



**IKM
HVAC AS**

**CLOSE
CONTROL
SYSTEMS**

PRODUCT GUIDE



**EXCELLENCE AND INNOVATION IN
PRECISION AIR CONDITIONING**



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CLOSE
CONTROL
SYSTEMS

PRODUCT RANGE



IKM BRANDED PRECISION AIR CONDITIONING.

IKM offers a range of specifically-designed products to fulfil the various types of applications, based on total climate control, reliability and energy efficiency, in order to optimise the investment made in the system.

TOTAL CLIMATE CONTROL.

LONGER SYSTEM SERVICE LIFE.

IKM units are designed especially for rooms with a specific high thermal load and ensure excellent thermal-hygrometric levels.

- **CONSTANT TEMPERATURE.** The use of Inverter* compressors prevents fluctuations in temperature, which could otherwise be damaging to servers.
- **LOW HUMIDITY, HIGH SHR.** Extremely high Sensible Capacity levels, up to 100% SHR: accurate dehumidification prevents the risk of condensation and corrosion on the racks, while maintaining levels to prevent static loads, harmful to data security. Dedicated versions equipped with humidifying and/or dehumidifying systems maintain the optimal level of humidity in every situation.
- **FILTERING SYSTEM, CLEAN AIR.** The air is kept free of impurities that can damage racks thanks to dedicated filtering systems in latex and high filtration fibre (standard M5, accessory F7-EU7).

* Available on dedicated models.



CONSTANT
TEMPERATURE



100% SHR



FILTERING SYSTEM



PRODUCT RANGE

LONG-TERM RELIABILITY.

SHUT-DOWN PREVENTION: THE DATA IS PROTECTED.

IKM precision air conditioners, designed to operate 24/7, 365 days a year, feature components specifically designed for continuous use (heavy duty) and maximum security. The materials are among the most resistant on the market, such as the paints and panels with thermo-acoustic and fireproof insulation that the unit structure is made of.

Specific models are designed according to an internal redundancy system to ensure System operation even in the case of unit failure, such as the dual fluid and dual coil models, or the double cooling circuit versions. The **LOGICA** rear cooling door System is a patented system against hydraulic leaks to guarantee maximum data protection.

The production plant is closely monitored throughout every phase of production, up to final testing of the units, in terms of quality and performance. In the after-sales phase, the Technical Assistance Centres distributed extensively throughout the international territory provide, on request, the on-site unit start-up in addition to complete technical assistance, quickly and precisely, during unit service life.

MAXIMUM ENERGY EFFICIENCY THROUGHOUT THE ENTIRE YEAR'S CYCLE.

REDUCED OPERATING COSTS.

In Data Centre Systems, a considerable part of total consumption is due to air conditioning on year-round operation. Accordingly, it is essential to design a cooling system that minimises energy consumption.

- **INVERTER TECHNOLOGY.** The high-efficiency line for medium-density systems with Scroll Inverter compressors and EC Inverter Plug-Fans features up to 50% less consumption at partial loads in comparison to traditional solutions.
- **LOGICA SYSTEM.** The integrated cooling system for high density systems that offers up to 93% in energy saving in comparison to traditional solutions.
- **FREE-COOLING.** Dedicated IKM cooling systems are designed with the Indirect Free-Cooling logic, others can also be connected to external liquid Chillers equipped with Free-Cooling technology.



