

# SystemTemp

Close Control Brochure



# Systemair Your reliable partner in data centre cooling



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Since then the product portfolio has grown considerably and today comprises of a wide range of energy efficient fans, air handling units, air distribution products, chillers, air curtains and heating products. Our business idea is that with simplicity and reliability as core values, develop, manufacture and market ventilation products of high quality.

With the business idea as a base and our customers in focus, we will be perceived as a company to trust with a focus on delivery security, availability and quality. Our focus is to develop innovative and energy efficient products - that are easy to select, install and maintain. With over 4000 employees in 45 countries, we are always close to our customers.

# Systemair worldwide



## **Skinnskatteberg, Sweden:**

Systemair AB, the Systemair group head office is in Skinnskatteberg, Sweden. The production is virtually fully automated with modern machinery featuring advanced computer support. Also located here is the company's most advanced test installation for measuring technical data.

## **Klockgården, Sweden:**

Systemair's small air handling units are manufactured at Klockgården in Skinnskatteberg. Frico's central warehouse of approximately 8000 m<sup>2</sup> is also located here.

## **Windischbuch, Germany:**

Production facility for fans and modular air handling units, specialized on engineered products (e.g. tunnel and jet fans). Distribution center.

## **Langenfeld, Germany:**

Production of air curtains.

## **Hässleholm, Sweden:**

VEAB is the leading European manufacturer of electric duct heaters. Production of heating and cooling coils, electric and water based.

## **Ukmerge, Lithuania:**

Production of smaller air handling units with energy recovery systems.

## **Maribor, Slovenia:**

Specialized in centrifugal smoke extract fans, EN certified.

## **Hasselager, Denmark:**

Production of modular air handling units.

## **Dal Eidsvoll, Norway:**

Production of air handling units.

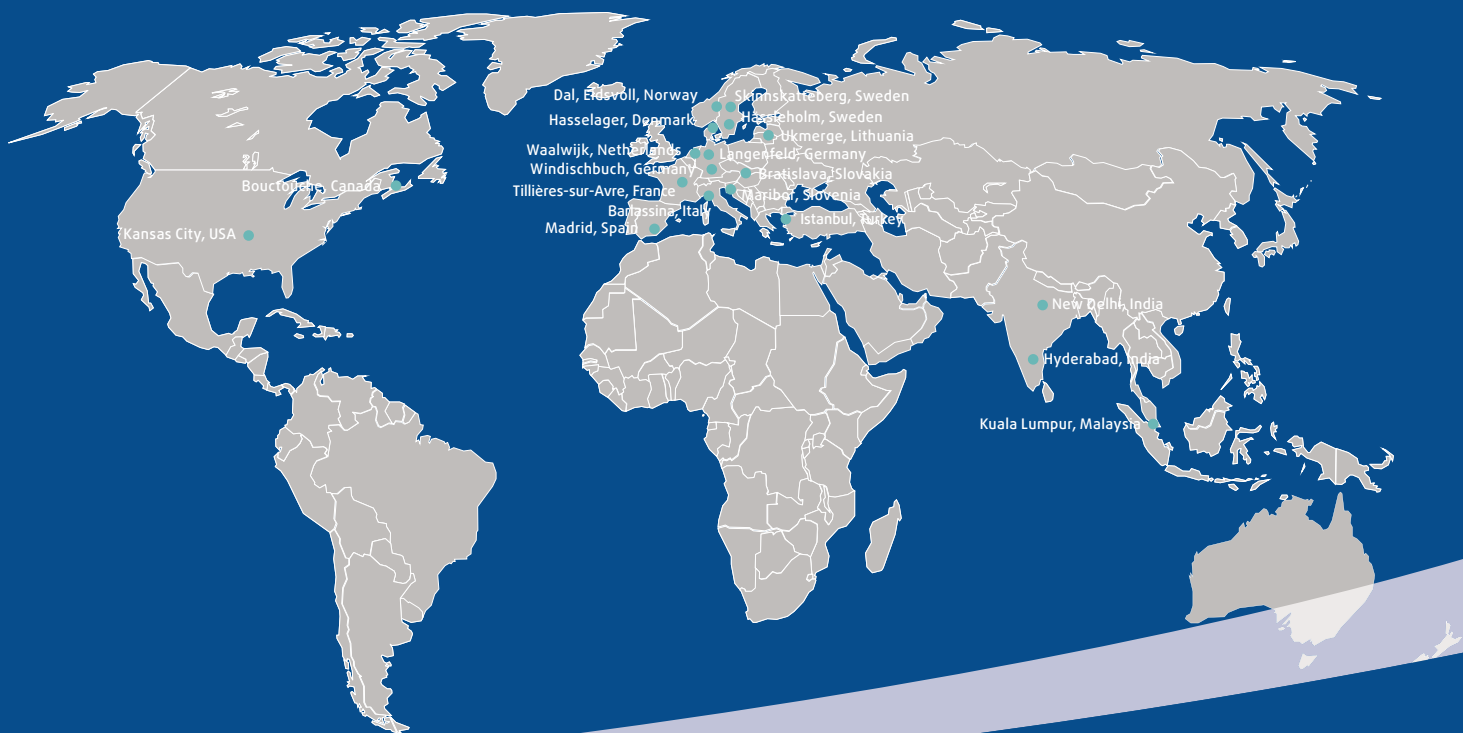


### Quality:

Systemair is certified in accordance with ISO 9001; ISO 14001 and ATEX. Our research and development laboratories are one of the most modern in Europe; measurements are made in accordance with international standards like AMCA and ISO.

