling capacity with the minimum footprint possible, which translates into optimal ratio levels of cooling capacity to footprint area. This is an important feature in reducing the space needed by machinery, allowing more room in the space for IT equipment. This advantage is especially important given the progressive increases in capacity required by data centers and other computer applications which, over time, need the addition of extra air conditioners.

Clean efficiency is also ensured by the use of the R-410A refrigerant, respectful to the ozone layer.

Features and performance

Brushless DC compressors with inverter technology

- Adapting cooling capacity to the real requirements of the plant is one of the principal conditions of guaranteeing the flexibility required by the most advanced systems. By incorporating **BRUSHLESS DC INVERTER** technology into the compressors it is possible to maximize the performance of the motor, especially at partial loads, the control of which is integrated in the microprocessor.
- The cooling coils of the downflow units (**YC-UP**), both in chilled water and direct expansion versions, have aluminium fins with a hydrophylic treatment that alleviates the risk of condensation and the coil face being covered with water, which would compromise the thermal performance and therefore the air conditioning capacity.
- The use of the environmentally friendly refrigerant HFC R410A does not contribute to the depletion of the ozone layer.
- Thanks to its larger surface area, the filter on the coil allows lower face velocity, which results in lower pressure drop.
- The lower energy consumption of these air conditioners, at the same efficiency, results in a much reduced TEWI (Total Equivalent Warming Impact). The application of EC plug fans reduces both energy consumption and noise levels.

Microprocessor regulation

The Standard digital microprocessor

- allows management of all typical air-conditioning functions: cooling, heating, humidification, dehumidification and filtering
- ensures a regular and optimised operation as to both performance and consumption, providing as well alarm management and self-diagnosis.

Cooling circuit

The air conditioners with direct expansion coil have a frigorific circuit equipped with: scroll compressor with all necessary protective devices, high pressure (manual reset) and low pressure (automatic reset) switches, dehydrating filter with refrigerant sight glass.

YC-OPA, **YC-UPA** models for pairing with remote condensers, are already equipped with a pressurisation nitrogen charge. The refrigerant charge, and the oil top-up (if required), shall be made by the installer on site.

YC-OPA and **YC-UPA** air conditioners in self-contained packaged format with built-in water-cooled condensers (accessory), are supplied with full refrigerant and oil charge.

Local network management or remote control

YORK® YC-P Series air conditioners are capable of standalone operation, local private network with multiple units (up to 12) or fully integrated with Metasys® Building Management System from Johnson Controls.

The **YORK® YC-P Series** are equipped with an innovative local network monitoring (LAN) system that simplifies management, simplifies maintenance, and optimizes operational safety.

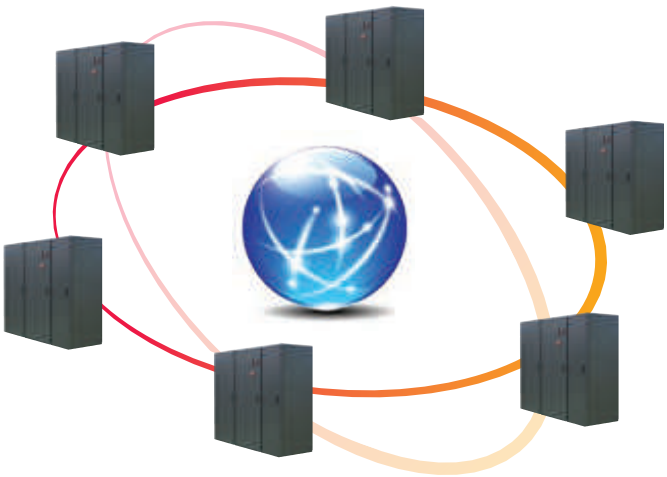
The innovative smart net system allows to revolutionize the local network concept. In fact, taking advantage of the modulation capabilities of the components, this system allows you to actively share the workload between all units in the local network.

Thanks to the breakdown of the workload, it is possible to increase the efficiency of the system by partially requesting the main components such as fans, compressors, electric batteries and humidifiers.

This partitioning translates directly into energy savings of up to 60% compared to redundant networks. In fact, instead of having active units that work 100% of their performance while one (or more) machines are stationary, the smart net system allows the entire unit group to have 50 or 60% of their maximum workload.

In remote applications, the machines can be controlled from remote positions interfacing with common Building Management Protocols such as BacNET, LON and Modbus, either via GSM Modem or TCP/IP Internet Protocol.

For total integration with Johnson Control Metasys® Building Management Systems (BMS) the units are equipped with an RS485 card working with BacNET MS/TP protocol.



Electronic expansion valve

Electronic expansion valves are one of the most recent pieces of equipment that enable us to improve the energy efficiency at partial loads of direct expansion machines. These valves are installed at the inlet of the evaporator, substituting the traditional thermostatic expansion ones: this allows more precise control of the quantity of refrigerant entering the evaporator, and guarantees good capacity regulation, typically between 100% and 50%. Electronic expansion valves also allows control of the amount of overheated gas at the outlet of the evaporator, thus allowing a significant reduction of the condensation pressure during winter or night-time operation whilst maintaining the evaporation pressure unchanged. Adoption of the electronic expansion valve (optional) guarantees a significant increase of the EER values.

One or two completely independent compressors

Models with "1" as the last digit of the unit model number have a single circuit and a single compressor. Those with "2" as the last digit on the other hand have two completely independent refrigerant circuits and two compressors.

The circuits are fitted with all the safety and regulation devices necessary for efficient and reliable operation.

The evaporator coil can be single or double circuit depending on the number of compressors.

Hydraulic circuit

Air conditioners with chilled water coil, **YC-OPU** and **YC-UPU**, include a finned coil and a three-way motorised valve for water flow regulation. The hydraulic circuit is provided with copper tubes. The coils are optimised for both water with a temperature of 7/12 and for higher ones such as 15/20.

Modulating regulation of the cooling capacity

If a very precise regulation and high response speed are required, a modulating valve is installed as standard. This valve is recommended in case of functionment with a lot of fresh air.

Control Panel

All the units are equipped with a complete control panel with main isolator switch. Magnetothermic switches, contactors, and all necessary protection is provided, as required by legal codes and standards.

The control panel of the units equipped with compressors ("A" as third letter of the identification code) has as standard a phase sequencer, which prevents the compressor from getting damaged when counter running. Also, the control panel has 4 configurable input and output for remote signalling, as well as two terminals for starting up and stopping the unit from remote position.

The condenser fan speed controller (accessory) is installed in the unit and controlled with a 0-10V signal from the microprocessor. All the control parameter are managed by the microprocessor.

The controller is valid for all the AC 230V motors.

EC fans control and power lines available as alternatives.

Modulating controller display and keypad

Large surface filters

The units are equipped with self-extinguishing media class G4 filters. The filters are installed inclined before the cooling coil in order to offer a larger surface and allow lower air crossing speeds, with lower energy consumption.

M5 or F7 filters ON COILS available as accessories.

Design suitable to civil environments

YORK® YC-P Series air conditioners have a pleasant and functional design, suitable for installation in civil environments. Their structure consists of aluminium profiles and closing panels hinged on them. Both panels and profiles are epossidic painting RAL 7024.

Two versions are available for up flow units (**YC-OP**): front grille & top air discharge (standard), or blind front panel, suction from the bottom and top discharge (optional).

Fan section

New generation of electronic fans

The ever-growing necessity to save energy has made the use of high-performance EC Plug Fans indispensable in reducing plant costs. The fans installed in **YC-P** close control air conditioners are fitted with **BRUSHLESS EC** (Electronically Commutated) **MOTORS** and a composite-material impeller to maximize performance.

Important advantages obtained as a result include:

- Power drawn by the fans is reduced by over 25% compared to fans using traditional AC technology.
- Power drawn by the fans is reduced by about 15% compared to the previous generation of EC fans.
- Noise levels are reduced by over 5 dB(A) at partial loads.
- Risk to the plant is reduced as the mechanical parts are subjected to less use.

Thanks to integration with the microprocessor, the EC fans can be controlled to:

- Reduce rotation speed and therefore air quantity as the cooling capacity requirement decreases, thus making possible a 50% energy saving, operating at partial loads, compared to a constant velocity system.
- Maintain constant air quantity controlled in real time by differential pressure sensors, optimal control if F7 filters are installed.
- Maintain constant air pressure in the raised floor or in the compartmented areas in order to optimize air distribution avoiding hot spots and guarantee maximum modularity of the plant plant.

Regulation Options

Johnson Controls provides four different alternatives for the regulation of the airflow of the EC fans depending on the requirements of the installation:

1. Constant fan rotation speed. The available high static pressure is ideal for most applications. The effective air flow depends on the real pressure drop of the aeraulic system of the installation, however it can be calculated through Johnson Controls computerised selection program.
2. Constant airflow independent of the pressure drop of the system. In order to maintain a constant airflow, an internal sensor guides the microprocessor management system to vary the airflow handled by the fan, depending on the degree of the system. This ensures that insufficient cooling does not occur due to reduced airflow arising from dirty filters.
3. Variable airflow depending on the cooling capacity required by the installation. This is the classic VAV (Variable Air Volume) plant arrangement which responds to increased demand by a proportionate increase in airflow and vice versa. This type of plant offers interesting energy advantages at partial loads, which occur extensively throughout the year, especially at night.
4. Airflow as a function of pressure in the raised floor. This regulation alternative is envisaged for plants with raised floors where the air is distributed under the floor itself. The microprocessor management system maintains constant under-floor pressure. In particular, in very large areas subdivided into multiple local zones with partition dampers driven by individual thermostats, constant regulation of the pressure is necessary to avoid imbalances in the distribution of the air.

Downflow supply (UPA-UPU models)

Standard version with suction with upper air intake and downflow, with raised floor stand.

Suction with upper air intake and front air outlet with distribution plenum with adjustable grilles.

Suction with upper air intake and front air delivery with grid front panel.

Upflow supply (OPA-OPU models)

Standard version with front air intake and upflow air delivery.

Front air intake and front air outlet delivery with distribution plenum with adjustable grilles.

Bottom air intake with raised floor support, blind front panel and upflow air delivery.

Special versions

"Water to air free cooling": using renewable energy sources

YC-OPA.../FC, YC-UPA.../FC air conditioners are equipped with a "Free cooling" system consisting of an additional chilled-water cooling coil integrated in the aluminium fins of the unit's direct expansion one, with a three-way modulating valve controlled by the controller. As long as the outside conditions allow the water to respond totally or partially to the cooling request, the controller cuts out or minimises the compressors' intervention, so reducing substantially the energy consumption.

The water cooled condensers of the frigorific circuit are equipped with a pressostatic system for the regulation of the condensing pressure (flooding valves).

The pumps and the expansion tank are not included in Johnson Control's supply. The system widely uses the outdoor air–a renewable energy source–in lieu of or in addition to the mechanical cooling.

'Two Sources' option utilising excess energy from building HVAC systems

This system consists of the same chilled-water cooling coil as the "Free cooling", but fed by the building water chiller. A built in frigorific circuit enters in operation in case of lack of chilled water. The result is the maximum security or a remarkable reduction of both consumption and running costs. This system can also use the direct-expansion coil circuit as primary cooling source and, in case of an emergency, the chilled-water coil connected with the tap water network.

The "Two Sources" version is available for units with direct expansion circuit **YC-OPA..../TS, YC-UPA..../TS** as well as units with built in water cooled condenser (accessory) and with double chilled water coil **YC-OPU.../TS, YC-UPU.../TS**: one for district water and the other for tap water or water from a chiller (emergency).

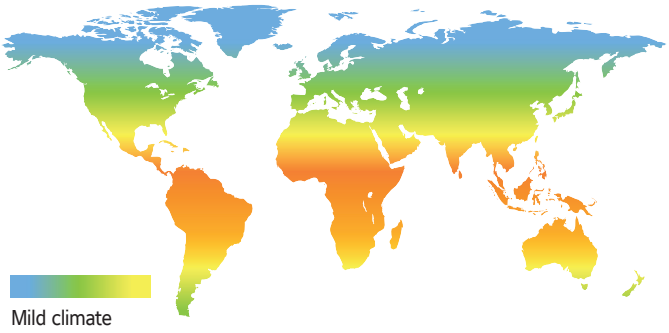
Focus on Free Cooling

High energy saving air conditioning unit

Using renewable energy sources is required to reduce the environmental impact of systems. Our innovative free cooling systems are able to achieve energy savings of over 50% compared to a conventional air conditioner.

Free Cooling from renewable sources

Using **outside air to cool environments** is the primary source of energy savings available in temperate climate areas.



YORK can now offer a range of **FREE COOLING** close control air conditioning units which ensure high energy savings combined with the efficiency and reliability that distinguish this type of product.

Intelligent energy saving

The high number of hours per year in which **FREE COOLING** systems can be used ensures that the air conditioning system energy consumption can be **reduced by over 50%.**

This is reflected in an immediate environmental sustainability increase, thanks to a significant reduction in CO2 emissions, and the system operating costs.

Free Cooling operating hours per year

	Amsterdam	Athens	Belgrade	Berlin	Brussels
Nbr. hours (1)	5,641	4,491	5,105	5,583	5,545
Percentage (2)	64%	51%	58%	64%	63%

	Bucharest	Budapest	Copenhagen	Dublin	Helsinki
Nbr. hours (1)	5,503	5,279	5,861	7,161	5,796
Percentage (2)	63%	60%	67%	82%	71%

	Istanbul	London	Madrid	Milan	Moscow
Nbr. hours (1)	4,779	5,575	4,643	5,281	6,046
Percentage (2)	55%	64%	53%	60%	71%

	Oslo	Paris	Prague	Reykjavik	Vienna
Nbr. hours (1)	6,202	5,187	5,619	7,743	5,651
Percentage (2)	73%	59%	64%	88%	65%

(1) Number of hours with temperatures lower than or equal to 18°C.
(2) Percentage calculated on a total of 8,760 hours per year.

Indirect Free Cooling

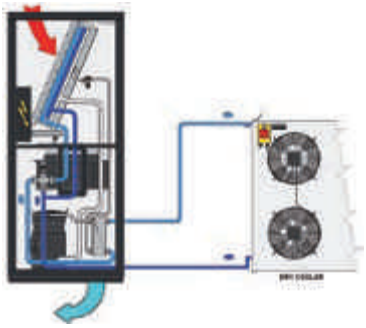
The indirect FREE COOLING system is characterised by a hybrid unit, consisting of a primary water circuit and a secondary direct expansion or chilled water circuit. The primary water circuit is connected to a dry cooler that uses outside air - a source of renewable energy - to cool water. The secondary circuit on the other hand exploits the mechanical cooling.

Optimised operating procedures

Depending on the outside air temperatures, three possible operating procedures are possible:

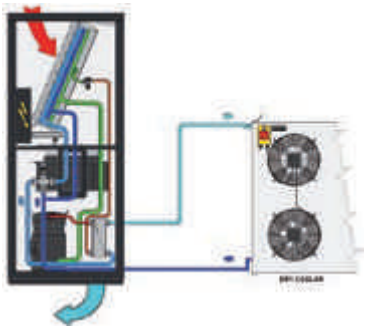
Total Free Cooling

The unit completely operates in **FREE COOLING** without triggering mechanical cooling.



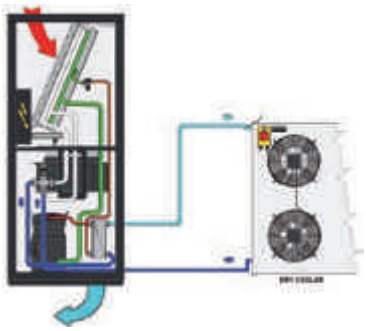
Partial Free Cooling

In addition to operating the **FREE COOLING** circuit, mechanical cooling can be triggered for the time strictly necessary to meet the demand for cooling.



No Free Cooling

Regulation is completely entrusted to mechanical cooling, excluding the **FREE COOLING** circuit.cooling.



Self-adaptive set-point of the dry cooler

In order to maximise the efficiency of the **FREE COOLING** system, the unit can handle the regulation of the dry cooler coupled to it directly. **Thanks to the self-adaptive set-point function, the fan speed can be regulated so that the water always has a temperature consistent with the outside air conditions.**

This leads to an **increase in the system efficiency,** allowing you to maximise the performance of both the **FREE COOLING** circuit and the direct expansion circuit, ensuring low condensing temperatures. In addition, the fans of the dry cooler will partially operate even with high temperatures, thereby increasing the energy savings of the system.

Focus on Two Sources

Dual circuit system

Some critical applications often require safety devices that prevent discontinuity of operation due to system failure. To allow for such an eventuality, YORK can offer **"Two Source" systems provided with two totally independent cooling sources.**

High operational safety

In an air conditioning system, the main cooling source may be insufficient to guarantee suitable environmental conditions. This may be due to an overload of the system, maintenance, possible seasonal closures or any type of emergency that may arise.

A reduction in the machine cooling capacity can lead to great instability in the system, reducing the ability to control the system thermo-hygrometric conditions.

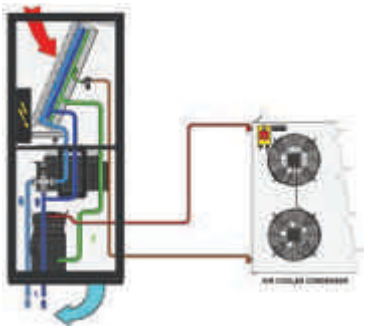
So as to avoid these problems, specific **TWO SOURCES (TS)** units have been developed providing a second source of cooling, complete with its own control valve and totally independent from the primary one.