HEAVY DUTY
COMPONENTS



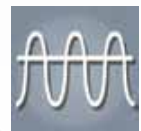
FIREPROOF



REDUNDANCY



AFTER-SALES



INVERTER
TECHNOLOGY



LOGICA SYSTEM



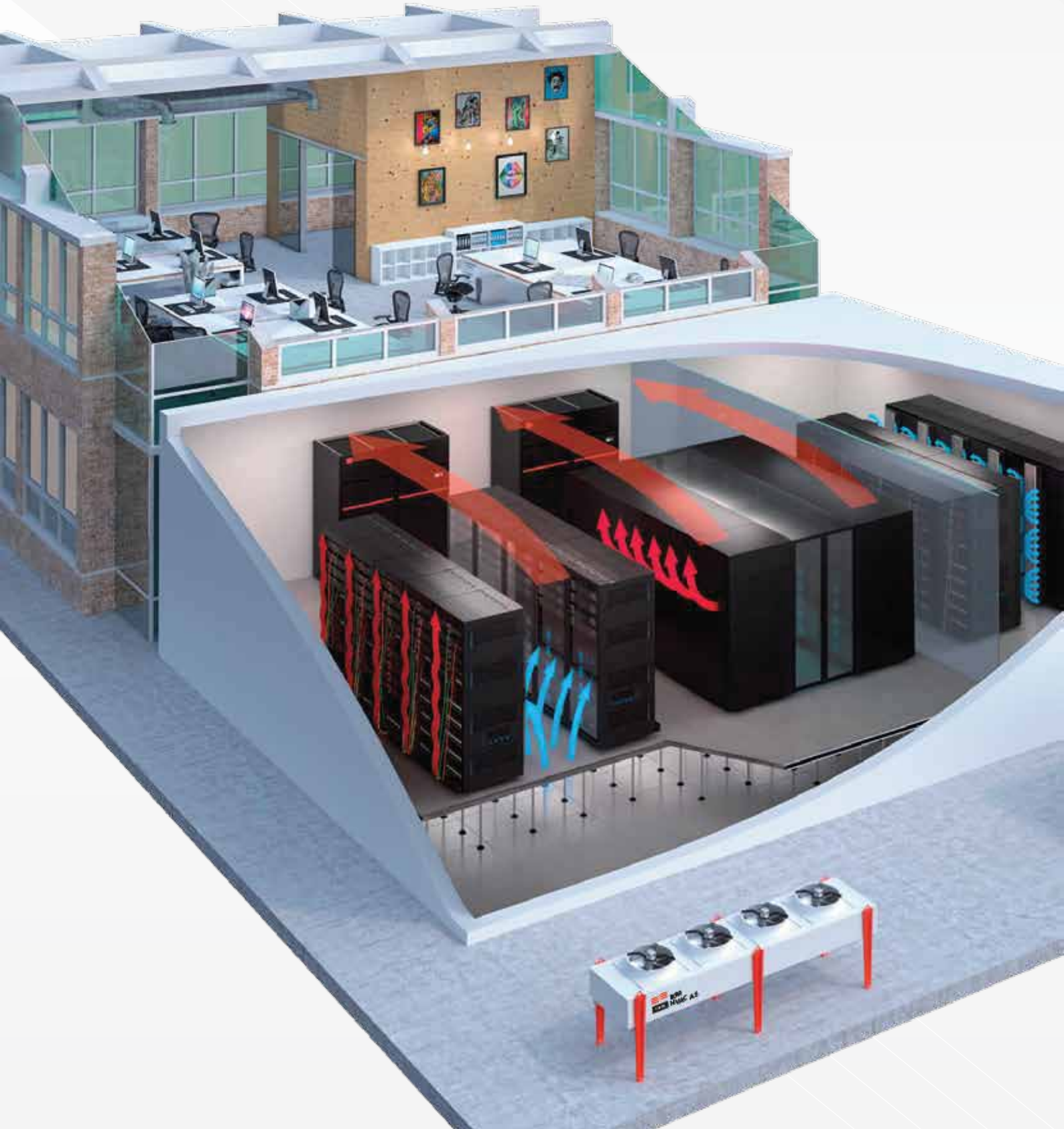
FREE-COOLING



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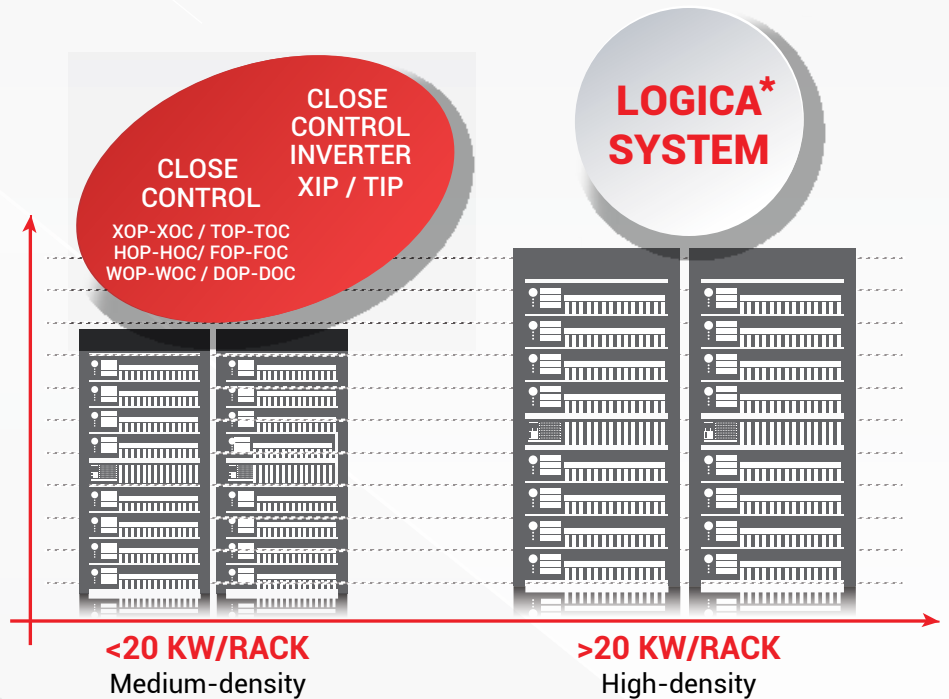
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PRODUCT RANGE

A BROAD RANGE FOR DIFFERENT NEEDS.

IKM offers new ranges, specifically designed on real thermal power loads of server rooms (kW/rack): for traditional, medium-density or latest-generation, high-density Data Centres.





