YORK® YC-P Series
Close Control Air Conditioners

A complete range from 7.7 kW up to 160 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.

"P" Series units are also available in configurations 'PG' for perimeter installation, or 'PR' for in row installation in large data centres.

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 (R134a available on request).
- 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.

Downflow unit with 2 fans and side compartment; full front access for both fans (covered) and technical compartment

Downflow unit with 2 fans and side compartment; full front access for both fans (not covered) and technical compartment on the side. No side maintanance space is required for accessing components

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
- in case of need to install any component requiring analogue control (modulating valve or electronic hot-gas by-pass valve), an optional modulating controller, with semigraphic display, shall be installed in lieu of standard. This alternative controller is also installed as standard microprocessor on special versions such as “Free cooling”, “Two Sources”and “Fresh air” units.

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.

In local network applications, one machine is the master, and the remaining slaves follow the same algorithm. The slave units are rotated at predetermined intervals and switch to the master role to balance the number of working hours of the compressors.

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 can be equipped with an RS485 card working with BacNET MS/TP protocol.

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, thermal expansion valve, 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.

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 throttling motorised valve for water flow regulation. The hydraulic circuit is provided with copper tubes with anti-condensate insulation. The coils are optimised for both water with a temperature of 7/12 and for higher ones such as 15/20.

The standard throttling valve (3 points) allows good modulation of the cooling capacity as a function of the environmental conditions, especially with constant thermal loads.

Modulating regulation of the cooling capacity (**)

If a very precise regulation and high response speed are required, a modulating valve (optional) can be installed in lieu of the throttling one. The installation of this valve is recommended in case of functionment with a lot of fresh air. However, the modulating valve needs an analogue signal, not digital, so the installation of the optional modulating controller is necessary.

(*) units equipped with frigorific circuit
(**) units equipped with chilled water coil

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 two spare terminals for remote indication of a cumulative alarm, as well as two terminals for starting up and stopping the unit from remote position.

The control panel does not include the fan speed controller(s) for the fans of the air cooled remote condensers (winter control). This device is included as standard in the CEA and CEA/LN air cooled condensers from Johnson Controls.

Should you decide to match the unit with a condenser from another manufacturer, the controller(s) can be ordered as accessory.

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.

A 450 mm high duct (accessory) can be installed for holding a F7 class filter, vertically on supply air discharge.

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 coated with a dark grey PVC layer (anthracites), thermoacoustically insulated by polyurethane layer, and further coated with an anti scratch plastic film.

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 filters. 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 clogging of the filters. 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.

Special versions

“Water to air free cooling”: using renewable energy sources

YC-OPW.../FC, YC-UPW.../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 modulating 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. Units in “free cooling” version cannot install the optional hot water heating coil, only the electric one, and have as standard the analogue modulating controller. 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).

Units in “Two Sources” cannot install the optional hot water heating coil, only the electric one, and have as standard the analogue modulating controller.

50 kW upflow 2 circuits direct expansion air conditioner

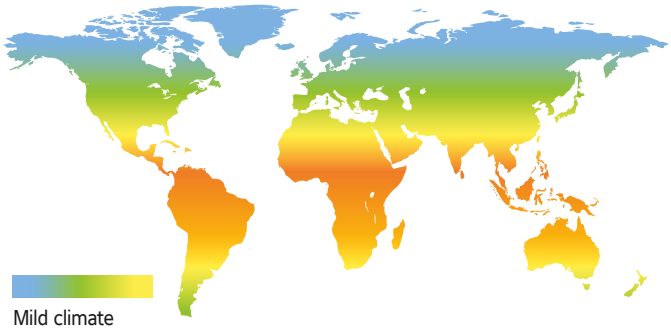
Focus on Free Cooling

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

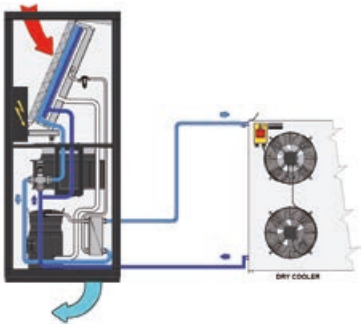
The indirect FREE COOLING system is characterised by a hybrid unit, consisting of a primary water circuit and a secondary direct expansion or chilled water circuit. The primary water circuit is connected to a dry cooler that uses outside air - a source of renewable energy - to cool water. The secondary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

