SYSTEMA

HEATING COOLING GREEN ENERGY

ABSORPTION CHILLERS

Absorption chillers and absorption heat pumps from 23 to 11630 kW

NON-ELECTRIC CHILLERS
REFRIGERANT GAS AT GWP 0
GREENHOUSE GAS REDUCTION -CO_2

ENERGY REUSE

ECOFRIENDLY SOLUTION

POWER SUPPLY WITH CLEAN ENERGIES

55°C ÷ 200°C

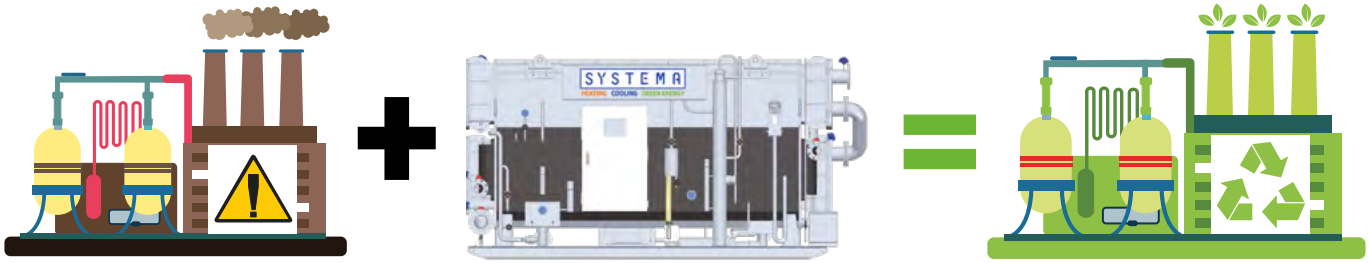
H_2O POWER SUPPLY

LOW NOISE IMPACT

TEE

COST SAVINGS AND TAX INCENTIVES

BUILDING A ZERO-EMISSION FUTURE

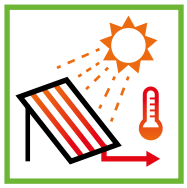


Systema S.p.A. supplies refrigeration units, whether for cooling process cycles or for air-conditioning rooms, proposing solutions that are characterised by the low use of primary energy and the rational use of available resources, through the conversion of thermal energy into cooling energy, actively contributing to achieving the objectives required by the ecological and energy transition, such as:

- ***COST REDUCTION,***
- ***REDUCING CLIMATE-CHANGING GAS EMISSIONS,***
- ***DECARBONISATION,***
- ***ECOSUSTAINABILITY,***

consistent with international goals and agreements to make a more sustainable future possible.

APPLICATION AREAS



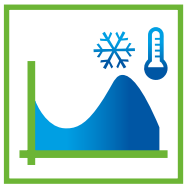
Conditioning using renewable energy sources, in particular solar cooling, is one of the key points of the EU's energy policy.

Thermal recovery applications derived from energy production by solid biomass, biogas, syngas, agricultural, livestock and forestry products and by-products.

Absorption refrigeration units can find application by directly exploiting energy vectors such as biomethane and hydrogen that can contribute to decarbonisation.

Trigeneration represents an efficient solution capable of achieving, compared to separate generation, a more rational use of combustible primary energy and a reduction in pollutant emissions.

