

CLOSE CONTROL AIR CONDITIONERS



TECNAIR LV

THE COMPANY



Continuous progress

Since entering the market in 1994, **TECNAIR LV** (part of the **LU-VE Group**) has been increasingly in the forefront, in Europe and in the world, of the “Close Control Air Conditioning” sector.

A prestigious position resulting from continuous research and development carried out in our Laboratories, in partnership with lecturers from the Faculty of Energy Engineering at the Polytechnic University of Milan who are authorities in the field, and the constant updating of work techniques and close collaboration with our customers.

High quality design

Design by means of computerised thermodynamic models, tests conducted in in-house R&D laboratories (the largest in the sector in Europe) and reconfirmed at the DMT laboratories (TÜV NORD), the use of advanced production techniques in a modern plant, and a Quality System certified in accordance with ISO 9001 guarantee the performance and absolute reliability of **TECNAIR LV** products.

Originality, design and attention to the requests of the market enable **TECNAIR LV** products to provide innovative solutions which cut down on design, manufacturing and running costs.



Competitive in terms of custom-built designs as well

The wide range of units and accessories makes it possible to meet most design and installation requirements. When this is not possible, **TECNAIR LV** can find alternative solutions to satisfy the most specific needs by calling on the know-how of its partners.

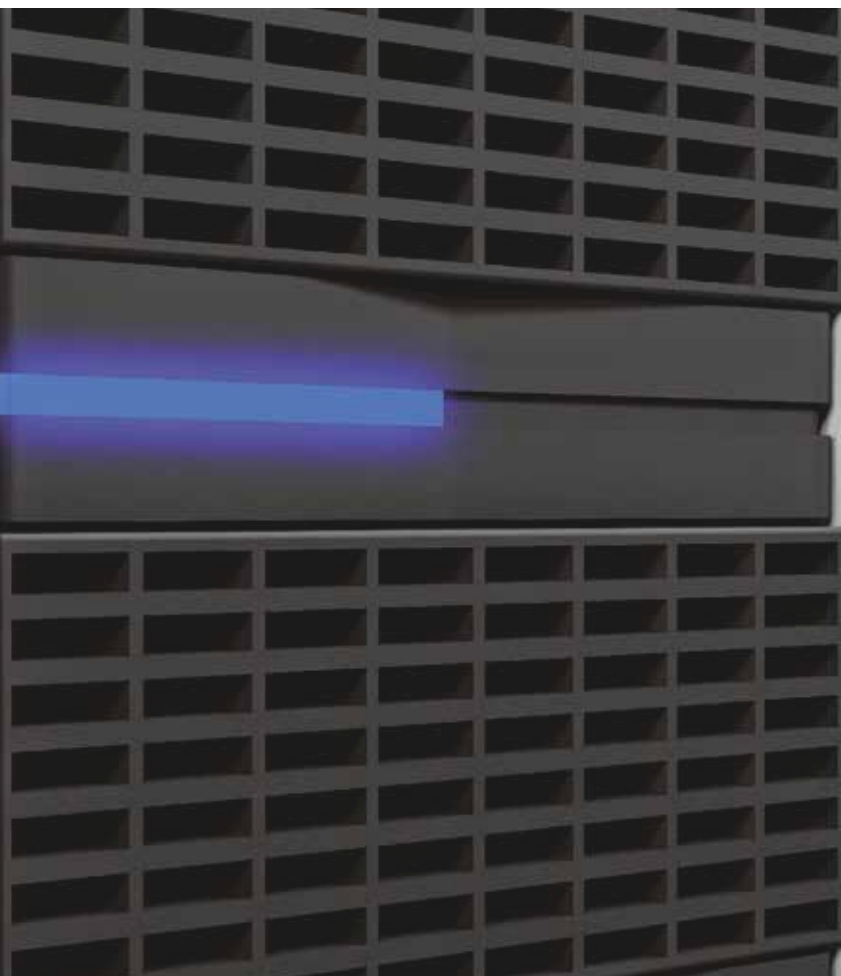
Quality is also good service

The professionalism of a company is also reflected in the timeliness of delivery, installation and start-up assistance and after-sales support.

An information system developed to meet customers' needs, a widespread distribution system and highly trained technicians are our first quality assurance.

TECNAIR LV: Professionalism, know-how, quality and safety at the service of the customer.

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EFFICIENCY AND ENERGY SAVING

GREEN BUILDING ENGINEERING

The design of environmentally friendly systems (Green Building) is the engineering challenge of recent years. A building can be defined a Green Building if it has been designed, built and managed in a sustainable and efficient way, and certified as such by an independent third party.

TECNAIR LV 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

Starting in 2012, **TECNAIR LV** was the first company in the market to choose to standardise fans with EC technology on the full range of close control air conditioners. This has resulted in energy savings of over 40% compared to the previous generation of fans.



Today **TECNAIR LV** wants to maintain this leadership by choosing to be the first to:

- Provide the full range of close control air conditioners with an advanced microprocessor control system, characterised by features that optimise unit control and system energy saving.
- Install the latest generation of EC fans, entirely controlled via Modbus® protocol, on the full range of close control air conditioners.
- Install electronic expansion valves on the entire range of direct expansion close control air conditioners.
- Make available for brushless DC compressors 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.

With the introduction of the **POWER VALVE** system, available as an accessory on chilled water units, implementing the water system has been simplified, resulting in construction cost reductions.

The **SMART COOL** system, instead, 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 revolutionised, increasing energy savings and safety compared to older systems.



REDUCING OPERATING COSTS

Through the use of high quality components, close control air conditioning units guarantee high reliability.

Managing and servicing close control air conditioning units 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 **SMART COOL** system.
- Advanced supervision of the water circuit, thanks to the use of the **POWER VALVE** system.
- “Tool-less” maintenance, with all the operation values of fans, cooling circuit, inverter compressors and chilled water 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.

TECNAIR LV can boast the following certifications:

- **Quality certification UNI EN ISO 9001:2008** regarding the design, manufacture and service of direct expansion air conditioners, chilled water air conditioners and air cooled condensers.
- **UNI EN ISO 50001:2011 certification** regarding the energy management of the production facility located in Uboldo (VA).
- **Rating 1 Cribis D&B certificate** that acknowledges **TECNAIR LV** the highest degree of economic-financial reliability.
- **CE certification of conformity with European Directives:**
 - Machinery Directive (MD) 2006/42/EC
 - Pressure Equipment Directive (PED) 97/23/EC (Only Direct Expansion units)
 - Electromagnetic Compatibility Directive (EMC) 2004/108/EC
 - Low Voltage Directive (LVD) 2006/95 EC
- **Compliance with the Eco-design Directive 2009/125/EC (ERP - Energy Related Products)** regarding the eco-design of electrical and electromechanical systems.
- **Compliance with IEC 60068/2/57:2013 and IEEE std 693:2005 standards** regarding the design and anti-seismic construction of electrical and electromechanical equipment.
- **EAC Declaration of Conformity of the Eurasec Customs Union (Russia, Kazakhstan and Belarus)** attesting the compliance of products with the Eurasec Customs Union regulations, allowing free trade therein.
- **Registration to the Conformity Assessment Programme for the Kingdom of Saudi Arabia (KSA CAP)** attesting the compliance of products with the regulations of the Kingdom of Saudi Arabia, allowing free trade therein.