A safe, flexible system

The Two Sources system is very flexible and allows three different types of systems:

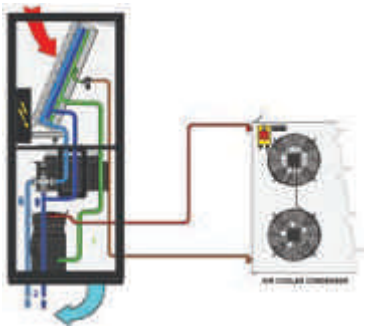
Chilled water + direct expansion Two Sources

The chilled water primary source of the unit is connected to a building chiller or to District Cooling, whereas the secondary, emergency, and direct expansion one is connected to remote air or in-built water condensers.



Direct expansion + chilled water Two Sources

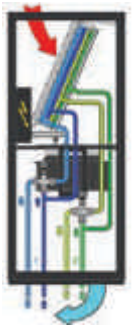
The direct expansion primary source of the unit is connected to remote air or in-built water condensers, whereas the secondary, emergency, and water one is connected to a dedicated chiller, to a groundwater/aqueduct water distribution network or to District Cooling.



Chilled water + chilled water Two Sources

Both sources of the unit are chilled water coils. The primary one is normally connected to a building chiller or to District Cooling.

The emergency source can be connected to a dedicated chiller or a groundwater/ aqueduct water distribution network.



Fittings and accessories

Numerous accessories and options are available for the **"P" Series** air conditioners to personalise the installation depending on the requirements of the plant and its design. Divided by function, they include:

Free cooling or two sources

- Additional Free cooling circuit.
- Additional Two sources circuit.

Alarms

- Water alarm (supplied loose).
- Out-of-range air discharge temperature alarm (standard).
- Smoke/fire alarm terminals (standard).

Water cooled condensers and pressostatic valves

- Welded stainless steel water cooled plate condenser.
- 2 way modulating valve (only if the water condenser is selected).

Sound proofing devices

- Sound damped duct for air suction or discharge (h=550 mm). Allows a reduction of approx 4 dB(A) of the SPL of the unit.

Panels and base

- Blind front panel (OP) and open base for bottom air intake.
- Front panel with grille in the lower part (UP) and closed base.

Plenum

- Plenum (h=550 mm) for air discharge or intake with adjustable grille.

Direct expansion unit cooling capacity regulation

- Electronic expansion valve (standard).
- INVERTER compressor available.

Heating, reheating and humidification

- Single-step or double-step low thermal inertia electrical heating/ reheating coil.
- Immersed-electrode modulating humidifier and dehumidification control.
- Humidity sensor for the single control of dehumidification.
- Humidity sensor and control signal for external humidification control not supplied by Johnson Controls.

Boards and sensors

- RS 485 communication board.

Dampers

- Gravity-operated overpressure dampers on the air outlet (OP series).
- Motorised overpressure dampers on the air intake (UP series).

Under bases

- Adjustable under base (OP only).
- Adjustable under base with air deflector (UP only).

Fans and filters

- Electronic EC fans with incorporated inverter for constant rotation speed regulation (standard).
- Electronic EC fans with incorporated inverter for the regulation of air flow in relation to the required cooling capacity (standard).
- Electronic EC fans with incorporated inverter for the regulation of constant pressure in the raised floor.
- M5 or F7 on the COIL.
- Monophase condenser-fan rotation speed variator

Performance at JOHNSON CONTROLS test conditions*

Technical Characteristics

YC-OPA: direct expansion air conditioners with air cooled or water condensers and up-flow air supply														
Models		**71**	**141**	**211**	**251**	**301**	**302**	**361**	**461**	**422**	**512**	**662**	**852**	**932**
Performances														
Total cooling capacity	kW	8.0	14.8	21.4	26.4	33.2	31.1	37.9	47.9	43.7	54.7	68.9	86.8	94.4
Sensible cooling capacity	kW	7.6	13.1	21.4	25.7	32.0	31.1	37.9	47.4	43.7	53	66.9	75	85
EER		3.72	3.46	3.36	3.28	3.17	3.36	3.49	3.57	3.42	3.4	3.41	3.46	3.63
Airflow	m^3/h	2.200	3.200	7.000	7.000	8.700	8.700	14.500	14.500	14.500	14.500	17.900	17.900	20.700
Sound pressure level	dB(A)	51	57	56	57	60	60	59	59	59	59	60	60	61
Dimensions & weight														
Lenght	mm	750	750	860	860	1.410	1.410	1.750	1.750	1.750	1.750	2.300	2.300	2.640
Depth	mm	601	601	880	880	880	880	880	880	880	880	880	880	880
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	180	210	270	270	320	340	440	450	450	500	640	660	860
Free Cooling		○	○	○	○	●	●	○	○	○	○	●	●	○
Two Sources		○	○	●	○	●	●	○	○	○	○	●	●	○

** Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 24°C-45%Rh; water 7/12°C; external static pressure 30 Pa. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.*
EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

Technical Characteristics

YC-UPA: direct expansion air conditioners with air cooled or water condensers and down-flow air supply														
Models		**71**	**141**	**211**	**251**	**301**	**302**	**361**	**461**	**422**	**512**	**662**	**852**	**932**
Performances														
Total cooling capacity	kW	8.0	14.8	21.4	26.4	33.2	31.1	37.9	47.9	43.7	54.7	68.3	86.8	94.4
Sensible cooling capacity	kW	7.6	13.1	21.4	25.7	32.0	31.1	37.9	47.4	43.7	53	66.9	75	85
EER		3.72	3.46	3.36	3.28	3.17	3.36	3.49	3.57	3.42	3.4	3.41	3.46	3.63
Airflow	m^3/h	2.200	3.200	7.000	7.000	8.700	8.700	14.500	14.500	14.500	14.500	17.900	17.900	20.700
Sound pressure level	dB(A)	51	57	56	57	60	60	59	59	59	59	60	60	61
Dimensions & weight														
Lenght	mm	750	750	860	860	1.410	1.410	1.750	1.750	1.750	1.750	2.300	2.300	2.640
Depth	mm	601	601	880	880	880	880	880	880	880	880	880	880	880
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	180	210	270	270	320	340	440	450	450	500	640	660	860
Free Cooling		○	○	○	○	●	●	○	○	○	○	●	●	○
Two Sources		○	○	●	○	●	●	○	○	○	○	●	●	○

** Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 24°C-45%Rh; water 7/12°C; external static pressure 30 Pa. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.*
EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

Performance at JOHNSON CONTROLS test conditions*

Technical Characteristics

YC-OPU: with chilled water coil and up-flow air supply									
Models		**10a**	**20a**	**30**	**50**	**80**	**110**	**160**	**220**
Performances									
Total cooling capacity	kW	10.1	18.2	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity	kW	9.4	15.7	29.8	38	62	72	110	144
EER		36.07	33.09	27.93	24.36	27.83	28.04	27.09	28.02
Airflow	m^3/h	2.200	3.200	7.400	8.200	15.400	17.000	26.000	34.000
Sound pressure level	dB(A)	51	57	58	61	60	61	63	64
Dimensions & weight									
Lenght	mm	750	750	860	860	1.750	1.750	2.640	3.495
Depth	mm	601	601	880	880	880	880	880	880
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	155	160	220	240	340	360	540	700
Free Cooling		○	○	○	●	○	●	●	○
Two Sources		○	○	○	●	○	●	●	○

** Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 24°C-45%Rh; water 7/12°C; external static pressure 30 Pa. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.*
EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

Technical Characteristics

YC-UPU: with chilled water coil and down-flow air supply									
Models		**10**	**20**	**30**	**50**	**80**	**110**	**160**	**220**
Performances									
Total cooling capacity	kW	10.1	19.2	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity	kW	9.4	15.7	29.8	38.1	62.1	72	109.7	144
EER		36.07	33.09	27.93	24.36	27.83	28.04	27.09	28.02
Airflow	m^3/h	2.200	3.200	7.400	8.200	15.400	17.000	26.000	34.000
Sound pressure level	dB(A)	51	57	58	61	60	61	63	64
Dimensions & weight									
Lenght	mm	750	750	860	860	1.750	1.750	2.640	3.495
Depth	mm	601	601	880	880	880	880	880	880
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	155	160	220	240	340	360	540	700
Free Cooling		○	○	○	●	○	●	●	○
Two Sources		○	○	○	●	○	●	●	○

** Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 24°C-45%Rh; water 7/12°C; external static pressure 30 Pa. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.*
EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

YORK® YC-G Series
Close Control Air Conditioners

A complete range from 43 kW up to 170.2 kW

Applications

"G" Series YORK air conditioners consist of a family of units specially designed to exploit the plant characteristics of the latest generation of large Data Centres.

In the design of air conditioning equipment for large Data Centres, the necessities of cable housing and for the distribution of the enormous quantities of air required to cool the servers have made it necessary to raise the height of the false floor to now reach the current 600-800 millimetres. This creates an ample space below the air conditioner destined to the installation of the plinth. This large space under the raised floor was therefore considered as the housing for the discharge fans. The air conditioners are supplied in two separate sections: the under-base containing the discharge fans to be installed under the floating floor, and the treatment unit with the exchanger coil, filters and the electrical panel.

This large space under the raised floor is used to house the supply air fans. The air conditioners are therefore supplied in two separate sections:

- The treatment unit with enlarged heat exchanger coil, filters and electrical panel.
- The plinth containing the supply air fans, to be installed under the raised floor. The plinth with the fans is supplied to match the height indicated in the order from the customer.

The two sections, shipped separately, are easy to install on-site as they require only electrical connection of the two junction boxes in the air conditioner and the plinth.

Downflow supply

Standard version for perimetral installation inside the Data Centre: the height of the raised floor must be minimum 550 mm.

Version for perimetral installation inside the Data Centre with raised floor height less than 550 mm. In this case, the plinth with fixed height of 550 mm is supplied with lateral closure panels and must be installed above the floor. It is essential to check that the height of the ceiling is sufficient to ensure good air suction.

Version for installation outside the Data Centre, without raised floor, rear air supply. In this case the plinth (fixed height 550 mm) is supplied with side closure panels and rear supply air grilles. Installation of the plenum with rear re-intake system is optional, if there is no ductwork.

Technical Characteristics

YC-UGA: direct expansion air conditioners with air-cooled or water-cooled condensers and downflow air supply				
Models		**461**	**612**	**932**
Total cooling capacity (1)	kW	50.6	63.4	95.6
Sensible cooling capacity (1)	kW	50.4	57	95.6
EER (2)		3.98	3.32	3.8
Airflow	m^3/h	9.500	10.000	19.000
Sound pressure level (3)	dB(A)	57	58	59
Lenght	mm	1.490	1.490	2.390
Depth	mm	921	921	921
Height	mm	1.990	1.990	1.990
Net weight	kg	630	680	870

YC-UGU: chilled water coil air conditioners with downflow air supply					
Models		**70**	**150**	**230**	**300**
Total cooling capacity (1)	kW	43.3	85.1	123	170.2
Sensible cooling capacity (1)	kW	43.3	85.1	123	170.2
EER (2)		31.15	32.48	34.55	39.13
Airflow	m^3/h	9.500	19.000	28.500	38.000
Sound pressure level (3)	dB(A)	57	59	61	60
Lenght	mm	1.320	2.220	3.120	4.020
Depth	mm	921	921	921	921
Height	mm	1.990	1.990	1.990	1.990
Net weight	kg	610	750	930	1.250

(1) Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 32°C-30%Rh; water 15/20°C; external static pressure 30 Pa.
The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.
(2) EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
(3) Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

YORK® YC-R Series
Close Control Air Conditioners

A complete range from 23.9 kW up to 34.4 kW

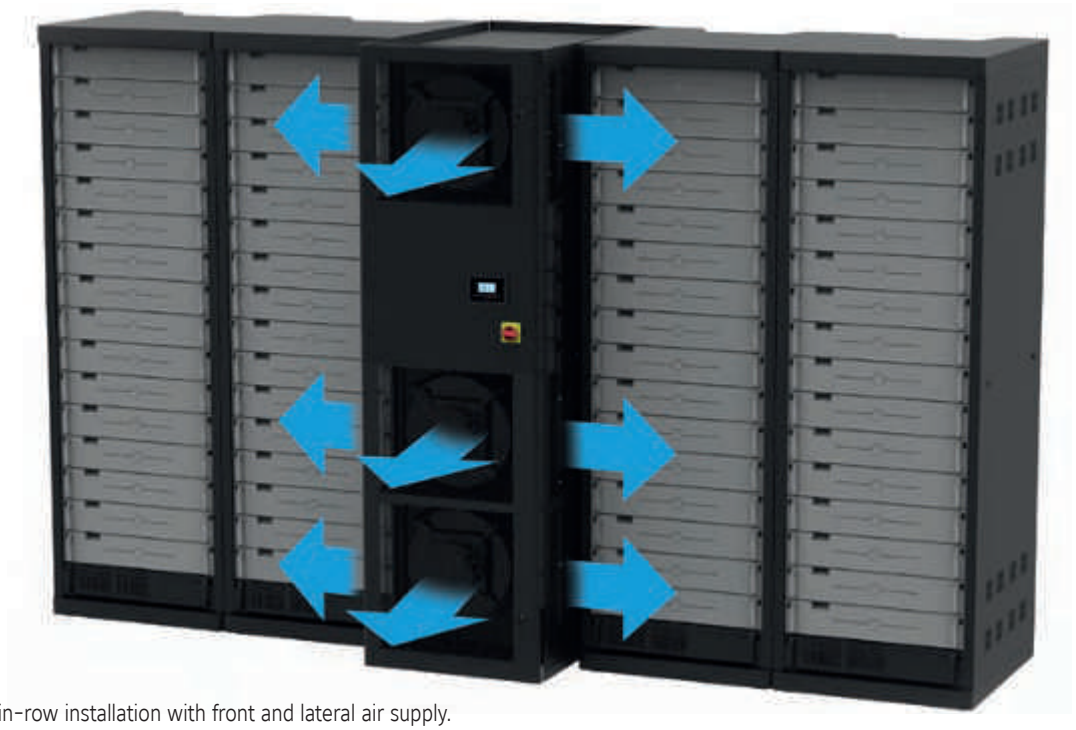
Applications

"R" Series YORK air conditioners consist of a family of units specially designed and constructed to have the same dimensions as the racks.

In the design of air conditioning plant for large Data Centres, the reduction of energy consumption is of ever increasing importance. For this reason the following concepts have become consolidated international standard practice:

- The racks containing the servers are more often positioned according to the "hot corridor aisle" and "cold corridor/aisle" layout.
- The working air temperatures are now allowed to go up to 30-35°C in the hot corridor and 20-25°C in the cold one, with very low humidity (never above 30%). Consequently, also the water temperature is allowed to rise up to 20-28°C, using the Free Cooling system to the best effect.
- Server capacities keep going up while their dimensions keep going down. This means that more servers can be installed in a rack so that some of these racks, remaining empty, can be removed. At the same time the heat dissipated rises and more capacity is required from the air conditioners.
- The servers work day and night albeit with a night time reduction of their capacity. It is therefore essential for the air conditioning installation to have an efficient modulating cooling capacity control and to be designed for minimum energy consumption and minimum environmental impact.

Horizontal supply



Version for in-row installation with front and lateral air supply.

Technical Characteristics

YC-HRA: direct expansion air conditioners with air-cooled or water-cooled condensers and horizontal air supply			
Models		**231**	**361**
Total cooling capacity (1)	kW	21.9	35.1
Sensible cooling capacity (1)	kW	21.8	33.9
EER (2)		3.52	3.75
Airflow	m^3/h	6.000	6.800
Sound pressure level (3)	dB(A)	52	54
Lenght	mm	600	600
Depth	mm	1.222	1.222
Height	mm	1.985	1.985
Net weight	kg	215	215
Free Cooling		●	○
Two Sources		●	○

YC-HRU: chilled water coil air conditioners with horizontal air supply			
Models		**20**	**40**
Total cooling capacity (1)	kW	24.1	36
Sensible cooling capacity (1)	kW	24.1	36
EER (2)		18.12	29
Airflow	m^3/h	6.000	9.000
Sound pressure level (3)	dB(A)	56	61
Lenght	mm	300	600
Depth	mm	1.200	1.222
Height	mm	1.970	1.985
Net weight	kg	120	190
Free Cooling		○	●
Two Sources		○	●

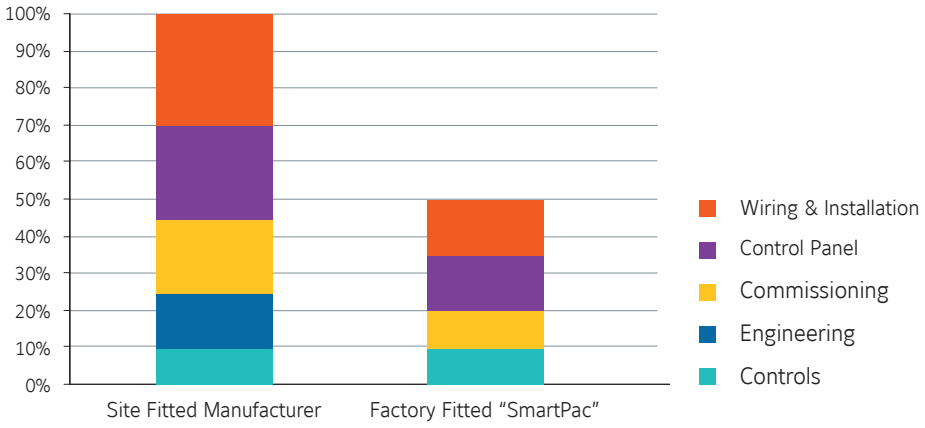
(1) Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 32°C-30%Rh; water 15/20°C; external static pressure 30 Pa.
The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.
(2) EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
(3) Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

SmartPac

As the need for ever more connected buildings and controls grows, and the Internet of Things approaches, SmartPac from Johnson Controls offers factory packaged control solutions that reduce cost, enhance quality and optimise site time.

