

SystemTemp

Brochure Close Control



Systemair Your reliable partner in data centre cooling



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Efficiency and energy saving



Green building engineering

Systemair aims to offer a comprehensive range of close control air conditioning units, designed to meet the requirements of environmentally sustainable development:

- Technical innovation
- Ease of use
- Flexibility of use
- Energy efficiency
- Service reliability

Improving energy efficiency and sustainability

SysTemp designed as a highly efficient and sustainable equipment and has the following features:

- SySmart advanced microprocessor control system, characterized by features that optimize unit control and system energy saving.
- The latest generation of EC fans, entirely controlled via Modbus® protocol, on the full range of close control air conditioners.
- Electronic expansion valves on the entire range of direct expansion close control air conditioners.
- Brushless DC compressors (accessory) with inverter control over the entire range of direct expansion close control air conditioners.

Optimising infrastructure

The wide range of models and accessories enables optimal configuration of the air conditioning system. The minimum plan dimensions and the possibility of modulating operation for all components allow development of solutions tailored to the actual needs of the infrastructure, as well as ensuring future expansion without high additional costs. The SysDrive system helps to simplify checks and maintenance operations on direct expansion circuits, by keeping the pressure, temperature and working conditions of the whole cooling cycle under control.

Finally, through the Smart Net system, the local network concept is revolutionized, increasing energy savings and safety compared to older systems.

Reducing operating costs

Through the use of high quality components, SysTemp range guarantee high reliability.

Managing and servicing SysTemp range has never been easier:

- Easy and intuitive use of the units via a large colour display.
- Advanced supervision of the direct expansion cooling cycle, with more than 10 different active safety checks to ensure optimal performance, thanks to the SysDrive system.
- Advanced supervision of the water circuit, thanks to the use of the Energy Valve system.
- Easy maintenance, with all the operation values of fans, cooling circuit, inverter compressors and chilled water circuits being available on your display.

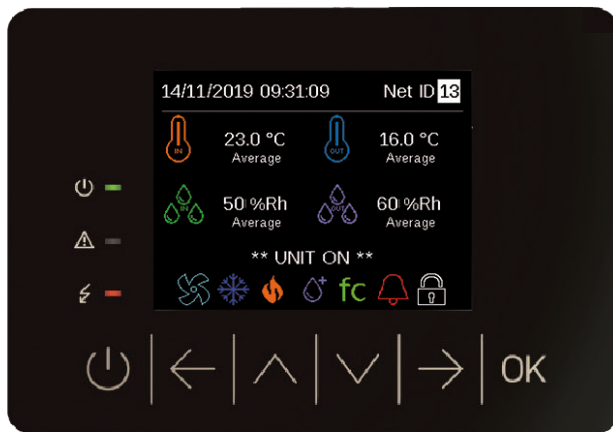
Ensuring certified quality

To be sure that the equipment used in your own infrastructure complies with the design and applicable regulations, you need a guarantee of the quality of the product and all its construction stages.

SySmart Control

New generation electronic control system

SysTemp close control air conditioning range features an advanced electronic control system called SySmart, conceived and designed to deliver optimum performance and easier access to information.



Innovative

Thanks to the control via Modbus® Master protocol, all key components of the unit are continuously supervised, with over 50 different variables that ensure the real-time monitoring of all operating cycles.

Simple

Thanks to the large colour display, access to all operating parameters is guaranteed in a simple and intuitive way, in addition to icons, progress bars, as well as daily and weekly temperature and humidity charts.

Flexible

With digital inputs and outputs which, depending on the needs of the system, can be configured with specific features designed to simplify the installation and use of the unit.

Efficient

With specific features dedicated to energy savings and the optimized management of all the unit direct expansion and chilled water operating cycles.

Reliable

Thanks to predictive safety systems designed to prevent unwanted shut-down failures, and to an advanced system for recording alarms and hours of operation.

High connectivity

Thanks to the integrated RS485/ RJ45 Modbus® card and BACnet, LonWorks® and SNMP gateway interfaces, easily and quickly interfacing with supervision systems and building management systems (BMS) is possible.

EC Fans

High performance, low power consumption electronic fans



SysTemp close control air conditioning range are equipped with state-of-the-art electronic fans which allow very high performance levels to be achieved with minimum energy impact.

Innovative

Thanks to the control exerted via the Modbus® Master protocol, it is possible to check all the fan operating values, ensuring the maintenance of the required working point via real-time feedback.

Simple

Thanks to the control via the Modbus® Master protocol, checking the fans is simple and intuitive. The fan self-routing system facilitates maintenance procedures.

Flexible

By modulating the fan speed, units can be adapted to the actual system needs. Pressure or constant air flow management allows the supply of the effective quantity of air necessary to the system.

Efficient

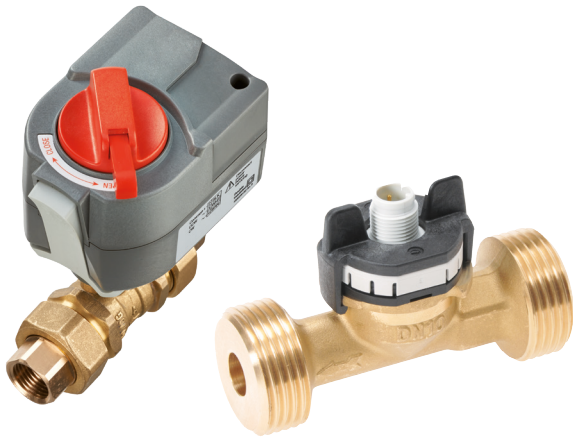
Thanks to the innovative design of the composite material blade, a 25% energy saving and a 4-5 dB(A) noise reduction are possible, compared to the previous generation of fans.

Reliable

Thanks to high reliability components and the independent management of each fan, a high level of system reliability can be ensured.

Energy Valve

Control valve with flow rate and energy electronic monitoring



The chilled water units of the SysTemp close control air conditioning range can be equipped with electronically controlled valves which allow the regulation and continuous monitoring of the water flow rate, inlet and outlet temperatures, and thus cooling capacity.

Innovative

Thanks to the electronic control of the water flow rate and coil inlet and outlet temperatures, the change on Energy Valve system allows the monitoring of the cooling circuit performance in real time and the automatic balancing of the water circuit without the involvement of external personnel.

Simple

Thanks to the automatic balancing with maximum water flow rate control, designing, installing and commissioning the system is easy and fast regardless of the water circuit pressure.

Flexible

Thanks to the real-time monitoring of the water circuit performance, designing how to arrange loads is easy and fast, even in the event of future enlargements of the system.

