YORK® AIRSIDE PRODUCTS

Delivering precision air conditioning for critical applications

Serie P R410A

Close Control
air conditioners

YORK® BY JOHNSON CONTROLS

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Air Conditioners for Close Control and Data Centers

High energy efficiency and minimum environmental impact

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

The total cooling capacity coverage of the models with direct expansion - OPA with up-flow air discharge and UPA with down-flow - ranges from 7 up to 90 kW.

The same machines are available in chilled water versions - OPU and UPU - with capacities of up to approximately 200kW.

The "P" Series air conditioners offer very high energy efficiency values in all operating conditions which translates into less CO2 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, musical instrument storage areas, 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. In these applications an integrated system of treatment of the external air may be requested.

GOST certification

ISO 9001
Cert. n° 273

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.

Silent functioning

The design of the machine has not not neglected the search for low sound operation, thanks in particular to:

- the selection of quiet scroll compressors;
- the application of EC plug fans featuring low sound levels at project conditions which appreciably reduce as the speed diminishes;
- extensive thermo-acoustic insulation of the cabinet shell.

Available versions

The "P" Series air conditioners are produced in two main construction versions which enable all application requirements to be met, in both data centres and in other specialised locations:

- direct expansion units, commonly used in buildings of medium/ small dimensions, with required capacity not exceeding 400kW;
- chilled water units, with dedicated cooling groups generally used above 400kW capacity.

Different versions for different needs

Also considering their adequacy from an aeraulic and performance level angle, the "P" Series direct expansion air conditioners are assembled with various combinations of compressors/airflows, thus determining different machine SHR (sensible heat ratio). Models with SHR between 0.9 and 1 are to be chosen for the air conditioning of areas where sensible thermal loads are prevalent and which do not require (if not minimally) the treatment of latent loads by dehumidification, such as data centers, highly computerised offices, telephone exchanges and more generally special close control uses.

Machines with SHR of less than 0.9 are characterised by having (at equal refrigerant circuit) a lower airflow and therefore greater dehumidification. This makes them well suited to civil or special applications also with high crowd levels and appreciable external airflow. They are appropriate for commercial and service industry areas such as offices, shopping centres, restaurants, libraries and museums.

Main features

Plug fans with EC motors

Plug fans, made up by one or more backward curved, free running impeller, radial fans, offer several advantages:

- particularly silent operation;
- extremely high performance;
- easy cleaning of the blades.

Plug fans factory fitted with EC (electronically commutated) constant current brushless motors with external rotors are the latest innovation in energy saving when it comes to the fan sector. They are about 25-30% more efficient than traditional asynchronous alternating current motors. They also allow continuous speed variation depending on the external sensor signal on the microprocessor control of the machine, without the need for an inverter or other electronic devices.

At equal operating conditions, the combination of EC motors and plug fans therefore offers several advantages:

- better functionality;
- improved energy efficiency;
- lower sound level;
- absence of vibration in operation and soft start (lower absorbed current on starting).

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. This type of regulation is recommended when F7 filters are used, in order to increase their working life.

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. The VAV system, which is recommended only for chilled water machines, requires that modulating regulation of the cooling capacity is provided.

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. In fact, without correct fan speed regulation, the closure of one or more of the dampers could cause an excessive increase in the airflow through the dampers remaining open. A pressure sensor is included to be installed in a representative under-floor point to guide the Survey which, in turn, regulates the fan speed in order to maintain the designed pressure values..

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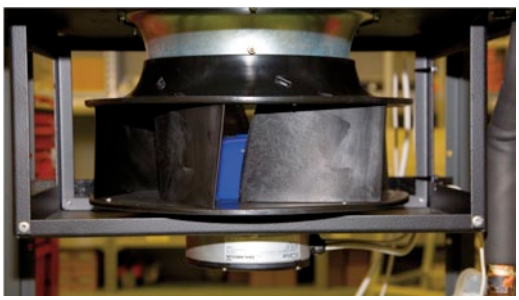
Plug fans with AC motors

Standard fans with AC motors have two operating speeds and therefore two different airflows and static pressures, which can be selected through their terminal strip cabling.