TECHNOLOGICAL INNOVATIONS

SURVEY^{evolution}

NEW GENERATION ELECTRONIC CONTROL SYSTEM

The units of TECNAIR LV close control air conditioning range feature an advanced electronic control system called SURVEY^{EVO}, 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 optimised 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.



SNMP

TECHNOLOGICAL INNOVATIONS



HIGH PERFORMANCE, LOW POWER CONSUMPTION ELECTRONIC FANS

The units of TECNAIR LV 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

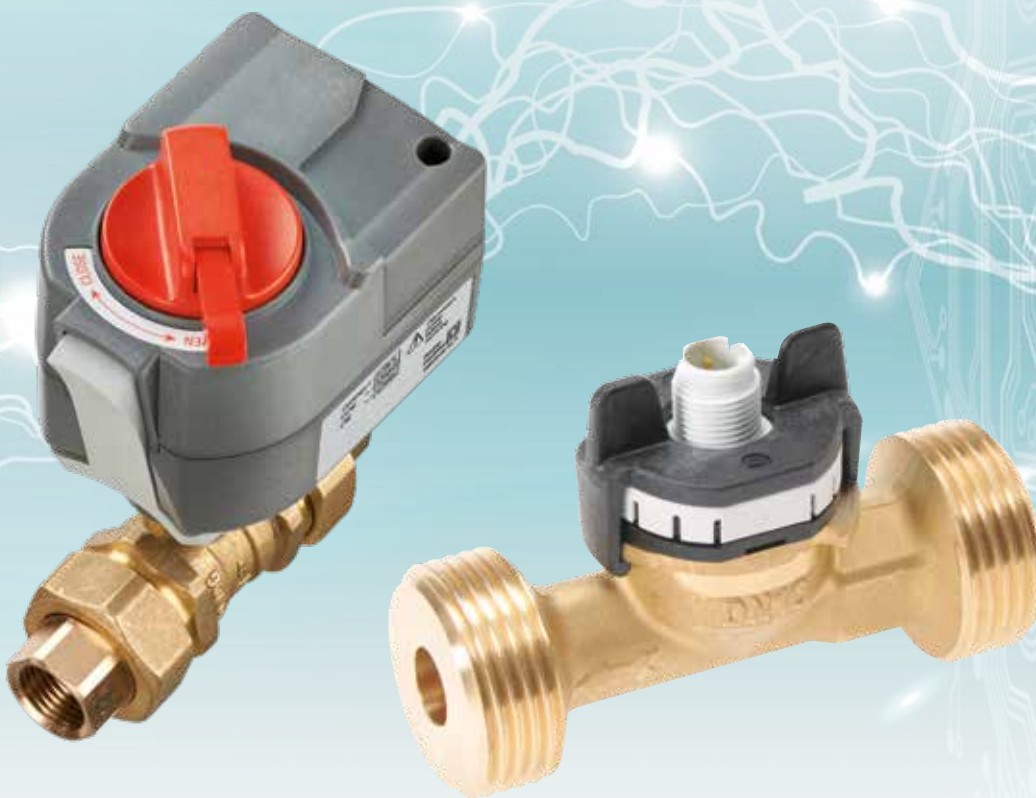
Thanks to **high reliability components** and the **independent management** of each fan, a high level of system reliability can be ensured.

TECHNOLOGICAL INNOVATIONS



CONTROL VALVE WITH FLOW RATE AND ENERGY ELECTRONIC MONITORING

The chilled water units of the TECNAIR LV 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 **POWER 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.

TECHNOLOGICAL INNOVATIONS



ELECTRONIC EXPANSION VALVE

The units of the TECNAIR LV close control air conditioning range are equipped with electronic expansion valves to maximise 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 optimising 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.

TECHNOLOGICAL INNOVATIONS



DC COMPRESSOR WITH INVERTER REGULATION

The direct expansion units of the TECNAIR LV close control air conditioning range can be equipped with DC compressors with inverter regulation which allow the delivered cooling capacity to be varied, maximising 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 optimising 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

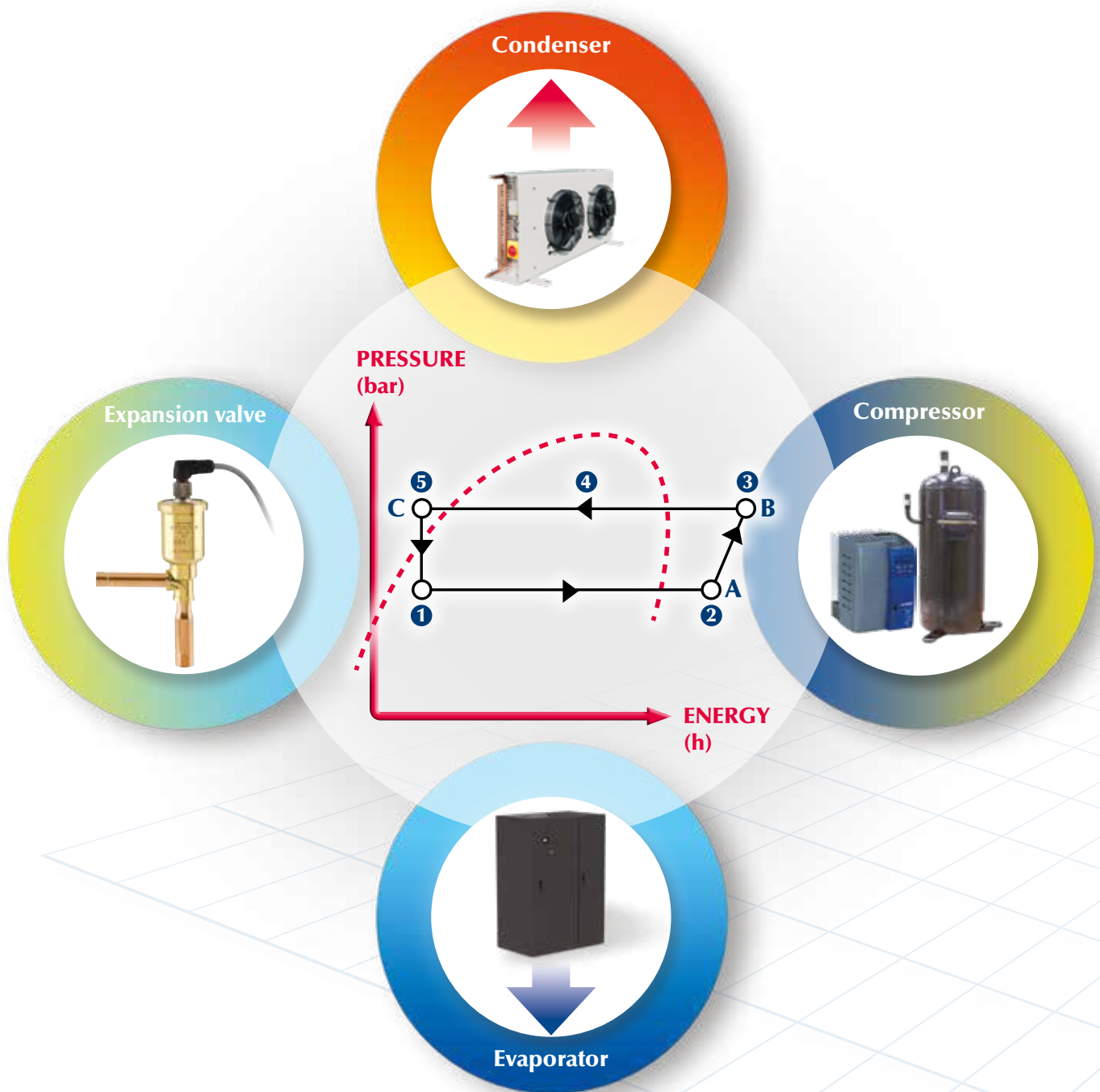
Thanks to the inverter control system, the brushless DC motor and the “High Pressure Shell” system, **it is possible to ensure the system high functional efficiency**, minimising the need to service the cooling circuit.