### Save energy, lower running cost!

Our label "Green Ventilations" features products with a high energy saving potential. All products labelled with "Green Ventilations" combine energy economy with energy efficiency.



#### Bratislava, Slovakia:

The factory in Bratislava manufactures air distribution products and EN certified fire and smoke dampers.

#### Kuala Lumpur, Malaysia:

Production and marketing of products for Tunnel and garage ventilation.

#### Madrid, Spain:

Production of air handling units for the southern European market.

#### Hyderabad, India:

Production of air distribution products.

#### New Delhi, India:

The factories in New Delhi and Noida manufacture grilles and diffusers.

#### Barlassina, Italy:

Our factory in Italy, Systemair, develops and manufactures a wide range of chiller and heat pump in A class from 20 to 1.700kW.

#### Bouctouche, Canada:

Our main North American production facility of air handling units and inline fans for commercial and residential applications is located in Bouctouche.

#### Kansas City, USA:

Production of fans for the US market.

#### Istanbul, Turkey:

Systemair-HSK is Turkey's leading manufacturer of air handling units.

#### Waalwijk, Netherlands:

Holland Heating is Netherlands leading manufacturer of air handling units.

#### Tillières-sur-Avre, France:

Our factory in France, Systemair, develops and manufactures: Roof top, water source heat pump, high temperature heat pump, water terminals.

# Product range

Systemair has an extensive range of ventilation products, the majority of which are fans and air handling units. Other products include a wide range of air terminal devices for various applications.

These products are installed in a variety of locations, including homes, offices, healthcare premises, shops, industrial buildings, tunnels, parking garages, training facilities, sports centres.

The most common usage is comfort ventilation, but safety ventilation in various forms is also an important market. Smoke gas ventilation and tunnel ventilation are two examples.



## Fans

Systemair is one of the world's largest suppliers of fans for use in various types of property. Our range includes everything from duct fans with a round connection – the company's original product – to rectangular duct fans, roof fans, axial fans, explosion-proof fans, and smoke gas fans.

These fans can be supplied in sizes suitable for everything from ducts with a diameter of just 100 mm to large road tunnel fans. All our fans have been developed to comply with stringent requirements and are characterised by user-friendliness, a high level of quality and a long service life.

### Circular duct fans

Duct fans with a circular connection.



### Rectangular duct fans

Duct fans with a rectangular connection.



### Axial fans

Axial fans for duct connection or wall mounting.



### Roof fans

Roof fans with a circular or square connection.



## Air handling units

Systemair produces a wide range of air handling units.

### Horizontal units

A broad range of horizontal air handling units with or without heat recovery. Useable everywhere from smaller premises to schools, stores and larger offices.

Air flow: 20-1500 l/s



### Vertical units

A broad range of vertical air handling units with or without heat recovery. Useable everywhere from smaller premises to schools, stores and larger offices.

Air flow: 20-1500 l/s



### Fire safety ventilation

Systemair produces fans, dampers and control equipment for protection against smoke and fire certified for use during normal operation and in the event of a fire. The axial fans are certified for installation inside or outside fire risk areas.

### Smoke gas fans

High-capacity fans for evacuation of smoke gases.



### Fire dampers

Dampers that reduce the spread of smoke and fire.



### Chillers & Heat pumps

Our wide range of Chillers and Heat Pumps cover a huge variety of applications. Our production is equipped with high-tech machinery and has one of the most modern research centers in Europe.

### Air cooled and water cooled chillers

Scroll compressor with or without heat recovery



### Water terminals and close control

Fan coils, cassettes and chilled beams



### Air terminal devices

Systemair's range also includes a wide selection of air terminal devices for all possible environments and positions. Development and manufacture take place at a modern factory in Slovakia.

### Supply, extract & transfer air terminal devices

For mounting in ceilings or walls.



### Nozzle air devices

Optimum air distribution for rooms.



### Supply & extract air ventilators

For mounting in ceilings and walls.



### Duct products

Dampers, plenum boxes, and duct accessories



# 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 Full Graphic LCD 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 wide Full Graphic LCD 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 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.