Efficient

Thanks to the water circuit automatic balancing, energy waste due to water over-flow can be reduced. Performance monitoring allows environmental loads to be controlled, thereby facilitating the identification of imbalances that can affect energy efficiency.

Reliable

Thanks to the electronic control system, water circuit problems that could affect the system service continuity can be identified in advance, thus facilitating maintenance and repair work planning.

Electronic expansion valve



SystemTemp close control air conditioning range are equipped with electronic expansion valves to maximize the performance of direct expansion cooling circuits, especially under partialisation conditions.

Innovative

Thanks to an advanced electronic controller, the entire cooling cycle of a unit can be controlled by constantly monitoring the operation conditions of all its components.

Simple

Thanks to an advanced system of adaptive adjustment, difficult circuit calibrations are not necessary. The entire cooling cycle control allows the operation to be monitored without the need to use pressure gauges, probes, etc.

Flexible

Thanks to the valves wide adjustment range, it is possible to ensure the best cooling circuit operation even in the presence of varying thermal loads and under partialisation conditions of the cooling capacity delivered by the circuit.

Efficient

By optimizing working conditions, it is possible to increase the cooling circuit energy efficiency by more than 40% compared to a system provided with a mechanical thermostatic expansion valve (TEV).

Reliable

Thanks to 10 different active safety systems, the cooling circuit locking risk can be reduced by identifying and solving abnormal working conditions in advance.

DC Compressors

DC Compressor with inverter regulation



The direct expansion units of the SysTemp close control air conditioning range can be equipped with DC compressors with inverter regulation, which allow the delivered cooling capacity to be varied, maximizing the motor performance and reducing energy consumption.

Innovative

Thanks to the brushless DC synchronous motor, a wide modulation between 20% and 100% of the delivered cooling capacity is possible.

The "High Pressure Shell" (HPS) system allows optimum lubrication of the compressor even at the lowest speed, separating the oil from the refrigerant directly inside the compressor.

Simple

Thanks to the direct control via the Modbus® Master protocol a continuous monitoring of the compressor operating conditions is possible with direct access from the terminal unit, or remotely via connection to supervision systems and building management systems (BMS).

Flexible

Thanks to the wide adjustment range, the compressors will automatically adapt to the actual cooling demand, guaranteeing the optimal supply of cooling capacity even in the presence of varying thermal loads.

Efficient

By optimizing the working conditions and efficiency of the brushless DC motor, it is possible to reduce the annual energy consumption by 35% in partial load.

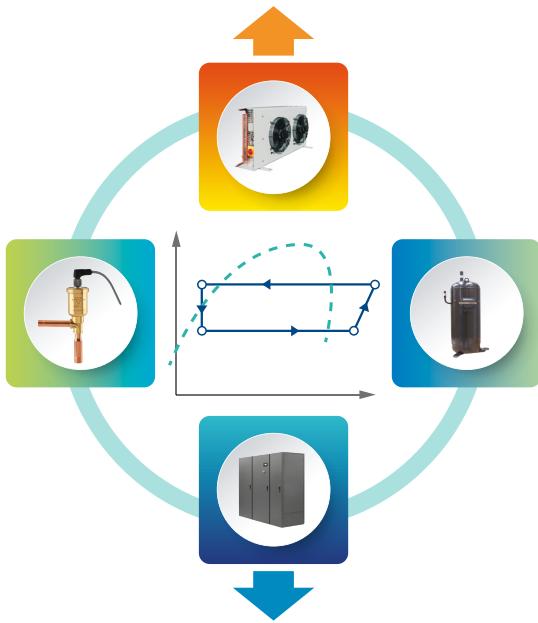
It is moreover possible to increase the energy efficiency ratio (EER) by over 25% compared to a system with a fixed speed compressor.

Reliable

Thanks to the inverter control system, the brushless DC motor and the "High Pressure Shell" system, it is possible to ensure the system high functional efficiency, minimizing the need to service the cooling circuit.

SysDrive

Cooling circuit advanced management system



All direct expansion units are equipped with an innovative control system of the cooling circuit, which allows simplified management, easier maintenance and optimized operational safety.

Active control of operating conditions

The SysDrive system allows the display and monitoring of the operating conditions of the whole cooling cycle, from both the local display and the supervision systems as well as building management systems (BMS).

Using suitable probes and pressure transducers helps to detect pressure and temperatures of an evaporator, compressors, a condenser and suction and discharge lines. Thanks to these figures, superheat, de-superheat and subcooling of the refrigerant are calculated.

If a DC inverter compressor is installed, actual speed and electrical power consumption will also be monitored.

Operational safety

The SysDrive system actively manages 10 different safety function, designed to provide high operational safety.

- Low evaporation pressure and high condensing pressure of the circuit
- Low operating pressure and high operating pressure of the circuit
- Compressor low compression ratio
- Low and high superheat values
- Low and high de-superheat values
- Refrigerant high discharge temperature

Tool-less simplified maintenance

The SysDrive system makes it possible to significantly simplify all the installation and maintenance procedures of direct expansion units.

Using tools to check the conditions of the cooling circuit will be no longer necessary. Technicians will be able to easily access all the operating conditions by simply pressing a button on the display.

Thanks to the ability to interface with the major supervision systems and building management systems (BMS), monitoring the entire cycle of a unit will be even easier and quicker.

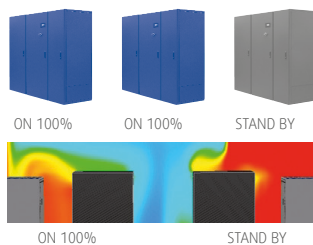
Smart Net

The intelligent local network

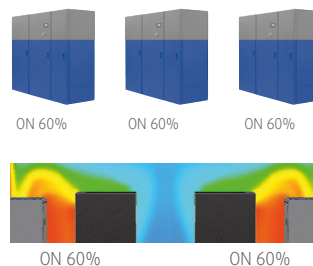


The units of the SysTemp close control air conditioning range are equipped with an innovative control system in a local network (LAN) which allows them to be managed and serviced more easily while improving operational safety.

DUTY / STAND-BY



Smart Net



Active distribution of workload

The innovative Smart Net system allows the concept of local network to be revolutionized. Taking advantage of the modulation capabilities of its components, this system makes it possible to actively share the workload among all the units in the local network.

Compared to the latent redundancy Duty / Stand-by (n+1 or n+n) system, where the backup units were stationary waiting for the onset of a problem, the Smart Net system allows the units connected to the network to be kept always active. The Smart Net system allows the units to work in unison to monitor thermo-hygrometric conditions and air pressure, ensuring there are no "hot spots" due to inactive units.