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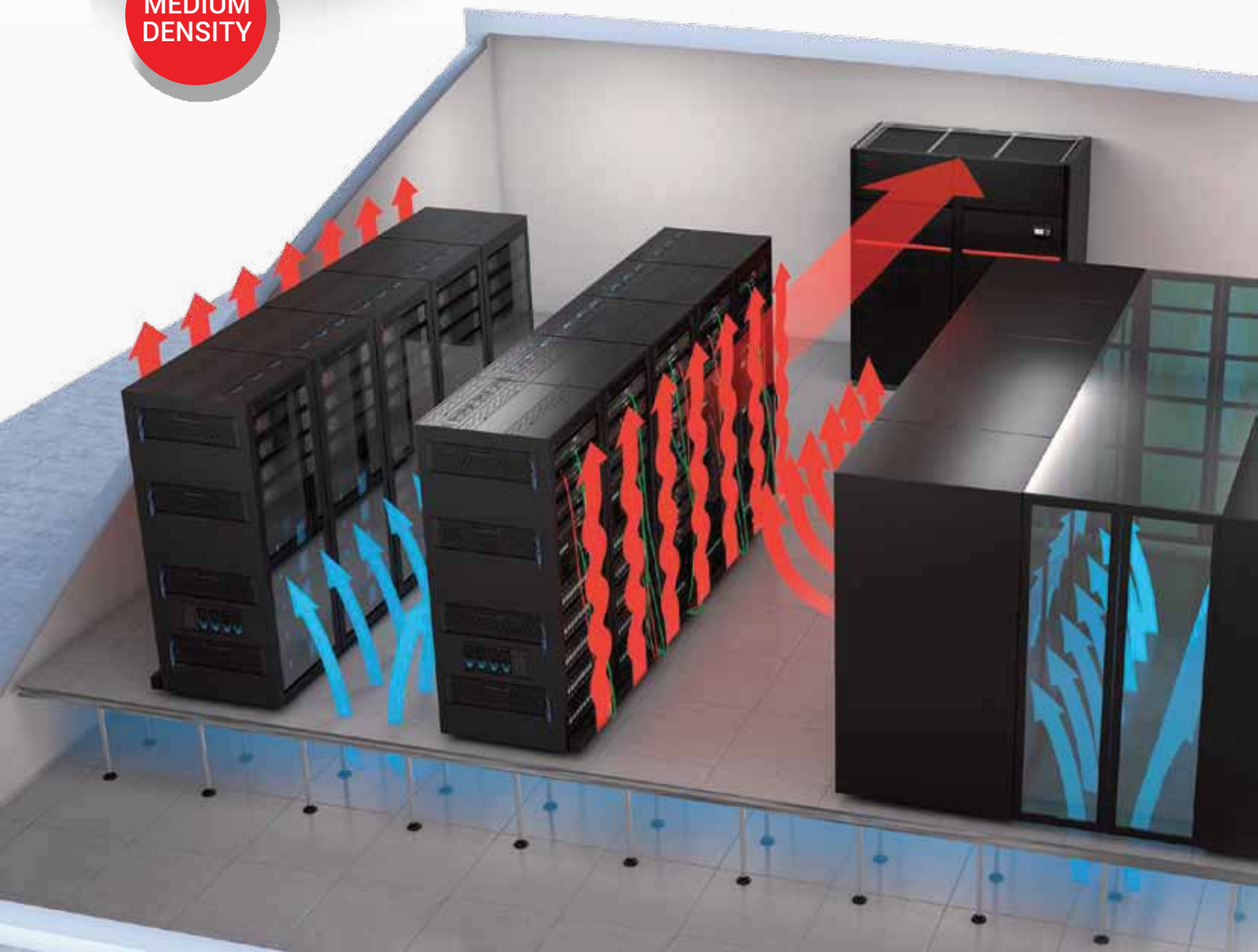
**CLOSE
CONTROL
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PRODUCT RANGE



**MEDIUM
DENSITY**

**CLOSE CONTROL UNITS
FOR MEDIUM-DENSITY
DATA CENTRES
<20 KW/RACK**





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INVERTER COMPRESSOR TECHNOLOGY 

EC INVERTER PLUG FAN 

The server room and its cooling system are designed to create **HOT AND COLD AISLES**. As the thermal power generated by the racks increases in order to reduce dispersion of the cold air produced by the Close Control units, the server room can be designed according to the logic of **CONTAINED COLD AISLES**. By closing the racks with dedicated walls, it prevents hot and cold air from mixing at the top of the aisles, thereby ensuring that all the cold air generated by the Close Control units is directed towards the servers.

This is the simplest solution, with the most reduced investment, and its flexibility makes it possible to re-design the server room quickly if any changes need to be made to the layout.



- INVERTER SCROLL COMPRESSOR
- EC INVERTER PLUG-FANS
- COMPACT DIMENSIONS
- THERMO-ACOUSTIC INSULATION
- REDUNDANCY
- MULTI COMPRESSOR
- HIGH EFFICIENCY LIQUID CHILLER
- FREE-COOLING TECHNOLOGY
- ELECTRONIC EXPANSION VALVE
- CONSTANT AIRFLOW AND STATIC PRESSURE
- REMOTE MANAGEMENT
- SUITABLE FOR HIGH EXTERNAL AMBIENT TEMPERATURE (UP TO 52°C)



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**MEDIUM
DENSITY**

INVERTER COMPRESSOR TECHNOLOGY 

EC INVERTER PLUG FAN 

CLOSE CONTROL INVERTER LINE: THE RANGES

The CLOSE CONTROL INVERTER line is based on the concept of INVERTER applied to compressors and Plug-Fans.

This broad line covers cooling capacities from 17 to 136 kW (from 5 to 39 TON) and includes the ranges:

XIP:

AIRCOOLED DIRECT EXPANSION UNITS WITH FULL INVERTER TECHNOLOGY.

TIP:

AIRCOOLED DIRECT EXPANSION DUAL FLUID UNITS WITH FULL INVERTER TECHNOLOGY.





PRODUCT RANGE



XIP

AIRCOOLED DIRECT EXPANSION UNITS WITH FULL INVERTER

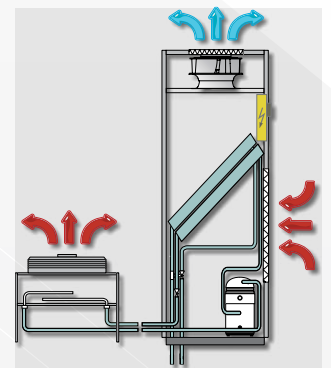
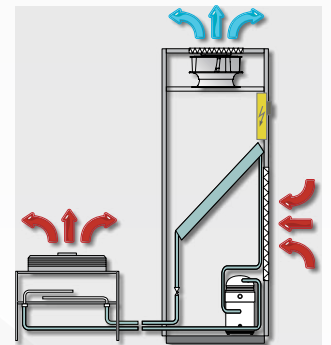
These units use the coolant as a heat carrier. The air in the room is handled in the evaporator coil where the coolant flows; the condensation heat is disposed of in an outdoor air condenser. The XIP series features Inverter Scroll compressor and EC Inverter Plug-Fans.