MANAGEMENT AND ECONOMIC ADVANTAGES



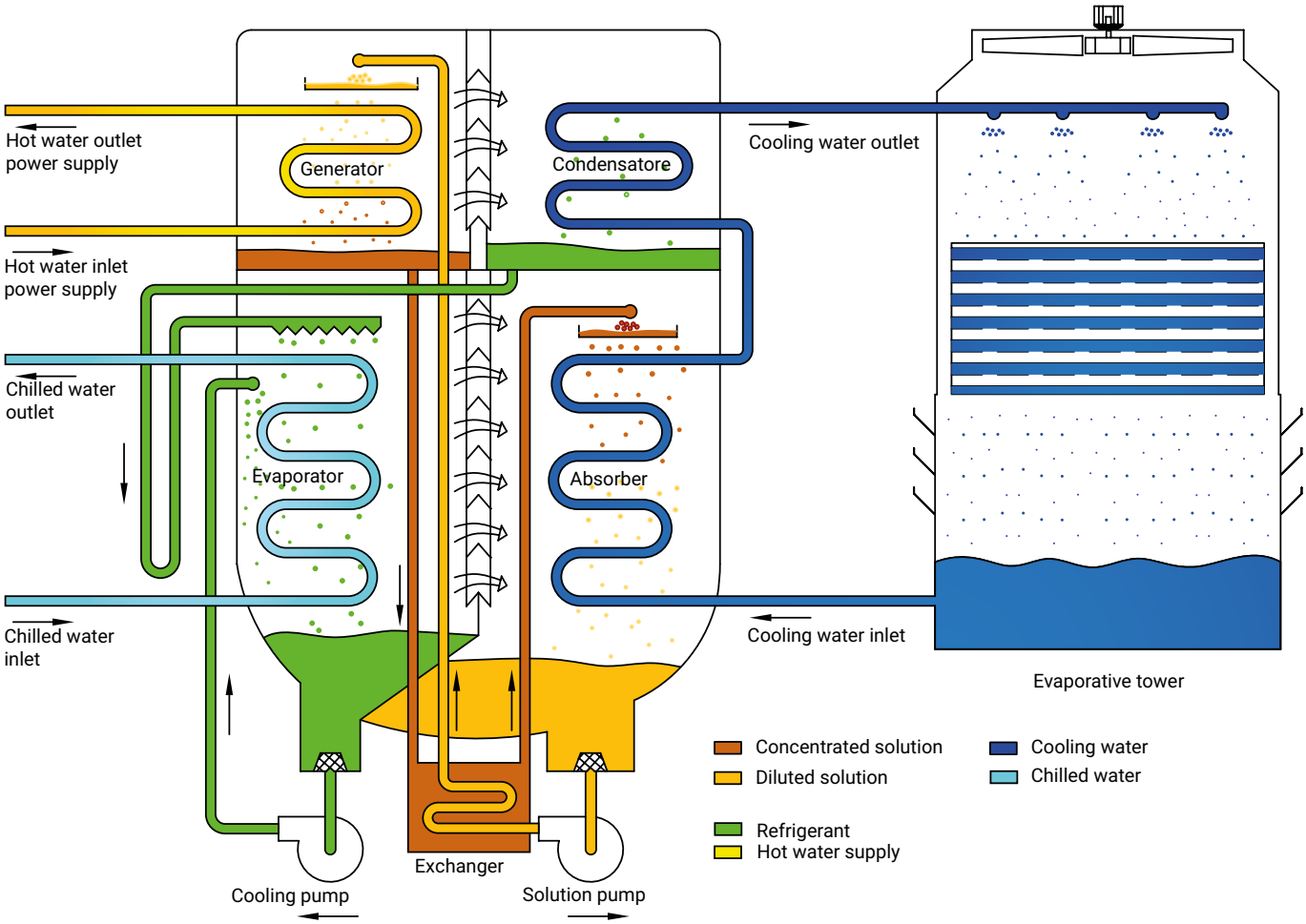
The modulation range is from 10% to 100% and allows adaptation to any applied load while maintaining high efficiency and performance.

Absorption refrigeration units use natural refrigerant fluid, so they are free of greenhouse gas emissions with benefits for our enviroment.

By using only pumps, the service life of the system is significantly extended, offering high reliability and safety.

Through the rational use of thermal energy, these systems can obtain incentives such as Energy Efficiency Certificates (TEE) or other forms of incentives such as the thermal account.

GENERAL OPERATING PRINCIPLE



Systema water chillers perform a thermodynamic water-lithium bromide absorption cycle, in which the cooling fluid is water, and the absorbing fluid is a highly concentrated solution of lithium bromide salts in water.

The refrigeration cycle originates in the Generator, where the diluted lithium bromide-water solution is heated by the hot source (hot water, steam, etc.) to boiling point, thus generating water vapour (refrigerant fluid) on the one hand, and a liquid solution with a high concentration of lithium bromide salts (absorbent solution) on the other.

The water vapour thus produced is conducted into the unit's condenser and cooled to a liquid state (condensation) through heat exchange with water from the cooling system (evaporative tower or other).