Efficiency and energy saving

Thanks to the distribution of workload, system efficiency can be increased by partialising the request to the main components such as fans, compressors, electric batteries and humidifiers.

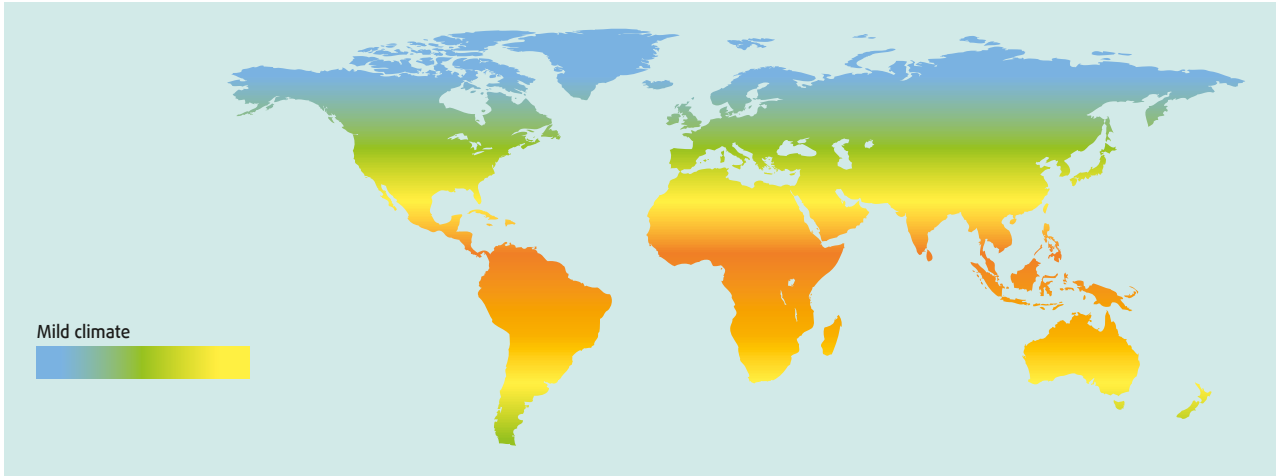
This partialisation directly translates into an energy saving of up to 60% compared to redundant-type networks (n+1 or n+n). Indeed, instead of having active units working at 100% of their performance while one or several machines are stationary, the Smart Net system allows the entire group of units to operate at 50 or 60% of their maximum load.

A safe and reliable network

The previous generation of latent redundancy systems gave control to a single unit (Master), while the other units were passive (Slaves). With a view to maximizing the safety of the units operating in the network, the Smart Net system has been developed with a Smart Net management logic. In the Smart Net system, each unit is able to take control of the local network even if communication among units is defective (broken or damaged cable), or in the case of shutdown of one of the units.

Free Cooling

High energy saving air conditioning unit



Systemair innovative Free Cooling systems are able to achieve energy savings of over 50% compared to a conventional air conditioner and reduces the environmental impact.

Free cooling from renewable sources

Thanks to technology of using an outside air for cooling, Systemair offers Free Cooling close control air conditioning units, able to 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	Bucharest	Budapest	Copenhagen	Dublin	Helsinki
Number of hours (1)	5,641	4,491	5,105	5,583	5,545	5,503	5,279	5,861	7,161	5,796
Percentage (2)	64%	51%	58%	64%	63%	63%	60%	67%	82%	71%

	Istanbul	London	Madrid	Milan	Moscow	Oslo	Paris	Prague	Reykjavik	Vienna
Number of hours (1)	4,779	5,575	4,643	5,281	6,046	6,202	5,187	5,619	7,743	5,651
Percentage (2)	55%	64%	53%	60%	71%	73%	59%	64%	88%	65%

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.

Optimized 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 (1).

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 (2).

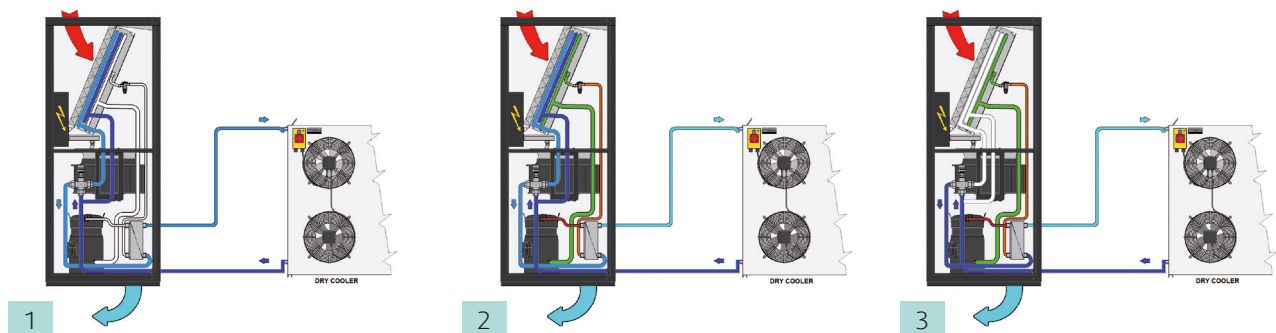
No free cooling

Regulation is completely entrusted to mechanical cooling, excluding the Free Cooling circuit.

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 (3).



DualPower

Dual circuit system



Systemair offers specific units, named DualPower, provided with two independent cooling sources for critical applications where the discontinuity of equipment operation is not acceptable.

High operational safety

Sometime the main cooling source may be insufficient to guarantee suitable environmental conditions. This may be due to an overload of the system, possible seasonal closures or any type of emergency. A reduction in the machine cooling capacity can lead to great instability in the system, even in the presence of redundancy or Smart Net systems.

To avoid these problems, specific DualPower units have been developed providing a second source of cooling, complete with its own control valve and independent from the primary one.

A safe, flexible system

The DualPower system is very flexible and allows three different types of systems.