Microprocessor

The "P" Series air conditioners are equipped with an on board controller which has been especially designed to manage the performance of the machines in both data centers and civil applications. The intelligent controller keeps control of the fundamental functions of the air conditioning: cooling with or without dehumidification, heating, humidification, regulation of the air flow based on the condition of the filters and/or other design requirements. These features mean that the Controller operates the machine at a high energy efficiency level in all working conditions. This ensures continuity of service, even in emergency situations, for example if the machines are equipped with two compressors or the plant has multiple machines. Also offers a wide range of auto-diagnosis functions, and the capability to fully manage all the alarms.



Scroll compressors

Extremely quiet, energy efficient scroll compressors have been installed in the direct expansion units. Offering a significant energy consumption reduction, they allow a very limited impact on the environment. Compared to alternative ones, at equal yield capacity scroll compressors give higher volumetric performance. In addition, the absence of valves eliminates the pressure drop which is typical of the traditional ones, allowing an increase in energy efficiency in equal conditions. The "P" Series air conditioners utilise the most efficient and reliable available scroll compressors models supplied from reputable global manufacturers.

Single or double refrigerant circuit

Models with "1" as the last digit of the numerical part of an identification code 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 installation designer can therefore choose to use a single compressor machine or one with two compressors which offers 50% redundancy. 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.

Electronic expansion valve

Electronic expansion valves are one of the most recent pieces of equipment that enable 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 much more precise control of the quantity of refrigerant entering the evaporator, depending on the effective requirement of the load. This guarantees good capacity regulation, typically between 100% and 50%. Electronic expansion valves also enable to control the amount of overheated gas at the outlet of the evaporator, thus allowing a significant reduction of the condensation pressure during winter or nighttime operation whilst maintaining the evaporation pressure unchanged. Adoption of the electronic expansion valve (optional) guarantees a significant increase of the EER values.

High efficiency heat exchanger coil

The copper-aluminum coils fitted to direct expansion machines with downward air discharge can have an optional hydrophilic surface treatment to the fins in order to prevent any downward condensate drag.

This treatment, penalising the heat exchange of the fins, makes it necessary to increase the coils' size and is required whenever the environment has to be dehumidified. It therefore has to be specified when many operators are present or when there are large volumes of fresh air.

In machines with chilled water coils, the hydrophilic treatment is not envisaged. Dehumidification is in fact non-existent, due to several factors:

- supply water temperatures are always higher to exploit the free cooling effect (up to 20°C in data centers with hot pool air distribution);
- operators' absence;
- absence of any kind of humidity.

The surface treatment reduces the heat exchange and requires coils with more rows, therefore making it totally unfruitful.

The aluminum fins have specialisation of the TURBO/COIL® profile, perfected in the LU-VE SpA research labs. They produce a predetermined turbulence of the crossing air which therefore increases the coefficient of heat exchange.

The copper tubes have the special TURBO/FIN® internal helical grooves which centrifuge the liquid refrigerant flow thus optimising the capacity of heat exchange between air and refrigerant.

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Refrigerant and oil charge

OPA e UPA mono-block air conditioners with incorporated water condenser (accessory) are supplied complete with refrigerant and oil charge.
OPA e UPA air conditioners for connecting to remote condensers are supplied only with nitrogen pressurized charge and the standard oil charge of the compressor(s). The refrigerant charge and any topping-up of the oil level has to be done by the installer during the installation process.

Hydraulic circuit and regulation valves

The chilled water units are fitted with a fin-pack type heat exchanger coil with several rows, copper tubes and aluminum fins. The coils have as standard a motorised three-way valve for the floating regulation of the water flow. The coils are designed to give maximum performance in the two regimes typical of chilled water temperatures:

- 15/20 °C, or higher, as required by most data centres, telephone exchanges etc;
- 7/12 °C, mainly for wellness applications in the civil sector.

In both cases, the standard floating regulation allows the progressive modulation of the cooling capacity based on the demand for cooling the environment, without any sudden variations which could cause discomfort. Nevertheless, a modulating valve is available as an accessory, installed in place of the floating one when very precise regulation of the cooling capacity is required. It is also very suitable for those cases which involve high rates of fresh air. If the plant is equipped with variable flow pumps, two-way valves with modulating regulation can be fitted instead of three-way ones.