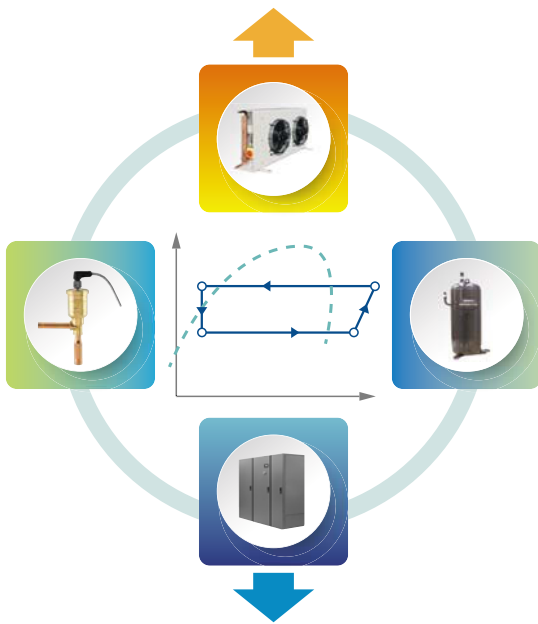
It is moreover possible to increase the energy efficiency ratio (EER) by over 25% compared to a system with a fixed speed compressor.

### 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.

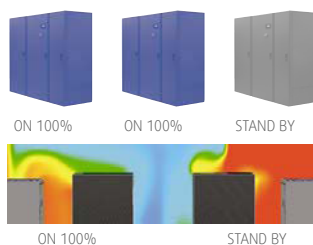
# Smart Net

## The intelligent local network

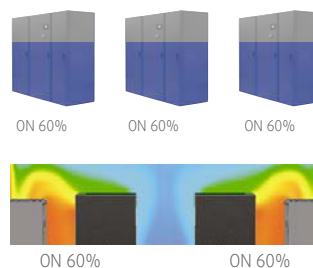


The units of the SysTemp close control air conditioning range are equipped with an innovative control system in a local network (LAN) which allows them to be managed and serviced more easily while improving operational safety.

### 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.

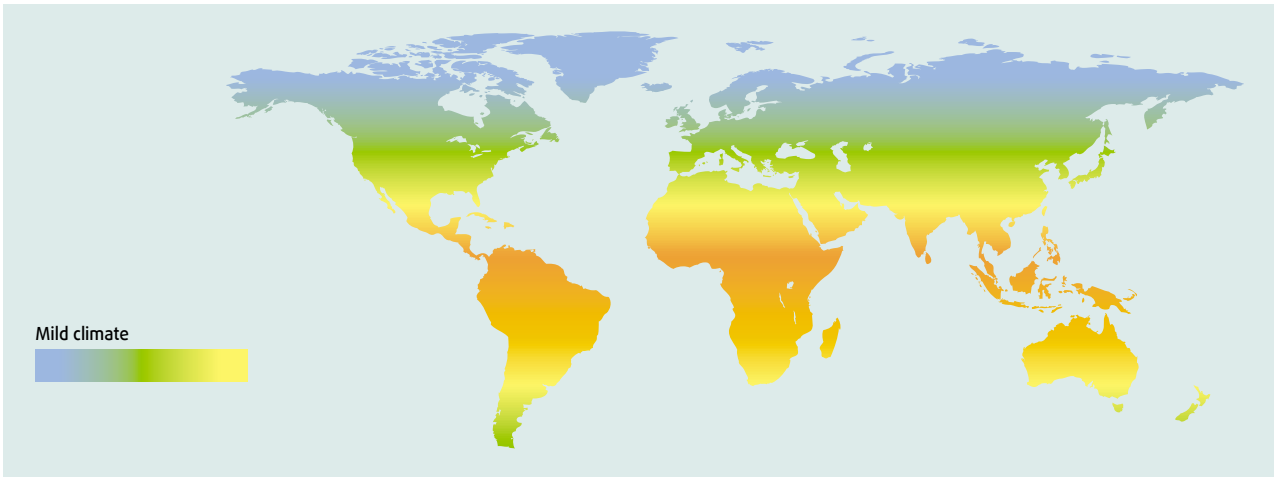
This partialisation directly translates into an energy saving of up to 60% compared to redundant-type networks (n+1 or n+n). Indeed, instead of having active units working at 100% of their performance while one or several machines are stationary, the SysSpace system allows the entire group of units to 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 SysSpace system has been developed with a SysSpace management logic. In the SysSpace 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 CO<sub>2</sub> 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	Reykjavík	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).