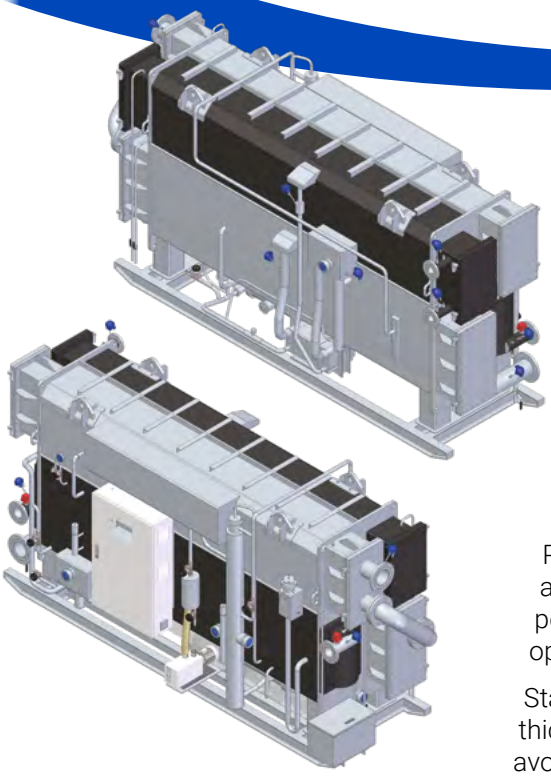
The liquid coming out of the condenser is then led, after pressure (lamination) and temperature reduction, to the evaporator where it evaporates again (at low temperature) by subtracting heat from the water of the 'consumer' system (air conditioning/refrigeration with AHUs, fan coils, etc.).

The low-temperature water vapour produced in the evaporator then flows to the absorber where it is placed in contact with the highly concentrated solution of LiBr salts from the generator.

In the absorber, the absorption process takes place, i.e. the dilution and condensation of the water vapour in the high LiBr salt solution. This process is exothermic (develops heat) and in order for it to be completed, it requires cooling implemented through heat exchange with the cooling water of the plant by means of an evaporative tower or other means.

Once the water vapour absorption process has been completed, the diluted water-LiBr solution exiting the absorber is led (thanks to the solution pump) to the generator after passing through the energy recovery exchanger carried out through heat exchange with the warmer, high concentration solution of LiBr salts exiting the generator. With the diluted H2O-LiBr solution returned to the generator, the cycle is reproduced. The refrigeration circuit, in addition to the heat exchange equipment and solution pump described above, also includes the coolant pump whose function is to circulate the coolant (water) in the evaporator.

TECHNICAL FEATURES



The Generator is composed of a tube bundle in Nickel-Copper alloy (NiCu) with high exchange capacity and corrosion resistance, alternatively for specific models it can also be in AISI316L and/or Titanium steel alloys.

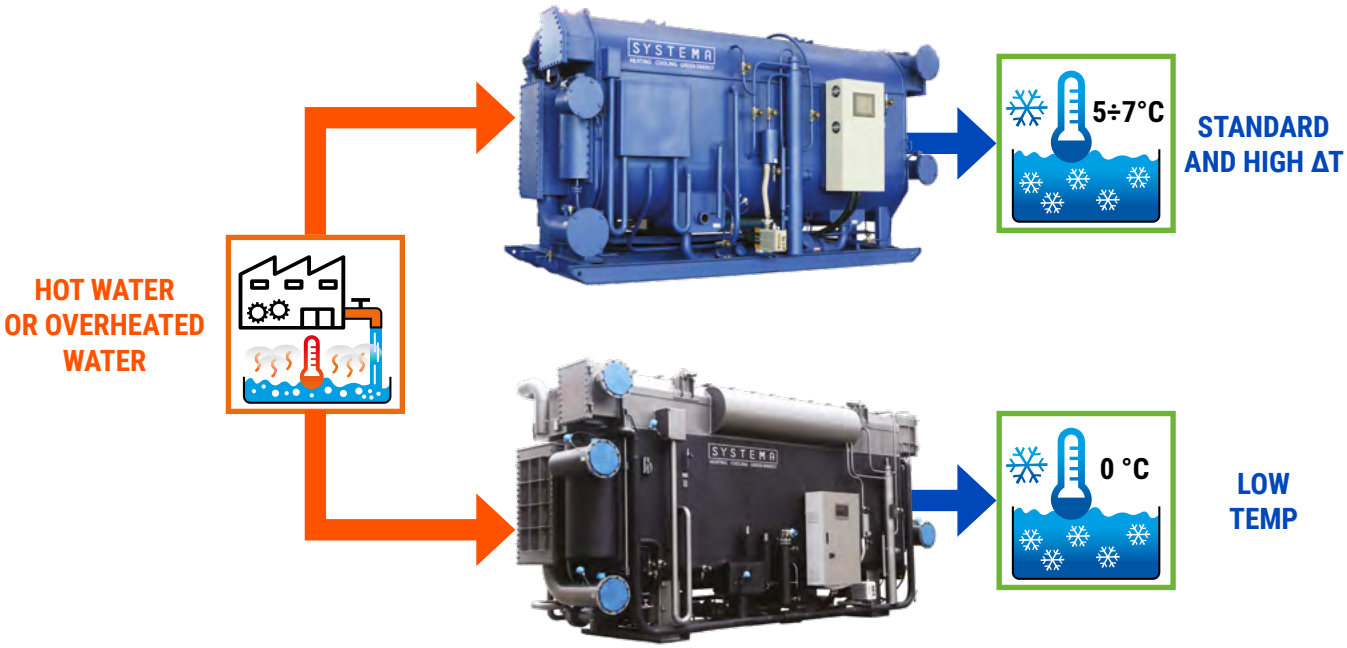
The Absorber, Condenser and Evaporator are made of copper tube bundles with high exchange capacity (or alternatively for specific models they can also be made of AISI316L and/or Titanium steel alloys).