Local network and remote management

"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, which come into operation in emergency situations or when peak demand exceeds the design values, are rotated at predetermined intervals (for example every 12 or 24 hours) 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 to Johnson Control Metasys® Building Management Systems (BMS) the units can be equipped with an RS485 card working with BacNET MS/TP protocol.
Further Gateways are available for interfacing more units (up to 12 units to 1 gateway) to other important Serial Communication Protocols:

- Lonworks FTT10;
- Bacnet MS/TP or TCP/IP;
- TCP/IP Ethernet;
- TCP/IP Ethernet with an integrated GSM modem.

Safety features

The "P" Series air conditioners comply with the main European and international safety regulations.
This also thanks to:

- electrical boards that feature a main switch with shutter-block function, in addition to magnetothermal switches and contactors;
- On/Off terminals for switching the machine by remote control, and other free terminals for the remote indication of a cumulative alarm;
- standard phase sequencers on machines with compressors that protect the compressors from any damage, should the machine start up in the opposite direction from normal;
- remote condenser fan speed regulators (accessory).

Air filtration requirements

Adequate air filtration is an especially important requirement in data centers, where air-dispersed particles can also carry corrosive substances damaging the equipment. But it is also in civil applications, where IAQ (indoor air quality) control is a topic of ever-growing importance.
To satisfy this demand, Johnson Controls equips its "P" Series air conditioners, as standard, with regenerable self-extinguishing class G4 filters, which can be substituted with high efficiency F7 air filters if a more rigorous IAQ control is required. The filters are installed, upstream of the cooling coil, in an inclined position. Their large surface allows lower air crossing speeds and therefore lower energy consumption.

Modern design

The "P" Series air conditioners feature a modern, functional design suitable not only for data centers but also for civil areas.

- anthracite grey colour that blends in perfectly with most office and laboratory furnishings
- metal frame and aluminium machine profiles, with closing panels and access doors in sheet steel;
- thermo-acoustically insulated doors and panels: the inside is covered by a layer of polyurethane protected by a plastic film for a total thickness of 25mm;
- anthracite PVC film external surface treatment for doors and panels.

The recirculation air intake for upflow (OP) units can be situated in two positions, at the choice of the user: the standard version has the suction grille on the front, while the special version has a blind front panel and takes air in from the bottom of the unit.
For downflow (UP) units, air is taken from the top of the machine and discharged through the bottom panel or, as an alternative, through grilles in the lower part of the front panel so that the air flows out above the floor.

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Renewable energy "Free cooling" air-water

This system (accessory) uses external air instead of (or in addition to), mechanical cooling. Envisaged for the OPA/FC - UPA/FC air conditioners, it consists of a cold water coil integrated with the direct expansion one with a three way modulating valve controlled by microprocessor.

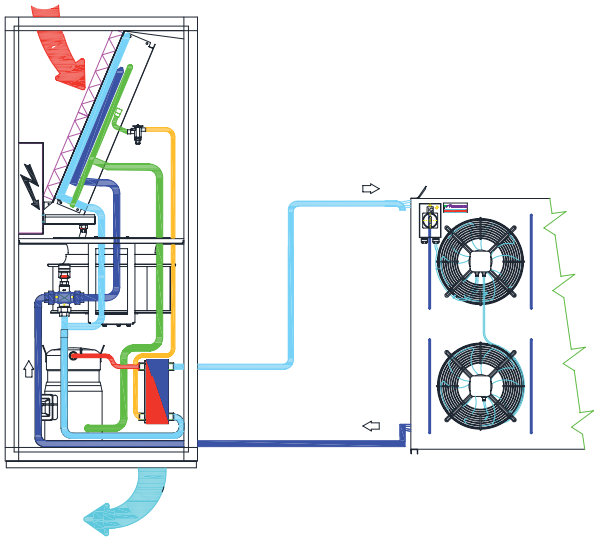
Three different operating regimes are therefore possible:

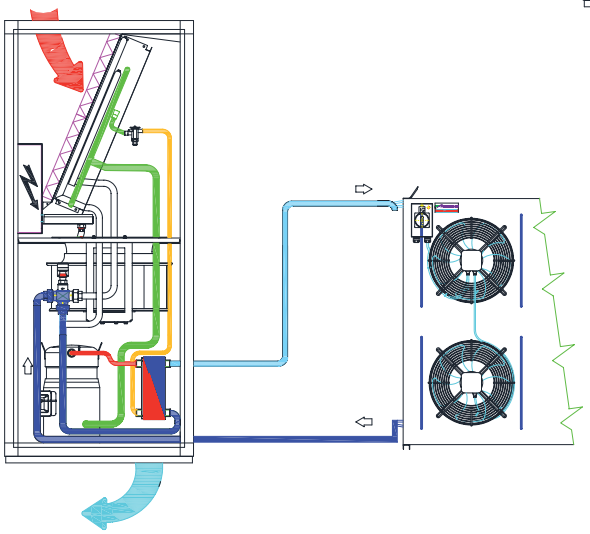
Free cooling only. This occurs when the external air temperature is sufficiently low to bring the water circulating in the coil to a value which fulfils the requirements of cooling in the area to be acclimatised. This is the maximum energy saving scenario as the compressors are always out of service.

Free cooling + mechanical cooling. If the external air temperature is higher than what necessary to maintain the water cooling at the desired temperature, one or more compressors are switched on for the length of time necessary to reach the desired conditions. This situation implies as well good energy savings.

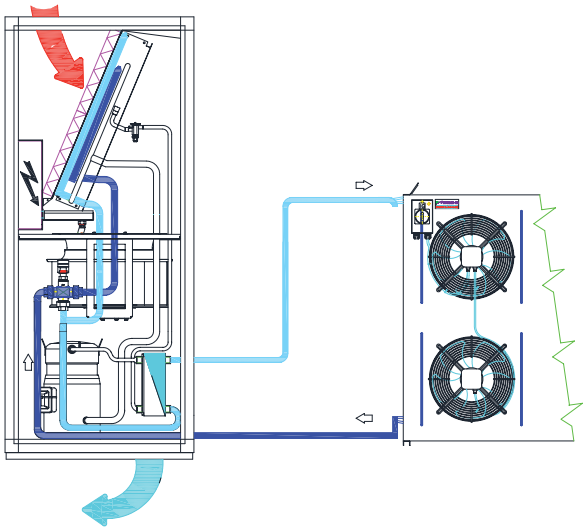
Mechanical cooling only. This situation arises when the temperature of the external air is too high to produce sufficient cooling. In this case compressors function as normal. This operation exploits to the full the high energy efficiency of the refrigerant circuits thanks to the larger size of the coil's fin pack. So even using only mechanical cooling helps to keep energy consumption down compared to other systems.
Accessory water cooled condensers of the refrigerant circuit are provided with a pressure-switch system to regulate the condensing pressure.

FREE COOLING SYSTEM
working mode
"SPRING - AUTUMN"
(Direct Expansion + H_2O).





FREE COOLING SYSTEM
working mode
"SUMMER"
(Direct Expansion)



FREE COOLING SYSTEM
working mode
"WINTER "
(chilled water)

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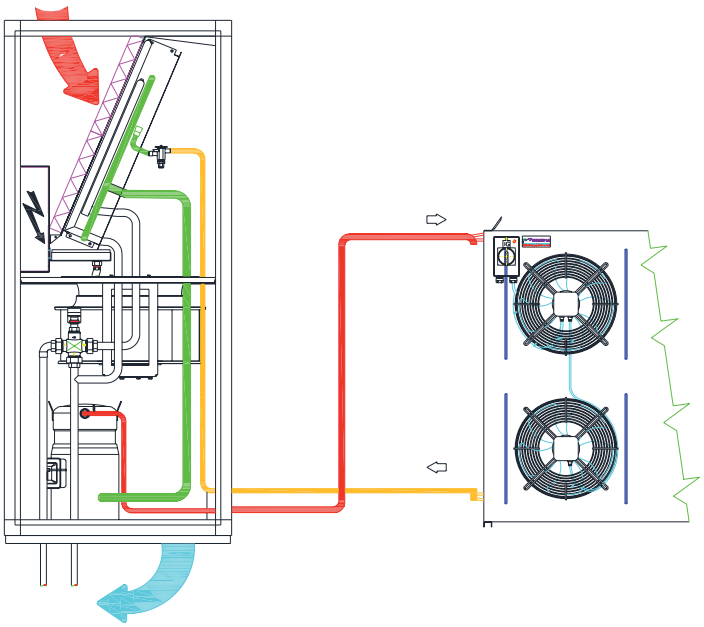
“Two sources” system: maximum safety, zero waste