Chilled water + direct expansion two sources

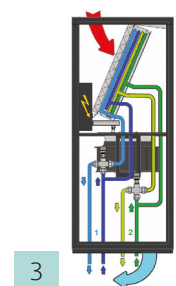
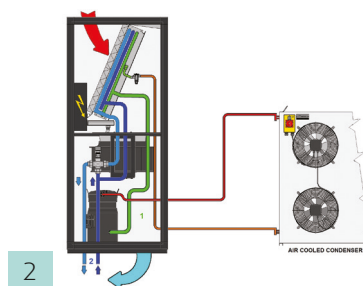
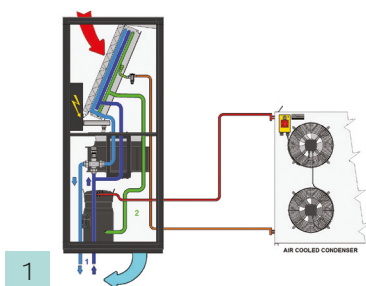
The chilled water primary source of the unit is connected to a building chiller or to district cooling, whereas the secondary, emergency, and direct expansion one is connected to remote air or in-built water condensers (1).

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 (2).

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 (3).



Unit identification

ST O P A 7 1 a TS

ST SysTemp close control range

Air supply type:

O Upflow air supply

U Downflow air

H Horizontal supply

Series name:

P Close Control Air Conditioners: Perimeter installation

G Air Conditioners for large Data Centres: Perimeter Installation

R Air Conditioners for large Data Centres: In Row installation

Cooling type:

A Direct expansion coil

U Chilled water coil

07 Nominal size (nominal cooling capacity in kW)

1 Number of cooling circuits (Only direct expansion units)

a Series modification index

Versions:

TS Two Sources

FC Free Cooling

SystemTemp P



The P Series close control air conditioners have constructional and operating characteristics suitable for environments where thermal loads of a sensitive nature prevail.

Although optimised for data centers, the technical characteristics of the P series make these units suitable for various types of special applications, such as metrology laboratories, TV production studios, recording and conservation rooms for musical instruments, museums and archives, control rooms in power stations and railway junctions.

In addition, their application proves ideal for various industrial sectors: optics, electronics, electromedical equipment, production of electrical or electronic equipment, production of musical instruments, etc.

P series air conditioners offer:

- Temperature and humidity close control.
- A high delivered cooling capacity to footprint ratio, which makes it easier to design the environments to be air conditioned.
- Very high values of energy efficiency, which translate into lower CO₂ emissions into the environment, and in particularly low operating costs.
- High flexibility of use, thanks to the wide range of accessories which can be selected.

Technical feature

- Very high EER (Energy Efficiency Ratio)
- Limited footprint
- Dark gray RAL 7024 metal structure
- Panels with thermo-acoustic insulation
- Electrical panel complete with control and safety devices
- SySmart control microprocessor with LCD graphic display
- G4-class efficiency air filters with dirty filter alert
- Return air temperature sensor
- Supply air temperature sensor
- Electronic EC fans
- R410A scroll compressors
- Electronic expansion valves with SysDrive system
- Three-way control valves
- Unit shutdown system for the presence of fire
- RS485 and RJ45 ports for Modbus® RTU and TCP/IP

Air Conditioners with downflow air supply



Standard version with top air intake and downflow air supply, with stand for raised floors.



Version with top air intake and front air supply through air distribution plenum with adjustable grilles.



Version with top air intake and front air supply through front panel.

ST UPA: Direct expansion air conditioners with downflow air supply and aircooled or watercooled condensers

ST UPA		071	141	211	251	321	322	361	422	461	512	662	852	932
Performance														
Total cooling capacity (1)	kW	9,2	16,3	22,7	32,2	36,8	33,8	40,3	45,4	54,0	61,6	69,2	88,8	100,8
Sensible cooling capacity	kW	8,3	13,6	22,4	27,8	36,8	33,8	40,3	45,4	49,4	55,2	67,0	75,6	88,9
EER (2)		3,37	3,45	3,43	3,29	3,34	3,29	3,84	3,50	3,18	3,47	3,29	2,95	3,37
Air flow rate	m ³ /h	2.200	3.200	7.000	7.000	12.000	12.000	14.000	14.000	14.000	14.000	18.000	18.000	21.000
Noise level (3)	dB(A)	51	59	57	58	67	68	59	59	59	60	63	63	62
Dimensions and weights														
Width	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	872	872	871	871	871	871	871	871	871	871	871
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	150	205	260	285	365	390	440	485	450	500	645	665	705
Free Cooling		o	o	o	o	•	o	o	o	•	o	•	•	o
Two Sources		o	o	•	o	•	o	o	o	•	•	•	•	•

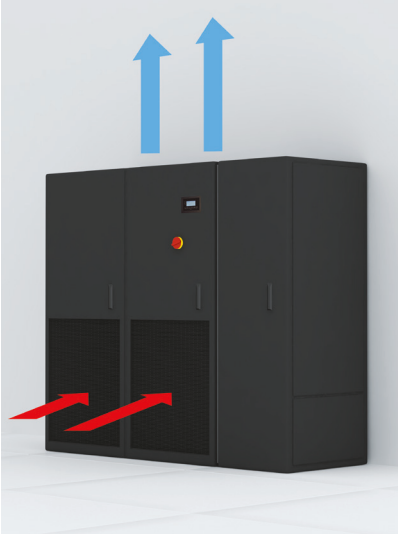
ST UPU: Chilled water air conditioners with downflow air supply

ST UPU		10	20	30	50	60	70	80	110	160	220
Performance											
Total cooling capacity (1)	kW	9,9	17,2	30,0	41,0	52,8	63,1	65,4	80,0	110,0	160,0
Sensible cooling capacity	kW	9,3	14,9	27,8	36,2	47,4	54,2	61,8	73,0	99,7	146,0
EER (2)		32,1	23,5	27,0	20,9	21,3	22,8	23,2	19,8	24,4	19,8
Air flow rate	m ³ /h	2.200	3.200	7.000	8.000	12.000	12.000	16.000	18.000	24.000	36.000
Noise level (3)	dB(A)	51	60	57	62	67	68	62	63	63	66
Dimensions and weights											
Width	mm	750	750	860	860	1410	1410	1750	1750	2640	3496
Depth	mm	601	601	872	872	871	871	871	871	871	871
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	115	130	225	220	240	260	340	360	620	720
Two Sources		o	o	o	•	o	•	o	•	•	o

Notes:

- (1) 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.
- (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.

Air Conditioners with upflow air supply



Standard version with front air intake and upflow air supply.



Version with front air intake and supply, through air distribution plenum with adjustable grilles.



Version with air intake from the bottom, stand for raised floor, blind front panel and upflow air supply.