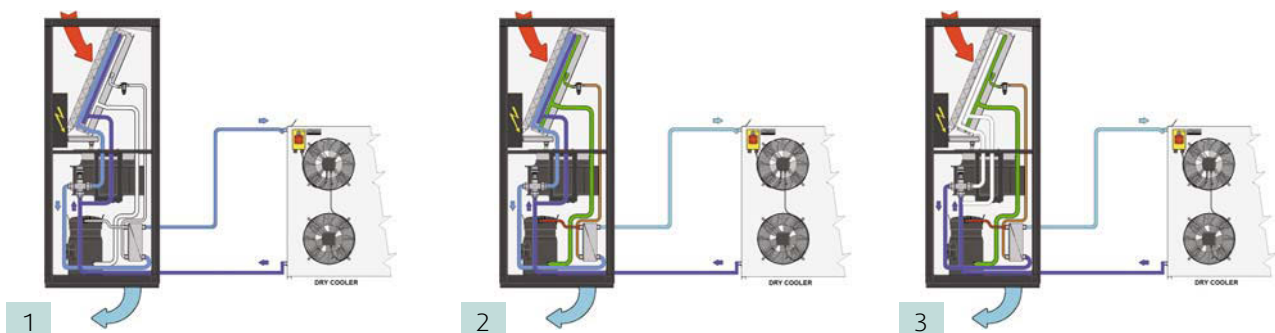
### No free cooling

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

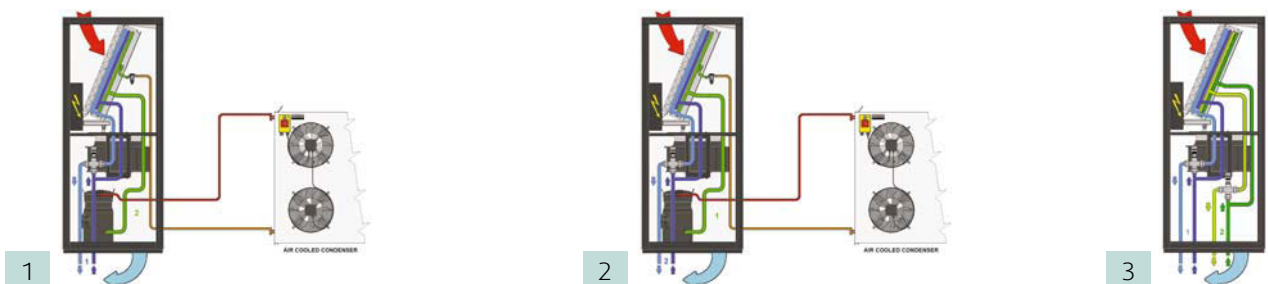
The chilled water primary source of the unit is connected to a building chiller or to district cooling, whereas the secondary, emergency, and direct expansion one is connected to remote air or in-built water condensers (1).

### 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).

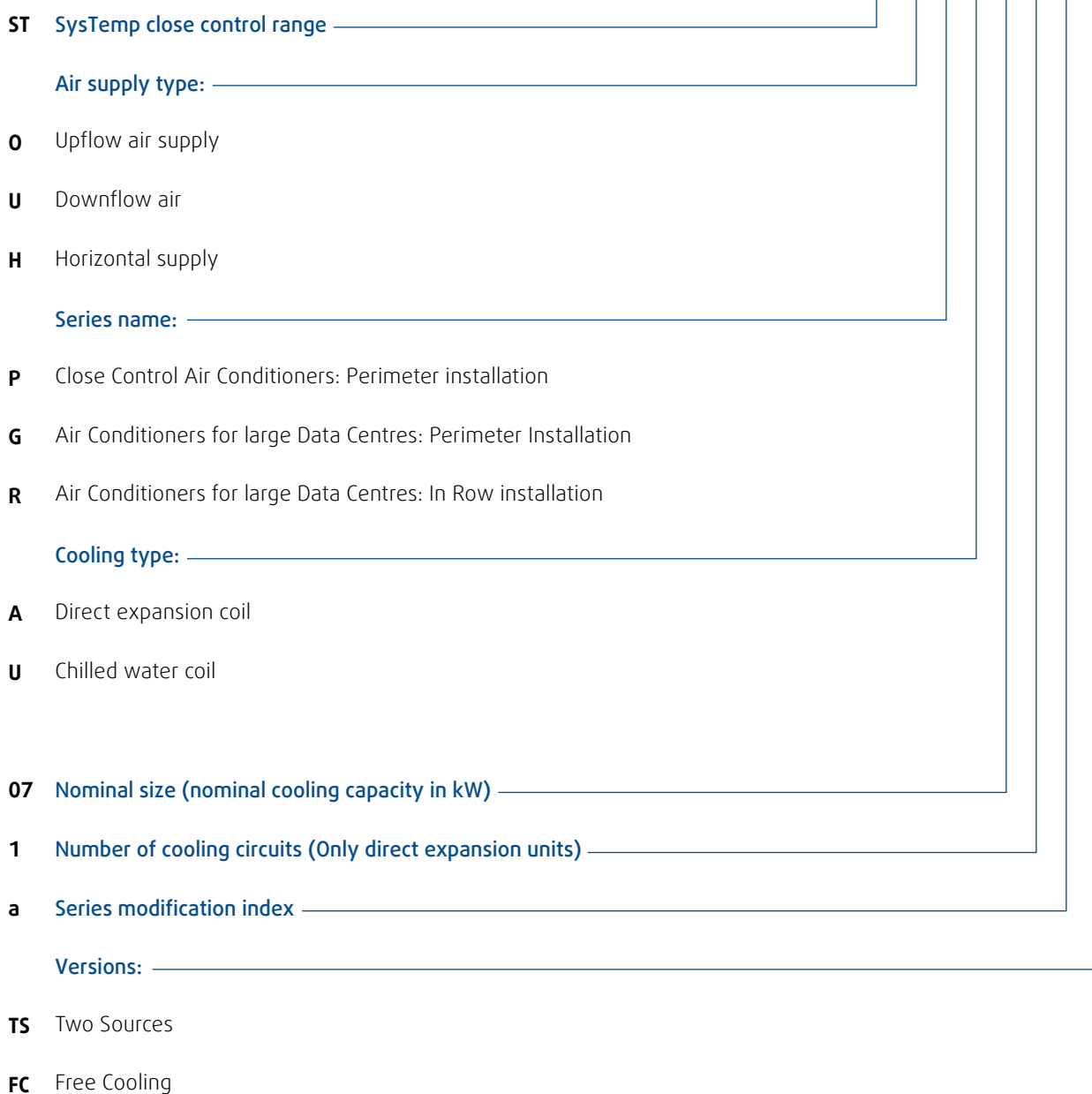
### Chilled water + chilled water two sources