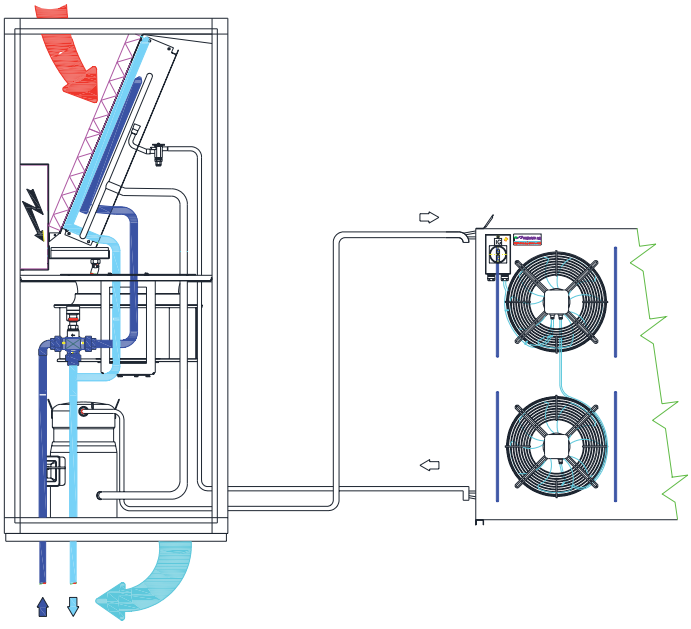
Instead of using a free cooling circuit, this system (accessory) uses any available excess energy from the air conditioning plant of the building. In other words, when there is enough cooling energy available from the central air conditioning plant, the unit stops its own compressors and uses the cooled water thus made available, passing it through the same water coil installed in the free cooling air conditioners. So excess energy consumption typical of a centralised installation is avoided.

One advantage of this system is the maximum safety of continuity of operation that it provides, for example, in emergency situations: if a dedicated cooling group breaks down, it will maintain a continuity of service thanks to the cooled water from the central plant. Another advantage resides in the flexibility that the “two sources” typology enables: the second source can be both by direct expansion or chilled water and the priority of operation can be chosen depending on the requirements of the installation.

TWO SOURCES SYSTEM
working mode
"DIRECT EXPANSION"



TWO SOURCES SYSTEM
working mode
"CHILLED WATER"



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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 thermalinertia 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 (winter control), maximum power 8 Ampere.

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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**	**372**	**361**	**461**	**422**	**512**	**612**	**662**	**852**	**932**
Performances																	
Total cooling capacity	kW	7.2	11.2	14.3	20.9	25.2	30.4	30.6	38.2	33.8	47.2	42.2	51.2	64.3	67.5	84.3	96.0
Sensible cooling capacity	kW	6.7	10.6	11.8	19.8	21.7	29.4	27.7	31.0	31.5	46.2	41.5	45.0	58.2	59.8	67.3	83.5
Airflow	m^3/h	2200	3200	3200	7000	7000	8700	8700	8700	14500	14500	14500	14500	17900	17900	17900	22500
EER		3.09	3.11	3.15	3.12	3.05	3.10	3.18	2.96	2.55	3.38	3.12	3.06	3.21	3.11	3.14	3.41
Sound pressure level	dB(A)	49	49	49	56	56	58	58	58	63	63	63	63	68	68	68	69
Dimensions & weight																	
Lenght	mm	750	750	750	860	860	750	1410	1410	1750	1750	1750	1750	2300	2300	2300	2640
Depth	mm	630	630	630	880	880	880	880	880	880	880	880	880	880	880	880	880
Height	mm	1990	1990	1990	1990	1990	1965	1990	1990	1990	1990	1990	1990	990	990	990	1990
Net weight	kg	170	170	170	210	270	270	300	315	330	400	420	440	420	490	315	330

** The performances are referred to: refrigerant R410; condensing temperature: 45°C; inlet air: 24°C - 45% RH; for chilled water: 7/12°C;*
The SPL is referred to 2 m distance, 1,5 m height, free field and sound damped discharge mouth. Available static pressure: 30 Pa.
EER = Electro Efficiency Ratio = Total cooling capacity / Compressors + fans + condensers fans power input.
The above performances don't consider the heat generated by the fans which must be added to the thermal load of the system.