The electrical panel allows for electronic management piloted by a Siemens PLC, programmed to guarantee optimal operation with a range of power modulation from 10 to 100%, depending on the output chilled water demand.

Pumps, actuators, pressure and temperature probes, valves and solenoid valves are carefully selected and sized to offer performance, quality and durability, guaranteeing the best operating conditions.

Standard insulation is made with insulating materials of adequate thickness to contain and maximise the efficiency of the system, avoiding unnecessary waste of thermal energy.

POWER SUPPLY: HOT OR SUPERHEATED WATER



Power supply	Type	Parameters	Models	Range of cooling capacity
SINGLE EFFECT				
Hot Water	Standard	75°C ÷ 95°C	SYDHL	23 kW – 105 kW
	Standard	75°C ÷ 130°C	SYDHH	150 kW – 11630 kW
	High ΔT	ΔT 30÷40°C in/out	SYDHH	250 kW – 11630 kW
	Low Temp	55°C ÷ 75°C	SYDDH	58 kW – 7630 kW
DOUBLE EFFECT				
Acqua surriscaldata	Standard	145°C ÷ 200°C	SYHH	150 kW – 11630 kW

POWER SUPPLY: STEAM

Power supply	Type	Parameters	Models	Range of cooling capacity
SINGLE EFFECT				
Steam	Standard	0,1 bar ÷ 2 bar	SYDSH	150 kW – 11630 kW
DOUBLE EFFECT				
Steam	Standard	3 bar ÷ 9 bar	SYSH	150 kW – 11630 kW – 11630 kW

POWER SUPPLY: FUMES

FUMES

STANDARD

SINGLE EFFECT				
Power supply	Type	Parameters	Models	Range of cooling capacity
Fumes	Standard	230°C ÷ 350°C	SYDEH	250 kW – 11630 kW
DOUBLE EFFECT				
Fumes	Standard	350°C ÷ 600°C	SYEH	350 kW – 7630 kW