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**



# 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 CO<sub>2</sub> 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 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 Modbus® RTU slave card

## 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		71	111	141	211	251	301	302	361	372	422	461	491	512	612	662	852	932	
<b>Performance</b>																			
Total cooling capacity (1)	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	
EER (2)		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	
Air flow rate	m <sup>3</sup> /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	
Noise level (3)	dB(A)	51	57	57	62	62	60	60	65	60	65	65	62	65	62	62	62	60	
<b>Dimensions and weights</b>																			
Width	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		o	o	o	o	o	•	•	o	•	o	o	•	o	•	•	•	o	
Two Sources		o	o	o	o	o	•	•	o	•	o	o	•	o	•	•	•	o	

## ST UPU: Chilled water air conditioners with downflow air supply

ST UPU		10	20	30	50	80	110	160	220
<b>Performance</b>									
Total cooling capacity (1)	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
EER (2)		34,42	28,98	22,82	21,48	23,95	24,29	23,62	24,29
Air flow rate	m <sup>3</sup> /h	2.200	3.200	7.400	8.200	15.400	17.000	26.000	34.000
Noise level (3)	dB(A)	51	57	63	59	66	61	63	64
<b>Dimensions and weights</b>									
Width	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		o	o	o	•	o	•	•	o
Two Sources		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		71	111	141	211	251	301	302	361	372	422	461	491	512	612	662	852	932	
<b>Performance</b>																			
Total cooling capacity (1)	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	
EER (2)		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	
Air flow rate	m <sup>3</sup> /h	2200	3200	3200	7000	7000	8700	8700	14500	8700	14500	14500	17900	14500	17900	17900	17900	20700	
Noise level (3)	dB(A)	51	57	57	62	62	60	60	65	60	65	65	62	65	62	62	62	60	
<b>Dimensions and weights</b>																			
Width	mm	750	750	750	860	860	1,41	1,41	1,75	1,41	1,75	1,75	2,3	1,75	2,3	2,3	2,3	2,64	
Depth	mm	601	601	601	880	880	880	880	880	880	880	880	880	880	880	880	880	880	
Height	mm	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	
Net weight	kg	180	200	210	270	270	320	340	440	350	450	450	540	500	640	640	660	860	
Free Cooling		o	o	o	o	o	•	•	o	•	o	o	•	o	•	•	•	o	
Two Sources		o	o	o	o	o	•	•	o	•	o	o	•	o	•	•	•	o	

### ST OPU: Chilled water air conditioners with upflow air supply

ST OPU		10	20	30	50	80	110	160	220
<b>Performance</b>									
Total cooling capacity (1)	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
EER (2)		34,42	28,98	22,82	21,48	23,95	24,29	23,62	24,29
Air flow rate	m <sup>3</sup> /h	2200	3200	7400	8200	15400	17000	26000	34000
Noise level (3)	dB(A)	51	57	63	59	66	61	63	64
<b>Dimensions and weights</b>									
Width	mm	750	750	860	860	1750	1750	2640	3495
Depth	mm	601	601	880	880	880	880	880	880
Height	mm	1990	1990	1990	1990	1990	1990	1990	1990
Net weight	kg	155	160	220	240	340	360	540	700
Free Cooling		o	o	o	•	o	•	•	o
Two Sources		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.

## Available accessories

### Direct expansion

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

### 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
- M5 efficiency class intake air filter (EU5)
- Soundproofed duct section on the supply line
- Distribution plenum with adjustable grilles
- 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 request on selected models only)
- Panels with reinforced acoustic lining (available on request 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 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 Modbus® RTU slave card



## Air Conditioners with downflow air supply



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



Standard version for data center perimeter 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		461	612	932
<b>Performance</b>				
Total cooling capacity (1)	kW	43,0	54,9	91,7
Sensible cooling capacity (1)	kW	35,9	42,1	79,4
EER (3)		3,39	2,86	3,60
Total cooling capacity (2)	kW	46,6	58,8	99,6
Sensible cooling capacity (2)	kW	46,6	53,1	99,6
EER(3)		3,67	3,07	3,92
Air flow rate	m <sup>3</sup> /h	9.500	10.000	19.000
Noise level (3)	dB(A)	57	58	59
<b>Dimensions and weights</b>				
Width	mm	1.490	1.490	2.390
Depth	mm	921	921	921
Height	mm	1.990	1.990	1.990
Net weight	kg	630	680	870