Optimised operating procedures

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

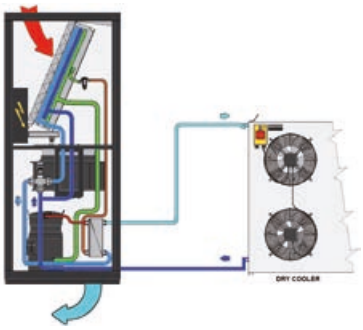
Total Free Cooling

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



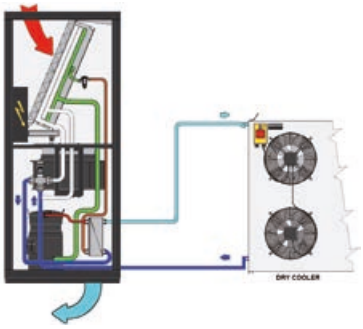
Partial Free Cooling

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.

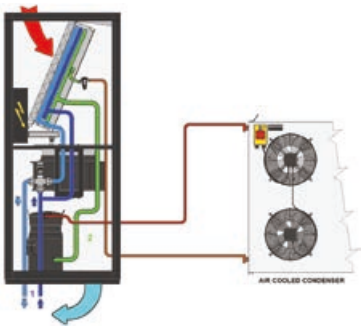
So as to avoid these problems, specific **TWO SOURCES (TS)** units have been developed providing a second source of cooling, complete with its own control valve and totally independent from the primary one.

A safe, flexible system

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

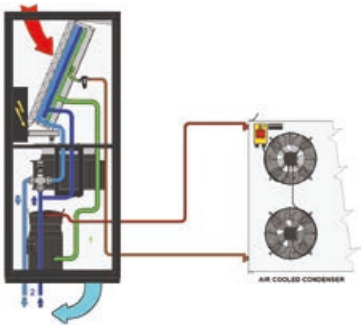
Chilled water + direct expansion Two Sources

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

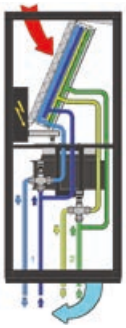
The direct expansion primary source of the unit is connected to remote air or in-built water condensers, whereas the secondary, emergency, and water one is connected to a dedicated chiller, to a groundwater/aqueduct water distribution network or to District Cooling.



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.
- Smoke/fire alarm terminals.

Water cooled condensers and pressostatic valves

- Welded stainless steel water cooled plate condenser.
- 2 way pressostatic 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.
- Double layer sound damping panels. Reduces SPL by approx 2 dB(A) in upflow units (OP series), and approx.4 dB(A) in downflow units ((UP series).
- Double-layer "sandwich" thermo-acoustic insulation panels.

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 front grille.
- Plenum (h=550 mm) for air discharge or intake with front and side grilles.

Direct expansion unit cooling capacity regulation

- Electronic expansion valve.
- Electronic hot-gas injection system for the regulation of cooling capacity (100-10%).

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.