Once on site, the equipment can be started immediately. Commissioning time is dramatically reduced, allowing to better control the project costs through simplifying equipment installation and commissioning.

Quality is ensured through application and testing to European Installation regulations at the factory. Pre-installed software is configured to deliver air at the specified volume, temperature and humidity.



PLUG & PLAY EXPERIENCE

SmartPac and YORK® Air Handling units

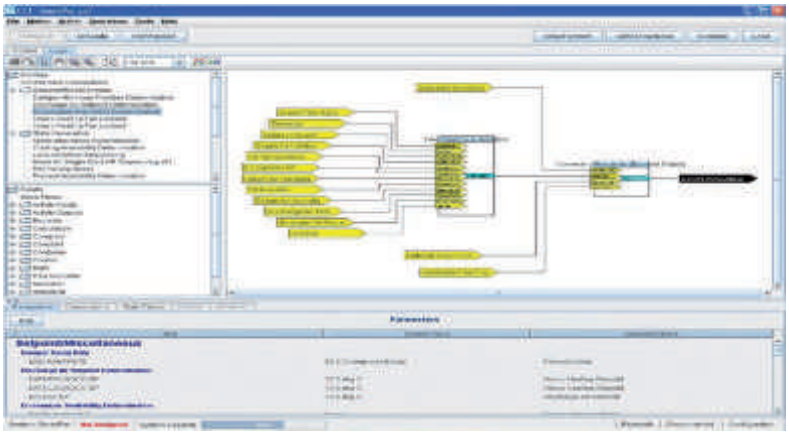
The Air Handling Unit arrives on site **ready to connect** to the site network, and final commissioning is simplified through the unit's keypad and display.

Panel Power wiring, controls wiring, Variable Speed Drive, pre-engineered controller and required peripheral devices are all supplied, factory fitted and tested.

SmartPac and YORK® Fan Coil units

YORK® Fan Coil Units are available with factory packaged controls and numerous options for controllers and valves **to allow reduced installation time on site.**

A range of standard configurable or fully programmable controllers are offered along with a choice of Industry standard protocols. Valve requirements can also be met with a wide range of modulating and on/off actuators and isolation valves available and factory fitted.



SmartPac and YORK® Rooftop & Close Control units

Factory packaged controls' solution enable, to **dramatically reduce on-site commissioning costs.** Both are delivered to site with pre-installed controls, factory tested and ready to apply the power.

SmartPac and YORK® Standard Control panel

Furthermore, Variable Speed Drives give **extra efficiency communicating** with the Johnson controller using industry standard protocols and providing for seamless communications with exisiting BAS control systems.

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 chiller operates and how it interacts with other components in your HVAC&R system. To help maximize efficiency and keep you in control, some of our YORK Airside equipment is available with integrated SMART EQUIPMENT™. This technology allows the equipment to connect seamlessly to building controls like our world-class *Verasys™* system, where smart-enabled equipment can self-identify and interoperate. *Verasys™* provides a truly 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, allowing a facility owner to potentially move from an average Class D efficiency classification to a Class A efficiency classification according to the EN 15232 standard. 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.

CE

Rooftop Equipment

ROOFTOP

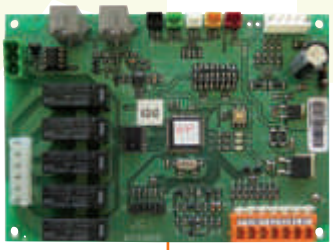
LARGE ROOFTOP

SPLIT ROOFTOP SYSTEM

Johnson Controls

Control System

YKN2open



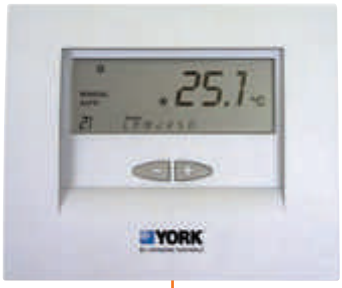
The YKN2open is a controller regulating all components and accessories. It will pro actively manage cool and heat stages to maintain a stable room temperature maximizing the efficiency.
Additionally, the benefits are:

- Redundancy on cool and heat stages (if one step is locked out, the PCB starts another one automatically).
- Random start between units to minimise electrical tariff.
- All stages will start in sequence to reduce peak inrush.
- Reduces nuisance calls by using 3 times "you are out" on all safeties before a hard lockout occurs.
- Automatic restart after power failure. Compressors run time priority.
- Alarm output relay and led diagnostic code. No parameters to check before starting.
- Lockout and incident level of protection. Last 10 lockouts stored in a non-volatile memory.
- 4 heating stages on hot water heating.
- **BMS connection (N2 Open protocol).**

YKtool N2open

The Yktool is the perfect tool to use on a regular basis for comissioning and service on site. For comissioning, it will override the thermostat and start the cooling or heating stages. Being a plug and play device, you will have direct acess to all sensors and status of each components and accessories installed (lockout & incidents, temperatures, defrost test...).

Code: S613786031



Thermostat DPC-1

- Day (normal), night (economy) and unoccupied (stand by).
- Lockout code on screen gives direct diagnostics.
- ON/OFF or programmable from dip switch setting.
- Day or night programmable state avoids wide internal temperature variation.
- 3 preset and 3 programmable profiles.
- Temperature override.
- Select the control sensor you want to use (integrated in the thermostat, return air in duct or room sensor).
- Turbo, normal or economy logic from dip switch setting.
- From −3°C to +3°C sensor offset.
- Average temperature with room or duct sensors.

Thermostats with integrated sensors

Thermostat models		DPC-1	DPC-1R
	Code	S603786044	S603786045
Rooftop	All models	0	0
Rooftop Split	VIRSAC & VIRSAH	X	0

Main features			
Strategy		Turbo, normal or economy	
Auto restart after power failure		●	●
Number of cool stages		2	1 / 2
Number of heat stages		2	1 / 2
Auxiliary Heat		●	●
Automatic Heat/Cool change over		●	●
Continuous or auto indoor fan		●	●
Manual setback (Day/Night key)		Day, night and unocuppied	
Override possibility		●	●
Compressor anti short cycle		●	●
°C Range cooling / heating		10 to 32°C / 9 to 32°C	
Programmable, 7-day		●	●
Lockout codes		●	●
Outdoor air temperature		●	with YKN2Open
Sensor selection		●	●

X : Delivered as standard with the unit.
O : Optional. ● *: Function available.*

RS-1

Room sensor

Indoor remote probe to provide close control of the ambient temperature at a location away from the DPC-1 and DPC-1R thermostats.

Code: S603786042

AS-1

Ambiance sensor

Digital remote probe to provide close control of the ambient temperature at a location away from DPC-1 and DPC-1R thermostats. Up to 4 remote probes can be connected to make an average of the room conditioned.

Code: S603786049

DS-1

Duct sensor

Remote probe to provide close control of the return air temperature in the duct, at a location away from DPC-1 and DPC-1R thermostats. The use of this probe is recommended when an indoor remote probe cannot be installed in the area where temperature is to be controlled.

Code: S603786047

BMS Connection

IP Network

METASYS®

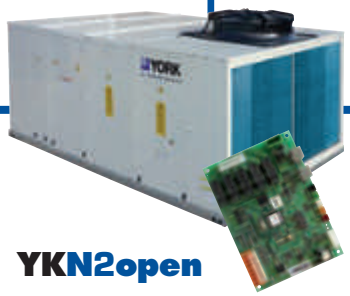
LONWORKS® CONNECTION

BACnet

DPC-1

YKN2open

DPC-1



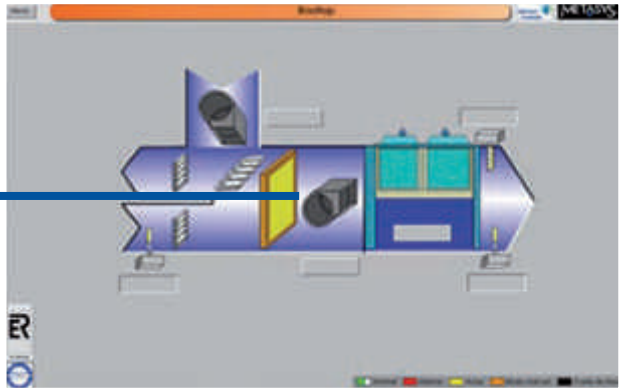
YKN2open

Light control,
Power station...

AHU

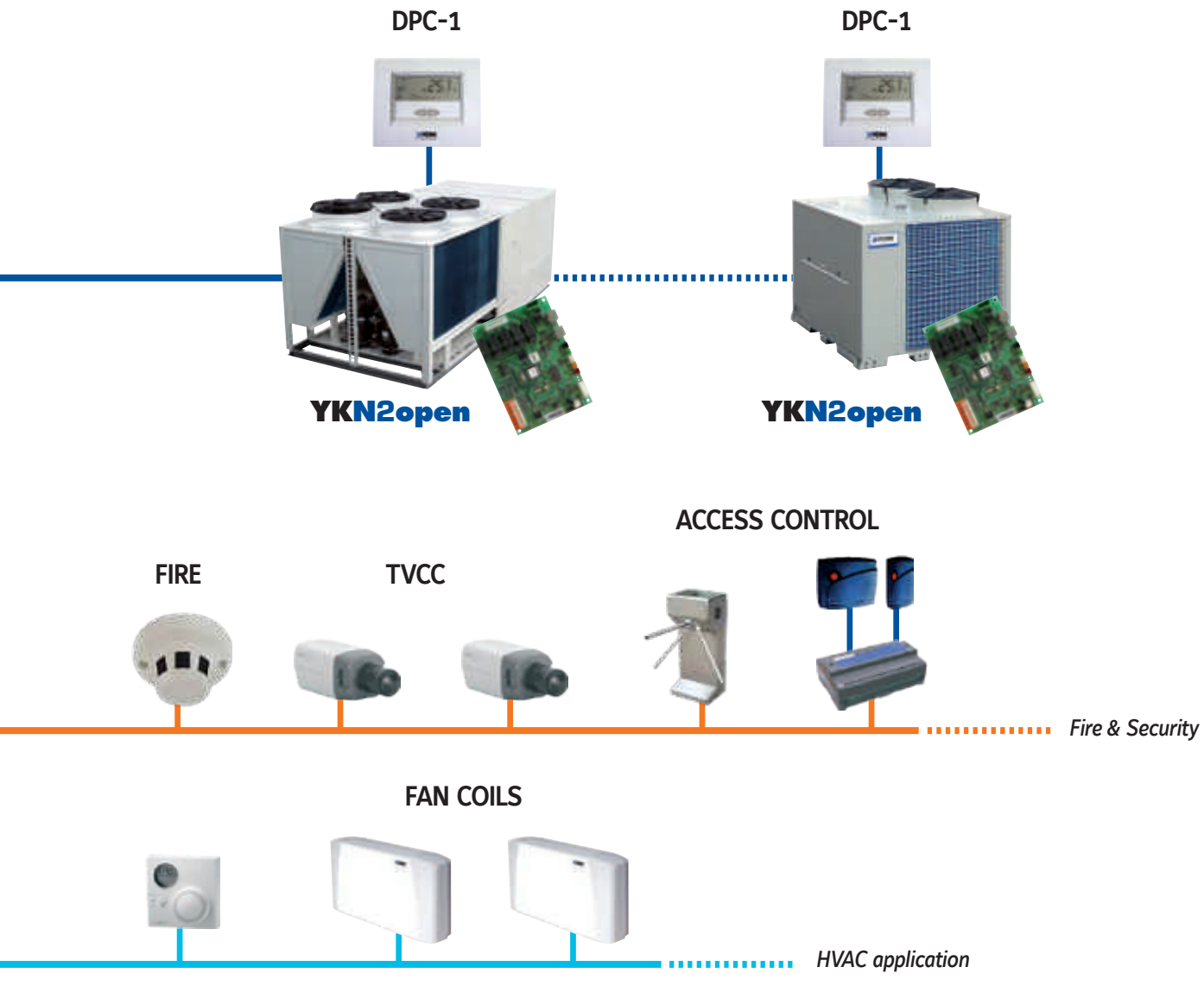
VRF

CHILLER



Sample screen

- BMS communication through new board YKN2Open delivered as standard (N2Open protocol)
- Possibility to fully control the unit and monitor more than 160 variables per unit.
- Can be integrated with other systems like lighting, fire&security or other HVAC equipment.
- Fully tailored solutions available (ask JCI sales office)



ACTIVA Rooftop

ARC-ARG-ARH-ARD

A complete range from 17 kW up to 40 kW

YKN2open

Features

- High efficiency EER and COP
- Low noise level
- EC supply fan
- All configurations: Cooling only, Cooling + gas, Heating, Heating + Gas
- BMS connection as standard (N2Open protocol)
- Compact design
- Energy recovery (enthalpy wheel)
- External HP & LP access
- Filters G4, F6 & F7 available

Nomenclature

A R C 032 A B

- B = Blue fin
  C = Copper fin (ask JCI)
- A = version
- **Capacity range:**
  032 = 32 kW
- **Product category:**
  C = Cooling
  H = Heat pump
  G = Cooling & Gas
  D = Heat pump & Gas (Dual)
- Rooftop
- Activa series

ACTIVA Rooftop

ARC-ARG-ARH-ARD 017 to 040 AB/BB

Technical features

Cooling only models		**ARC 017 AB**	**ARC 022 AB**	**ARC 032 AB**	**ARC 040 AB**
Net cooling capacities	kW	18.2	22.2	31	39.9
Power input	kW	5.5	7.4	9.9	14.2
SEER		3.82	3.85	4.06	3.28
ηs,c		149.6	151.1	159.4	128.1
Working range (full load / partial load)	°C	7°C ~ 46°C / -10°C ~ 52°C			
Heat pump models		**ARH 017 BB**	**ARH 022 BB**	**ARH 032 AB**	**-**
Net cooling capacities	kW	18.2	24	31	-
Power input in cooling	kW	5.5	7.4	9.9	-
Heating capacities (1)	kW	17.2	23.5	30.9	-
Power input in heating	kW	4.5	5.7	9.8	-
SCOP		2.96	2.96	2.96	-
ηs,h		115.2	115.2	115.3	
Working range (full load / partial load)	°C	-10°C ~ 46°C / -10°C ~ 52°C			
Cooling only + Gas heating models		**ARG 017 AB**	**ARG 022 AB**	**ARG 032 AB**	**ARG 040 AB**
Net cooling capacities	kW	18.2	22.2	31	39.9
Cooling power input	kW	5.5	7.4	9.9	14.2
Standard Heating capacities (1) NET	kW	23	23	41	41
Natural gas 2ND-H, G20	m^3/h	2.5	2.5	4.5	4.5
Working range (full load / partial load)	°C	-15°C ~ 46°C / -15°C ~ 52°C			
Heat pump + Gas heating models		**ARD 017 BB**	**ARD 022 BB**	**ARD 032 AB**	**-**
Net cooling capacities	kW	18.2	24	31	-
Power input in cooling	kW	5.5	7.4	9.9	-
Heating capacities (1)	kW	17.2	23.5	30.9	-
Power input in heating	kW	4.5	5.7	9.8	-
Standard Heating capacities (1) NET	kW	23	23	41	-
Natural gas 2ND-H, G20	m^3/h	2.5	2.5	4.5	-
Working range (full load / partial load)	°C	-15°C ~ 46°C / -15°C ~ 52°C			
Common characteristics					
Power supply		400V/3 + N/ 50Hz			
Main switch	A	20	25	40	50
Main cable	Nbr. x mm^2	5 x 4	5 x 6	5 x 10	5 x 16
Cable to thermostat	Nbr. x mm^2	10 x 0.22			
Number of circuits / Compressor type		1 / 1 x Scroll		1 (Tandem) / 2 x Scroll	
Evaporator fan at nominal airflow — Airflow	m^3/h	3400	4300	5700	7400
Evaporator fan at nominal airflow — ASP	Pa	600	600	600	600
Nett dimensions — Height	mm	1 420	1 420	1 420	1 420
Nett dimensions — Length	mm	1 866	1 866	2 135	2 135
Nett dimensions — Depth	mm	1 540	1 540	1 850	1 850
Nett weight ARC / ARG	kg	420 / 462	440 / 482	581 / 642	585 / 646
Nett weight ARH / ARD	kg	425 / 467	445 / 487	587 / 648	-

All the data are at EUROVENT conditions with 400V/3+N/50Hz.
Cooling : Entering indoor coil temp. 27°C / 19°C WB and outdoor temperature 35°C - Heating : Entering indoor coil temp. 20°C and outdoor temperature 7°C / 6°C WB
(1) Add indoor fan motor consumption to know total heating capacity.