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**	**372**	**361**	**461**	**422**	**512**	**612**	**662**	**852**	**932**
Performances																	
Total cooling capacity	kW	7.2	11.2	14.3	20.9	25.2	30.4	30.6	38.2	33.8	47.2	42.2	51.2	64.3	67.5	84.3	96.0
Sensible cooling capacity	kW	6.7	10.6	11.8	19.8	21.7	29.4	27.7	31.0	31.5	46.2	41.5	45.0	58.2	59.8	67.3	83.5
Airflow	m^3/h	2200	3200	3200	7000	7000	8700	8700	8700	14500	14500	14500	14500	17900	17900	17900	22500
EER		3.09	3.11	3.15	3.12	3.05	3.10	3.18	2.96	2.55	3.38	3.12	3.06	3.21	3.11	3.14	3.41
Sound pressure level	dB(A)	49	49	49	56	56	58	58	58	63	63	63	63	68	68	68	69
Dimensions & weight																	
Lenght	mm	750	750	750	860	860	750	1410	1410	1750	1750	1750	1750	2300	2300	2300	2640
Depth	mm	630	630	630	880	880	880	880	880	880	880	880	880	880	880	880	880
Height	mm	1990	1990	1990	1990	1990	1965	1990	1990	1990	1990	1990	1990	990	990	990	1990
Net weight	kg	170	170	170	210	255	270	300	315	330	400	420	440	420	470	315	330

** The performances are referred to: refrigerant R410; condensing temperature: 45°C; inlet air: 24°C - 45% RH; for chilled water: 7/12°C;*
The SPL is referred to 2 m distance, 1,5 m height, free field and sound damped discharge mouth. Available static pressure: 30 Pa.
EER = Electro Efficiency Ratio = Total cooling capacity / Compressors + fans + condensers fans power input.
The above performances don't consider the heat generated by the fans which must be added to the thermal load of the system.

Performance at JOHNSON CONTROLS test conditions*

Technical Characteristics

YC-OPU: with chilled water coil and up-flow air supply									
Models		**10**	**20**	**30**	**50**	**80**	**110**	**160**	**220**
Performances									
Total cooling capacity	kW	10.6	19.6	31.4	41.3	71.2	92.5	148.4	178.8
Sensible cooling capacity	kW	9.9	17.2	31.4	38.8	68.0	83.2	131.2	148.7
Airflow	m^3/h	2200	3400	7800	8300	16000	17000	26400	34800
Sound pressure level	dB(A)	47	49	57	56	59	61	64	82
Dimensions & weight									
Lenght	mm	750	750	860	860	1750	1750	2640	3496
Depth	mm	630	630	880	880	880	880	880	880
Height	mm	1990	1990	1990	1990	1990	1990	1990	1990
Net weight	kg	155	155	180	250	450	450	650	900

** The performances are referred to: refrigerant R410; condensing temperature: 45°C; inlet air: 24°C - 45% RH; for chilled water: 7/12°C;*
The SPL is referred to 2 m distance, 1,5 m height, free field and sound damped discharge mouth. Available static pressure: 30 Pa.
EER = Electro Efficiency Ratio = Total cooling capacity / Compressors + fans + condensers fans power input.
The above performances don't consider the heat generated by the fans which must be added to the thermal load of the system.