POWER SUPPLY: DIRECT FLAME

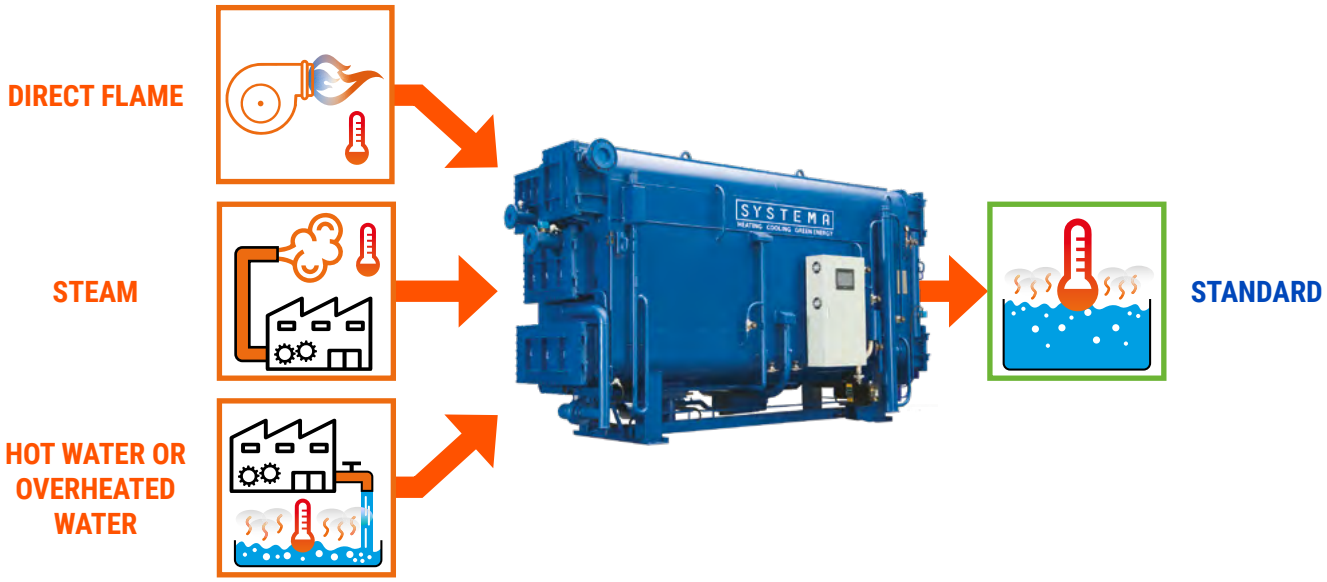
DIRECT FLAME

STANDARD

DOUBLE EFFECT				
Power supply	Type	Parameters	Models	Range of cooling capacity
Direct flame	Standard	Gas Burner	SYZL SYZX	58 kW – 7630 kW
Combined power supply	Multi energy	Gas/Fumes/Hot water	SYEXHH SYZXH	350 kW – 11630 kW

SYSTEMA SOLUTIONS THAT TRANSFORM ENERGY

HEAT PUMP COMBINED POWER SUPPLY



HEAT PUMP					
Power supply	Type	Parameters	Models	Range of cooling capacity	
Gas/Steam/Hot Water	Class I heat only	145°C ÷ 200°C	SYRXH1	350 kW	11630 kW
	Class II heat only	90°C ÷ 130°C	SYSRXH2	350 kW	11630 kW

CUSTOMISED ENERGY STATION VERSIONS

CUSTOMISED ENERGY STATIONS for INTERIOR use
Models with water-lithium-bromide mixture
Complete with pumping section - plate heat exchanger - command and control panel
Hot water - steam - flue gas supply
Powers from 23 to 2,500 kW

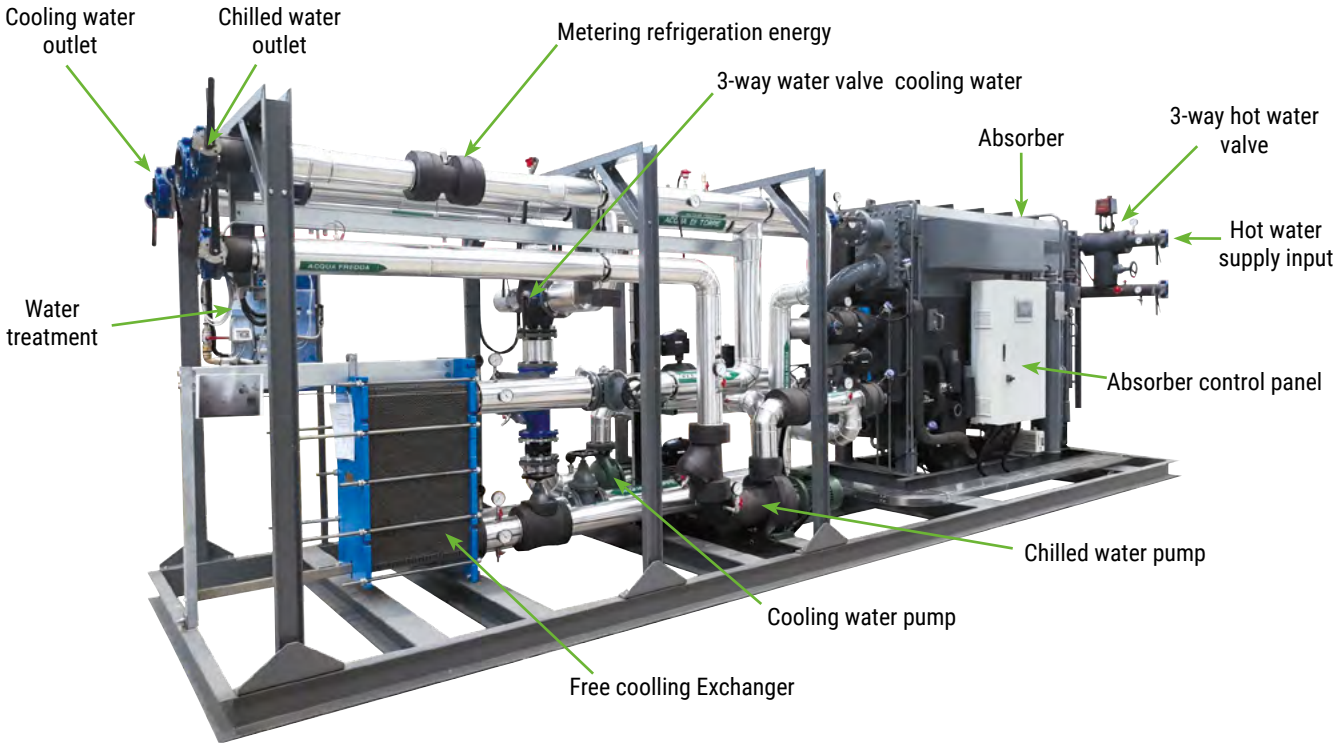
PERSONALISED ENERGY STATIONS for OUTDOOR use
Models with water-lithium-bromide mixture
Complete with pumping section - plate heat exchanger - command and control panel
Hot water - steam - flue gas supply
Powers from 23 to 2,500 kW