Codes

Cooling only models	**ARC 017 AB**	**ARC 022 AB**	**ARC 032 AB**	**ARC 040 AB**
	S661752110	S661752120	S661752130	S661752150
Heat pump models	**ARH 017 BB**	**ARH 022 BB**	**ARH 032 AB**	**-**
	S661752513	S661752127	S661752133	-
Cooling only + Gas heating models	**ARG 017 AB**	**ARG 022 AB**	**ARG 032 AB**	**ARG 040 AB**
	S661752111	S661752121	S661752131	S661752151
Heat pump + Gas heating models	**ARD 017 BB**	**ARD 022 BB**	**ARD 032 AB**	**-**
	S661752118	S661752128	S661752132	-
Thermostat				
to be ordered separately	DPC-1			

Manufacturer reserves the rights to change specifications without prior notice.

Activa rooftop details & features

High Efficiency

High efficiency compressor and fans managed by an smart control allows the unit to achieve and maintain the level of comfort required in the most efficient way, reducing therefore the energy bill.

Low Noise

Ultra quiet fans and optimized airflow reduces the noise level increasing the comfort. Compressors are mounted on shock absorbers and anti-vibration springs are available to avoid vibration transmissions into de building.

Easy Installation and Maintenance

The high level of usability of the control, the internal solutions adopted (like direct driven fans with variable speed) and the easy access to components simplify and reduce the need of external interventions. Full information on commissioning and maintenance plan are provided to help to ensure unit keeps running always in optimal conditions.

Compact Design

The refrigerant circuit layout has been redesigned and high efficiency exchangers been used to reduce the footprint and improve the transport and handling. Transition roofcurbs are available to fit in existing installations.

Accessories & options

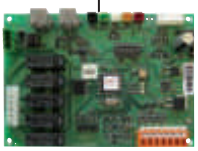
		Code	Cooling only				Heat pump			Cooling + gas heating				Heat pump + gas heating		
			017	022	032	040	017	022	032	017	022	032	040	017	022	032
Thermostat DPC-1		S603786044	A	A	A	A	A	A	A	A	A	A	A	A	A	A
YNK2Open Gateway BACnet / IP - JCI Metasys N2		S606791244	A	A	A	A	A	A	A	A	A	A	A	A	A	A
YNK2Open Gateway Modbus TCP / IP - JCI Metasys N2		S606791245	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Dry bulb triple input economizer or motorized air damper with rain hood		S611752301	O	O			O	O		O	O			O	O	
		S611752311			O	O			O			O	O			O
Enthalpy probes		S613990081	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Indoor air quality sensor		S606819964	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Power Exhaust		S611752302	A	A			A	A		A	A			A	A	
		S611752312			A	A			A			A	A			A
Barometric relief damper and rain hood		S611752472	A	A			A	A		A	A			A	A	
		S611752473			A	A			A			A	A			A
Fresh air damper and rain hood (2)		S611752303	A	A			A	A		A	A			A	A	
		S611752313			A	A			A			A	A			A
Low ambient kit		S611752381	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Roofcurb adapter (3)		S611752886	A	A			A	A		A	A			A	A	
		S611752887			A	A			A			A	A			A
Fixed roof curb		S611752881	A	A			A	A		A	A			A	A	
		S611752882			A	A			A			A	A			A
Adjustable roof curb		S611752883	A	A			A	A		A	A			A	A	
		S611752884			A	A			A			A	A			A
Dirty filter switch		S613990085	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Smoke detector		S613995382	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Fire detection thermostat		S613903003	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Hot water coil		S611752351	O	O			O	O								
		S611752352			O	O			O							
Electric heaters	16 kW	S611752516	O	O			O	O								
	16 kW	S611752616			O	O			O							
	25 kW	S611752525	O	O			O	O								
	25 kW	S611752625			O	O			O							
	37 kW	S611752537			O	O			O							
Propane conversion Kit		S611752780								A	A	A	A	A	A	A
Filter kit F6		S611752401	O	O			O	O		O	O			O	O	
		S611752402			O	O			O			O	O			O
Filter kit F7		S611752411	O	O			O	O		O	O			O	O	
		S611752412			O	O			O			O	O			O
Grill condenser coil protection		S611752451	O	O			O	O		O	O			O	O	
		S611752452			O	O			O			O	O			O
Antivibration mounting kit		S611752461	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Energy recovery		S611752501	A	A			A	A		A	A			A	A	
		S611752511			A	A			A			A	A			A
Filter kit F6 for energy recovery		S611755506	O	O			O	O		O	O			O	O	
		S611755516			O	O			O			O	O			O
Filter kit F7 for energy recovery		S611752507	O	O			O	O		O	O			O	O	
		S611752517			O	O			O			O	O			O
Alarm relay board		S606791243	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Copper-copper coil		Contact us	O	O	O	O	O	O	O	O	O	O	O	O	O	O

O=Option (factory fitted). A=Accessory (supplied loose). O/A=If you want this item factory fitted, precise it in the order form.
(1) Energy recovery accessory includes: economizer, rain hood, indoor air quality sensor and G4 filters.
(2) Fresh air damper can not be installed if economizer or motorized damper is fitted.
(3) Transition roofcurbs to fit in D_IC/D_IG/B_IG existing installations (090-150 kbtu/h).

ACTIVA Rooftop

ARC-ARG-ARH-ARD

A complete range from 48 kW up to 84 kW



YKN2open

Features

- High efficiency EER and COP
- Low noise level
- All configurations: Cooling only, Cooling + gas, Heating, Heating + Gas
- BMS communication as standard (N2Open protocol)
- Energy recovery (enthalpy wheel)
- EC Return fan
- External HP & LP access
- Filters G4, F6 & F7 available
- Tandem configuration (up to 52°C outdoor temperature)

Nomenclature

A R C 045 B B

- B = Blue fin
  C = Copper fin (ask JCI)
- B = version
- **Capacity range:**
  045 = 45 kW
- **Product category:**
  C = Cooling
  H = Heat pump
  G = Cooling & Gas
  D = Heat pump & Gas (Dual)
- Rooftop
- Activa series

ACTIVA Rooftop

ARC-ARG-ARH-ARD 045 to 090 BB

Technical features

Cooling only models		**ARC 045 BB**	**ARC 060 BB**	**ARC 075 BB**	**ARC 090 BB**
Net cooling capacities	kW	48	62	75	83
Power input	kW	15.0	20.9	26.0	30.0
SEER		3.03	3,00	3.01	3.01
ηs,c		118.1	116.9	117.1	117.2
Working range (full load / partial load) *	°C	7°C ~ 46°C / -10°C ~ 52°C			
Heat pump models		**ARH 045 BB**	**ARH 060 BB**	**ARH 075 BB**	**ARH 090 BB**
Net cooling capacities	kW	48	62	72	84
Power input in cooling	kW	17.0	20.0	28.0	36.0
Heating capacities (1)	kW	45.2	58.0	71.7	86.5
Power input in heating	kW	16.0	19.0	27.0	33.0
SCOP		3.19	3.10	3.05	3.15
ηs,h		124.6	121.0	119.1	123.0
Working range (full load / partial load) *	°C	-10°C ~ 46°C / -10°C ~ 52°C			
Cooling only + Gas heating models		**ARG 045 BB**	**ARG 060 BB**	**ARG 075 BB**	**ARG 090 BB**
Net cooling capacities	kW	48	62	75	83
Cooling power input	kW	15.0	20.9	26.0	30.0
Standard Heating capacities (1)	kW	76.0	76.0	76.0	76.0
Natural gas 2ND-H, G20	m³/h	8.60	8.60	8.60	8.60
High Heating capacities (1)	kW	90.0	90.0	90.0	90.0
Natural gas 2ND-H, G20	m³/h	9.80	9.80	9.80	9.80
Working range (full load / partial load) **	°C	-15°C ~ 46°C / -15°C ~ 52°C			
Heat pump + Gas heating models		**ARD 045 BB**	**ARD 060 BB**	**ARD 075 BB**	**ARD 090 BB**
Net cooling capacities	kW	48	62	72	84
Cooling power input	kW	17.0	20.0	28.0	36.0
Heating capacities (1)	kW	45.2	58.0	71.7	86.5
Power input in heating	kW	16.0	19.0	27.0	33.0
Standard Heating capacities (1)	kW	76.0	76.0	76.0	76.0
Natural gas 2ND-H, G20	m³/h	8.60	8.60	8.60	8.60
High Heating capacities (1)	kW	90.0	90.0	90.0	90.0
Natural gas 2ND-H, G20	m³/h	9.80	9.80	9.80	9.80
Working range (full load / partial load) **	°C	-15°C ~ 46°C / -15°C ~ 52°C			
Common characteristics					
Power supply		400V/3 + N/ 50Hz			
Main switch	A	50	63	80	80
Main cable	Nbr. x mm²	5 x 10	5 x 16	5 x 25	5 x 25
Cable to thermostat	Nbr. x mm²	10 x 0.22			
Number of circuits / Compressor type		1 (tandem) / 2 x scroll		2 (tandem) / 4 x scroll	
Evaporator fan at nominal airflow — Airflow	m³/h	8 500	11 500	13 500	16 000
Evaporator fan at nominal airflow — Power input	kW	3	4	5.5	7.5
Nett dimensions — Height	mm	1 316	1 316	1 367	1 367
Nett dimensions — Length	mm	3 180	3 180	3 750	3 750
Nett dimensions — Depth	mm	2 337	2 337	2 337	2 337
Nett weight ARC / ARG	kg	900 / 1 010	945 / 1 055	1 118 / 1 228	1 142 / 1 252
Nett weight ARH / ARD	kg	930 / 1 040	985 / 1 095	1 145 / 1 255	1 220 / 1 330

All the data are at EUROVENT conditions with 400V/3+N/50Hz.
Cooling : Entering indoor coil temp. 27°C / 19°C WB and outdoor temperature 35°C - Heating : Entering indoor coil temp. 20°C and outdoor temperature 7°C / 6°C WB
(1) Add indoor fan motor consumption to know total heating capacity.
** With Premium kit (full load / partial load): -10°C ~ 50°C / -10°C ~ 52°C*
*** With Premium kit (full load / partial load): -20°C ~ 50°C / -20°C ~ 52°C*

Codes

Cooling only models	**ARC 045 BB**	**ARC 060 BB**	**ARC 075 BB**	**ARC 090 BB**
	S661752149	S661752165	S661752175	S661752195
Heat pump models	**ARH 045 BB**	**ARH 060 BB**	**ARH 075 BB**	**ARH 090 BB**
	S661752147	S661752167	S661752177	S661752197
Cooling only + Gas heating models	**ARG 045 BB**	**ARG 060 BB**	**ARG 075 BB**	**ARG 090 BB**
	S661752146	S661752166	S661752176	S661752196
Heat pump + Gas heating models	**ARD 045 BB**	**ARD 060 BB**	**ARD 075 BB**	**ARD 090 BB**
	S661752148	S661752168	S661752178	S661752198
Thermostat				
to be ordered separately	DPC-1			

Manufacturer reserves the rights to change specifications without prior notice.

Activa rooftop details & features

Condenser fan

New condenser fans with high technology blades and outdoor bell that reduce the turbulences in the air and therefore increase the efficiency and improve the noise level performance.

PCB board

Tandem scroll compressors

Tandem compressors configuration allows the unit to operate at partial load (only with one compressor) with higher efficiency and increases the working range up to +52°C ambient temperature.

PCB board

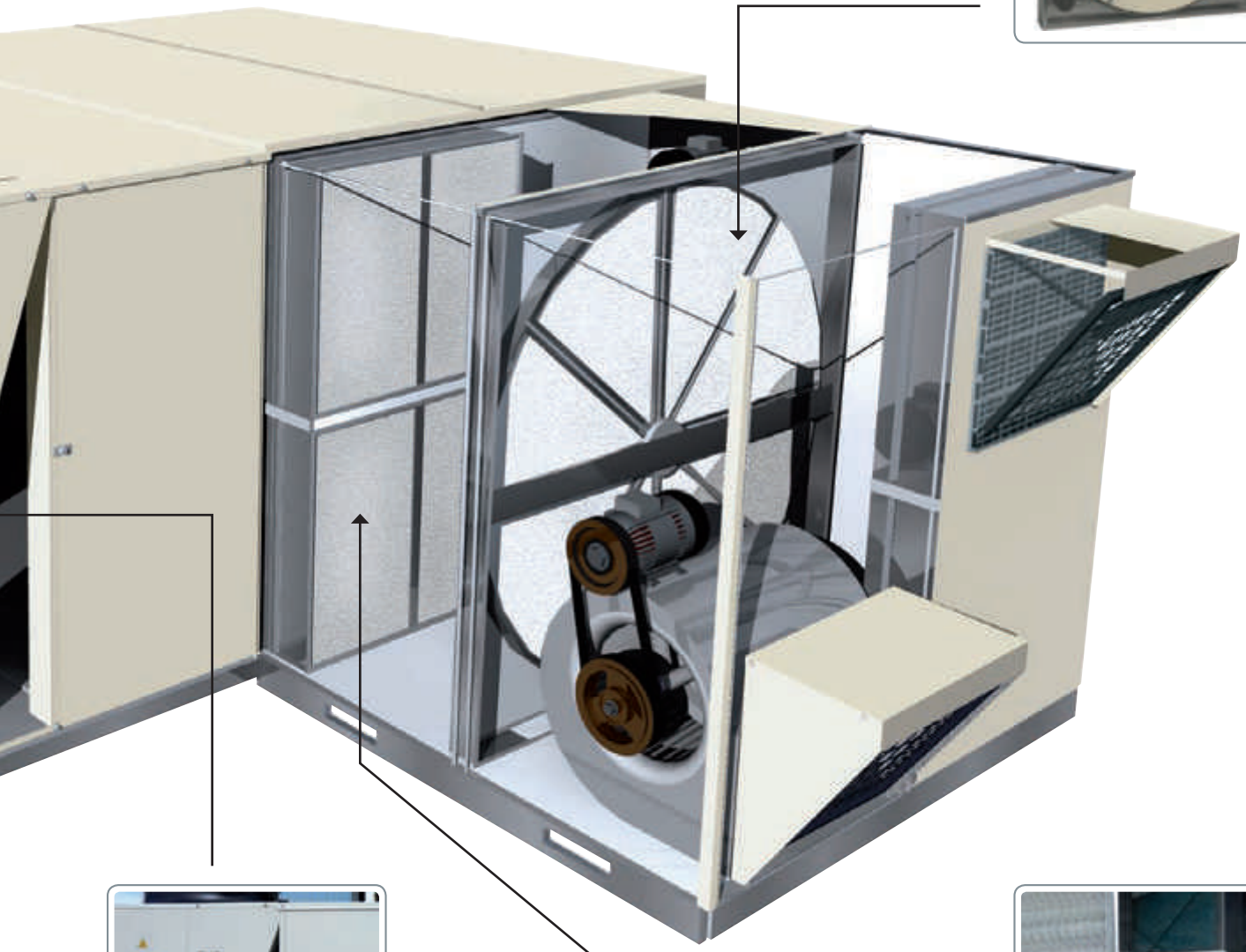
The YKN2Open board keeps same features and benefits as YKlon V3 and adds new logical to control the tandem circuit, the new options (heat recovery, return fan) and the possibility to communicate with BMS system as standard (only N2Open protocol).

Return fan

Located in a special roof curb underneath the rooftop, it works simultaneously with the indoor fan in order to balance the amount of air supplied to and removed from the space. It is the best suited for systems with high return path static pressures.
Also, incorporates EC technology and a differential pressure gauge to easy set up and maintain automatically the working point in the installation.

Energy recovery system

It is the preferred solution to solve two conflicting requirements: reduce running costs (increase efficiency) while maintaining the indoor air quality at high levels (through ventilation).
An enthalpy rotary wheel retains the energy from the exhaust air and transmits it to the fresh air stream that is being supplied in the conditioned space.
The material used is manufactured with the latest technology to increase the energy transmission in both sensible and latent heat.
The wheel is split into 6 portions that can be easily removed for cleaning.



V-Coils

Made in blue fin (or in copper for harsh conditions under special request), increases the heat exchange surface for a given rooftop footprint. The floor pan is sloped for easy condensates drainage.