FOCUS ON



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 **SMART COOL** 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, the following quantities are detected:

- 1) **Evaporation pressure and temperature** of the refrigerant in the evaporator.
- 2) **Refrigerant temperature aspirated** (suction) by the compressor.
- 3) **Temperature of the supply line refrigerant** (discharge) from the compressor.
- 4) **Condensing pressure and temperature** of the refrigerant in the condenser.
- 5) **Temperature of the outgoing liquid refrigerant** from the condenser.

The following values are calculated from these figures:

- A) **Superheat** of the refrigerant (SH).
- B) **De-superheat** of the refrigerant (DSH).
- C) **Subcooling** of the refrigerant (SC).

If a DC inverter compressor is installed, the following values will also be monitored:

- **Actual speed** in hertz (Hz)
- **Electrical power consumption** in amps (A)
- **Power draw** in kilowatt (kW)

OPERATIONAL SAFETY

The **SMART COOL** system actively manages 10 different safety function, designed to provide high operational safety:

- **Low evaporation pressure** of the circuit (Low Pressure - LP)
- **High condensing pressure** of the circuit (High Pressure - HP)
- **Low operating pressure** of the circuit (LOP)
- **High operating pressure** of the circuit (Maximum Operating Pressure - MOP)
- **Compressor low compression ratio** (LCR)
- **Low superheat** value (LoSH)
- **High superheat** value (HiSH)
- **Low de-superheat** value (LDSH)
- **High de-superheat** value (HDSH)
- **Refrigerant high discharge temperature** (HDT)

TOOL-LESS SIMPLIFIED MAINTENANCE

The **SMART COOL** 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.**

FOCUS ON



THE INTELLIGENT LOCAL NETWORK

The units of the TECNAIR LV 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.



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**.

DUTY / STAND-BY

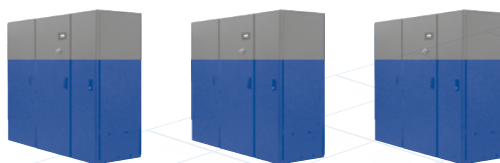


On 100%

On 100%

Stand-by

SMART NET



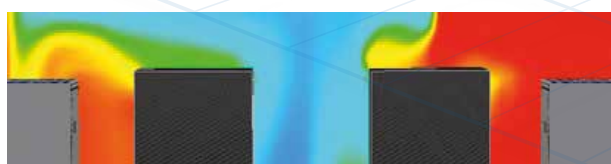
On 60%

On 60%

On 60%

Thanks to a system of **active average of ambient conditions**, 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.

DUTY / STAND-BY



On 100%

Stand-by

SMART NET



On 60%

On 60%



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 maximising the safety of the units operating in the network, the **SMART NET** system has been developed with a **MULTIMASTER management logic**. In the **MULTIMASTER 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.

FOCUS ON

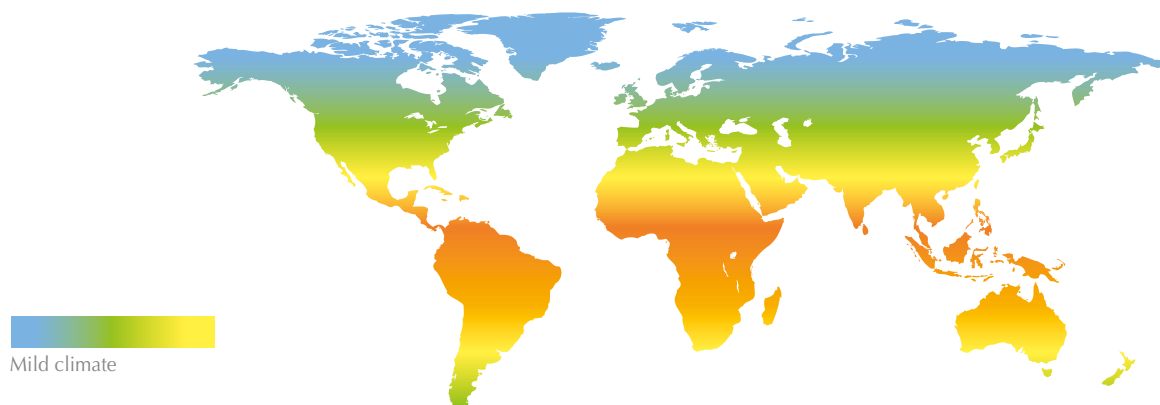


HIGH ENERGY SAVING AIR CONDITIONING UNIT

Using renewable energy sources is required to reduce the environmental impact of systems. TECNAIR LV has developed innovative FREE COOLING systems able to achieve energy savings of over 50% compared to a conventional air conditioner.

FREE COOLING FROM RENEWABLE SOURCES

Using **outside air to cool environments** is the primary source of energy savings available in temperate climate areas.



TECNAIR LV has therefore decided to invest in the development of **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	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%

Notes: (1) Number of hours with temperatures lower than or equal to 18°C. (2) Percentage calculated on a total of 8,760 hours per year.

INDIRECT FREE COOLING

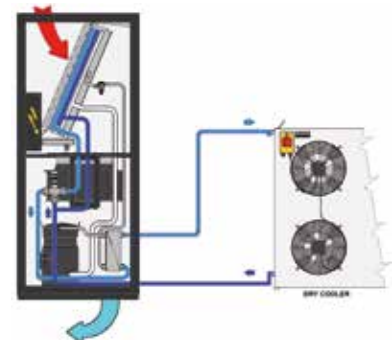
The **indirect FREE COOLING** system is characterised by a **hybrid unit**, consisting of a primary water circuit and a secondary direct expansion or chilled water circuit. The primary water circuit is connected to a dry cooler that uses outside air - a source of renewable energy - to cool water. The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

OPTIMISED OPERATING PROCEDURES

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

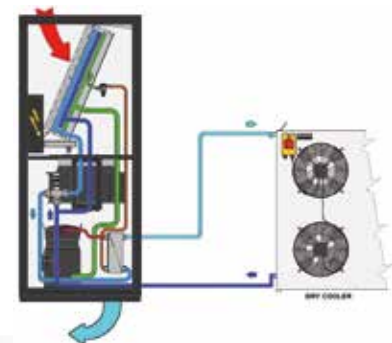
TOTAL FREE COOLING

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



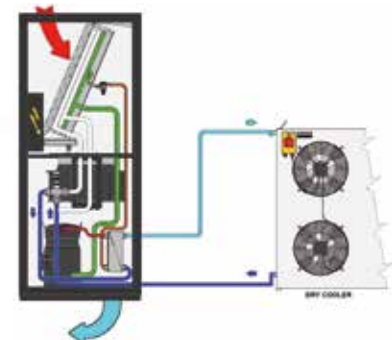
PARTIAL FREE COOLING

In addition to operating the **FREE COOLING** circuit, mechanical cooling can be triggered for the time strictly necessary to meet the demand for cooling.