TIP

AIRCOOLED DIRECT EXPANSION DUAL FLUID UNITS WITH FULL INVERTER

The units in the TIP range are equipped with two separate cooling systems that do not start up simultaneously: a PRIMARY chilled water system (CW) connected to an on-site liquid Chiller, and a SECONDARY direct expansion system (DX) that can also have a back-up function. These models are particularly suited for systems requiring RELIABILITY, DATA PROTECTION and REDUNDANCY of the conditioning system.

The TIP series features Inverter Scroll compressor and EC Inverter Plug-Fans.





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**MEDIUM
DENSITY**

EC INVERTER PLUG FAN

CLOSE CONTROL LINE: THE RANGES

The broad Close Control line covers cooling capacities from 9 to 155 kW (from 3 to 44 TON) and includes the following ranges to fulfil every installation need:

XOP AND XOC:

AIRCOOLED DIRECT EXPANSION UNITS.

TOP AND TOC:

AIRCOOLED DIRECT EXPANSION DUAL FLUID UNITS.

HOP AND HOC:

WATERCOOLED DIRECT EXPANSION UNITS.

FOP AND FOC:

WATERCOOLED DIRECT EXPANSION FREE-COOLING UNITS.

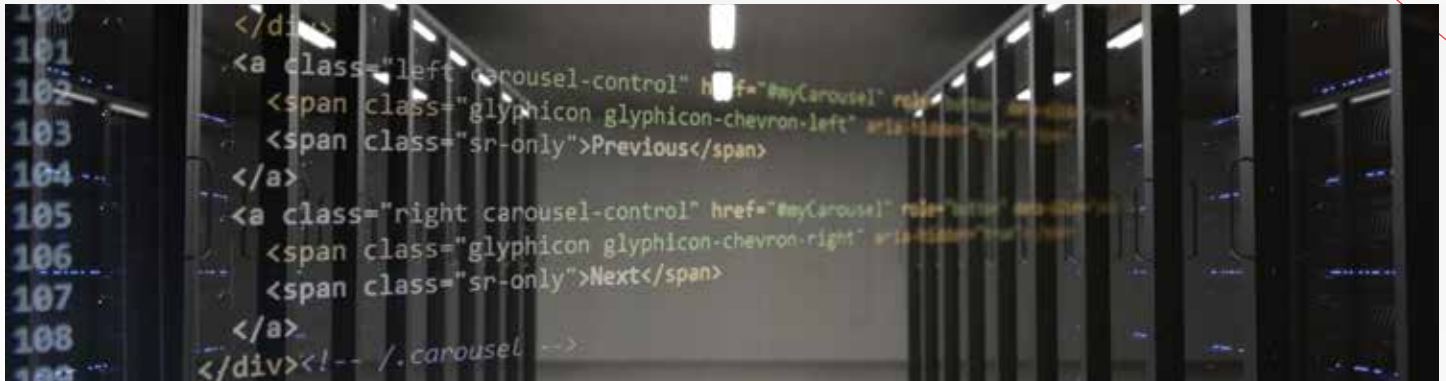
WOP AND WOC:

CHILLED WATER UNITS.

DOP AND DOC:

CHILLED WATER DUAL COIL UNITS.

EC Inverter Plug-Fans or radial fans, depending on the model, provide optimised air flow for the requested thermal load.



XOP / XOC

AIRCOOLED DIRECT EXPANSION UNITS

These units use the coolant as a heat carrier. The air in the room is handled in the evaporator coil where the coolant flows; the condensation heat is disposed of in an outdoor air condenser.

- **XOP** – with EC Inverter Plug-Fans
- **XOC** – with radial fans

TOP / TOC

AIRCOOLED DIRECT EXPANSION DUAL FLUID UNITS

The units in the T series are equipped with two separate cooling systems that do not start-up simultaneously: a PRIMARY chilled water system (CW) connected to an on-site liquid Chiller, and a SECONDARY direct expansion system (DX) that can also have a back-up function. These models are particularly suited for systems requiring RELIABILITY, DATA PROTECTION and REDUNDANCY of the conditioning system.

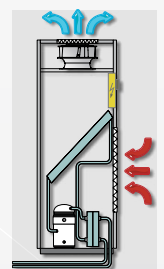
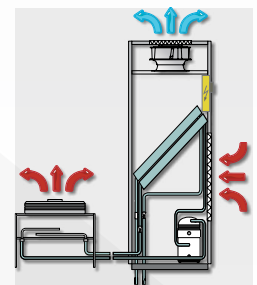
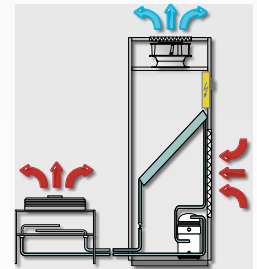
- **TOP** – with EC Inverter Plug-Fans
- **TOC** – with radial fans

HOP / HOC

WATERCOOLED DIRECT EXPANSION UNITS

These units use the coolant as a heat carrier. The air in the room is handled in the evaporator coil where the coolant flows; the condensation heat is disposed of in an internal plate exchanger, in turn connected to a water circuit: well water, local water supply or closed circuits as cooling towers and/or dry coolers.

- **HOP** – with EC Inverter Plug-Fans
- **HOC** – with radial fans





PRODUCT RANGE

FOP / FOC

WATERCOOLED DIRECT EXPANSION FREE COOLING UNITS

Units equipped with two separate cooling systems, a PRIMARY direct expansion system (DX) and a SECONDARY chilled water one (CW). The microprocessor, that the units are equipped with, manages 3 operating modes: DX only, MIXED and CW. Based on the outdoor temperature, this maximises energy saving through the intelligent management of the three operating modes. This type of unit is particularly suited for systems requiring special ENERGY EFFICIENCY and SAVINGS on the entire conditioning system.