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	11.1	19.3	30.6	39	69.2	88	151	175.8
Sensible cooling capacity	kW	8.4	13.8	24.5	30	53	64.9	106.5	129.5
Airflow	m^3/h	2400	3500	7800	8300	16000	17000	26400	34000
Sound pressure level	dB(A)	47	49	57	56	59	61	64	82
Dimensions & weight									
Lenght	mm	750	750	860	860	1750	1750	2640	3495
Depth	mm	630	630	880	880	880	880	880	880
Height	mm	1990	1990	1990	1990	1990	1990	1990	1990
Net weight	kg	155	155	180	250	450	450	650	900

** The performances are referred to: refrigerant R410; condensing temperature: 45°C; inlet air: 24°C - 45% RH; for chilled water: 7/12°C;*
The SPL is referred to 2 m distance, 1,5 m height, free field and sound damped discharge mouth. Available static pressure: 30 Pa.
EER = Electro Efficiency Ratio = Total cooling capacity / Compressors + fans + condensers fans power input.
The above performances don't consider the heat generated by the fans which must be added to the thermal load of the system.

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Air cooled condensers to be matched with Johnson Controls 'P' series air conditioners

Galvanised steel casing with Epoxy-Polyester powder coating for a maximum resistence to the corrosion Painted in white colour RAL 9003.
High efficiency condensing coil.
High efficiency single phase directly driven axial fans for continuos external operation.
Life lubrificated and thermally protected motors. Each fan section is separated from the others.
Safety protection grilles on air discharge.
Main switch fitted in a weatherproof box.
Fans speed regulation (winter control) is available as accessory in the indoor unit. The models ACC 74 and ACC 83 are standard equipped with fans speed regulation.

Models		8	11	16	19	21	25	29
Performances								
Nominal capacity (1)	kW	8.3	10.8	16.5	19.9	21.5	24.8	29.8
Air quantity	m^3/h	2600	2200	5200	4800	4400	7800	7.00
Fans number	n.	1	1	2	2	2	3	3
Fans diameter	mm	350	350	350	350	350	350	350
Motor power input	W	180	180	360	360	360	540	540
Absorbed current	Amps	0.85	0.85	1.7	1.7	1.7	1.7	2.5
Sound pressure level (2)	dB(A)	40	40	43	43	43	45	45
Internal circuit volume	dm3	2.0	3.0	3.0	4.0	5.0	4.0	6.0
Dimensions & weight								
Lenght (H - V installation)	mm	743	743	1.298	1.298	1.298	1.853	1.853
Depth (H installation)	mm	610	610	610	610	610	610	610
Depth (V installation)	mm	510	510	510	510	510	510	510
Height (H installation)	mm	906	906	906	906	906	906	906
Height (V installation)	mm	578	578	578	578	578	578	578
Weight	kg	20	29	29	33	37	42	48

Models		32	42	50	55	61	74	83
Performances								
Nominal capacity (1)	kW	32.3	43.1	50.3	56.1	62.0	75.4	84.0
Air quantity	m^3/h	6600	8800	13600	12700	14900	20400	19000
Fans number	n.	3	4	2	2	2	3	3
Fans diameter	mm	350	350	500	500	500	500	500
Motor power input	W	540	720	1.250	1.250	1.160	1.880	1.880
Absorbed current	Amps	2.5	3.4	5.5	5.5	5.5	8.3	8.3
Sound pressure level (2)	dB(A)	45	46	50	50	51	51	51
Internal circuit volume	dm3	6.0	10.0	9.0	12.0	14.0	13.0	17.0
Dimensions & weight								
Lenght (H - V installation)	mm	1853	2408	1895	1895	2393	2705	2705
Depth (H installation)	mm	610	610	905	905	1110	905	905
Depth (V installation)	mm	510	510	470	470	705	470	470
Height (H installation)	mm	906	906	1070	1070	1230	1070	1070
Height (V installation)	mm	578	578	830	830	1040	830	830
Weight	kg	54	71	94	102	177	132	144

(1) Nominal capacity at 35°C ambient and 50°C condensing temperature; R410A
(2) Sound pressure level in free field at 10 meters from the unit.

The ACC air cooled condensers are available in the following versions:
ACC/H horizontal installation and vertical air discharge;
ACC/V vertical installation and horizontal air discharge;
ACC/LT for very low temperature; vertical installation and horizontal air discharge.

Available accessories:
ALUPAINT: for better protection of the aluminium fins (suggested in salt atmospheres);
EC FANS: for energy saving (available on models with fan diameter 500 mm).


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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.

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