NO FREE COOLING

Regulation is completely entrusted to mechanical cooling, excluding the **FREE COOLING** circuit.



SELF-ADAPTIVE SET-POINT OF THE DRY COOLER

In order to maximise the efficiency of the **FREE COOLING** system, the unit can handle the regulation of the dry cooler coupled to it directly. **Thanks to the self-adaptive set-point function, the fan speed can be regulated so that the water always has a temperature consistent with the outside air conditions.**

This leads to an **increase in the system efficiency**, allowing you to maximise the performance of both the **FREE COOLING** circuit and the direct expansion circuit, ensuring low condensing temperatures. In addition, the fans of the dry cooler will partially operate even with high temperatures, thereby increasing the energy savings of the system.



FOCUS ON



DUAL CIRCUIT SYSTEM

Some critical applications require safety devices that prevent discontinuity of operation due to system problems. TECNAIR LV has developed specific units, named TWO SOURCES, provided with two totally independent cooling sources.



HIGH OPERATIONAL SAFETY

In an air conditioning system, the main cooling source may be insufficient to guarantee suitable environmental conditions. This may be due to an overload of the system, maintenance, possible seasonal closures or any type of emergency that may arise.

A reduction in the machine cooling capacity can lead to great instability in the system, reducing the ability to control the system thermo-hygrometric conditions, even in the presence of redundancy or **SMART NET** systems.

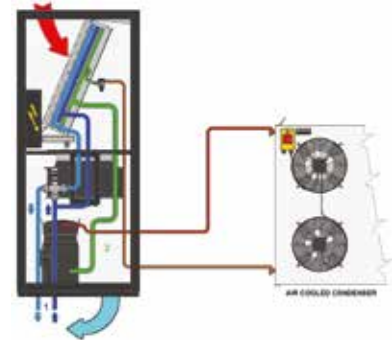
So as to avoid these problems, specific **TWO SOURCES (TS)** units have been developed providing a second source of cooling, complete with its own control valve and totally independent from the primary one.

A SAFE, FLEXIBLE SYSTEM

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

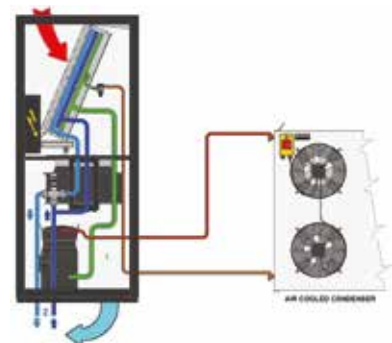
CHILLED WATER + DIRECT EXPANSION TWO SOURCES

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



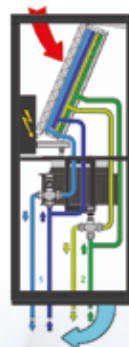
DIRECT EXPANSION + CHILLED WATER TWO SOURCES

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



CHILLED WATER + CHILLED WATER TWO SOURCES

Both sources of the unit are chilled water coils. The primary one is normally connected to a building chiller or to District Cooling. The emergency source can be connected to a dedicated chiller or a groundwater/aqueduct water distribution network.



P series

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



SURVEY evolution

EC fans

SMART net

FREE cooling

Pseries

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.

GENERAL FEATURES

- 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
- **SURVEY^{EVO}** 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 **SMART COOL system**
- Three-way control valves
- Unit shutdown system for the presence of fire
- RS485 Modbus[®] RTU slave card

POWER  **VALVE**

SMART  **COOL**

EEV  **VALVE**

DC  **COMPRESSOR**

TWO  **SOURCES**

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.

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

MODELS		71	141	211	251	301	302	361	461	422	512	662	852	932
Performance														
Total cooling capacity (1)	kW	7.8	14.9	21.3	26.8	33.6	30.9	37.8	48.1	43.7	54.2	67.3	90.1	93.3
Sensible cooling capacity (1)	kW	7.6	13.4	21.3	25.6	31.7	30.6	37.8	47.9	43.7	52.8	64.8	77.0	85.0
EER (2)		3.69	3.37	3.15	3.18	3.08	3.20	3.30	3.43	3.27	3.25	3.13	3.33	3.53
Air flow rate	m ³ /h	2,200	3,200	7,000	7,000	8,700	8,700	14,500	14,500	14,500	14,500	17,900	17,900	20,700
Noise level (3)	dB(A)	51	57	62	62	60	60	65	65	65	64	62	63	60
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	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
Net weight	kg	180	210	270	270	320	340	440	450	450	500	640	660	860
Free Cooling		○	○	○	○	●	●	○	○	○	○	●	●	○
Two Sources		○	○	●	○	●	●	○	○	○	○	●	●	○

UPU: Chilled water air conditioners with downflow air supply

MODELS		10	20	30	50	80	110	160	220
Performance									
Total cooling capacity (1)	kW	10.2	18.0	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity (1)	kW	9.2	15.4	29.8	38.1	62.1	72.0	109.7	144.0
EER (2)		34.42	28.52	22.83	21.48	23.95	24.29	23.62	24.29
Air flow rate	m ³ /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
Dimensions and weights									
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		○	○	○	●	○	●	●	○
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.

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.

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

MODELS		71	141	211	251	301	302	361	461	422	512	662	852	932
Performance														
Total cooling capacity (1)	kW	7.8	14.9	21.3	26.8	33.6	30.9	37.8	48.1	43.7	54.2	67.3	90.1	93.3
Sensible cooling capacity (1)	kW	7.6	13.4	21.3	25.6	31.7	30.6	37.8	47.9	43.7	52.8	64.8	77.0	85.0
EER (2)		3.69	3.37	3.15	3.18	3.08	3.20	3.30	3.43	3.27	3.25	3.13	3.33	3.53
Air flow rate	m ³ /h	2,200	3,200	7,000	7,000	8,700	8,700	14,500	14,500	14,500	14,500	17,900	17,900	20,700
Noise level (3)	dB(A)	51	57	62	62	60	60	65	65	65	64	62	63	60
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	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
Net weight	kg	180	210	270	270	320	340	440	450	450	500	640	660	860
Free Cooling		○	○	○	○	●	●	○	○	○	○	●	●	○
Two Sources		○	○	●	○	●	●	○	○	○	○	●	●	○