ST OPA: Direct expansion air conditioners with upflow air supply and aircooled or watercooled condensers

ST OPA		071	141	211	251	321	322	361	422	461	512	662	852	932
Performance														
Total cooling capacity (1)	kW	9,2	16,3	22,7	32,2	36,8	33,8	40,3	45,4	54,0	61,6	69,2	88,8	100,8
Sensible cooling capacity	kW	8,3	13,6	22,4	27,8	36,8	33,8	40,3	45,4	49,4	55,2	67,0	75,6	88,9
EER (2)		3,43	3,55	3,49	3,32	3,38	3,54	3,93	3,57	3,22	3,52	3,40	3,02	3,41
Air flow rate	m3/h	2.200	3.200	7.000	7.000	12.000	12.000	14.000	14.000	14.000	14.000	18.000	18.000	21.000
Noise level (3)	dB(A)	51	59	56	58	67	67	58	58	58	59	61	62	61
Dimensions and weights														
Width	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	872	872	871	871	871	871	871	871	871	871	871
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	150	205	260	285	365	390	440	485	450	500	645	665	705
Free Cooling		o	o	o	o	•	o	o	o	•	o	•	•	o
Two Sources		o	o	•	o	•	o	o	o	•	•	•	•	•

ST OPU: Chilled water air conditioners with upflow air supply

ST OPU		10	20	30	50	60	70	80	110	160	220
Performance											
Total cooling capacity (1)	kW	9,9	17,2	30,0	41,0	52,8	63,1	65,4	80,0	110,0	160,0
Sensible cooling capacity	kW	9,3	14,9	27,8	36,2	47,4	54,2	61,8	73,0	99,7	146,0
EER (2)		38,3	29,1	30,0	24,5	22,8	22,2	24,8	24,2	29,3	24,2
Air flow rate	m3/h	2.200	3.200	7.000	8.000	12.000	12.000	16.000	18.000	24.000	36.000
Noise level (3)	dB(A)	51	59	56	60	67	68	61	62	62	65
Dimensions and weights											
Width	mm	750	750	860	860	1410	1410	1750	1750	2640	3496
Depth	mm	601	601	872	872	871	871	871	871	871	871
Height	mm	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Net weight	kg	115	130	225	220	240	260	340	360	620	720
Two Sources		o	o	o	•	o	•	o	•	•	o

Notes:

- (1) 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.
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- (3) Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

Available accessories

Direct expansion

- Brushless DC compressors with inverter regulation and integrated oil separator
- 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
- LAC valve for operation with low temperature outside air with remote condenser
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature control valve

Chilled water

- Two-way control valves
- Inlet and outlet water temperature sensors
- Energy valve kit

Heating

- Low thermal inertia electric heaters with stage control
- Low thermal inertia electric heaters with modulating control (available on request on selected models only)
- Hot water heating coils with 2- or 3-way control valve (available on request on selected models only)

Humidification

- Room humidity probe
- Supply humidity probe
- Immersed electrodes humidifier

Mechanical and structural

- Condensate drain pump
- Condensate and humidifier drain pump
- Supply overpressure relief damper
- M7 efficiency class intake air filter (EU7)
- M5 efficiency class intake air filter (EU5)
- Soundproofed duct section on the supply line
- Distribution plenum with adjustable grilles
- Free-cooling air plenum with modulating dampers (UPA series only)
- Height adjustable stand for installation with raised floor
- Grilled panels for front supply
- Closed panels for air intake from the bottom
- Panels with sandwich counter panelling (available on request on selected models only)
- Panels with reinforced acoustic lining (available on request on selected models only)

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

SystemTemp G



G series close control air conditioners have constructional and operating characteristics suitable for meeting the design criteria of the latest generation data centers.

When designing air conditioning systems for large data centers, the need for electrical cable housing and the enormous air volumes required to cool down the servers have made it essential to increase the height of raised floors up to the current 550/1,000-millimetre level. A large space below the air conditioner for the installation of an adjustable stand has thus created. It was therefore decided to use this large space to house supply fans.

Without increasing the footprint of the machine, and only exploiting space where it is provided, great advantages have been obtained:

- With the same air conditioner footprint, it has been possible to increase the front section of the coil by about 40-50% by reducing the pressure drop on the air side, and thus the fan energy consumption.
- Increasing the size of the air filters installed upstream of the cold coil allows a significant reduction in load losses and replacement frequency for maintenance.
- Increased efficiency of the fans which, installed in the stand, expel treated air horizontally and completely unobstructedly.

Technical feature

- Very high EER (Energy Efficiency Ratio)
- Limited footprint
- Dark gray RAL 7024 metal structure
- Panels with thermo-acoustic insulation
- Electrical panel complete with control and safety devices
- SySmart control microprocessor with LCD graphic display
- G4-class efficiency air filters with dirty filter alert
- Return air temperature sensor
- Supply air temperature sensor
- Electronic EC fans
- R410A scroll compressors
- Electronic expansion valves with SysDrive system
- Two-way control valves
- Unit shutdown system for the presence of fire
- RS485 and RJ45 ports for Modbus® RTU and TCP/IP

Air Conditioners with downflow air supply



Standard version for data center perimeteral installation: The height of the raised floor must be at least 550 mm.



Standard version for data center perimeteral installation with raised floor height less than 550 mm. In this case the stand, having a fixed height of 550 mm provided with side closing panels, must be installed above the floor. However, please make sure that the ceiling height allows good air intake.



Version for installation outside the data center, with no raised floor and rear supply line. In this case the stand, having a fixed height of 550 mm, is provided with side closing panels and rear supply grilles. The installation of a plenum with a rear air intake system is optional, in the absence of a duct system.

ST UGA: Direct expansion air conditioners with downflow air supply and aircooled or water cooled condensers

ST UGA		932	1342
Performance			
Total cooling capacity (1)	kW	96,8	130,5
Sensible cooling capacity (1)	kW	80,1	121,2
EER (2)		3,43	3,83
Air flow rate	m ³ /h	18.000	31.500
Noise level (3)	dB(A)	56	61
Dimensions and weights			
Width	mm	2.390	3.290
Depth	mm	921	921
Height	mm	1.990+550	
Net weight	kg	720	1.000

ST UGU: Chilled water air conditioners with downflow air supply

ST UGU		70	150	230	300
Performance					
Total cooling capacity (1)	kW	50,0	98,1	153,1	190,5
Sensible cooling capacity (1)	kW	42,7	83,6	130,4	172,3
EER (2)		43,5	46,9	52,8	40,2
Air flow rate	m ³ /h	9.000	18.000	28.000	40.000
Noise level (3)	dB(A)	55	56	58	60
Dimensions and weights					
Width	mm	1.320	1.840	2.740	4.020
Depth	mm	921	921	921	921
Height	mm	1.990+550			
Net weight	kg	400	620	930	1.250

Notes:

(1) 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.