- **FOP** – with EC Inverter Plug-Fans
- **FOC** – with radial fans

WOP / WOC

CHILLED WATER UNITS

These units use chilled water produced by a liquid Chiller, which can be watercooled or air cooled, also with Free-Cooling technology. An internal 3-way valve manages the flow of liquid through the unit's water coil.

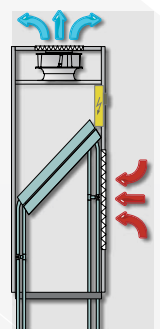
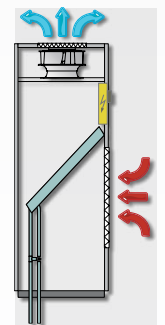
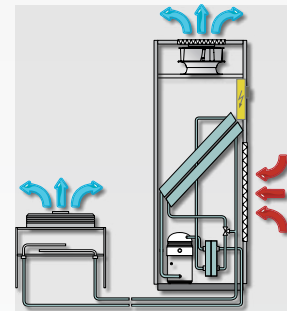
- **WOP** – with EC Inverter Plug-Fans
- **WOC** – with radial fans

DOP / DOC

CHILLED WATER UNITS WITH DUAL COIL

These units have two cooling circuits, both running on chilled water and both operating separately. These circuits are connected to 2 on-site water or air condensing liquid Chillers, also with Free-Cooling technology. These models are particularly suited for systems requiring RELIABILITY, DATA PROTECTION and REDUNDANCY of the conditioning system.

- **DOP** – with EC Inverter Plug-Fans
- **DOC** – with radial fans





BENEFITS



AIR FLOW CONFIGURATION:

Each model is available with top or bottom air discharge. Baseframes and deflectors are also available to enlarge the possible airflow configurations.



TOP

The air discharge is directed upwards and the intake is frontal.
(T version)

BOTTOM

The air discharge is directed under-floor and the intake is at the top of the unit.
(B version)



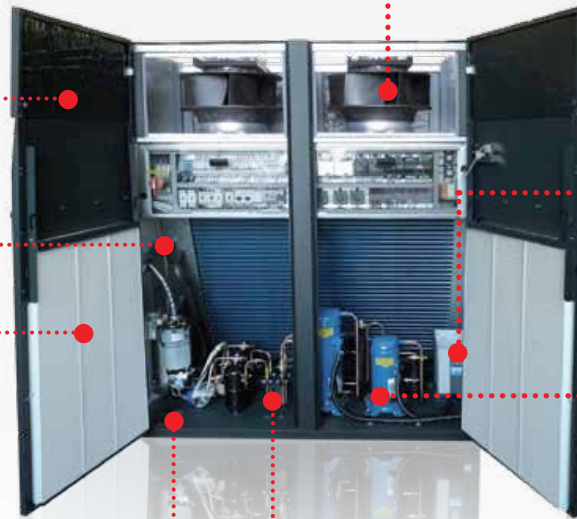


Thermo-acoustic insulation

Electronic thermostatic expansion valve

High efficiency filter M5/F7

New design with compact dimensions



EC Inverter Plug-Fans

Inverter control on compressor

BLDC compressor controlled by Inverter

Multi-compressor and multi-circuit redundancy



**INVERTER
COMPRESSOR**



**EC INVERTER
PLUG-FANS**

INVERTER: MAXIMUM ENERGY EFFICIENCY

EER UP TO 4,5.

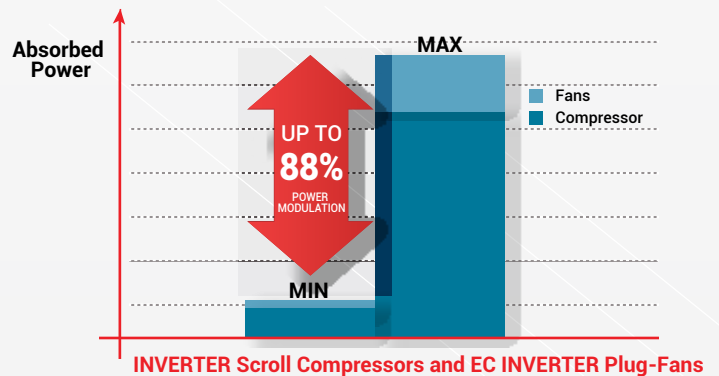
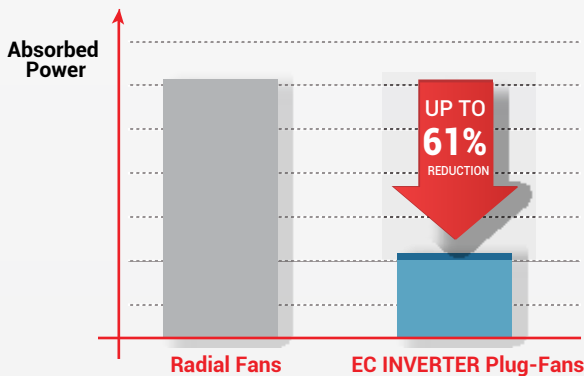
The operating costs of the server room are kept to a minimum thanks to capacity modulation:

- **INVERTER COMPRESSOR*** modulates the speed based on the requested thermal load, reducing the energy consumption at partial loads.
- **EC INVERTER PLUG-FANS*** manage a variable air flow based on the requested thermal load, thereby reducing the energy consumption even more, especially at partial loads.

* Available on dedicated models

Thanks to speed modulation, the EC INVERTER Plug-Fans allow to reduce energy consumption up to 61% compared to traditional radial fans.

Models with full INVERTER technology are able to vary the energy consumption from minimum to maximum levels, reducing the total energy consumption up to 88%.





REDUCED CONSUMPTION.

LOWER RUNNING COSTS.