OPU: Chilled water air conditioners with upflow air supply

MODELS		10	20	30	50	80	110	160	220
Performance									
Total cooling capacity (1)	kW	10.2	18.0	32.4	43.6	66.8	80.2	121.9	160.3
Sensible cooling capacity (1)	kW	9.2	15.4	29.8	38.1	62.1	72.0	109.7	144.0
EER (2)		34.42	28.52	22.83	21.48	23.95	24.29	23.62	24.29
Air flow rate	m ³ /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
Dimensions and weights									
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		○	○	○	●	○	●	●	○
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:

- 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
- "Power 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:

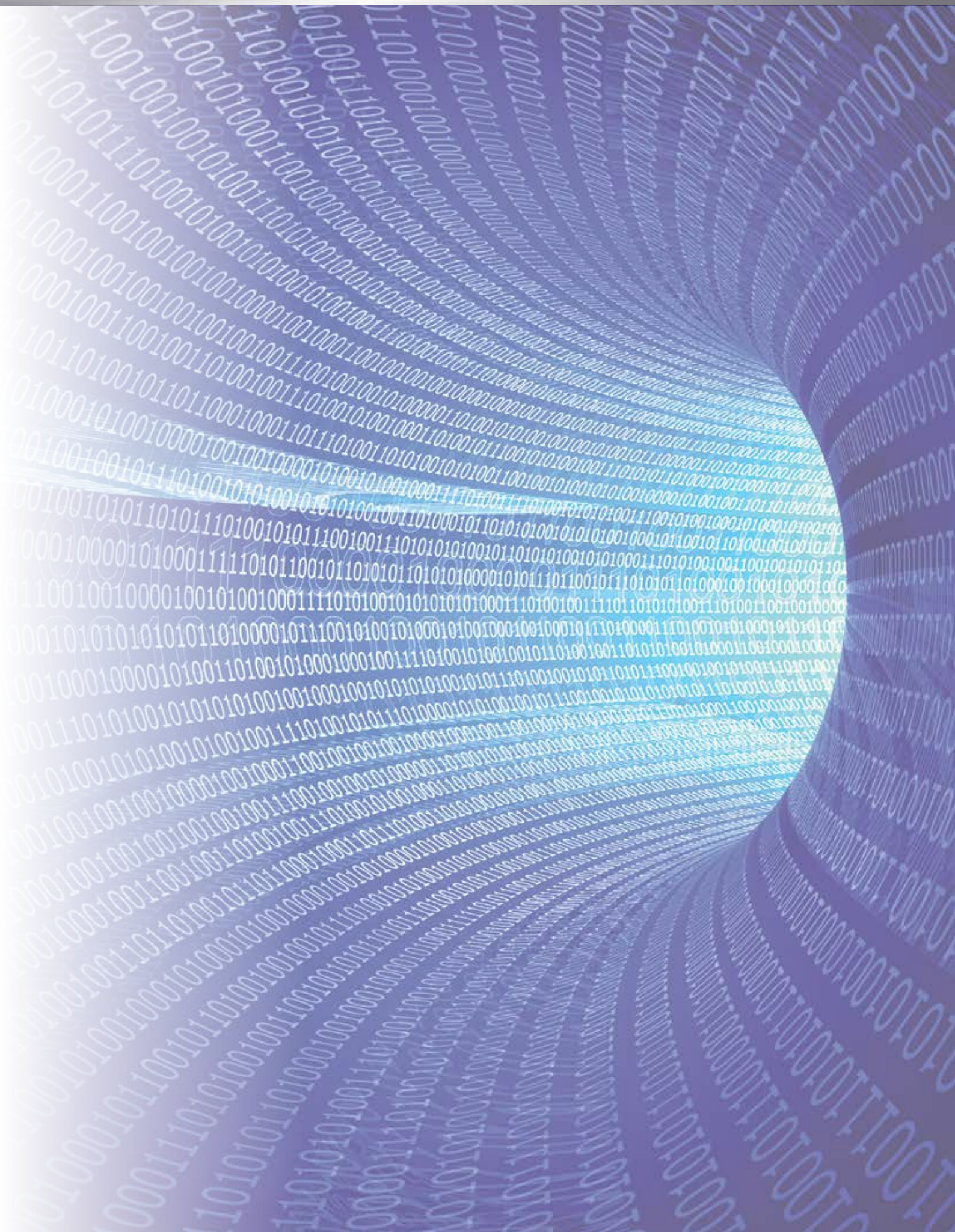
- Condensate drain pump
- Condensate and humidifier drain pump
- Supply overpressure relief damper
- M5 efficiency class intake air filter (EU5)
- Soundproofed duct section on the supply line
- Distribution plenum with adjustable grilles
- Height adjustable stand for installation with raised floor
- 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





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



SURVEY evolution

EC fans

SMART net

FREE cooling



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.

GENERAL FEATURES

- 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
- **SURVEY^{EVO}** 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 **SMART COOL** system
- Two-way control valves
- Unit shutdown system for the presence of fire
- RS485 Modbus[®] RTU slave card

POWER  **VALVE**

SMART  **COOL**

EEV  **VALVE**

DC  **COMPRESSOR**

TWO  **SOURCES**

AIR CONDITIONERS WITH DOWNFLOW AIR SUPPLY



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



Standard version for data center perimetral 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.

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

MODELS		461	612	932
Performance				
Total cooling capacity (1)	kW	49.2	62.2	103.5
Sensible cooling capacity (1)	kW	48.1	54.7	103.5
EER (2)		3.87	3.25	4.06
Air flow rate	m ³ /h	9,500	10,000	19,000
Noise level (3)	dB(A)	57	58	59
Dimensions and weights				
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

UGU: Chilled water air conditioners with downflow air supply

MODELS		70	150	230	300
Performance					
Total cooling capacity (1)	kW	43.3	85.1	124.4	170.2
Sensible cooling capacity (1)	kW	43.3	85.1	124.4	170.2
EER (2)		31.12	32.48	34.65	39.13
Air flow rate	m ³ /h	9,500	19,000	28,500	38,000
Noise level (3)	dB(A)	57	59	61	60
Dimensions and weights					
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	1,250

Notes:

- (1) Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 32°C-30%Rh; water 15/20°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.
- (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:

- Three-way control valves
- Inlet and outlet water temperature sensors
- "Power 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

R series

R series close control air conditioners are built and sized in such a way that they can be installed alongside data center racks.



SURVEY evolution

EC fans

SMART net

FREE cooling

CLOSE CONTROL AIR CONDITIONERS FOR “IN ROW” INSTALLATION

R series

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.