(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.

Available accessories

Direct expansion

- Brushless DC compressors with inverter regulation and integrated oil separator
- 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
- LAC Valve for operation with low temperature outside air with remote condenser
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature control valve

Chilled water

- Three-way control valves
- Inlet and outlet water temperature sensors
- Energy valve kit

Heating

- Low thermal inertia electric heaters with stage control
- Low thermal inertia electric heaters with modulating control (available on request on selected models only)
- Hot water heating coils with 2- or 3-way control valve (available on request on selected models only)

Humidification

- Room humidity probe
- Supply humidity probe
- Immersed electrodes humidifier

Mechanical and structural

- Condensate drain pump
- Condensate and humidifier drain pump
- Supply overpressure relief damper
- M5 efficiency class intake air filter (EU5)
- Front or rear intake plenum
- Free-cooling air plenum with modulating dampers (UGA series only)
- Ventilated stand with panelling for front or rear supply
- Ventilated stand with panelling for bottom supply (installation on the raised floor)
- Panels with sandwich counter-panelling
- Panels with reinforced acoustic lining

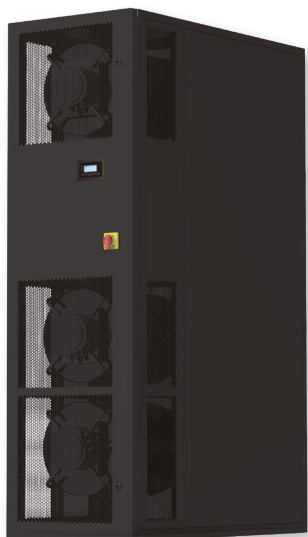
Electrical

- 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

SystemTemp R



R series close control air conditioners are built and sized in such a way that they can be installed alongside data center racks. In air conditioning systems for large data centers, the adoption of the following design concepts has in fact become an established custom:

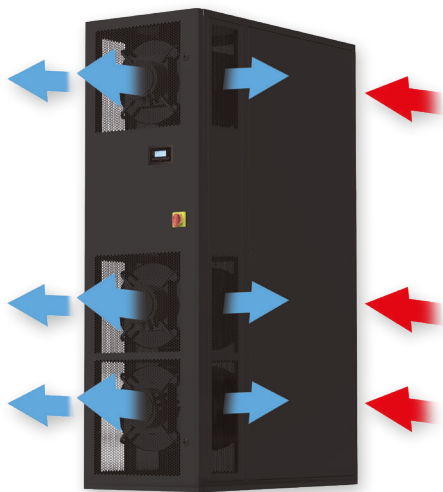
- The racks containing servers are increasingly positioned according to the Hot Aisle and Cold Aisle layout.
- Air temperatures are allowed to rise up to 30-35°C in the hot aisle and 20-25°C in the cold one, with very low humidity (never above 30%).
- Server performance is increasingly on the rise, while server sizes are increasingly reduced. As a result, many more servers can be installed in a rack, so some of these racks can be eliminated as they are empty. At the same time, heat dissipation increases, thereby requiring more power from air conditioners. R series air conditioners are designed and built so as to fit into this plant layout perfectly. As a matter of fact:

- They exploit the space left free from racks and allow cold air to be distributed as close as possible to servers, that is, where heat is generated.
- They feature rear intake from the hot aisle and front supply to the cold aisle with a horizontal flow. The horizontal flow reduces internal pressure drop, with a consequent reduction in the power draw of the fan.

Technical feature

- Very high EER (Energy Efficiency Ratio)
- Limited footprint
- Dark gray RAL 7024 metal structure
- Panels with thermo-acoustic insulation
- Front and rear accessibility for easy maintenance
- Cooling, electric and water top/bottom connections
- Electrical panel complete with control and safety devices
- SySmart control microprocessor with LCD graphic display
- G2/G4-class efficiency air filters with dirty filter alert (according to the size)
- Return air temperature sensor
- Supply air temperature sensor
- Electronic EC fans
- Brushless DC compressors with R410A inverter regulation
- Electronic expansion valves with SysDrive system
- Three-way control valves
- Unit shutdown system for the presence of fire
- RS485 and RJ45 ports for Modbus® RTU and TCP/IP

Air Conditioners with horizontal air supply



Version for "in row" installation with front and side air supply

ST HRA: Direct expansion air conditioners with horizontal supply

ST HRA		121	201	231	361
Performance					
Total cooling capacity (1)	kW	9,6	19,3	20,8	32,5
Sensible cooling capacity	kW	9,6	15,1	17,2	26,3
EER(2)		3,14	3,09	3,36	3,43
Air flow rate	m3/h	3.200	3.600	6.000	6.600
Noise level (3)	dB(A)	51	54	54	57
Dimensions and weights					
Width	mm	300	300	600	600
Depth	mm	1.200	1.200	1.222	1.222
Height	mm	1.975	1.975	1.985	1.985
Net weight	kg	200	215	215	215
Free Cooling		○	○	●	○
Two Sources		○	○	●	○

ST HRU: Chilled water air conditioners with horizontal supply

ST HRU		20	40
Performance			
Total cooling capacity (1)	kW	24,9	37,8
Sensible cooling capacity	kW	22,2	33,9
EER(2)		22,81	27,78
Air flow rate	m3/h	5.600	9.000
Noise level (3)	dB(A)	54	62
Dimensions and weights			
Width	mm	300	600
Depth	mm	1.200	1.222
Height	mm	1.975	1.985
Net weight	kg	120	190
Two Sources		○	●

Notes:

- (1) 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.
- (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.