- The standard **electronic thermostatic expansion valve*** stabilizes the operating mode of the cooling circuit, optimising compressor operation.
- **Multi-compressor splitting:** up to four compressors can be activated in series based on the requested thermal load, reducing absorbed power at partial loads.
- **High efficiency liquid Chiller:** models with chilled water circuits can be connected to high-efficiency liquid Chillers, such as those with Inverter technology compressors, to maximise the efficiency of the entire system.

HIGH WATER TEMPERATURE OPERATION: 13-18°C.

Chilled water series can operate at high water temperature (13-18°) with dedicated HT accessory: coils are optimized for that setpoint to reach an higher energy efficiency.

INTERNAL REDUNDANCY.

DATA PROTECTION, PREVENTS SYSTEM SHUT-DOWN.

An internal redundancy system guarantees the system operation even in the case of unit failure.

- **Dual Fluid and Dual Coil models:** with chilled water primary circuit and direct expansion secondary circuit, or with double chilled water circuits. The two systems are separate with non-simultaneous start-up, for back-up operation.
- **Double cooling circuit:** : with independent operation to provide a back-up in case of failure of one circuit.

SERVER PROTECTION.

NO SERVER DAMAGES, DATA PROTECTION.

- Polyurethane and glass fibre thermo-acoustic and fireproof insulating panels guarantee Euroclass 1 fire-resistance**.

Available as standard, an alarm alerts in the case of fans failure (fan pressure switch).

* Available as standard or as accessory on dedicated models.

** According to UNI EN 1350-1.



ELECTRONIC
EXPANSION VALVE



MULTI-COMPRESSOR



HIGH EFFICIENCY
LIQUID CHILLER



HIGH WATER
TEMPERATURE



REDUNDANCY



FAN PRESSURE
SWITCH



FREE-COOLING

FREE-COOLING.

ZERO COST DURING THE COLD SEASON.

During the cold season, when the outdoor air temperature is sufficiently low, server room cooling can be carried out using the energy from external air, without compressors activation.

- Models of FOP / FOC series are based on Indirect Free-Cooling technology.
- Chilled water models can be connected to liquid Chillers with Free-Cooling technology.



COMPACT
DIMENSIONS

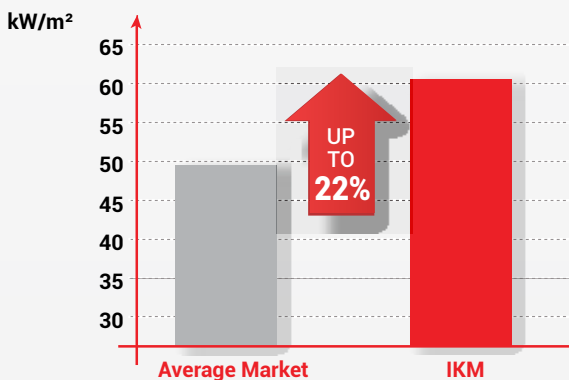
COMPACT DIMENSIONS.

MORE SPACE TO SERVERS.

The new range has been specifically designed to minimise the external overall dimensions and thereby offers more space for servers. The internal parts and overall layout have been optimised, achieving an important reduction in overall dimensions in comparison to units commonly available on the market.



LOW NOISE

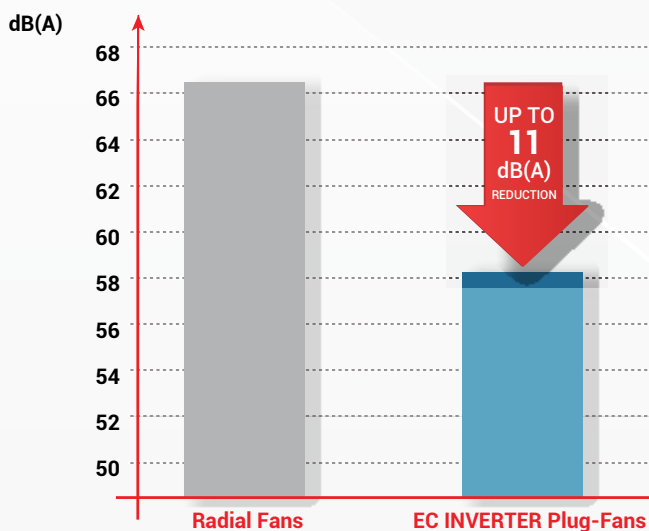


Delivered cooling power per occupied space. On the same footprint, the new IKM product range delivers the highest cooling power, +22% if compared to the average market levels.

LOW NOISE LEVELS.

NO DISTURB TO WORKPLACES.

- Thanks to insulating panels and EC Inverter Plug-Fans, the noise level is considerably lower than traditional units.
- Especially at partial loads, the Inverter control reduces the fans and compressors speed, and therefore noise levels, when a lower cooling power is requested.
- Available as accessory, silencing on compressors ensures a further reduction of overall noise levels of the unit.



Thanks to speed modulation, the EC INVERTER Plug-Fans allow to reduce noise levels up to 11 dB(A) compared to traditional radial fans.

CONSTANT AIR FLOW AND AVAILABLE STATIC PRESSURE.

REGULATION CONTROL SYSTEMS.

The new IKM Regulation Control Systems for Constant Air Flow and Constant Available Static Pressure solve the problem of differences in under-floor pressure, which is common in systems with hot and cold aisles. An electronic system with pressure sensors on the system and control sensors on EC Plug-Fans adjusts the flow rate and the available static pressure to keep the air flow towards the servers constant.



CONSTANT AIR FLOW



CONSTANT AVAILABLE AIR PRESSURE



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BENEFITS



REMOTE MANAGEMENT.

WEB MONITORING.

IKM Close Control units can be monitored and supervised remotely through the WEB MONITORING system using communication protocols GPRS/GSM/TCP-IP*. Through a dedicated WEB page Users that are set up for the service can access monitoring, management and statistic functions. Thanks to this application, all the information can be displayed through a dedicated website.