GENERAL FEATURES

- 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
- **SURVEY^{EVO}** 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 **SMART COOL** system
- Three-way control valves
- Unit shutdown system for the presence of fire
- RS485 Modbus[®] RTU slave card

POWER  **VALVE**

SMART  **COOL**

EEV  **VALVE**

DC  **COMPRESSOR**

TWO  **SOURCES**

AIR CONDITIONERS WITH HORIZONTAL AIR SUPPLY



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

HRA: Direct expansion air conditioners with horizontal supply and aircooled or watercooled condensers

MODELS		231	361
Performance			
Total cooling capacity (1)	kW	23.9	31.5
Sensible cooling capacity (1)	kW	23.9	27.2
EER (2)		3.79	3.33
Air flow rate	m ³ /h	6,000	6,800
Noise level (3)	dB(A)	52	54
Dimensions and weights			
Width	mm	600	600
Depth	mm	1,222	1,222
Height	mm	1,985	1,985
Net weight	kg	215	215
Free Cooling		•	◦
Two Sources		•	◦

HRU: Chilled water air conditioners with horizontal supply

MODELS		20	40
Performance			
Total cooling capacity (1)	kW	23.9	34.4
Sensible cooling capacity (1)	kW	23.9	34.4
EER (2)		24.88	27.29
Air flow rate	m ³ /h	6,000	9,000
Noise level (3)	dB(A)	52	61
Dimensions and weights			
Width	mm	300	600
Depth	mm	1,200	1,222
Height	mm	1,970	1,985
Net weight	kg	120	190
Free Cooling		◦	•
Two Sources		◦	•

Notes:

- (1) Performance refers to: R410a refrigerant; condensing temperature 45°C; incoming air 32°C-30%Rh; water 15/20°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
- “Power Valve” kit

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

F series

F series close control air conditioners exploit the indirect FREE COOLING system with adiabatic cooling to ensure high system energy savings.



SURVEY evolution

EC fans

SMART net

FREE cooling

F series

The F series units are the ideal solution to cool air in systems where environmental sustainability and energy savings are priorities, such as large, latest generation data centers, ensuring a performance similar to direct **FREE COOLING** without however contaminating air-conditioned premises, as outside air contains pollutants, dust, and humidity.

The units are designed to be installed outdoors, typically on the roof, and consist of two treatment sections, one for inside air and another for outside air, physically separated and with two completely independent filtering and ventilating sections.

GENERAL FEATURES

- **EUROVENT** certified plate heat exchanger
- **OXYVAP**® evaporative panel
- White RAL 9010 metal structure
- Panels with 50-mm thermal and acoustic insulation
- G4-class efficiency air filters with dirty filter alert
- Electronic **EC FANS**
- Electric panel complete with control and safety devices
- **SURVEY**^{EVO} control microprocessor with graphic display
- Unit shutdown system for the presence of fire
- RS485 Modbus® RTU slave card
- RJ45 ethernet card

POWER VALVE

SMART COOL

EEV VALVE

DC COMPRESSOR

INDIRECT FREE COOLING WITH ADIABATIC COOLING

The **indirect FREE COOLING system with adiabatic cooling** includes both the technology of air-to-air heat recovery and that of the adiabatic cooling, in which some water is evaporated to cool down outside air.

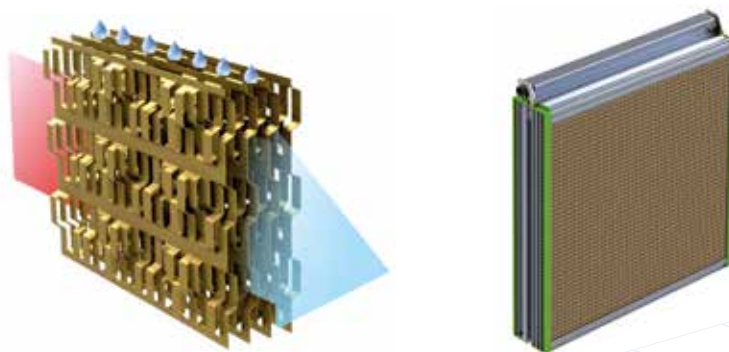
Being able to exploit the **FREE COOLING system even at external temperatures of 30°C/35%Rh**, these units **can achieve very high energy efficiency and energy savings of over 80% compared to a mechanical cooling system.**

AN INNOVATIVE EVAPORATIVE PANEL

In order to maximise the system efficiency, **TECNAIR LV** uses an innovative evaporative panel that allows **saturation efficiency greater than 90% using more than 60% less water.**

Thanks to the **OXYVAP®** system, formed by special **aluminium fins treated to retain water**, it is possible to:

- **Use drinking water.** No expensive water demineralisation systems, indispensable in conventional spraying systems, are required.
- **Cut down on water consumption.** An over 60% water reduction compared to conventional evaporative panels and spraying systems.
- **Eliminate the risk of the formation of mould, algae and pathogenic organisms.** The surface treatment of aluminium fins and the absence of a collection and water circulation tank eliminates the risk of pathogenic organism formation.



EUROVENT CERTIFIED HEAT EXCHANGER

The air-to-air plate heat exchangers allow heat to be transferred from one flow to another under the action of a temperature difference. Their design allows for higher reliability of the unit and easier maintenance, as these exchangers have no moving parts and are easy to clean.

TECNAIR LV uses certified EUROVENT plate heat exchangers to ensure optimum performance and reliability, thanks to independent tests that confirm their validity.



FREE COOLING AIR CONDITIONERS WITH ADIABATIC COOLING

SPECIFIC SURVEY^{EVO} CONTROL SOFTWARE

TECNAIR LV has developed a specific software based on SURVEY^{EVO} hardware which allows the combination of close control advanced functions with those needed to optimise the **FREE COOLING** system control.

Thanks to the integrated Ethernet card, units can be supervised via specific web pages while being regularly interfaced with supervision and building management systems (BMS).

ENHANCED OPERATING MODES

The units with indirect **FREE COOLING** system and adiabatic cooling can work in three operating modes:

WINTER MODE

During the winter period, units **exploit the plate heat exchanger to cool down the air coming from the system**. The outside air flow is adjusted to provide the cooling capacity needed to cool down the system, **thus optimising efficiency and energy savings**. The air flow to the system is kept constant by managing the air flow rate or the environment pressure.



SUMMER MODE

During the summer period, **the evaporative panel is enabled**. This, by saturating the outside air flow, reduces the temperature thereof. This **allows you to continue to exploit the plate heat exchanger to cool down the air coming from the system**. The outside air flow and the activation of the evaporative panel are adjusted to provide the cooling capacity needed to cool down the system, **thus optimising efficiency and energy savings**. The air flow to the system is kept constant by managing the air flow rate or the environment pressure.



SUPPLEMENTARY POST COOLING

Under extreme external conditions, it is possible to install a supplementary **post cooling circuit** which allows you to further cool down the air already treated by the plate heat exchanger, keeping the heat and humidity conditions required by the system. This can be a direct expansion or a chilled water supplementary circuit.



FREE COOLING AIR CONDITIONERS WITH ADIABATIC COOLING



Version for outdoor installation with crossed air flows

AFC: Free cooling air conditioners with adiabatic cooling

MODELS		120
Performance		
Nominal cooling capacity (1)	kW	120
EER (3)		9.60
Nominal cooling capacity (2)	kW	100
EER (3)		8.10
Air flow rate	m ³ /h	30,000
Water consumption (4)	l/h	230
"Structure" noise level (5)	dB(A)	64
"Air inlet" noise level (5)	dB(A)	80
"Air Supply" sound level (5)	dB(A)	86
Dimensions and weights		
Width	mm	6,530
Depth	mm	2,500
Height	mm	2,900
Net weight	kg	4,500

Notes:

- (1) Performance refers to: outside air 35°C-40%Rh; inside air 38°C-30%RH, ΔT 12 K; external static pressure 50 Pa.
- (2) Performance refers to: outside air 35°C-40%Rh; inside air 35°C-30%RH, ΔT 10 K; external static pressure 50 Pa.
- (3) EER (Energy Efficiency Ratio) = total cooling capacity / fans power consumption.
- (4) Water consumption refers to: outside air 35°C-40%Rh; conductivity ≤1000 μS/cm; network pressure 3 Bar.
- (5) Sound levels at a 2 m distance, in a free field, as per UNI EN ISO 3744:2010.