Filter options

Washable air filters: G4 class filter (gravimetric efficiency above 90%) and M1 fire class, it comes with galvanized sheet metal frame that allows easy cleaning and replacement. Delivered as standard.
Filter kit F6: for Average Opacimetric efficiency (em) 60% ≤ em ≤ 80%
Filter kit F7: for Average Opacimetric efficiency (em) 80% ≤ em ≤ 90%
As per EN 779

Accessories & options

Accessories & options

		Code	Cooling only				Heat pump			
			45	60	75	90	45	60	75	90
Thermostat DPC-1		S603786044	A	A	A	A	A	A	A	A
YNK2Open Gateway BACnet / IP - JCI Metasys N2		S606791244	A	A	A	A	A	A	A	A
YNK2Open Gateway Modbus TCP / IP - JCI Metasys N2		S606791245	A	A	A	A	A	A	A	A
Dry bulb triple input economizer or motorized air damper with rain hood		S661752301	O	O			O	O		
		S661752311			O	O			O	O
Enthalpy probes		S613990081	O	O	O	O	O	O	O	O
Indoor air quality sensor		S606819964	A	A	A	A	A	A	A	A
Power Exhaust		S661752302	A	A			A	A		
		S661752322			A	A			A	A
Barometric relief damper and rain hood		S613990472	A	A			A	A		
		S613990473			A	A			A	A
Fresh air damper and rain hood (2)		S661752303	A	A			A	A		
		S661752323			A	A			A	A
High pressure drive	4 kW	S611990401	O				O			
	5.5 kW	S611990601		O				O		
	7.5 kW (IE3)	S611990701			O				O	
	7.5 kW (IE3)	S611990702				O				O
	11 kW (IE3)	S611990903				O				O
Soft start indoor fan	5.5 kW	S606744690	O	O	O	O	O	O	O	O
	11.5 kW	S606744691			O	O			O	O
Premium Kit (LAK included) *		S613118302	O	O			O	O		
		S613118304			O				O	
Side duct flanges		S613991482	A	A			A	A		
		S613991483			A	A			A	A
Fixed roof curb		S613991884	A	A			A	A		
		S613991885			A	A			A	A
Adjustable roof curb		S613992081	A	A			A	A		
		S613992082			A	A			A	A
Dirty filter switch		S613990085	O	O	O	O	O	O	O	O
Smoke detector		S613995382	O	O	O	O	O	O	O	O
Fire detection thermostat		S613903003	O	O	O	O	O	O	O	O
Hot water coil		S611083351	O	O	O	O	O	O	O	O
Electric heaters	12 kW	S611761584	O	O	O	O	O	O	O	O
	25 kW	S611762284	O	O	O	O	O	O	O	O
	37 kW	S611763385	O	O	O	O	O	O	O	O
	50 kW	S611764485	O	O	O	O	O	O	O	O
Propane conversion Kit		S611801780	A	A	A	A	A	A	A	A
High heat gas conversion kit		S611803080	O	O	O	O	O	O	O	O
Filter kit F6		S611300401	O	O			O	O		
		S611300701			O				O	
		S611300901				O				O
Filter kit F7		S611300402	O	O			O	O		
		S611300702			O				O	
		S611300902				O				O
Grill condenser coil protection		S661752304	O				O			
		S661752324		O				O		
		S661752314			O	O			O	O
Antivibration mounting kit		S613990411	A	A	A	A	A	A	A	A
Return fan bottom duct		S613993042	A	A			A	A		
		S613993072			A	A			A	A
Energy recovery	Q6000 (1)	S611994511	A	A			A	A		
	Q3000 (1)	S611994512	A	A			A	A		
	Q9000 (1)	S611997511			A	A			A	A
	Q4500 (1)	S611997512			A	A			A	A
Filter kit F6 for energy recovery		S611994506	O	O			O	O		
		S611997506			O	O			O	O
Filter kit F7 for energy recovery		S611994507	O	O			O	O		
		S611997507			O	O			O	O
Alarm relay board		S606791243	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Copper-copper coil		Contact us	O	O	O	O	O	O	O	O

O=Option (factory fitted). A=Accessory (supplied loose). O/A=If you want this item factory fitted, precise it in the order form.
(1) = Energy recovery accessory includes: economizer, rain hood, indoor air quality sensor and G4 filters.
(2) Fresh air damper can not be installed if economizer or motorized damper is fitted.
** Features: increased efficiency by 0.15, extended max outdoor temperature up to +50°C at full load, Low ambient kit.*

Accessories & options

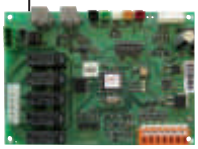
		Code	Cooling + gas heating				Heat pump + gas heating			
			45	60	75	90	45	60	75	90
Thermostat DPC-1		S603786044	A	A	A	A	A	A	A	A
YNK2Open Gateway BACnet / IP - JCI Metasys N2		S606791244	A	A	A	A	A	A	A	A
YNK2Open Gateway Modbus TCP / IP - JCI Metasys N2		S606791245	A	A	A	A	A	A	A	A
Dry bulb triple input economizer or motorized air damper with rain hood		S661752301	O	O			O	O		
		S661752311			O	O			O	O
Enthalpy probes		S613990081	O	O	O	O	O	O	O	O
Indoor air quality sensor		S606819964	A	A	A	A	A	A	A	A
Power Exhaust		S661752302	A	A			A	A		
		S661752322			A	A			A	A
Barometric relief damper and rain hood		S613990472	A	A			A	A		
		S613990473			A	A			A	A
Fresh air damper and rain hood (2)		S661752303	A	A			A	A		
		S661752323			A	A			A	A
High pressure drive	4 kW	S611990401	O				O			
	5.5 kW	S611990601		O				O		
	7.5 kW (IE3)	S611990701			O				O	
	7.5 kW (IE3)	S611990702				O				O
	11 kW (IE3)	S611990903				O				O
Soft start indoor fan	5.5 kW	S606744690	O	O	O	O	O	O	O	O
	11.5 kW	S606744691			O	O			O	O
Premium Kit (LAK included) *		S613118302	O	O			O	O		
		S613118304			O				O	
Side duct flanges		S613991482	A	A			A	A		
		S613991483			A	A			A	A
Fixed roof curb		S613991884	A	A			A	A		
		S613991885			A	A			A	A
Adjustable roof curb		S613992081	A	A			A	A		
		S613992082			A	A			A	A
Dirty filter switch		S613990085	O	O	O	O	O	O	O	O
Smoke detector		S613995382	O	O	O	O	O	O	O	O
Fire detection thermostat		S613903003	O	O	O	O	O	O	O	O
Hot water coil		S611083351								
Electric heaters	12 kW	S611761584								
	25 kW	S611762284								
	37 kW	S611763385								
	50 kW	S611764485								
Propane conversion Kit		S611801780	A	A	A	A	A	A	A	A
High heat gas conversion kit		S611803080	O	O	O	O	O	O	O	O
Filter kit F6		S611300401	O	O			O	O		
		S611300701			O				O	
		S611300901				O				O
Filter kit F7		S611300402	O	O			O	O		
		S611300702			O				O	
		S611300902				O				O
Grill condenser coil protection		S661752304	O				O			
		S661752324		O				O		
		S661752314			O	O			O	O
Antivibration mounting kit		S613990411	A	A	A	A	A	A	A	A
Return fan bottom duct		S613993042	A	A			A	A		
		S613993072			A	A			A	A
Energy recovery	Q6000 (1)	S611994511	A	A			A	A		
	Q3000 (1)	S611994512	A	A			A	A		
	Q9000 (1)	S611997511			A	A			A	A
	Q4500 (1)	S611997512			A	A			A	A
Filter kit F6 for energy recovery		S611994506	O	O			O	O		
		S611997506			O	O			O	O
Filter kit F7 for energy recovery		S611994507	O	O			O	O		
		S611997507			O	O			O	O
Alarm relay board		S606791243	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Copper-copper coil		Contact us	O	O	O	O	O	O	O	O

O=Option (factory fitted). A=Accessory (supplied loose). O/A=If you want this item factory fitted, precise it in the order form.
(1) = Energy recovery accessory includes: economizer, rain hood, indoor air quality sensor and G4 filters.
(2) Fresh air damper can not be installed if economizer or motorized damper is fitted
** Features: increased efficiency by 0.15, extended max outdoor temperature up to +50°C at full load, Low ambient kit.*

Large ACTIVA Rooftop

ARC-ARH 100 to 175 AB

A complete range from 108 kW up to 169 kW



YKN2open

Features

- High efficiency EER and COP
- Quiet operation
- Configurations: Cooling only and Heating
- BMS communication as standard (N2Open protocol)
- Partial loads
- Extended working range (up to 52°C outdoor temperature)
- F6 & F7 filters available as option (G4 standard)
- Energy recovery (ask JCI for availability)

Nomenclature

A R C 150 A B

- B = Blue fin
  C = Copper fin (ask JCI)
- A = version
- **Capacity range:**
  150 = 150 kW
- **Product category:**
  C = Cooling
  H = Heat pump
- Rooftop
- Activa series

Large ACTIVA Rooftop

ARC-ARH 100 to 175 AB

Technical features

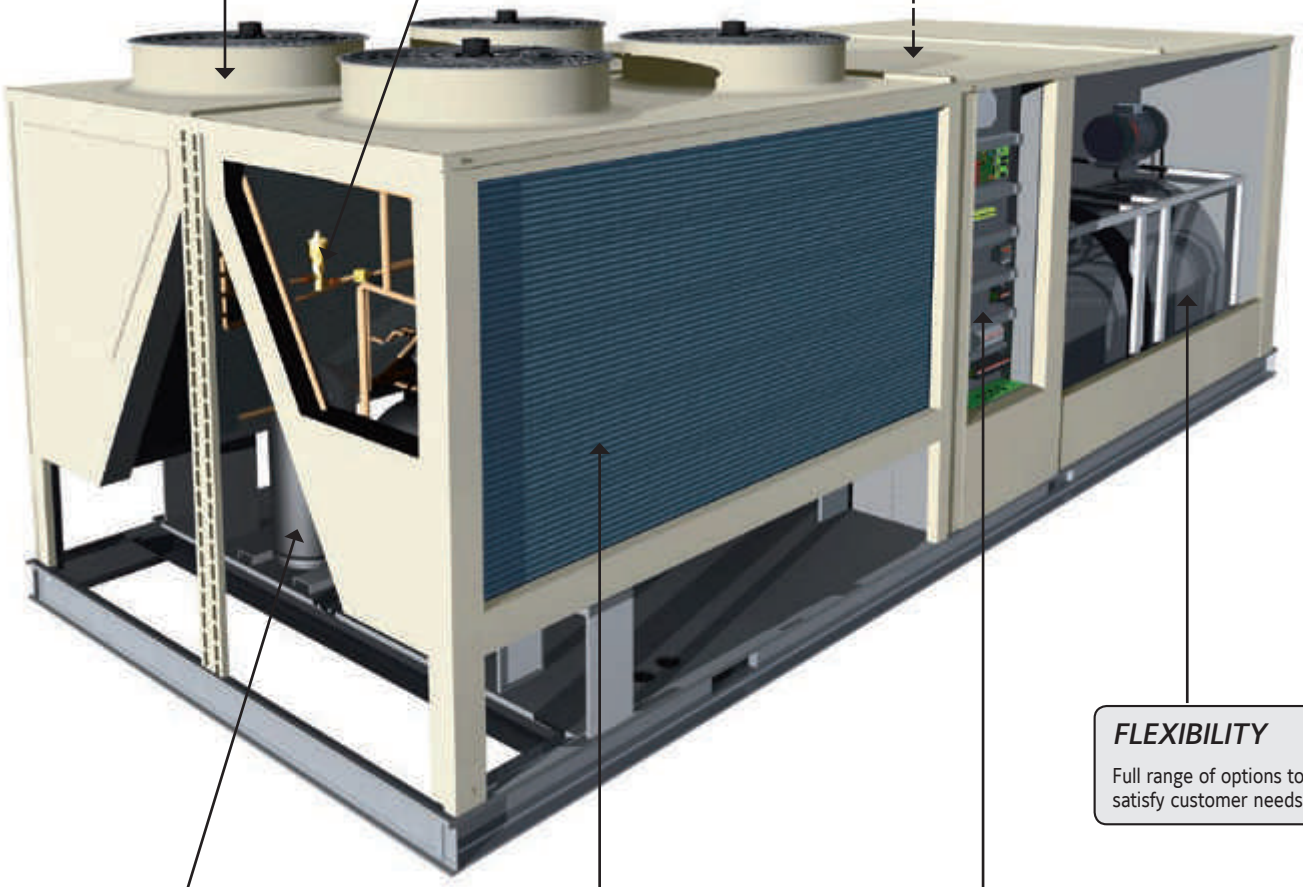
Cooling only models			**ARC 100 AB**	**ARC 125 AB**	**ARC 150 AB**	**ARC 175 AB**
Net cooling capacities		kW	108.1	121.8	149.3	169.0
Power input		kW	34	41	59	64
SEER			4.95	4.58	3.72	3.29
ηs,c			195.0	180.1	145.7	128.8
Working range (full load / partial load) *		°C	7°C ~ 46°C / -10°C ~ 52°C			
Heat pump models			**ARH 100 AB**	**ARH 125 AB**	**ARH 150 AB**	**ARH 175 AB**
Net cooling capacities		kW	108.1	121.8	149.3	169.0
Power input in cooling		kW	34	41	59	64
Heating capacities (1)		kW	104.6	118.4	147.0	167.0
Power input in heating		kW	33	37	53	61
SCOP			3.58	3.44	3.44	3.44
ηs,h			140.2	134.5	134.6	134.5
Working range (full load / partial load) *		°C	-10°C ~ 46°C / -10°C ~ 52°C			
Common characteristics						
Power supply			400V / 3 / 50Hz			
Main switch		A	100	125	160	200
Main cable		Nbr. x mm²	3 x 35	3 x 50	3 x 50	3 x 70
Cable to thermostat		Nbr. x mm²	10 x 0,22			
Number of circuits / Compressor type			2 (tandem) / 4 x scroll			
Evaporator fan at nominal airflow	Airflow	m³/h	19 000	21 000	27 000	31 000
	Power input	kW	3.0	3.3	8.3	9.1
Nett dimensions	Height	mm	2 142		2 142	
	Length	mm	4 036		5 085	
	Depth	mm	2 250		2 250	
Nett weight ARC		kg	1 737	1 744	2 074	2 090
Nett weight ARH		kg	1 765	1 772	2 135	2 150

All the data are at EUROVENT conditions with 400V/3+N/50Hz.
Cooling : Entering indoor coil temp. 27°C / 19°C WB and outdoor temperature 35°C - Heating : Entering indoor coil temp. 20°C and outdoor temperature 7°C / 6°C WB
(1) Add indoor fan motor consumption to know total heating capacity.
** With Premium kit (full load / partial load): -10°C ~ 50°C / -10°C ~ 52°C*

Codes

Cooling only models	**ARC 100 AB**	**ARC 125 AB**	**ARC 150 AB**	**ARC 175 AB**
	S661852400	S661852420	S661852450	S661852480
Heat pump models	**ARH 100 AB**	**ARH 125 AB**	**ARH 150 AB**	**ARH 175 AB**
	S661852403	S661852423	S661852453	S661852483
Thermostat				
to be ordered separately	DPC-1			

Large Activa rooftop details



QUIET

High efficiency condenser fans for a low noise operation.

RELIABLE

Electronic expansion valve to keep the refrigerant circuit working at optimal conditions.

HEALTHY

Full range of filters available to improve air quality.

FLEXIBILITY

Full range of options to satisfy customer needs.

EFFICIENT

Multiscroll compressors providing high efficiency at full and partial loads.

DURABLE

Cabinet and coil treated to withstand extreme outdoor conditions.

USABLE

Electronic control with BMS communcation.

Accessories & options

		Code	Cooling only				Heat pump			
			100	125	150	175	100	125	150	175
Thermostat DPC-1		S603786044	A	A	A	A	A	A	A	A
YNK2Open Gateway BACnet / IP - JCI Metasys N2		S606791244	A	A	A	A	A	A	A	A
YNK2Open Gateway Modbus TCP / IP - JCI Metasys N2		S606791245	A	A	A	A	A	A	A	A
Dry bulb triple input economizer or motorized air damper with rain hood		S611751011	O	O			O	O		
		S611751511			O	O			O	O
Enthalpy probes		S613990081	O	O	O	O	O	O	O	O
Indoor air quality sensor		S606819964	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Power Exhaust		S611751021	A	A			A	A		
		S611751521			A	A			A	A
Barometric relief damper		S611751031	A	A			A	A		
		S611751531			A	A			A	A
Fresh air damper		S613751021	A	A			A	A		
		S613751521			A	A			A	A
High pressure drive	7.5 kW (IE3)	S611751091	O	O			O	O		
	11 kW (IE3)	S611751093	O	O			O	O		
	5.5 kW (IE3)	S611751591			O				O	
	7.5 kW (IE3)	S611751592			O	O			O	O
Side duct supply		S611751061	O	O			O	O		
		S611751561			O	O			O	O
Soft start indoor fan	5.5 kW	S606744690	O	O	O	O	O	O	O	O
	11.5 kW	S606744691	O	O	O	O	O	O	O	O
Premium Kit (LAK included) *		S611751071	O	O	O	O	O	O	O	O
Fixed roof curb		S611751081	A	A			A	A		
		S611751581			A	A			A	A
Adjustable roof curb		S611751082	A	A			A	A		
		S611751582			A	A			A	A
Dirty filter switch		S613990085	O	O	O	O	O	O	O	O
Smoke detector		S613995382	O	O	O	O	O	O	O	O
Fire detection thermostat		S613903003	O	O	O	O	O	O	O	O
Hot water coil		S611751051	O	O			O	O		
		S611751551			O	O			O	O
Electric heaters	37 kW	S611751037	O	O	O	O	O	O	O	O
	50 kW	S611751050	O	O	O	O	O	O	O	O
	60 kW	S611751060	O	O	O	O	O	O	O	O
Filter kit F6		S611751046	O	O			O	O		
		S611751546			O	O			O	O
Filter kit F7		S611751047	O	O			O	O		
		S611751547			O	O			O	O
Grill condenser coil protection		S611751041	O	O			O	O		
		S611751541			O	O			O	O
Antivibration mounting kit 100/125		S613751011	O	O			O	O		
Antivibration mounting kit 150/175		S613751511			O	O			O	O
Alarm relay board		S606791243	O/A	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Copper-copper coil		Contact us	O	O	O	O	O	O	O	O

O=Option (factory fitted). A=Accessory (supplied loose). O/A=If you want this item factory fitted, precise it in the order form.
(1) = Energy recovery accessory includes: economizer, rain hood, indoor air quality sensor and G4 filters.
** Features: increased efficiency by 0.15, extended max outdoor temperature up to +50°C at full load, Low ambient kit.*

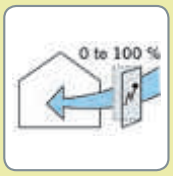
Rooftop & Large Rooftop accessories & options

Triple input economizer

This system utilizes 3 probes: Return Air, Outdoor Air and Supply Air. The Outdoor Air damper and the Return Air dampers are mechanically interconnected in order to provide the same airflow at the coil inlet, with a single damper motor. The PCB compares sensor values and modulates the dampers providing maximum efficiency of the economiser system (free cooling) and comfort (Supply Air > 12°C). Combined with the air quality sensor, your payback will be ensured within few months. The rain hood is painted to match the basic unit and aluminium mesh pre-filter prevents water penetration.