### ST UGU: Chilled water air conditioners with downflow air supply

ST UGU		70	150	200	300
<b>Performance</b>					
Total cooling capacity (1)	kW	47,7	91,7	128,3	183,5
Sensible cooling capacity (1)	kW	42,1	82,6	119,9	165,3
EER (3)		32,89	33,97	35,15	40,77
Total cooling capacity (2)	kW	38,5	74,9	106,7	149,8
Sensible cooling capacity (2)	kW	38,5	74,9	106,7	149,8
EER(3)		27,7	28,69	29,81	34,51
Air flow rate	m <sup>3</sup> /h	9.500	19.000	28.500	38.000
Noise level (3)	dB(A)	57	59	61	60
<b>Dimensions and weights</b>					
Width	mm	1.320	2.220	3.120	4.020
Depth	mm	921	921	921	921
Height	mm	1.990	1.990	1.990	1.990
Net weight	kg	610	750	930	1,25

#### 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, ventilated plenum, height 1000 mm. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.
- (2) Performance refers to: R410A refrigerant; condensing temperature 45°C; incoming air 30°C-30%Rh; water 14/20°C; external static pressure 30 Pa, ventilated plenum, height 1000 mm. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.
- (3) EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
- (4) 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
- Power supply line for remote condenser
- Power supply line with speed regulator for remote condenser
- Condensing regulation with 0-10V signal for remote condenser with EC fans
- LT kit for operation with low temperature outside air with remote condenser
- Oversize liquid receiver
- Check valves on the supply and liquid pipes
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature control valve
- HT Kit for operation at high condensing temperatures

### 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
- 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:

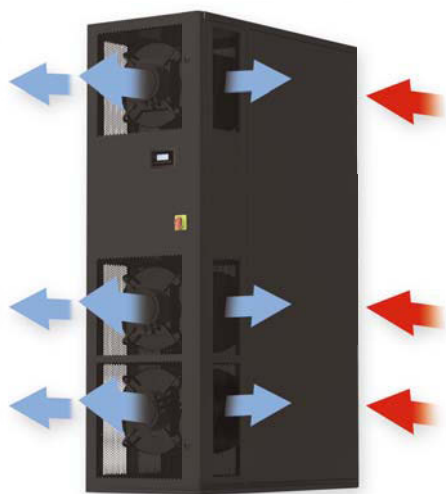
- The racks containing servers are increasingly positioned according to the Hot Aisle and Cold Aisle layout.
- Air temperatures are allowed to rise up to 30-35°C in the hot aisle and 20-25°C in the cold one, with very low humidity (never above 30%).
- Server performance is increasingly on the rise, while 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 graphic display
- G4-class efficiency air filters with dirty filter alert
- 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 Modbus® RTU slave card

## 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

ST HRA		231	361
<b>Performance</b>			
Total cooling capacity (1)	kW	20,6	36,2
Sensible cooling capacity	kW	20,6	35,6
EER(2)		3,31	3,65
Air flow rate	m <sup>3</sup> /h	6.500	7.500
Noise level (3)	dB(A)	52	54
<b>Dimensions and weights</b>			
Width	mm	600	600
Depth	mm	1.180	1.180
Height	mm	2.000	2.000
Net weight	kg	215	215
Free Cooling		•	◦
Two Sources		•	◦

### ST HRU: Chilled water air conditioners with horizontal supply

ST HRU		40
<b>Performance</b>		
Total cooling capacity (1)	kW	31,6
Sensible cooling capacity	kW	31,6
EER(2)		26,58
Air flow rate	m <sup>3</sup> /h	9.000
Noise level (3)	dB(A)	61
<b>Dimensions and weights</b>		
Width	mm	600
Depth	mm	1.180
Height	mm	2.000
Net weight	kg	190
Free Cooling		•
Two Sources		•

#### Notes:

- (1) Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 30°C-30%Rh; water 14/20°C; external static pressure 30 Pa. The declared performance does not take into account the heat generated by fans, which must be added to the system thermal load.
- (2) EER (Energy Efficiency Ratio) = total cooling capacity / compressors power consumption + fans power consumption (air cooled condensers excluded).
- (3) Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

## 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
- LT Kit for operation with low temperature outside air with remote condenser
- Oversize liquid receiver
- Check valves on the supply and liquid pipes
- Water-cooled condenser
- Water-cooled condenser with a condensing temperature control valve

### Chilled water

- Two-way control valves
- Inlet and outlet water temperature sensors
- HT Kit for operation at high condensing temperatures

### 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
- M5 efficiency class intake air filter (EU5)
- Closed front panel for side supply
- Closed side panels for front supply
- Wheels for handling