CUSTOMISED SOLUTION - ENERGY STATION

For more than 25 years, Systema has been proposing diversified solutions of absorption units according to the customer's needs. Customised "**ENERGY STATION**" plant solutions can be envisaged both for applications in dedicated technical rooms, and outdoors by means of a special insulated box.

Systema's experience acquired in the field through the numerous installations it has carried out, with applications in various industrial, commercial, hotel, residential, etc. sectors, and the solid collaboration established with the various operators in the thermo-technical/energy plant engineering sector, has led to the development and supply of factory pre-assembled plant engineering systems complete with absorption plant and all the parts and components essential for the correct and efficient interconnection to the plant of the user to be served.

This "turnkey" absorption plant solution simplifies the technical work of the design studios and installation companies responsible for building the entire plant, in order to guarantee continuous and reliable operation of the equipment with low energy consumption and long life and reliability.



CUSTOMISED SOLUTION - ENERGY STATION

Thanks to Systema's experience gained in the specific absorption sector for more than 25 years, **ENERGY STATIONS represent one of the best proposals on the market**, especially for their versatility, in development, design and construction according to applicable standards and regulations.

ENERGY STATIONS are prepared for indoor or outdoor installation depending on the intended use, maintaining a high level of quality every step of the way: from quotation to sales, from technical design to construction, from production to project management, **in accordance with the ISO9001 quality certification held by Systema.**

Control panel with **ModBUS and/or LAN interface** for two-way communication, supervision and local and/or remote control.

DEVICES – ENERGY STATION

Absorption refrigeration unit selected and sized according to specific customer requirements.

Control panel with touch interface and possibility of local or remote two-way supervision or control