WEB MONITORING



**HIGH AMBIENT
TEMPERATURE**

SUITABLE FOR HIGH EXTERNAL AMBIENT TEMPERATURE.

UP TO 52°C.

IKM Close Control ranges are also suitable to operate at high external ambient temperature, up to 52°C.

* Available as accessory.



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PRODUCT RANGE

LOGICA* SYSTEM

**LATEST GENERATION
FOR HIGH-DENSITY
DATA CENTRES
<20 KW/RACK**



**HIGH
DENSITY**



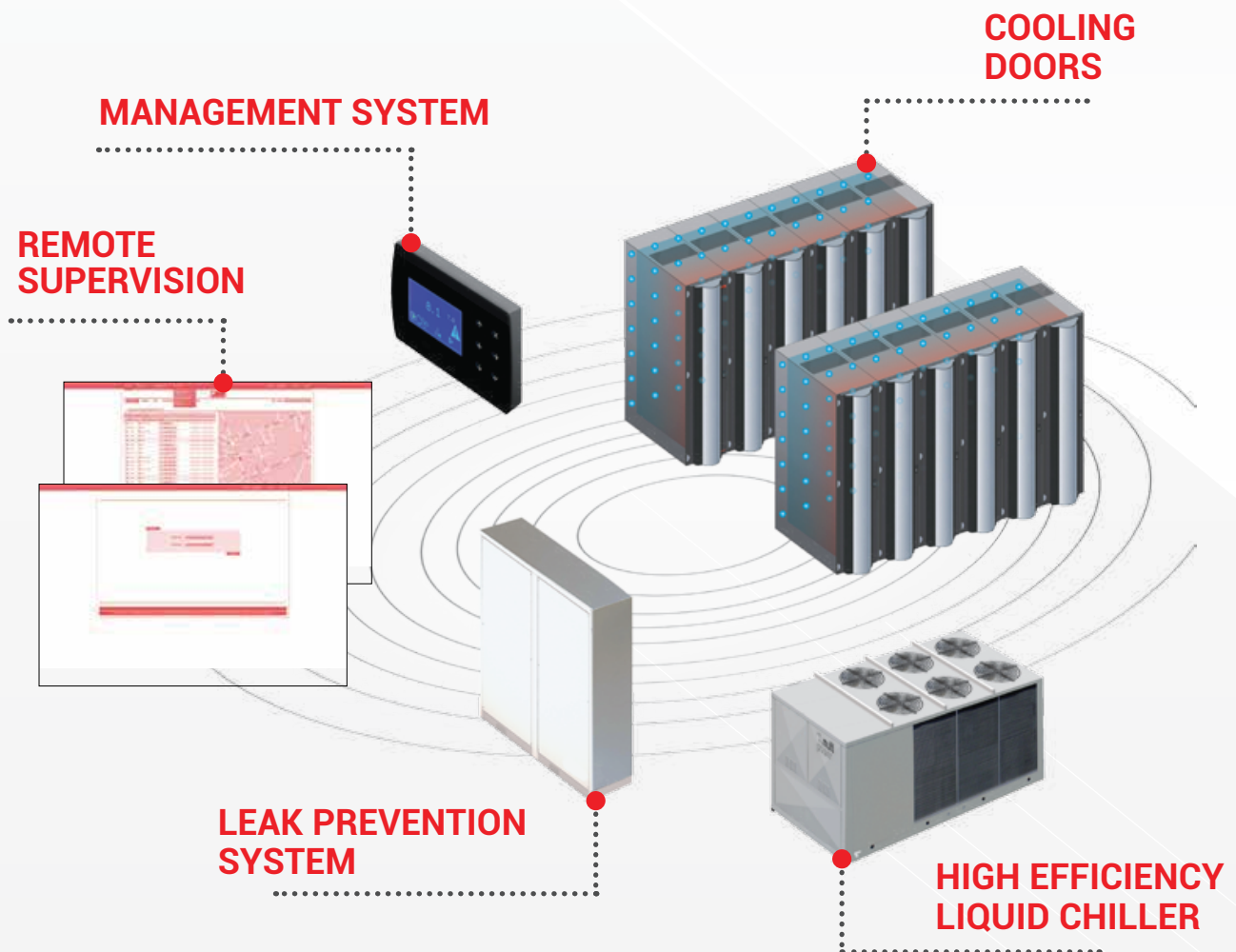


PRODUCT RANGE

The rapid technological progress in the IT industry over recent years has led to the development of increasingly higher performing Servers and Data Centres with thermal loads of increasingly higher density. These Data Centres require high-level and performing cooling systems.

LOGICA SYSTEM: THE FUTURE OF HIGH-DENSITY DATA CENTRES.

LOGICA is the latest generation system for high density server rooms, where the thermal load produced by the servers is particularly high. LOGICA goes beyond the concept of hot and cold aisles and **provides localised cooling**, focusing directly on hot spots caused by the servers, through a cooling doors system installed directly on the racks. The energy efficiency is boosted to the maximum and therefore the Data Centre operating costs drop drastically. LOGICA is a hydronic system based on a patented NEGATIVE PRESSURE technology named Leak Prevention System: servers are fully protected against any water leaks that might occur.



BENEFITS



93%

ENERGY SAVING

UP TO 93% YEARLY ENERGY SAVING.

Cooling is localised directly on the server "hot spots", avoiding cooling the entire room. Energy consumption is optimised and the Data Centre operating costs drop drastically.

LOGICA operates with a liquid Chiller using water at higher temperature than traditional systems, allowing greater energy saving.

LOGICA also makes it possible to use higher efficiency liquid Chillers with Inverter technology or Free-cooling for high energy savings.