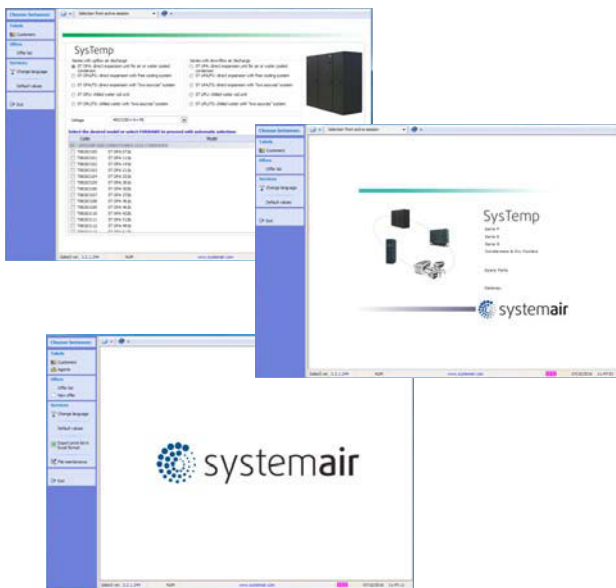
### Electrical

- 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 an innovative selection software for Systemair products operating on Windows™.

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

The minimum requirements to install the Selection Software selection software are:

- Windows™ XP, Windows™ Vista, Windows™ 7, Windows™ 8 or 8.1 (not RT)
- 300 MHz or higher
- At least 2 GB of RAM memory
- At least 2 GB of free space on the hard drive
- Keyboard and mouse, or compatible pointing device
- Video card and monitor with Super VGA (1024x768) resolution or higher
- Adobe® Flash® Player

## Customised version



The wide range of Systemair close control air conditioners allows most design and installation requirements to be met. When this is not the case, however, Systemair is able to put forward alternative solutions to satisfy the most specific needs with in-house know-how.

### Close control air conditioners for ceiling installation

This type of unit is designed to be installed on the ceiling in the premises to be conditioned. These units are particularly suitable for small rooms, where the available space is not enough to install perimeter units.

Available with direct expansion circuit for remote condensing unit and with chilled water circuit, for cooling capabilities from 5 to 20 kW.

### Console close control air conditioners

Designed to have a height of 1250 mm, this type of unit has been designed for environments where the operating spaces are not suitable for the installation of normal perimeter units.

Available with direct expansion circuit for remote air or in-built water condensers and with chilled water circuit, for cooling capabilities up to 15 kW.



# 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

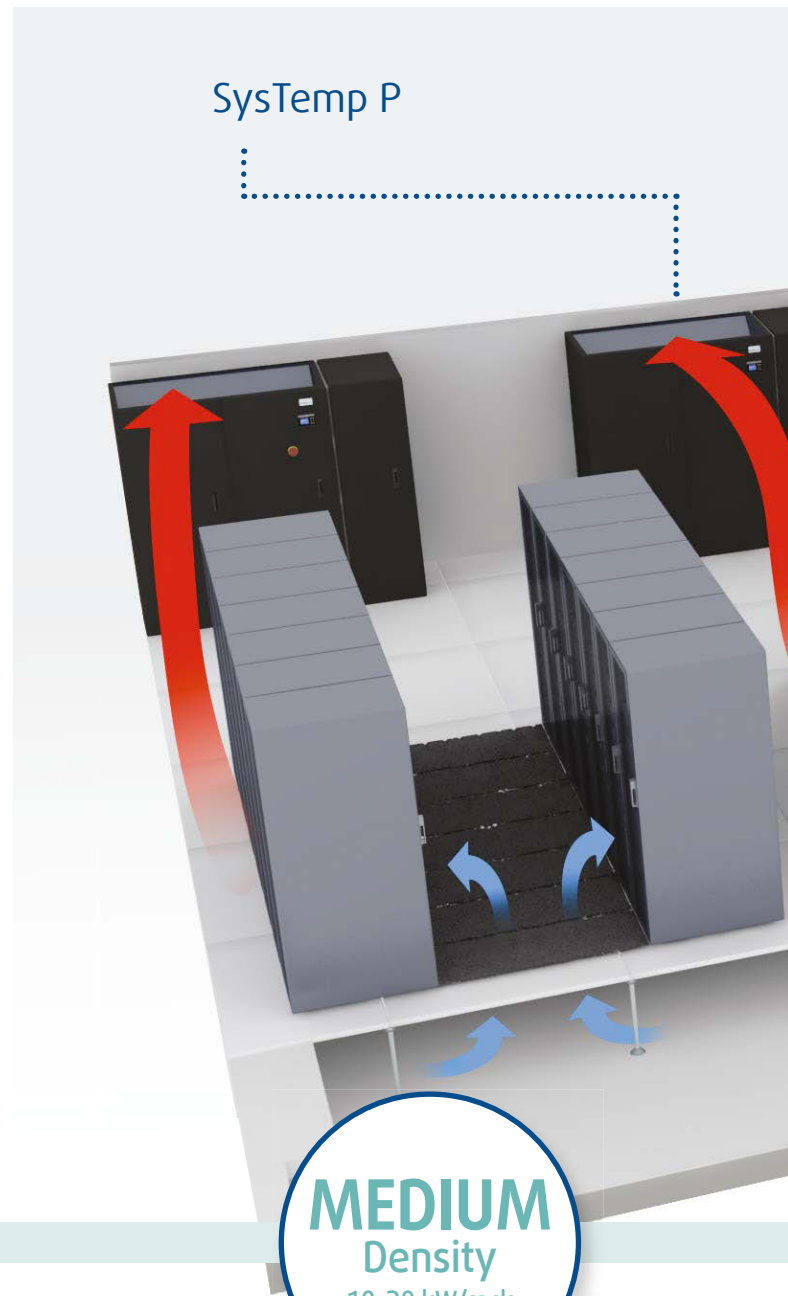
## Available accessories

- 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.