AVAILABLE ACCESSORIES

Direct expansion:

- Direct expansion, supplementary post cooling circuit with DC inverter compressors
- 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 adjustment valve
- "HT Kit" for operation at high condensing temperatures

Chilled water:

- Chilled water, supplementary post cooling circuit with two-way control valve
- Three-way control valves
- Inlet and outlet water temperature sensors
- "Power valve" kit

Mechanical and structural:

- Condensate drain and adiabatic panel discharge pump
- Outside air flow motorised dampers
- Inside air flow motorised dampers
- Motorised damper for environment overpressure management
- M5 efficiency class air filters

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

CUSTOMISED VERSIONS

The wide range of TECNAIR LV close control air conditioners allows most design and installation requirements to be met. When this is not the case, however, TECNAIR LV 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

By partnering with LU-VE, TECNAIR LV is able to offer a wide range of air cooled condensers and dry coolers which can be matched to close control air conditioners, or meet any system requirement.

The entire range of air cooled condensers and dry coolers is certified EUROVENT "Certify All".

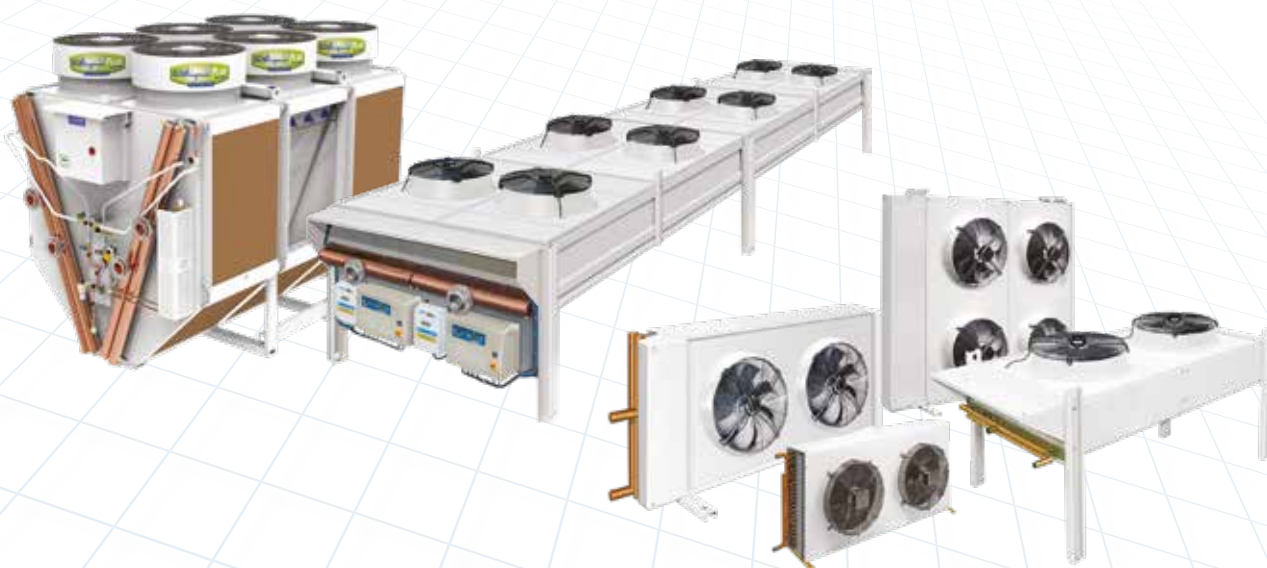


GENERAL FEATURES

- Range of air cooled condensers with capabilities from 4.6 kW to 2340 kW
- Range of dry coolers with capabilities from 11 kW to 2333 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
- Vibration-damping kits
- Electrical panel complete with control, safety devices and fans wiring
- The **Whisperer®** silencers
- Dry and Spray system
- Water Spray System