50%

MORE SPACE

UP TO 50% MORE SPACE TO SERVERS.

LOGICA eliminates the overall dimension of the traditional Close Control unit and the raised floor: offering the same installed power, 50% less space is occupied by the cooling system.



LEAK PREVENTION
SYSTEM

MAXIMUM SECURITY: IT PREVENTS WATER LEAKS.

Thanks to the patented negative pressure system, the servers are protected against any water leaks in the cooling door.



TOTALLY FLEXIBLE AND ADAPTABLE TO EXISTING CABINETS

LOGICA adapts to existing and future development needs (power, use, times): the cooling door system is modular, therefore it can be installed on an existing system and, as the server room grows, just adding more cooling doors.

IT ELIMINATES THE RAISED FLOOR, REDUCES INSTALLATION COSTS.

LOGICA does not require a raised floor, like traditional systems, therefore no particular design is required for the server room during installation.

EASY MAINTENANCE.

The independent cooling door system makes it possible to perform maintenance on one door while keeping the others running, without stopping the entire system.

REMOTE MANAGEMENT.

LOGICA features the WEB MONITORING system for remote management and control of the units through communication protocols GPRS/GSM/TCP-IP. Through a dedicated WEB page Users that are set up for the service can access monitoring, management and statistical functions. Thanks to this application, all the information can be displayed through a dedicated website.

SUITABLE FOR HIGH EXTERNAL AMBIENT TEMPERATURE.

LOGICA is also suitable to operate at high external ambient temperature, up to 52°C.



FLEXIBLE
AND ADAPTABLE



NO
RAISED FLOOR



EASY
MAINTENANCE



WEB
MONITORING



HIGH EXTERNAL
AMBIENT TEMPERATURE



BENEFITS



LOGICA SYSTEM:

LOGICA SYSTEM is made up of four parts:

HIGH EFFICIENCY LIQUID CHILLER.

Chilled water is supplied by the liquid Chiller, which can also feature Free-Cooling or magnetic levitation technology for maximum efficiency.



REAR COOLING DOOR.

Through dedicated pipes, the chilled water reaches the Rear Cooling Door. The heat generated by the servers is pushed towards the heat exchanger located in the cooling door, where the air is cooled and released back into the room at ambient temperature. Accordingly, the indoor temperature of the server room is not raised by the servers.



LEAK PREVENTION SYSTEM.

The chilled water that flows between the Chiller and the cooling doors is sucked by the Leak Prevention System, a patented system that generates negative pressure inside the structure, so that the servers are protected against any water leaks from the cooling door.



MANAGEMENT SYSTEM.

The Management System is the system's brain. The temperature of the server room is controlled locally by the LOGICA electronic management system which acts simultaneously on the cabinet and server room, automatically adjusting fan speed and flow rate and the temperature of the water in circulation. Accordingly, the temperature inside the Data Centre is kept constant.



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AIR CONDITIONING FOR TELECOM APPLICATIONS





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THE RANGE

The range includes Outdoor and Indoor Direct Expansion Packaged units to cool Telephone Exchangers and Telecommunication Shelters. The units are completely reliable, designed for continuous operation 24/7, 365 days a year, offering low energy consumption and easy inspection to guarantee complete site autonomy and management.

The range includes Outdoor and Indoor units, for operation both for standard and high ambient air temperature up to 52°C. The range:

CZ:

PACKAGED OUTDOOR UNIT.

CY:

PACKAGED INDOOR UNIT.

CZ...XT:

PACKAGED OUTDOOR UNIT FOR HIGH EXTERNAL AMBIENT TEMPERATURE (UP TO 52°C).

CY...XT:

PACKAGED INDOOR UNIT FOR HIGH EXTERNAL AMBIENT TEMPERATURE (UP TO 52°C).

Units are available in two configurations: with top and bottom air discharge, also with Free-Cooling technology for maximum energy saving.



**INVERTER
EC PLUG FANS**



**R410A AND R134a
REFRIGERANTS**



FREE-COOLING



**HIGH EXTERNAL
AMBIENT TEMPERATURE**

ENERGY SAVING.

EC INVERTER Plug-Fans* manage a variable air flow based on the requested real thermal load, reducing the energy consumption even more, especially at partial-loads.

ENVIRONMENT AND EFFICIENCY.

Thanks to R410A and R134a refrigerants, ranges ensure environment respect and energy efficiency

FREE-COOLING.

Units with Free-Cooling technology make it possible to reduce energy consumption up to 50%. During the cold season, when the outdoor air temperature is low, shelter cooling can be carried out using energy from external air, without turning on the compressors. The Free-Cooling logic is completely managed by the microprocessor which also makes it possible to control the air in the room by mixing outdoor air with air from the intake, guaranteeing a renewal of fresh air.

SUITABLE FOR HIGH EXTERNAL AMBIENT TEMPERATURE.

XT ranges are specifically designed to operate at high external ambient temperature, up to 52°C.

* Available as accessory.



EASY POSITIONING AND MAINTENANCE.

Front access makes it possible to position the units side by side to reduce overall dimensions and easily perform maintenance activities.

SITE PROTECTION AND SELF-MANAGEMENT.

- The units are equipped with a microprocessor that makes it possible to set up a network of units and manage operation in series with automatic rotation.
- The microprocessor independently manages the start-up of units in stand-by in case of alarm and simultaneous operation if temperature limits are exceeded.
- For units with Free-Cooling technology the microprocessor is electrically powered by the emergency system of the telephone site and guarantees the operation in Free Cooling mode in the case of power outages.

REMOTE CONTROL.

The units can be equipped with serial interfaces, whereby it is possible to control the operations remotely and verify and change the operating parameters, in order to always guarantee the correct operating status of the station.



FRONT ACCESS



NETWORK



ALARMS



REMOTE CONTROL