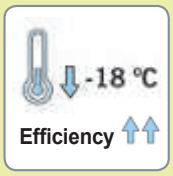
Indoor air quality

This sensor measures concentrations of pollutant gases, such as tobacco smoke, human body odours, kitchen odours, carbon monoxide, etc... It automatically overrides the economizer when pollutant levels rise above preset limits. A shorting plug will set the algorithm to acceptable, good or very good air quality. This VOC sensor (Volatile Organic Compounds) sends an ON/OFF signal to the control PCB. The YKN2Open will then adjust the fresh air damper, optimising indoor air quality and minimising the energy consumption.



Motorised outdoor air damper

Equipped with the same dampers as the economizer, the Return Air probe is not used. Outdoor air damper opens to pre-set position whenever the indoor fan is operating (selected from the thermostat, the indoor fan can be activated with the compressor or to operate continuously) and will drive fully closed when the indoor fan shuts down. The rain hood is painted to match the basic unit and aluminium mesh pre-filter prevents water penetration.



Premium Kit - Low ambient control

All our rooftops are designed to work in cooling mode down to 7°C ambient temperatures. Although this working range suits most applications, the units can operate correctly down to -18°C with optional Premium Kit.
The Premium Kit option consists on an EC condensing fan that will allow us to increase the airflow at reduced consumption. Also we have condensing and evaporating pressure control that will extend our operating limits. It's estimated an increased efficiency by +0.15% in EER and COP.

Enthalpy sensors

To control the economizer in humid areas, or when indoor air humidity needs to remains dry, you should select enthalpy regulation. Enthalpy sensors will be used with the triple input economizer.

High pressure drive

The high pressure drive will increase the supply fan performance for applications requiring greater air flow and/or static pressure.
Please consult technical guide for more information.

Barometric relief damper

This accessory can be used to relieve internal air pressure on units equipped with triple input economiser or motorised air damper but no power exhaust. When the rooftop is working in free cooling or introducing fresh air, the damper opens to relieve over pressure from the return air section. This accessory is comprised of a rain hood, a protective grille and a fully assembled damper.

Power Exhaust

Used to mechanically relieve internal air pressure from the Return Air section and ensure efficient fresh air introduction on units equipped with triple input economiser or motorised air damper. The power exhaust fan motor works when enough Outdoor Air is blowing into the room and if Outdoor Air temperature is acceptable (12°C < t° < 30°C).

Fresh air damper and rain hood

The most cost effective method with a complete rain hood and a fixed damper that can be adjusted to provide approximately 10, 15 or 25% of fresh air.

Smoke detector

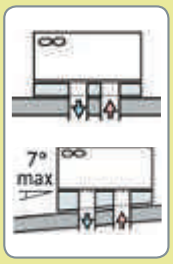
The smoke detector is protecting the AHU but must not be used to ensure a full building protection against smoke danger. If smoke is detected the AHU is shutdown (lockout). A manual reset is necessary.

Fire detection thermostat

This fire detection thermostat is protecting the AHU but must not be used to ensure a full building protection against fire danger. The standard AHU is protected as standard with a Supply Air probe that shuts the unit down (lockout) when temperature exceeds 80°C. The electro-mechanical fire detection thermostat is used to fulfil specific local requirement. A manual reset is necessary.

Dirty filter switch

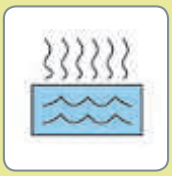
Ensures that clean air is being supplied, advises when maintenance is required to prevent excessive depression and ensures water integrity of the AHU. These are the main advantages of filter dirty switch. Connected with the DPC-1 thermostat, the filter icon will appear on the thermostat screen when a filter change is required.



Fixed and adjustable roof curbs

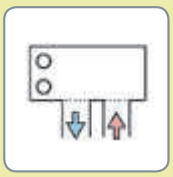
Ideal for down-flow applications, it is a great help for installation allowing duct connections, electrical connection and weatherproofing between the roofcurb and the roof of the building. Shipped in kit form, it also gives sufficient height for condensate trap operation.

The adjustable roof curbs have the same benefits as the fixed roof curb, it allows the rooftop to be levelled on a roof with up to 7° slope (4%).



Hot water coil with control

The hot water coil and his control are always fitted, wired and factory tested. Located in the supply air section, side or bottom duct connection is possible without any modification. Complete with an anti-frost thermostat, the PCB will activate the modulated valve (24V supply, 0 – 10V modulating signal) in order to get the best comfort. A jumper will allow using hot water coil as 1st heating stage.



Side duct flanges

It's an optional (factory fitted) required when rooftops from sizes 45-175 need to work with horizontal air configuration. It's not required for models 17 to 40.
Composed of easy to install sheet metal panels to allow ductwork connections on the side of the AHU for horizontal return air and/or supply air.

Electric heaters

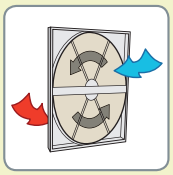
Available on cooling only and Heat pump units, the electric heater is protected with two overheats per element.
When the overheat operates, there is a lock out of the faulty electric heater stage and the PCB starts automatically another heat stage.

Kit conversion propane

This kit comprises replacement burner, pilot injectors and all necessary instructions for converting the natural gas burner to propane gas. The nominal pressure of the propane gas should be 37 mbar.

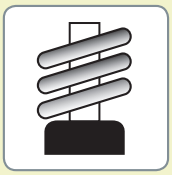
High heat gas

This kit comprises replacement burner injectors and all necessary instructions to provide high heat capacity for gas rooftop.



Energy recovery

Attached to the return air box of the rooftop, a rotary enthalpy wheel retrieves the energy of the exhausted air and transmits it to the fresh air intake. A special material used in the wheel allows that latent heat as well as sensible heat are transmitted.



Antivibration mounting kit

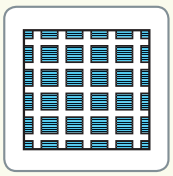
It is composed by a set of stainless steel springs, to be assembled underneath the rooftop in a specific position. Their installation avoids the potential vibration transmission of the equipment to the building and reduces therefore the noise level (compressors have their own shock absorbers delivered as standard).

Indoor fan soft start

Compact control unit with a motor with AC semiconductors, designed for soft starting and stopping of three-phase motors for centrifugal fans. The starting time, the stopping time and the initial torque are adjusted by mean of independent potentiometers.

Return fan

Used to overcome high return path pressure drops, works in series with the indoor fan to maintain the air pressure of the conditioned space within acceptable levels.
(Only available in models ARx 45-90).



Grill condenser protection

Metallic frame painted with oven-baked polymerized paint (800h salt spray resistance) to protect the fins of the coils from external damages.

Air filters

G4, F6 and F7 filters are available to purify the air in the room. M1 fire class and manufactured in sheet metal frame, they are easy to install and clean.

VITALITY Split Rooftop

VIRSAC / VIRSAH 20 to 90 AB

A complete range from 19.1 kW up to 86.1 kW

Features

- Split rooftop for installation where space is at a premium
- Available with energy efficient axial fan on outdoor unit
- YKN2open board
- High technology fan blades increases efficiency and reduces noise level
- Service valves
- Economizer or motorized damper
- Return fan
- Indoor air quality
- Hot water coil and control
- Scroll compressor with crankcase heater
- Digital thermostat DPC-1 included

Nomenclature

V I R S A C 45 A B

- B = Blue fin
  C = Copper fin (ask JCI)
- A = version
- **Capacity range:**
  45 = 45 kW
- **Product category:**
  C = Cooling only
  H = Heat Pump
- A = Axial
- S = Split System
- R = Reversible
- I = Indoor
- V = VITALITY Rooftop

VITALITY Split Rooftop

VIRSAC / VIRSAH 20 to 90 AB

Technical features

COMPLETE MODEL			VIRSAC20AB VIRSAH20AB	VIRSAC25AB VIRSAH25AB	VIRSAC30AB VIRSAH30AB	VIRSAC45AB VIRSAH45AB	VIRSAC60AB VIRSAH60AB	VIRSAC75AB VIRSAH75AB	VIRSAC90AB VIRSAH90AB
INDOOR UNITS									
Cooling only and Heat pump		**VIR**	**25AB**		**40AB**	**45AB**	**60AB**	**75AB**	**90AB**
OUTDOOR UNITS									
Cooling only models		**VAC**	**20AB**	**25AB**	**30AB**	**45AB**	**60AB**	**75AB**	**90AB**
Cooling capacities		kW	19.10	23.00	28.80	42.90	54.00	72.30	86.10
Power input in cooling		kW	5.60	6.99	9.60	13.53	18.60	23.09	28.60
SEER			3.49	3.30	3.01	3.32	3.10	3.21	3.25
ηs,c			136.7	129.0	117.5	129.6	121.2	125.4	126.9
Refrigerant charge on site for 7 m piping length		kg	12	12	12.5	2 x 11	2 x 11.5	2 x 15.5	2 x 15
Heat pump models		**VAH**	**20AB**	**25AB**	**30AB**	**45AB**	**60AB**	**75AB**	**90AB**
Cooling capacities		kW	19.10	23.00	28.80	42.90	52.10	72.30	86.10
Power input in cooling		kW	5.60	6.99	9.60	13.53	18.60	23.09	28.60
Heating capacities		kW	21.20	25.20	31.90	44.80	59.40	81.00	93.10
Power input in heating		kW	4.94	6.73	8.41	12.69	17.06	22.13	28.82
SCOP			2.97	2.96	2.96	3.03	3.02	2.98	2.96
ηs,h			115.8	115.4	115.5	118.2	117.9	116.2	115.4
Refrigerant charge on site for 7 m piping length		kg	12	12	12.5	2 x 11	2 x 11.5	2 x 15.5	2 x 15
Power supply			400V/3 + N/ 50Hz						
Nominal / Starting current		A	8.5 / 74	11.8 / 95	15 / 118	2 x 12 / 95	2 x 15 / 118	2 x 19 / 140	2 x 25 / 198
Main switch (1)		A	20	25	32	50	63	80	100
Main cable to the outdoor unit (1)		Nbr x mm²	5 x 4	5 x 4	5 x 6	5 x 10	5 x 16	5 x 25	5 x 35
Interconnecting cable (1)		Nbr x mm²	4 x 1.5	4 x 1.5	4 x 1.5	4 x 1.5	4 x 1.5	4 x 1.5	4 x 2.5
Cable to standard thermostat (2)		Nbr x mm²	10 x 0.22						
Insulated refrigerant piping		Suction	1-1/8"	1-1/8"	1-1/8"	2 x 1-1/8"	2 x 1-1/8"	2 x 1-3/8"	2 x 1-3/8"
		Liquid	1/2"	1/2"	5/8"	2 x 1/2"	2 x 5/8"	2 x 7/8"	2 x 7/8"
Evaporator fan VIR at nominal airflow (3)	Airflow	m³/h	4 590	4 590	7 500	9 000	10 500	13 000	16 000
	Standard ESP	Pa	172		153	150	178	170	240
	ESP with HSD	Pa	267		242	203	277	289	399
	ESP with HSDM	Pa	267		242	203	277	289	399
Nett dimensions outdoor VAC / VAH	Height	mm	1 230	1 230	1 382	1 378 / 1 429	1 378 / 1 429	1 534	1 534
	Length	mm	882	882	882	1 627	1 627	1 627	1 627
	Depth	mm	1 354	1 354	1 354	1 453	1 453	2 099	2 099
Nett dimensions indoor VIR	Height	mm	592		665	764	764	838	838
	Length	mm	1360		1740	2240	2240	2653	2653
	Depth	mm	785		785	772	772	892	892
Nett weight	VAC / VAH	kg	227	228	250	470	483	610	610
	VIR	kg	128		173	223	223	310	312

(1) For information only. These should be checked for compliance with local regulations depending also on installation and conductor type.
(2) Shield type cable only. (3) ESP = External static pressure HSD = High speed drive HSDM = High speed drive and motor
All the data are at EUROVENT conditions with 400V/3+N/50Hz.
Cooling : Entering indoor coil temp. 27°C / 19°C WB and outdoor temperature 35°C Heating : Entering indoor coil temp. 20°C and outdoor temperature 7°C / 6°C WB

Please note indoor and outdoor units can no longer be purchased as individual items, they can only be supplied as a matching pair to comprise the Split Rooftop system.

Vitality Split Rooftop systems comprise of following matched pairs:

CODES	PRODUCT	OLD PRODUCT
S661522073	**VIRSAC20AB (Blue fin)**	VAC20AB + VIR 25 AB (Blue fin)
S661522573	**VIRSAC25AB (Blue fin)**	VAC25AB + VIR 25 AB (Blue fin)
S661523073	**VIRSAC30AB (Blue fin)**	VAC30AB + VIR 40 AB (Blue fin)
S661524673	**VIRSAC45AB (Blue fin)**	VAC45AB + VIR 45 AB (Blue fin)
S661526173	**VIRSAC60AB (Blue fin)**	VAC60AB + VIR 60 AB (Blue fin)
S661527673	**VIRSAC75AB (Blue fin)**	VAC75AB + VIR 75 AB (Blue fin)
S661529173	**VIRSAC90AB (Blue fin)**	VAC90AB + VIR 90 AB (Blue fin)

CODES	PRODUCT	OLD PRODUCT
S662532073	**VIRSAH20AB (Blue fin)**	VAH20AB + VIR 25 AB (Blue fin)
S662532573	**VIRSAH25AB (Blue fin)**	VAH25AB + VIR 25 AB (Blue fin)
S662533073	**VIRSAH30AB (Blue fin)**	VAH30AB + VIR 40 AB (Blue fin)
S662534673	**VIRSAH45AB (Blue fin)**	VAH45AB + VIR 45 AB (Blue fin)
S662536173	**VIRSAH60AB (Blue fin)**	VAH60AB + VIR 60 AB (Blue fin)
S662537673	**VIRSAH75AB (Blue fin)**	VAH75AB + VIR 75 AB (Blue fin)
S662539173	**VIRSAH90AB (Blue fin)**	VAH90AB + VIR 90 AB (Blue fin)

Accessories or options

Compatibility table / Codes

VITALITY UNITS								
Cooling only models		**VAC 20 AB**	**VAC 25 AB**	**VAC 30 AB**	**VAC 45 AB**	**VAC 60 AB**	**VAC 75 AB**	**VAC 90 AB**
		S661522073	S661522573	S661523073	S661524673	S661526173	S661527673	S661529173
Heat pump models		**VAH 20 AB**	**VAH 25 AB**	**VAH 30 AB**	**VAH 45 AB**	**VAH 60 AB**	**VAH 75 AB**	**VAH 90 AB**
		S662532073	S662532573	S662533073	S662534673	S662536173	S662537673	S662539173
Thermostat								
Delivered with the unit		DPC-1						
YNK2Open Gateway BACnet / IP - JCI Metasys N2	S606791244	A	A	A	A	A	A	A
YNK2Open Gateway Modbus TCP / IP - JCI Metasys N2	S606791245	A	A	A	A	A	A	A

Accessories or options for outdoor units

VAC/VAH models		20AB	25AB	30AB	45AB	60AB	75AB	90AB
Low Ambient Kit	S606819974	O	O	O				
	S606819975				O	O	O	O
Soft start compressor	S606744692	O	O	O				
	S606744693				O	O	O	O
Alarm relay board	S606791243	O/A	O/A	O/A	O/A	O/A	O/A	O/A
Copper-copper coil	Contact us	O	O	O	O	O	O	O
Power cut-off switch control panel mounted	S606819801	O	O	O				
	S606819802				O	O		
	S608819803						O	O