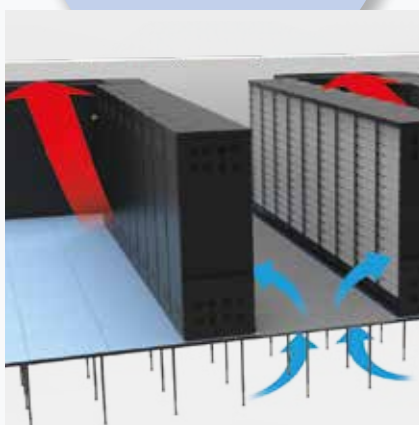


OUR SOLUTIONS FOR DATA CENTERS



LOW Density

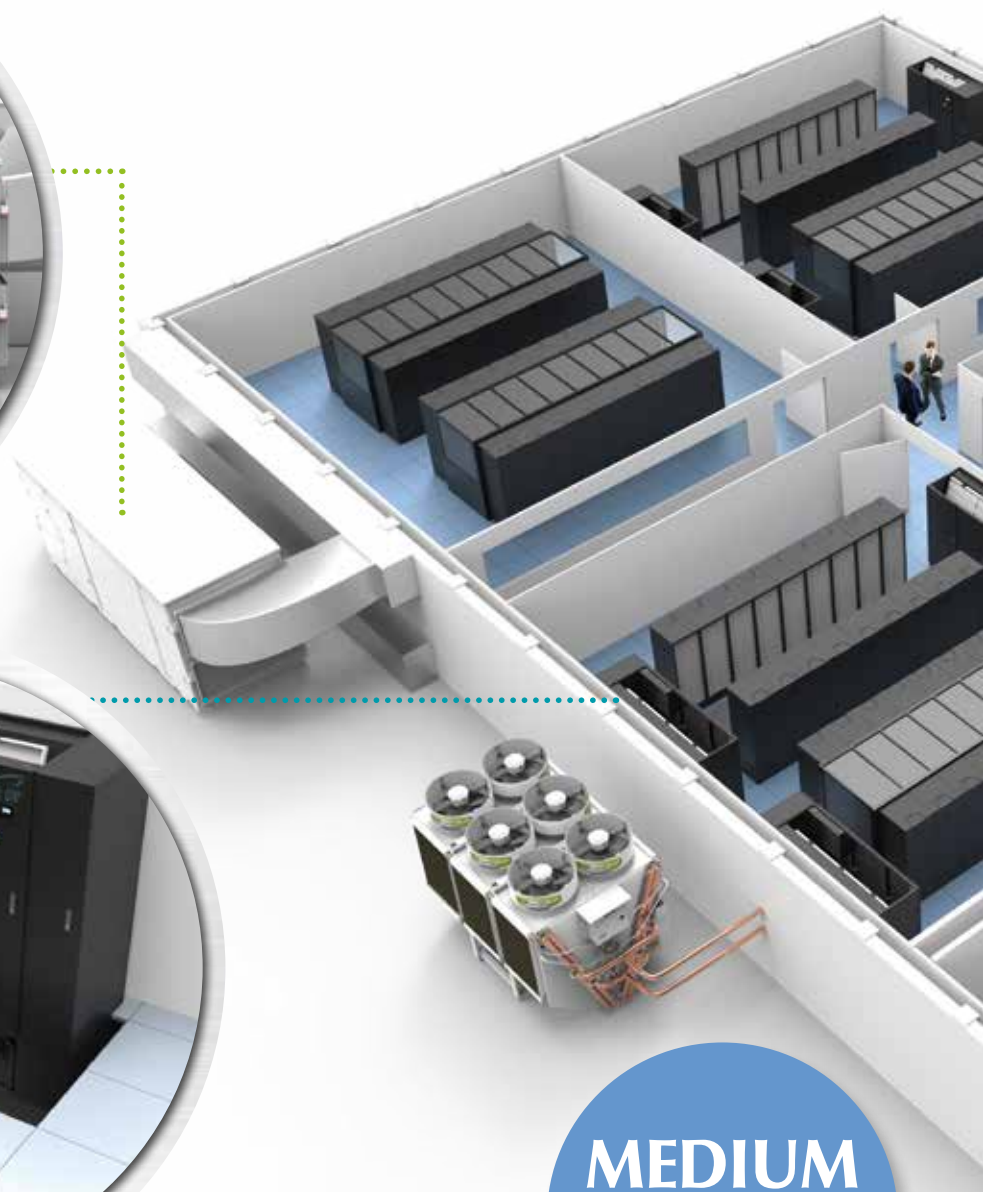
< 10 kW/rack



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

This type of system involves the use of perimetral 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.

SALES 5 SELECTION SOFTWARE

SALES 5 is an innovative selection software for TECNAIR LV products operating on Windows™.

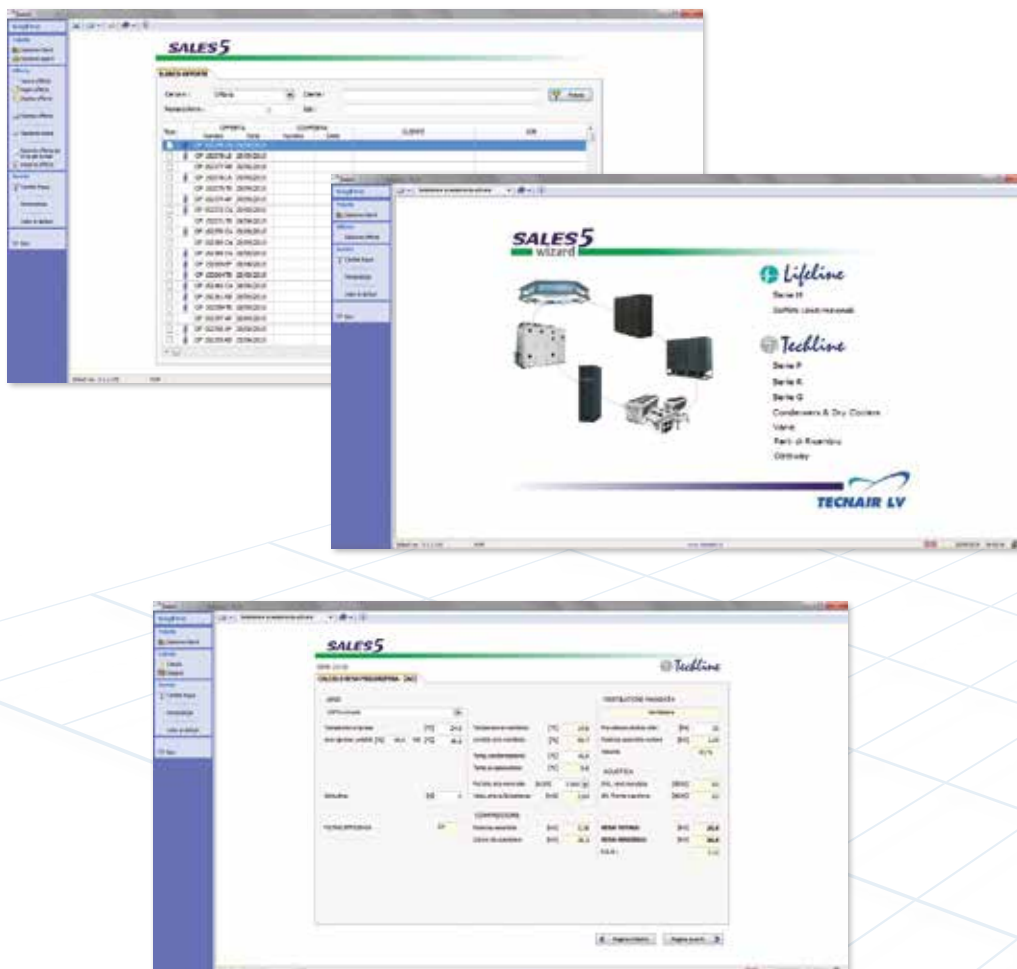
SALES 5 is the ideal tool to select and calculate units in **TECNAIR LV** production landscape. Through a simple, intuitive interface, it allows the user to:

- 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 **SALES 5** 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 SuperVGA (1024x768) resolution or higher
- Adobe® Flash® Player

SALES 5 can be downloaded after registration from **TECNAIR LV** web site: www.tecnairlv.it.



REFERENCES

“Real progress happens only when advantages of a new technology become available to everybody”

Henry Ford



KING ABDULAZIZ INTERNATIONAL AIRPORT Jeddah - Saudi Arabia
921 direct expansion and chilled water close control air conditioners.



NATIONAL LIBRARY OF ROMANIA Bucharest - Romania
185 direct expansion and chilled water close control air conditioners.



KHAZNA DATA CENTER Dubai & Abu Dhabi - United Arab Emirates
156 chilled water close control air conditioners.



CANAL DE PANAMÀ Panama
96 direct expansion close control air conditioners.



BERGEN - FLESLAND AIRPORT Bergen - Norway
64 chilled water close control air conditioners.



BRITISH PETROLEUM Baku - Azerbaijan
46 Two Sources and chilled water close control air conditioners.

THE GROUP



The **LU-VE Group** brand is an international reference in the design, production and marketing of heat exchangers and components for commercial and industrial refrigeration equipment, air conditioning, industrial applications and close control air conditioning.

A process of cultural and technological innovation has made it possible to establish the **LU-VE Group** in Uboldo (Varese), Italy.

A solid, wide-ranging project consisting of 10 production companies and their sales subsidiaries in 12 countries.

LU-VE Group has been listed on the Italian Stock Exchange, on the Alternative Investment Market (AIM) Italia, since July 2015.

Our Core Numbers:

- **2,000** qualified employees
- **390,200 m²** of surface (of which 145,000 m² are covered)
- **2,500 m²** for Research & Development laboratories
- 70% of production is sold in **100 countries**
- Turnover of more than **€ 250 million**



Manufacturing companies



Sales companies



AUSTRALIA



AUSTRIA



FRANCE



GERMANY



HONG KONG



INDIA



POLAND



RUSSIA



SINGAPORE



SPAIN



UAE



UK - EIRE



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