Available accessories

Direct expansion

- 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
- LAC Valve for operation with low temperature outside air with remote condenser
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature control valve

Chilled water

- Two-way control valves
- Inlet and outlet water temperature sensors

Heating

- Low thermal inertia electric heaters with stage control

Humidification

- Room humidity probe
- Supply humidity probe
- Immersed electrodes humidifier

Mechanical and structural

- Condensate drain pump
- G4/M5 efficiency class intake air filter (EU5) (according to the size)
- Closed front panel for side supply
- Closed side panels for front supply
- Wheels for handling

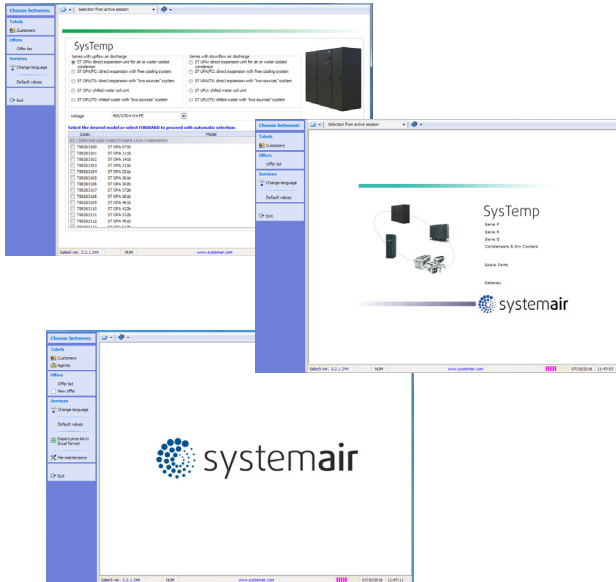
Electrical

- 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

Selection Software

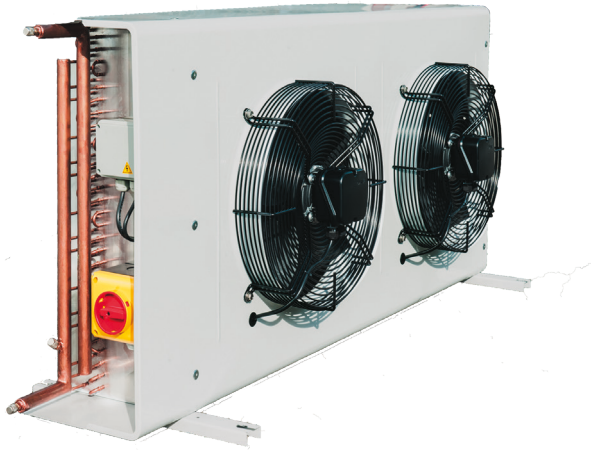


Selection Software is the ideal tool to select and calculate SysTemp range. Through a simple, intuitive interface, it allows the user to:

- Select and customise units through a configuration wizard
- Calculate the unit performance depending on the project requirements
- Access the DWG Autocad® drawings of the selected units
- Manage your customer portfolio through a special integrated function
- Manage the issuance and filing of bids
- Manage document storage within individual offers

Selection Software is an innovative selection software for Systemair products operating on Windows™.

Air cooled condensers and dry coolers



Systemair is able to offer a range of air cooled condensers and dry coolers which can be matched to close control air conditioners, or meet any system requirement.

General features

- Range of air cooled condensers with capabilities from 4.6 kW to 116.6 kW
- Range of dry coolers with capabilities from 11 kW to 120 kW
- Versions for horizontal and vertical installation and with V-shaped structure
- TURBOCOIL® heat exchangers with SAFETUBES SYSTEM® coil suspension
- Casing made of galvanised steel, powder coated Epoxy-Polyester RAL 9003 resistant to corrosion
- New high-efficiency, low-consumption motors, statically and dynamically balanced, with permanently greased bearings, in-built overheat protection and integrated protection grilles

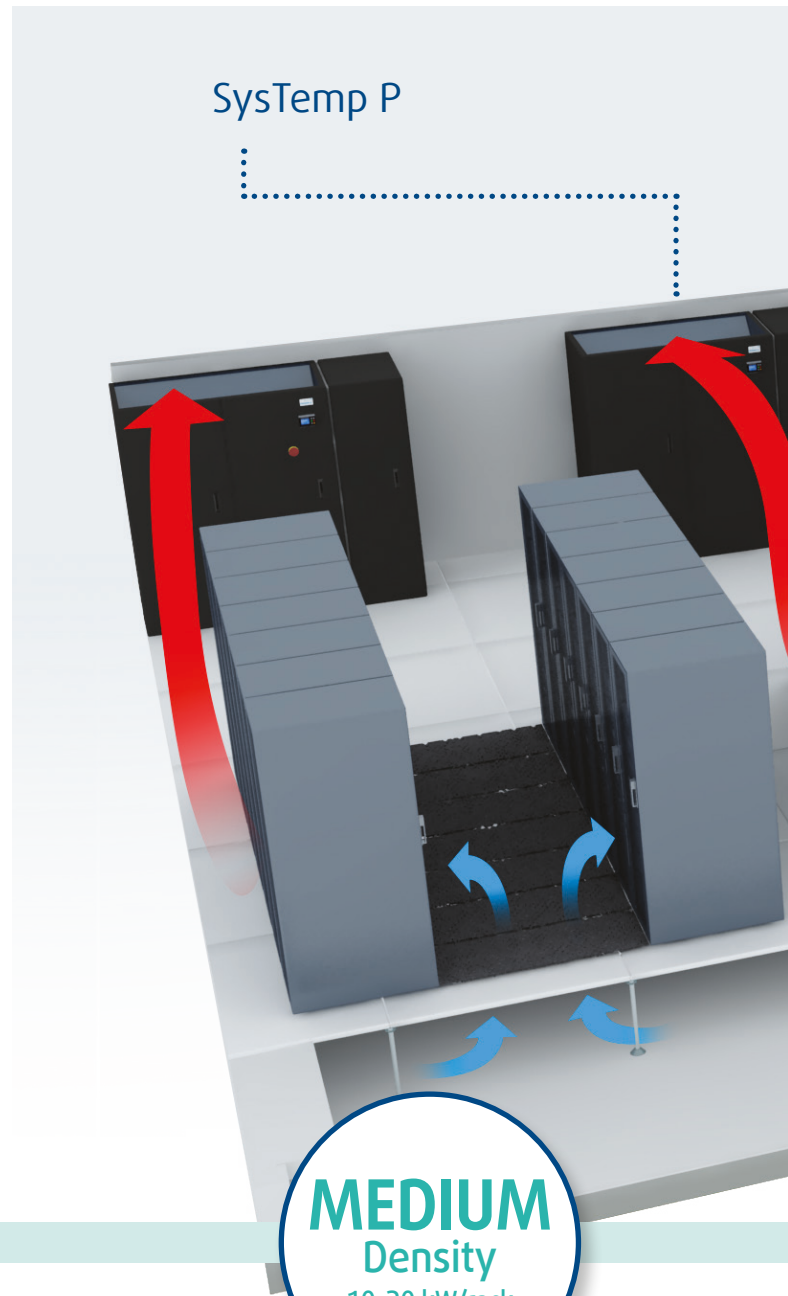
Available accessories

- Latest generation EC fans for high energy savings, reduced noise levels and better regulation of the number of revolutions
- Fins coated with ALUPAINT® for better aluminium corrosion protection
- Configuration with multiple circuits or subcooling circuits
- If more powerful remote condensers and dry coolers are needed, please use selection software.