PID control valve for hot water supply

Control and power management panels

Circulation pumps for chilled water and cooling water

Insulated outdoor box

Selection and configuration of evaporative towers

Water management and treatment system in case of open circuits

SYSTEMA IS THE COMPLETE SOLUTION

CUSTOMIZED ENGENEERING

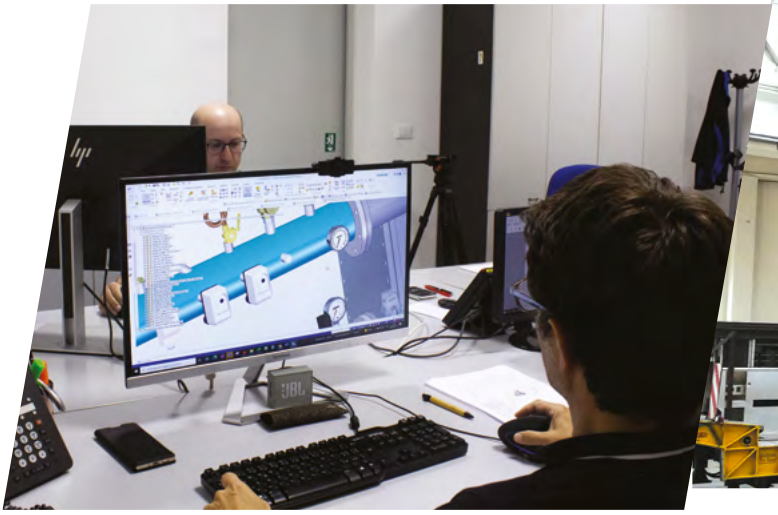
CERTAIN LEAD TIMES

EASY INSTALLATION

COST REDUCTION

EXECUTION MADE IN ITALY

SYSTEMA GUARANTEE



SERVICE CENTRES

ORIGINAL SPARE PARTS

SYSTEMA TRAINING

REMOTE CONTROL

MULTIYEAR CONTRACTS

INTERNAL TECHNICIANS

The maintenance of refrigeration and technological equipment is an important component in maintaining industrial and air conditioning systems in full efficiency.

Systema S.p.A. has its own service and after-sales division, consisting of in-house personnel with highly specialised training and a complete set of professional tools, as well as a complete availability of spare parts in its warehouse, which allows for the correct operation, programming and intervention for the correct management and running of the plant.

SYSTEMA S.p.A. always implements in its "**ENERGY STATION**" projects, more technological solutions that improve and simplify the control and management of the equipment, with the aid of systems for remote monitoring and control of the main parameters of the refrigeration units.

TOOLS AND MEANS

Vacuum meter

Ultrasound meter

Combustion analyser

NOTES

NOTES

Since 1986, Systema S.p.A. is one of the leader companies in Italy and Europe in designing, developing and producing devices for the heating and conditioning in industrial and commercial buildings.
There has been always in Systema's Research and Development department where high investments have been made, since the beginning, for the creation of an internal laboratory who could design and offer highly innovative products that can satisfy and anticipate all the requests coming from the market. In this field Systema works together with important Italian, European and extra-European laboratories and university departments. A cooperation which leads to the concept of innovative and visionary products and solutions and to the obtaining of several international patents.
Systema S.p.A. differs from competitors because can offer a complete range of products that goes from commercial and industrial heating with radiant and hot air solutions, to conditioning with absorption chillers, electric heat pumps and evaporative adiabatic coolers and with a specific focus on the agricultural and breeding farms products for heating (both heaters and radiant systems) and conditioning with adiabatic coolers. This range has been conceived looking for environmental-friendly products with the lowest energy consumption.
Managing such a large range of products is not easy but, also in this field, Systema S.p.A. has been always different with an internal and external organization that guarantees high quality services through an extensive commercial network made of highly qualified technical salesmen, an internal organization of customer service with experience in designing and consultancies well aware of all the required standards and rules and a massive after sales structure both internal and external that Systema keeps regularly update in order to have technicians who are always very well prepared.
The work of these structures is greatly facilitated by Systema S.p.A.'s production facilities, which are made up of the highest quality standards and production processes that are technologically advanced and constantly modernised. The united work of those responsible for production, procurement and quality allows Systema S.p.A. to make available to its commercial structure products and systems that are of high quality, reliable and made in full compliance with the most advanced standards.
Systema S.p.A. is able to supply its sales organisation with products and systems of high quality and reliability and manufactured in full compliance with the most advanced standards.
Systema S.p.A. has thus managed, over the years, to gain a strong international presence which sees it active in markets all over the world, carrying forward the flag of top quality Made in Italy and achieving leadership positions in many countries. A strategic decision was taken by Systema S.p.A. to create Systema Polska, which is able to provide a highly qualified, high quality production force and a commercial structure, in synergy with that of Systema S.p.A., which is able to present and improve the commercial penetration of Systema products in markets such as Poland and neighbouring countries.
The synergies put in place have greatly facilitated the growth of the services offered to the market, services made up of a very high level of attention to the customer, who in Systema finds not only a business partner but also a highly qualified technical consultancy service that goes hand in hand with reliable after-sales services that are always ready to quickly resolve any problems reported by the customers themselves.

Systema: focus on the future
by interpreting the present...

SYSTEMA
HEATING COOLING GREEN ENERGY

SYSTEMA S.p.A. Via San Martino, 17/23 - Santa Giustina in Colle C.A.P. 35010 PADOVA - ITALY
Tel. +39.049.9355663 r.a. - export@systema.it
www.systema.it

In order to improve the quality of its products, Systema S.p.A. reserves the right to modify the characteristics without prior notice.

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