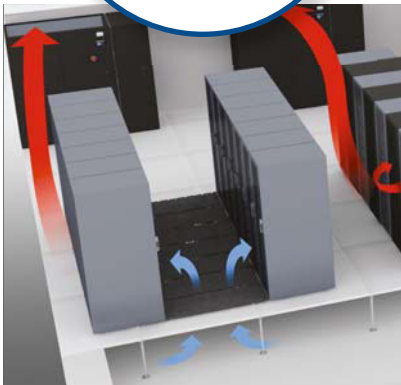
# Systemair solutions

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



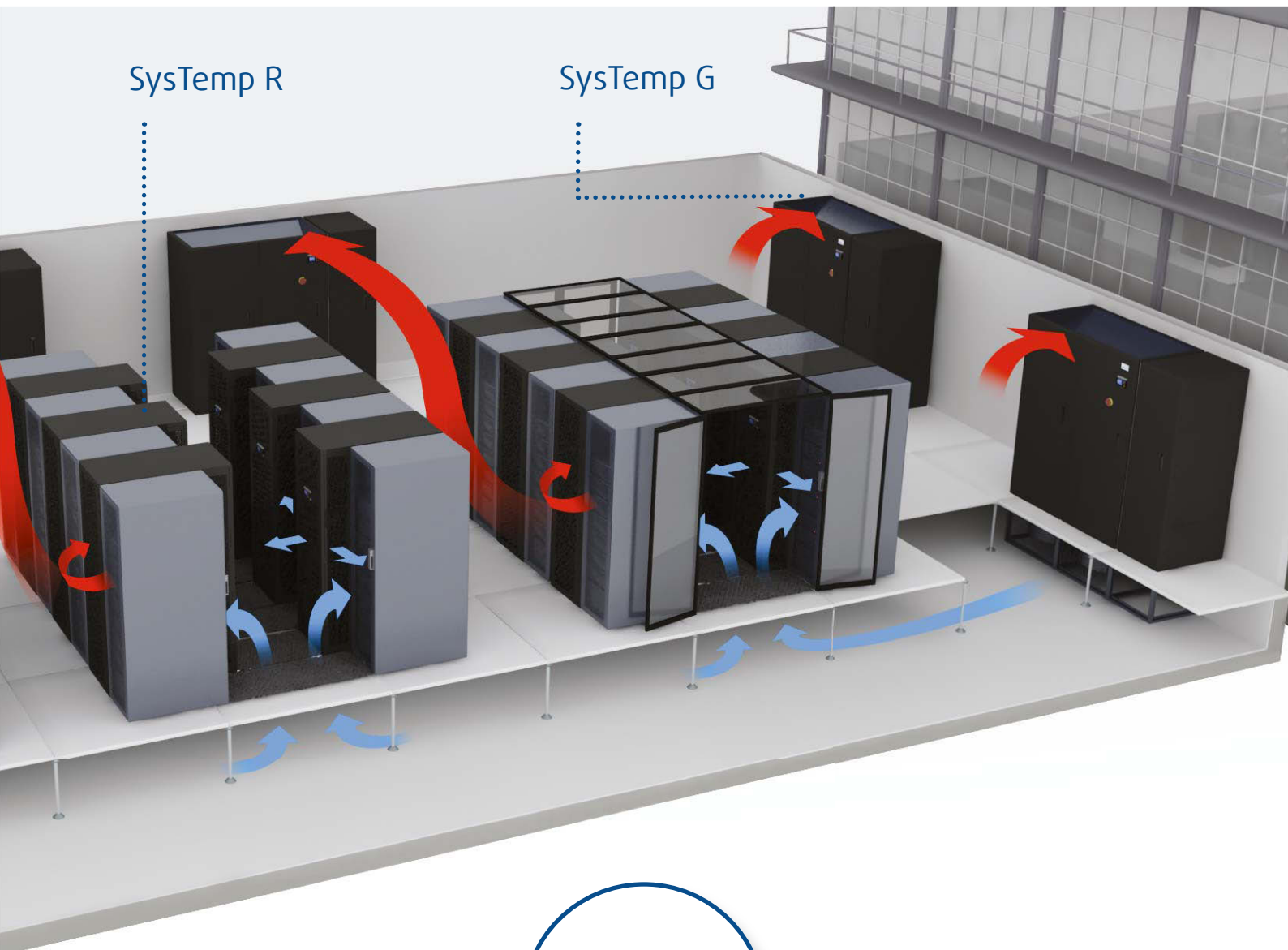
Low-density data centers are normally configured according to the hot/cold aisle design.

This type of system involves the use of perimeteral 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.











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