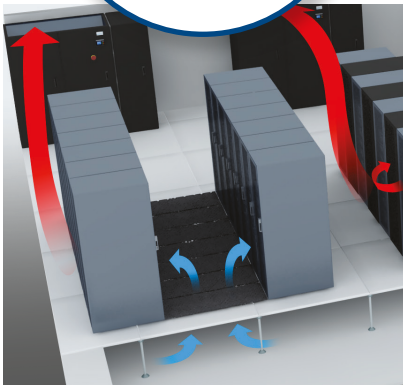
Systemair solutions

The units of the Systemair close control air conditioning range have been optimised for use in new generation data centers, offering the highest guarantee of flexibility, efficiency and reliability.

Technological progress has created the need for ever greater exchange of data, thereby exponentially increasing the concentration of electronic equipment in data centers. Infrastructure limits and constantly growing energy costs have thus redefined the design and development standards of data centers, making efficiency and energy saving key concepts underlying the choice of close control air conditioners.



LOW
Density
< 10 kW/rack



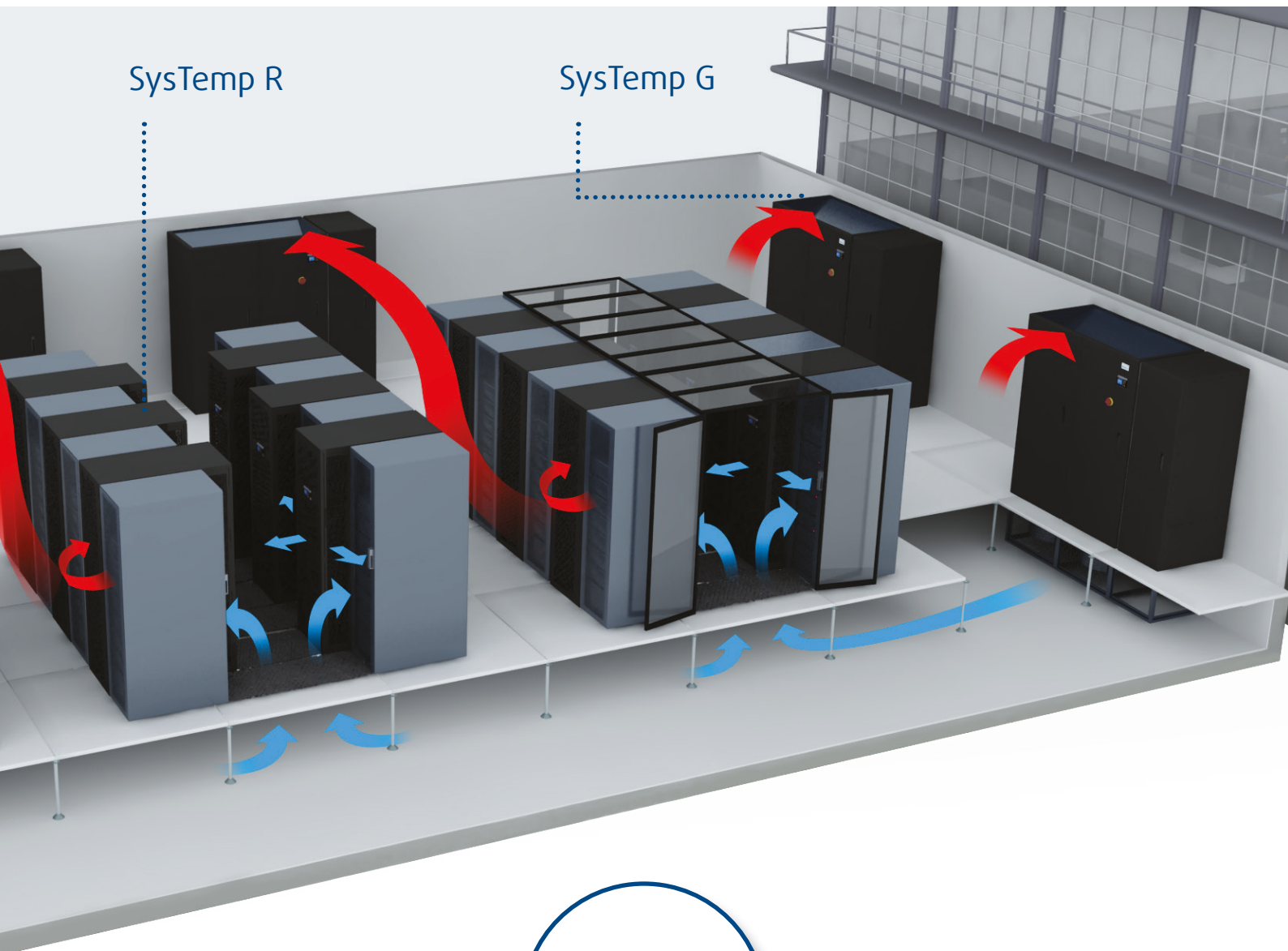
Low-density data centers are normally configured according to the hot/cold aisle design.

This type of system involves the use of peripheral units which, through a raised floor, convey air into the "cold aisle". The air heated by servers is then collected by "hot aisles".

This solution offers high flexibility, making it easy to enlarge a data center over time, as well as changing the rack arrangement.

MEDIUM
Density
10-20 kW/rack





HIGH Density

> 20 kW/rack

Medium-density data centers are normally configured according to the hot/cold aisle design and adding localised "in-row" air conditioning units.

This type of system involves the use of perimetral units which, through a raised floor, convey air into the "cold aisle". The air heated by racks will then be collected by hot aisles.

"In-row" units allow you to add a localised temperature control, which eliminates "hot-spot" problems.

This solution is optimal both if an existing data center is expanded, and for the optimisation of loads in newly implemented data centers.



High-density data centers are normally configured according to the hot/cold aisle partitioning design, with any localised, "in-row" air conditioning units.

This type of system involves the use of high-efficiency perimetral units, with ventilation being installed in the raised floor. The rack aisles (hot or cold) are partitioned to prevent hot and cold water from being mixed and obtain homogeneous distribution on the servers. "In-row" units allow you to add a localised temperature control, which eliminates "hot-spot" problems.

This solution allows you to optimise air distribution and maximize the system energy efficiency, avoiding energy waste due to mixing hot and cold air in the upper part of the racks.

Systemair srl
Via XXV Aprile, 29
20825 Barlassina (MB)
Italy

Tel. +39 0362 680 1
Fax +39 0362 680 693

www.systemair.com