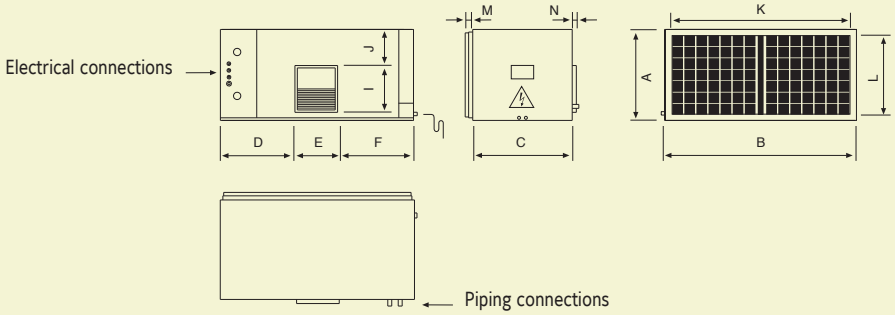
Accessories or options for indoor units

VIR models			25A	40AB	45AB	60AB	75AB	90AB
Electrical Heaters (Inside the unit) (cable 20 m included)	10 kW (1 stage)	S611763704	O/A					
	15 kW (1 stage)	S611763714	O/A					
	10 kW (1 stage)	S611763724		O/A				
	20 kW (2 stages)	S611763734		O/A				
	15 kW (1 stage)	S611763744			O/A	O/A		
	30 kW (2 stages)	S611763754			O/A	O/A		
	30 kW (2 stages)	S611763764					O/A	O/A
	40 kW (2 stages)	S611763774					O/A	O/A
50 m connecting cable	1 stage	S611763780	A	A	A	A		
	2 stages	S611763781		A	A	A	A	A
Economizer or Motorised damper (dry bulb sensors included) (cable 20 m included)		S613994250	A					
		S613994400		A				
		S613994450			A	A		
		S613994750					A	A
Indoor air quality		S606819964	A	A	A	A	A	A
Hot water coil and control (cable 20 m included)		S611082513	O					
		S611084010		O				
		S611084512			O	O		
		S611087510					O	O
50 m communication cable (Economizer/HWC)		S611087520 *	A	A	A	A	A	A
Return fan		S613995450			A	A		
		S613995750					A	A
Vertical discharge Kit		S669482502	O					
		S669484002		O				
		S669486002			O	O		
		S669487502					O	O
Indoor fan smooth start up to 5,5 kW		S606744690	O	O	O	O	O	O
High speed drive		S611991087	O					
		S611991089		O				
		S611991091			O		O	
		S611991092				O		
		S611991095						O
High speed drive and motor		S611991088	O					
		S611991090			O			
		S611991093				O		
		S611991094					O	
		S611991096						O

O = Option (factory fitted) A = Accessory (supplied loose) O/A = If you want this item factory fitted, precise it in the order form
(1) Factory fitted, for horizontal airflow only.
** If the unit is equipped with economizer and hot water coil, only 1 communication cable is necessary.*

Indoor units dimensions

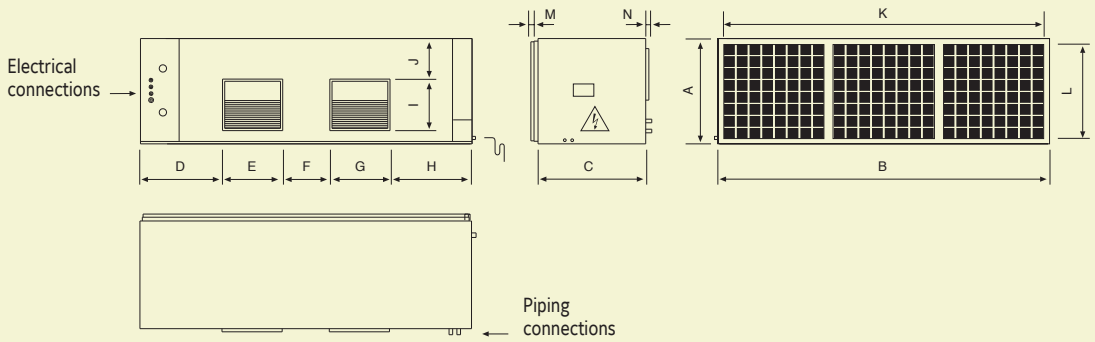
VIR 25 AB



All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
VIR 25 AB	592	1360	785	480	403	480	-	-	347	40	1094	520	21	25

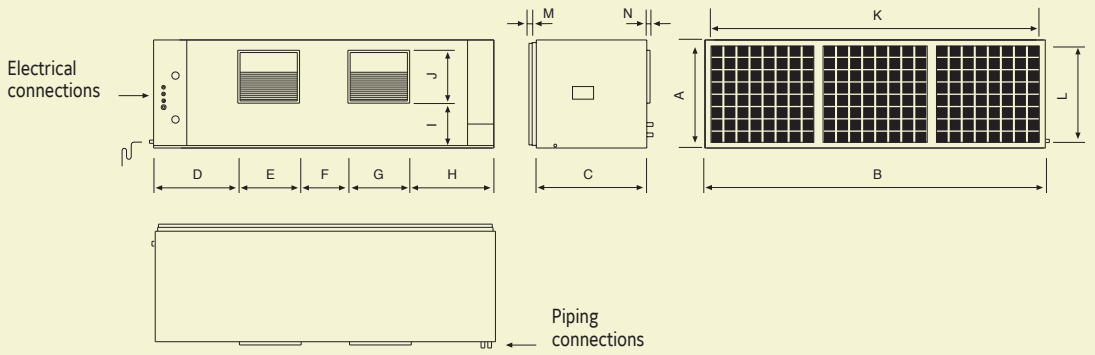
VIR 40-45-60 AB



All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
VIR 40 AB	665	1740	785	442	316	229	316	442	347	79	1337	593	21	25
VIR 45 AB	764	2240	772	567	401	309	401	567	347	79	1920	692	21	25
VIR 60 AB	764	2240	772	567	401	309	401	567	347	79	1920	692	21	25

VIR 75-90 AB

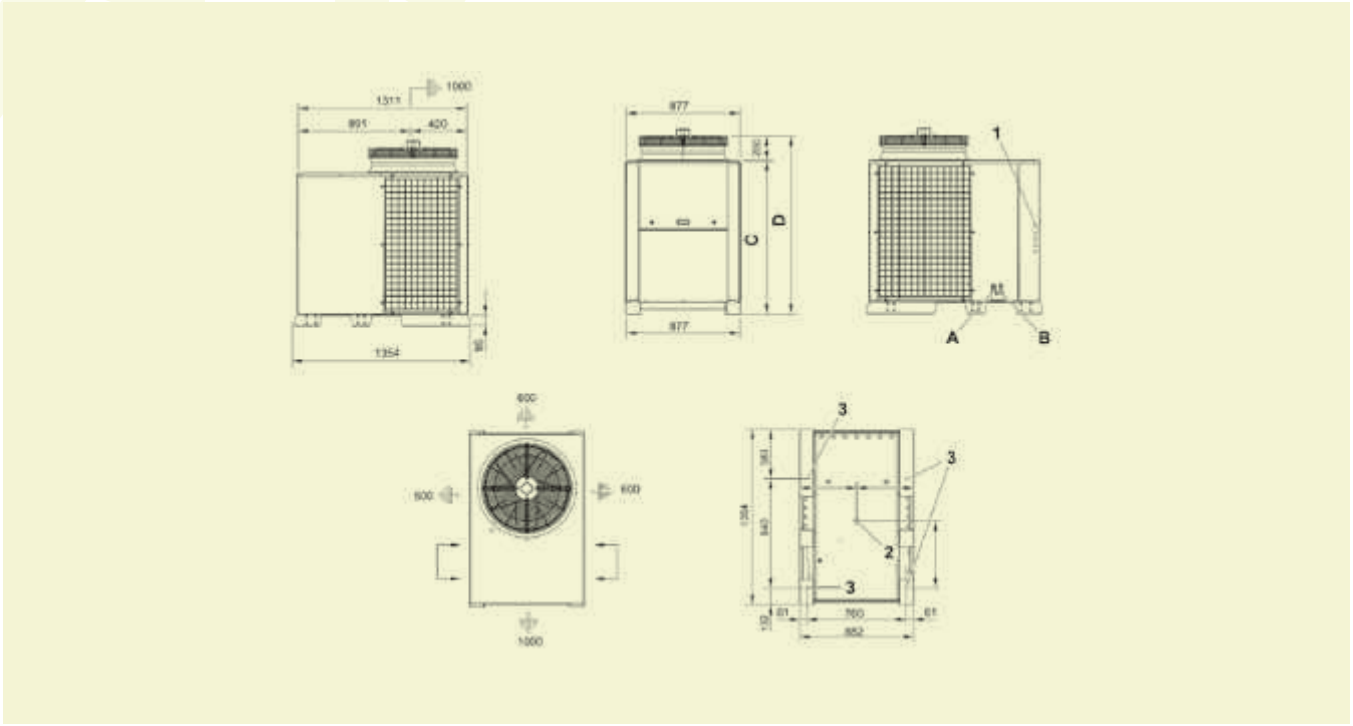


All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
VIR 75 AB	838	2653	892	663	478	376	478	663	409	79	2196	766	21	25
VIR 90 AB	838	2653	892	663	478	376	478	663	409	79	2196	766	21	25

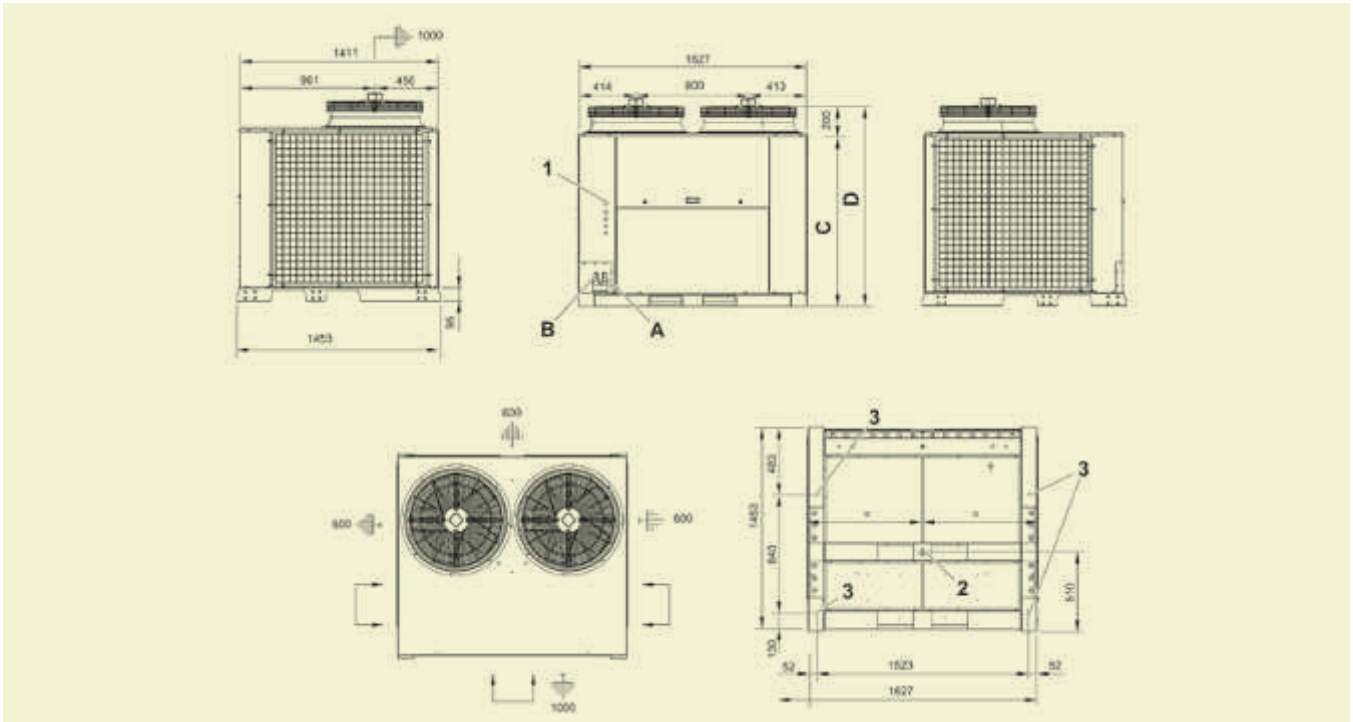
Dimensions and space requirements for outdoor units

VAC-VAH 20-25-30 AB



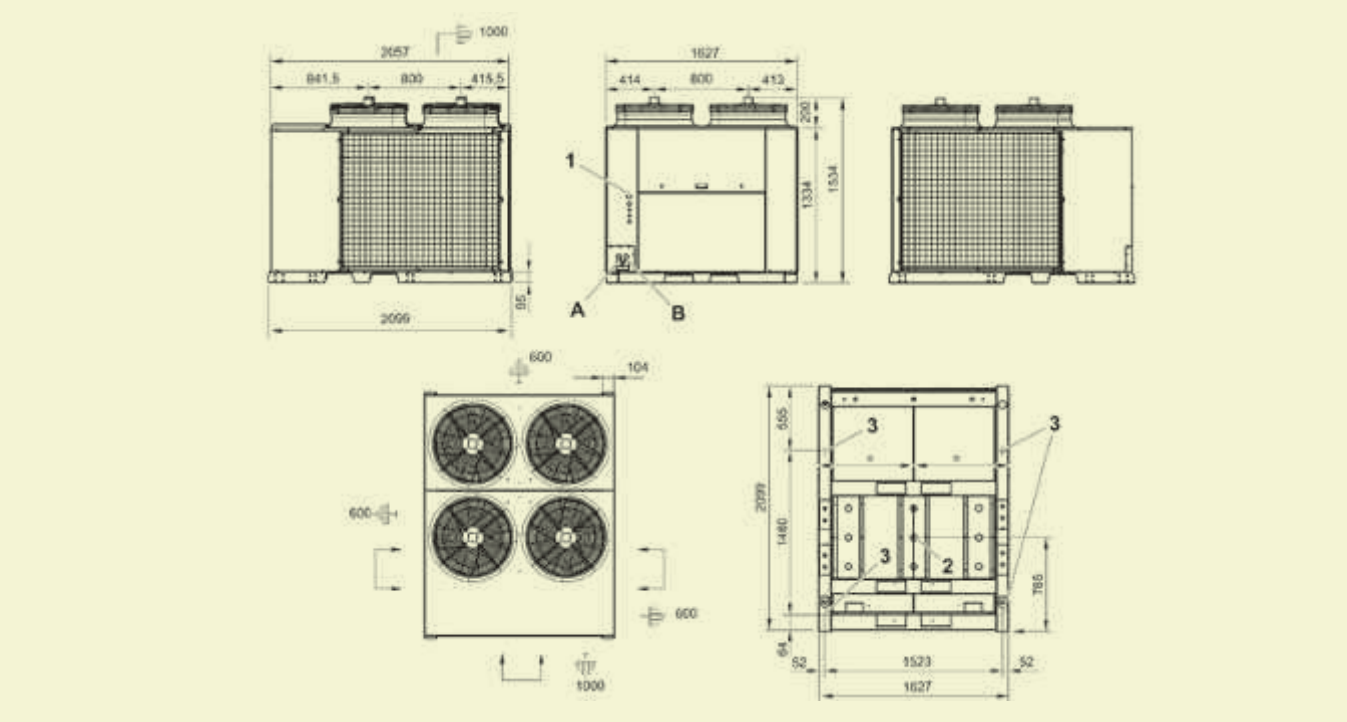
All dimensions in mm. Drawings not a scale.

VAC-VAH 45-60 AB



All dimensions in mm. Drawings not a scale.

VAC-VAH 75-90 AB



All dimensions in mm. Drawings not a scale.

VAC-VAH 20-25-30 AB

	A	B	C	D
Unit	Gas piping diameter	Liquid piping diameter	mm	mm
VAC 20 AB	1-1/8"	1/2"	1 030	1 230
VAH 20 AB	1-1/8"	1/2"	1 030	1 230
VAC 25 AB	1-1/8"	1/2"	1 030	1 230
VAH 25 AB	1-1/8"	1/2"	1 030	1 230
VAC 30 AB	1-1/8"	5/8"	1 182	1 382
VAH 30 AB	1-1/8"	5/8"	1 182	1 382

VAC-VAH 45-60 AB

	A	B	C	D
Unit	Gas piping diameter	Liquid piping diameter	mm	mm
VAC 45 AB	2 x 1-1/8"	2 x 1/2"	1 178	1 378
VAH 45 AB	2 x 1-1/8"	2 x 1/2"	1 129	1 429
VAC 60 AB	2 x 1-1/8"	2 x 5/8"	1 178	1 378
VAH 60 AB	2 x 1-1/8"	2 x 5/8"	1 129	1 429

VAC-VAH 75-90 AB

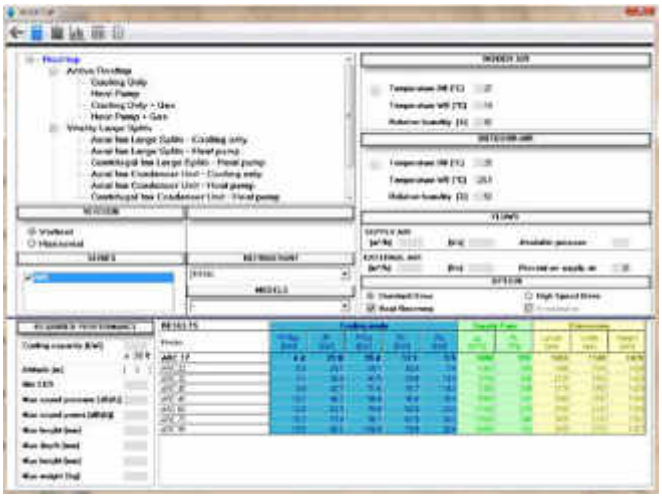
	A	B	C	D
Unit	Gas piping diameter	Liquid piping diameter	mm	mm
VAC 75 AB	2 x 1-3/8"	2 x 7/8"	-	-
VAH 75 AB	2 x 1-3/8"	2 x 7/8"	-	-
VAC 90 AB	2 x 1-3/8"	2 x 7/8"	-	-
VAH 90 AB	2 x 1-3/8"	2 x 7/8"	-	-

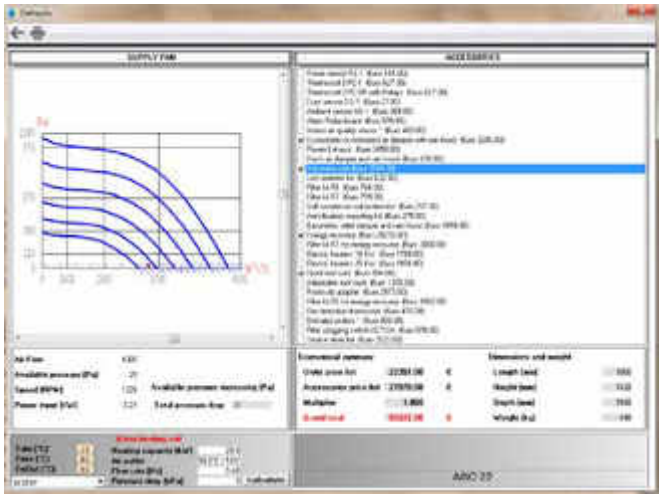
Selection Tool for Advanced Rooftops - S.T.A.R.