Boards and sensors

- Humidity sensor and board for external humidification control not supplied by Johnson Controls.
- 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). *(Precise height to be specified with order).*
- Adjustable under base with air deflector (UP only). *(Precise height to be specified with order).*

Fans and filters

- Electronic EC fans with incorporated inverter for constant rotation speed regulation.
- Electronic EC fans with incorporated inverter for the regulation of air flow in relation to the required cooling capacity.
- Electronic EC fans with incorporated inverter for the regulation of constant pressure in the raised floor.
- Electronic two-speed AC fans.
- F7 filter to be installed on the air intake as substitute for the standard G4.
- 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**	**111**	**141**	**211**	**251**	**301**	**302**	**361**	**372**	**422**	**461**	**491**	**512**	**612**	**662**	**852**	**932**
Performances																		
Total cooling capacity	kW	7.7	11.1	14.5	20.8	25.3	31.2	30.6	36.6	38.8	42.7	46.9	52.3	51.6	63.2	67.7	87.3	94.2
Sensible cooling capacity	kW	7.4	11.1	12.8	20.8	22.7	30.3	30.1	36.6	33.6	42.7	45.3	52.3	47.4	62.6	64.5	73.2	85.4
Airflow	m³/h	2 200	3 200	3 200	7 000	7 000	8 700	8 700	14 500	8 700	14 500	14 500	17 900	14 500	17 900	17 900	17 900	20 700
EER		3.69	3.26	3.36	3.12	3.06	3.13	3.20	3.24	3.03	3.22	3.37	3.47	3.14	3.21	3.17	3.29	3.59
Sound pressure level	dB(A)	51	57	57	62	62	60	60	65	65	65	65	62	65	62	62	62	60
Dimensions & weight																		
Lenght	mm	750	750	750	860	860	1 410	1 410	1 750	1 410	1 750	1 750	2 300	1 750	2 300	2 300	2 300	2 640
Depth	mm	601	601	601	880	880	880	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	1 990	1 990	1 990	1 990
Net weight	kg	180	200	210	270	270	320	340	440	350	450	450	540	500	640	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**	**111**	**141**	**211**	**251**	**301**	**302**	**361**	**372**	**422**	**461**	**491**	**512**	**612**	**662**	**852**	**932**
Performances																		
Total cooling capacity	kW	7.7	11.1	14.5	20.8	25.3	31.2	30.6	36.6	38.8	42.7	46.9	52.3	51.6	63.2	67.7	87.3	94.2
Sensible cooling capacity	kW	7.4	11.1	12.8	20.8	22.7	30.3	30.1	36.6	33.6	42.7	45.3	52.3	47.4	62.6	64.5	73.2	85.4
Airflow	m³/h	2 200	3 200	3 200	7 000	7 000	8 700	8 700	14 500	8 700	14 500	14 500	17 900	14 500	17 900	17 900	17 900	20 700
EER		3.69	3.25	3.36	3.12	3.06	3.13	3.20	3.24	3.03	3.22	3.37	3.47	3.14	3.21	3.17	3.29	3.59
Sound pressure level	dB(A)	51	57	57	62	62	60	60	65	60	65	65	62	65	62	62	62	60
Dimensions & weight																		
Lenght	mm	750	750	750	860	860	1 410	1 410	1 750	1 410	1 750	1 750	2 300	1 750	2 300	2 300	2 300	2 640
Depth	mm	601	601	601	880	880	880	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	1 990	1 990	1 990	1 990
Net weight	kg	180	200	210	270	270	320	340	440	350	450	450	540	500	640	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	10.0	18.0	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity	kW	9.2	15.4	29.8	38.1	62.1	72.0	109.7	144.0
Airflow	m^3/h	2 200	3 200	7 400	8 200	15 400	17 000	26 000	34 000
EER		34.42	29.24	22.83	21.48	23.94	24.30	23.62	24.29
Sound pressure level	dB(A)	51	57	63	59	66	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	10.2	18.0	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity	kW	9.2	15.4	29.8	38.1	62.1	72.0	109.7	144.0
Airflow	m^3/h	2 200	3 200	7 400	8 200	15 400	17 000	26 000	34 000
EER		34.42	28.98	22.82	21.48	23.95	24.29	23.62	24.29
Sound pressure level	dB(A)	51	57	63	59	66	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.