Johnson Controls continues the improvement of the selection software for Packaged and Commercial Split Systems called YORK® S.T.A.R – Selection Tool for Advanced Rooftop. By installing new releases, available through Virtual Branch portal, the selection tool is updated periodically with the aim to help and simplify the product selection and quotation process.

Using S.T.A.R you will be able to select:

- The ACTIVA Rooftop range units
- Roomtop units (RTC/RTH)
- Vitality Large Split units (including condenser units only)





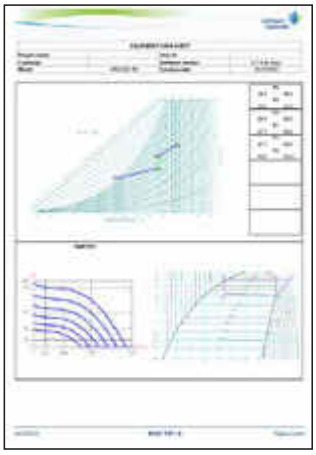
In addition, the selection of some **key options are possible**.

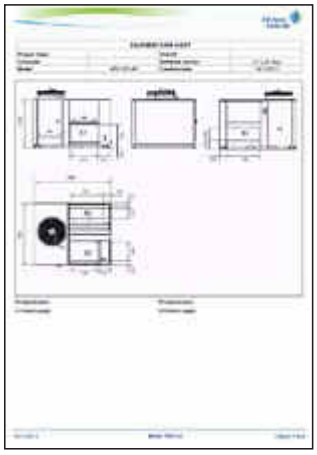
For instance: **economizer, enthalpy wheel, high pressure drive, hot water coil** for the ACTIVA Rooftops 17-40 and 45-90.

The tool allows **extracting reports easily in different formats** (editable and non editable).

S.T.A.R. is currently available in English, Spanish, Polish and Italian. The tool can be translated to other languages if required.

* Call your JCI Sales Representative and request access now.





Comprehensive Solutions

VERASYS™ CONFIGURABLE BUILDING CONTROLS SYSTEM FOR SMARTER BUILDINGS

METASYS® BUILDING AUTOMATION AND CONTROL SYSTEMS

Johnson Controls

VERASYS™

Configurable building controls system for smarter buildings

For Light Commercial Building Controls

Enterprises have more options to reduce costs and increase control of HVAC, refrigeration and lighting equipment. Verasys™ is a new plug-and-play control system with less complexity and more capabilities. It streamlines installation, commissioning, and servicing, and provides access to critical data – when you need it and where you need it – to help facilities perform at peak levels.

Verasys provides a simple user experience with configurable controllers (without tools), creating the first plug-and-play experience integrating HVACR equipment and controls for a certified system that's compliant for energy efficient operations.

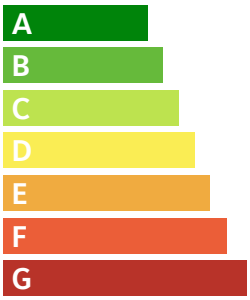
Making buildings smarter by optimizing equipment.

The Verasys control system leverages smart equipment technology from any manufacturer. Verasys is a straightforward, easy way to control and optimize single-site and multi-site enterprises. All mechanical equipment seamlessly connect to it and self-identify without requiring any special programming tools. As a result, you can take advantage of a new level of insight into building operations, and provide facilities that better serve occupants.

Smart, integrated control. Simplified and supported.

Verasys gives users remote access over a secure internet connection. Plus, optional fault detection and diagnostics deliver alarm notifications immediately via email or text, and user-friendly graphics provide easy access to critical facility information to help minimize the risk of unplanned downtime and costly repairs. You can take advantage of predictive technologies solutions that deliver the quality and value your enterprise requires.

Enhanced energy efficient control for smaller commercial buildings allow for an even higher energy class according to the EN15232. The advantage is that a facility owner can move from an average class D to a class A. The key to this efficiency is demand control, where the consumer spaces/rooms send the energy demands signals/requirements to the heating/cooling equipment. Matching the demand side and the supply side guarantees an energy efficient system overall.



Whether it's one site, or one thousand, Verasys provides an advanced level of control flexibility, including scheduling, alarming, setpoints, custom trending, and more. It communicates using BACnet® MSTP, so Verasys is expandable to any BACnet® compliant system. And it works with third-party package equipment for greater application flexibility and to protect existing investments.

Leveraging Smart Equipment from Johnson Controls.

Smart Equipment from Johnson Controls identifies embedded equipment that has advanced technology and smarts already embeded. Verasys takes full advantage of our Smart Equipment technology. It provides real-time performance data. No programming or commissioning tools. No engineering required. Just plug-and-play.

The primary benefit of Smart Equipment is that it already has controls embedded by the manufacturer. This means it can connect seamlessly to controls systems like Verasys. It uses on-board controls to support data analytics, including fault detection, to support proactive maintenance and minimize downtime. Plus, control products/devices that are capable of controlling equipment without a supervisory controller provide a user interface experience. This allows it to self-discover and/or communicate with other Smart Equipment. In short, Smart Equipment helps maximize control for greater efficiency, extended equipment life and reduced operating costs.

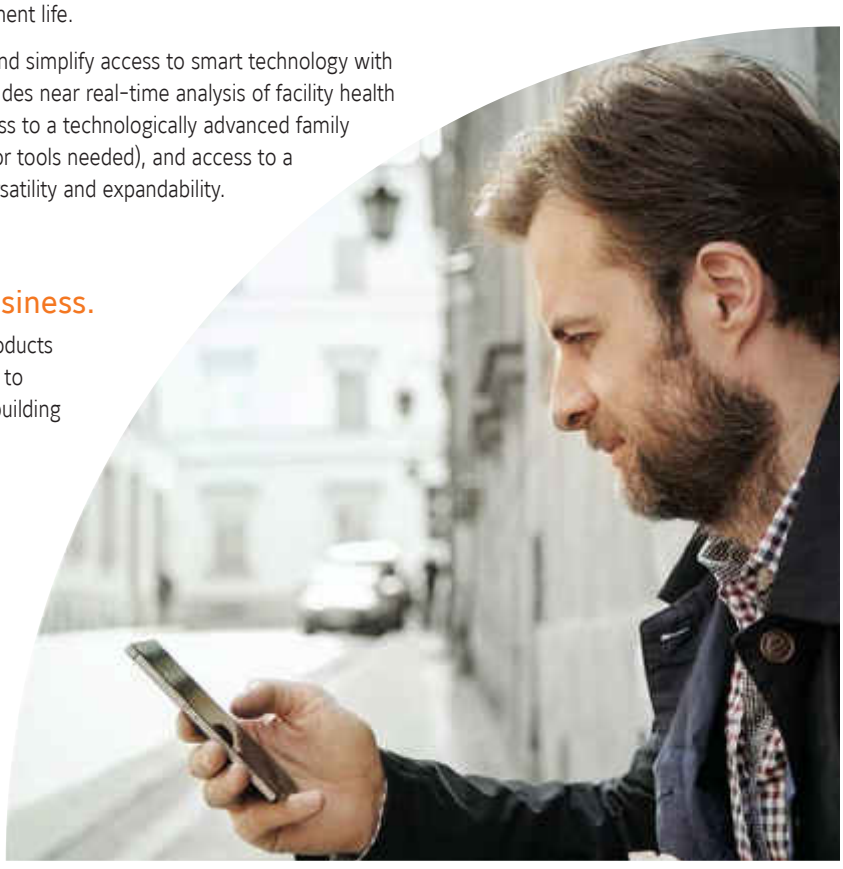
To see how you can take advantage of Smart Equipment, visit www.getsmartequipment.com.

SMART EQUIPMENT

Built-in comfort and efficiency.

Verasys helps enable a smarter building which means more comfort, productivity and efficiency. Verasys connects you to data streams from smart controls in rooftop units, chillers, heat pumps, fan coils, zone dampers, refrigeration systems, lighting panels and more. Data can be accessed anywhere, at any time, from any mobile device. This unprecedented, real-time access to critical information ensures energy efficiency and lower operating costs throughout the building's lifecycle so you can identify issues before they result in unplanned downtime. This extends equipment life.

You also have the opportunity to save operating costs and simplify access to smart technology with Verasys, a complete buildings controls system that provides near real-time analysis of facility health and performance for optimal uptime. This includes access to a technologically advanced family of controllers which are configurable (no programming or tools needed), and access to a library with a vast array of applications that provides versatility and expandability.



A smarter way to transform your business.

Verasys provides the means, capabilities and reliable products to deliver leading-edge, end-to-end control technology to building owners. You get the best value and optimized building environments that support enterprise needs to increase productivity, efficiency, and maximize energy and cost savings.

Plug and play control system to manage smart buildings.

In a single building, or across an entire enterprise, Verasys offers a new kind of plug-and-play controls solution. Through an advanced yet intuitive user interface, it delivers a higher level of building control intelligence that optimizes building ecosystems, resulting in a building that better serves its occupants.

Metasys® Building Automation and Control Systems

Metasys® building management system from Johnson Controls ensures all of the building systems – comfort controls, lighting, fire safety, security and HVAC equipment – operate together in harmony. With an innovative, IT-based infrastructure, software and wireless capabilities, Metasys® is the one building management system that coordinates and organizes all the information logically to deliver it where and when needed, giving more control and easier access to information than any other system of its kind.

Previously a winner of the Frost & Sullivan North American BAS Market Leadership Award, Metasys now offers even more.

Ease of use

- Easy to configure and deploy
- No special training is required to use it
- The new Metasys UI is designed to enhance our customers' productivity and effectiveness. It allows users to navigate by space to view summaries, trends, and activities, emulating the way they work every day. The new user interface is also optimized for all devices, enabling our customers to work smarter from any device and any location.

METASYS®

More efficiency, less costs

- The Energy Essentials leverages the Metasys® Advanced Reporting System to take the existing data and present it in an organized and informative way, providing easy-to-configure, easy-to-use and actionable energy reports
- The improved Johnson Controls Central Plant Optimization™ 10 (CPO 10) helps facility managers operate their chiller plants more efficiently. CPO algorithms are used to operate and sequence plant equipment in an efficient and reliable manner, and to ensure that runtime, starts and stops are equalized across the individual plant components saving energy and improving reliability in the facility.

Single platform communication

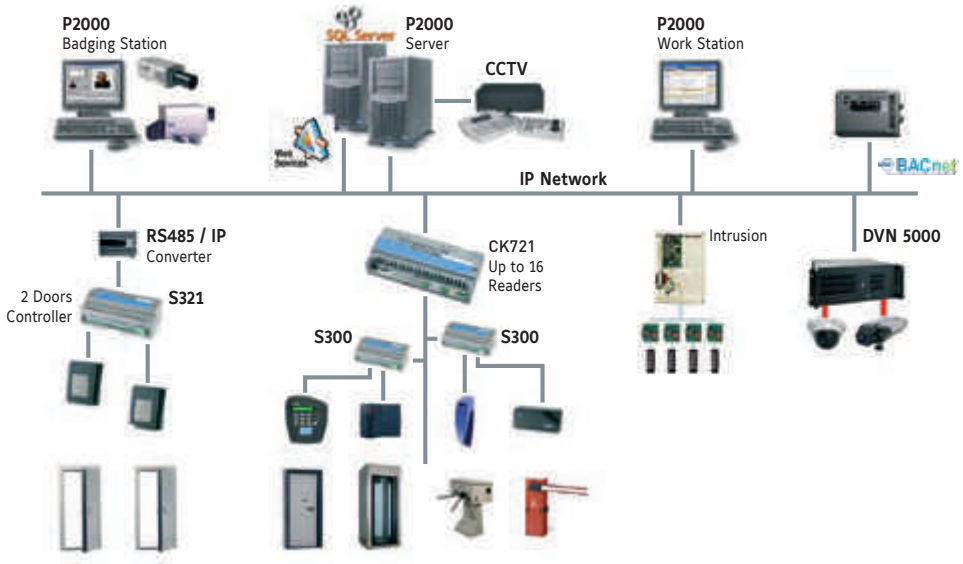
- Enhanced, single platform interface of thousands of different hardwired and wireless systems, devices and equipment.
- Even more control options and better information access by users, thanks to:
  - Field Equipment Controllers redesigning
  - Terminal Equipment Controller updates and improvements
  - Added wireless and network sensors
  - Enhanced software and firmware

Wireless Capabilities

- Increased control flexibility, streamlines retrofits and faster download times, thanks to the latest wireless technologies that Metasys® incorporates into more devices.
- At system's user interface, network automation, field controller or room sensing levels, Wireless Building Technologies from Johnson Controls always result in increased application flexibility and cost effectiveness.

Security features

- Metasys® now incorporates P2000 Security Management System, whose software and network controllers ensure the safety of employees and security of company assets.
- P2000 open integration platform, designed for interoperability with a variety of security subsystems including access control, alarm & intrusion detection, video surveillance, visitor management.



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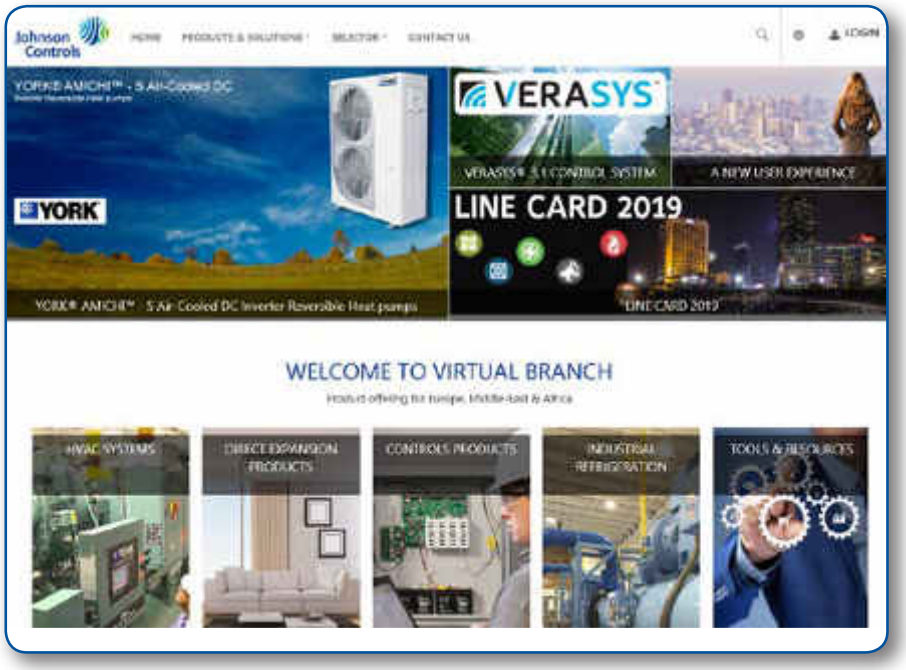
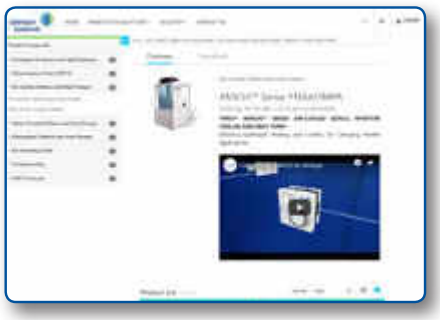
Johnson Control's eCatalog

Johnson Control's eCatalog, also known as the "Virtual Branch", is not only an extensive database of product information but also a point of entry into our organization.

Within the eCatalog you are connected to the cloud and hence stay up-to-date on all new product launches, product selection tool releases and updates, technical documents, eLearning modules and much more. You will reach our products in 3-clicks or less through the use of a powerful search engine and a very easy-to-browse navigation menu. You can also view the purchase prices online for many of our products and check the availability of stocked items at a glance. Also, rest assured that access to our network of Sales Representatives and Technical Support teams is directly available for your use.

Call your Sales Representative and request access now.






Johnson
Controls

About Johnson Controls

Johnson Controls delivers products, services and solutions that increase energy efficiency and lower operating costs in buildings for more than one million customers.

Operating from 500 branch offices in more than 150 countries, the company is a leading provider of equipment, controls and services for heating, ventilating, air-conditioning, refrigeration and security systems. Johnson Controls is involved in more than 500 renewable energy projects including solar, wind and geothermal technologies.

Its solutions have reduced carbon dioxide emissions by 13.6 million metric tons and generated savings of $7.5 billion since 2000. Many of the world's largest companies rely on Johnson Controls to manage 1.5 billion square feet of their commercial real estate.

YORK®

INSTALL CONFIDENCE.

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