

IT Cooling

PRODUCT OVERVIEW

▶ CLOSE CONTROL AIR CONDITIONERS

▶ EVAPORATIVE COOLING SYSTEM

▶ AIR CONDITIONERS FOR HIGH DENSITY RACKS AND BLADE SERVERS

▶ DATA CENTER INFRASTRUCTURE

▶ CHILLERS

▶ TELECOM SOLUTIONS

▶ CONTROL, SUPERVISION AND OPTIMISATION SYSTEMS

▶ ADVANCED SOLUTIONS FOR SMART THERMAL MANAGEMENT

CLIMAVENETA'S MISSION



With over 45 years of experience in the HVAC industry, the Climaveneta brand has been a major player widely recognized for its leadership in IT Cooling solutions. Building on this strong legacy, Mitsubishi Electric Hydronics & IT Cooling Systems SpA has decided to turn Climaveneta into the group's brand for data center cooling.

The result is a brand new business organisation providing the most complete product range, which combines the best technologies, solutions and innovations from RC and Climaveneta. This is enhanced by both brands' extensive experience, and by the advantages of integrated R&D, operations and central functions.

Over 50 years of experience

Dedicated products & specialized solutions

13
specialized manufacturing hubs

Worldwide distribution and service network

8 R&D and testing labs in Italy, China and India

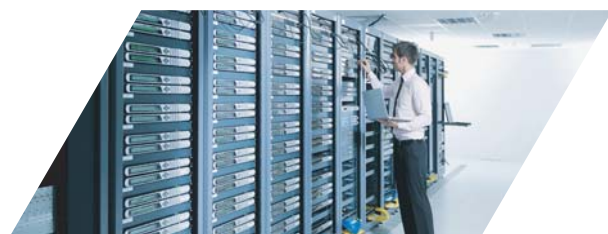
Vast portfolio of proprietary & patented technologies

- Sales network
- Manufacturing hubs or R&D labs

COUNTLESS SUCCESSFUL PROJECTS WORLDWIDE

 **Wiit Spa** - Milano, Italy
Tier IV certified

 **Data Center proRZ**
Munich, Germany





CLIMAVENETA
leading-edge cooling technologies
and solutions for IT applications are
designed to provide even the most
challenging Data Center and
Telecom projects with:



Smart integration of the most advanced technologies



Building on the experience of RC Group and Climaveneta both on HPAC and on chillers, Climaveneta IT Cooling solutions offer the smartest combination of the most advanced technologies such as: full inverter concept, free cooling, heat recovery management, adiabatic cooling.

Reduced operating costs



In infrastructures working 24 hours per day, 365 days per year, over an average of 10 years, every energy improvement allows for a significant reduction in OPEX (operating costs).

Complete reliability and extended lifetime



The uptime of server infrastructure and hence of most critical services in modern society, is tightly related to the reliability of the IT cooling system, which must guarantee Tier IV uptime standards over its whole lifetime.

Widest use of the available power capacity



In all installations where power feeds are at capacity, the key option to expand data center facilities is to significantly improve the energy performance of the whole data center.

Optimised footprint



A green, high efficiency approach to data centers is key also to enable a more effective use of available space thus delaying the need of building new rooms.

Increased sustainability




Intelligent energy management is crucial also for sustainability, considering the growing impact of data center industry in terms of total CO2 emissions.

more on: www.climaveneta.com

 **Fastweb** - Milano, Italy
Tier IV certified

 **China Construction Bank**
Data Center - Beijing China



 **ANZ Bank Server Room**
Auckland - New Zealand

 **SKY Studios**
Unterfoehring - Germany

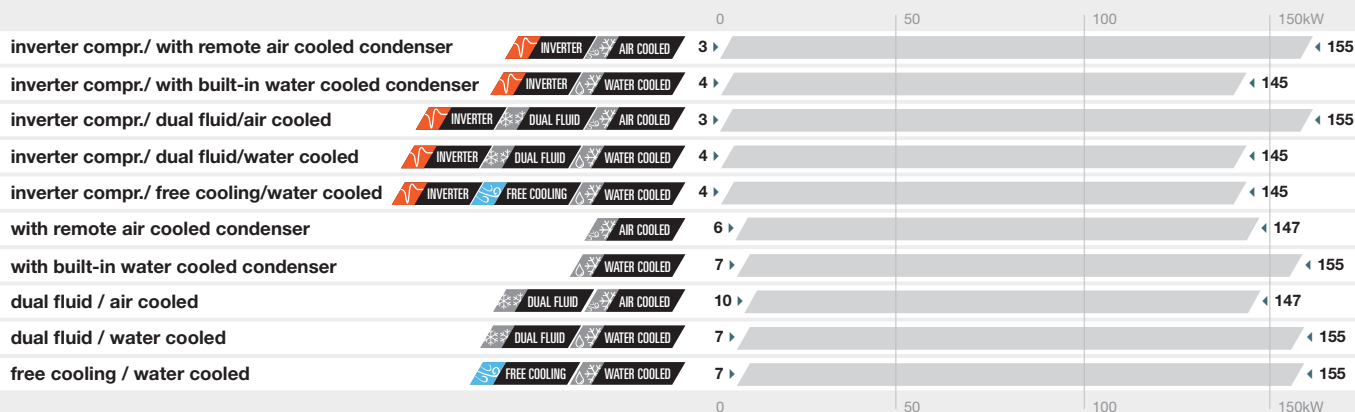
CLOSE CONTROL AIR CONDITIONERS



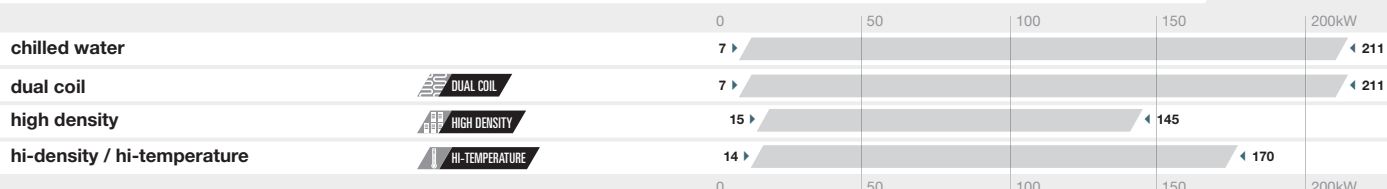
- ▶ High efficiency
- ▶ Perfect redundancy

- ▶ Quick and easy expansion
- ▶ Low initial investment

Close Control Units Direct Expansion



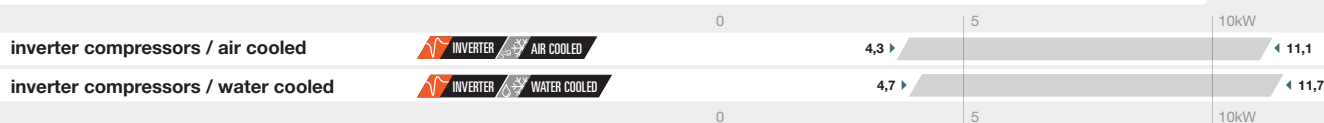
Close Control Units Chilled Water



Close Control Units Chilled Water 2 Sections

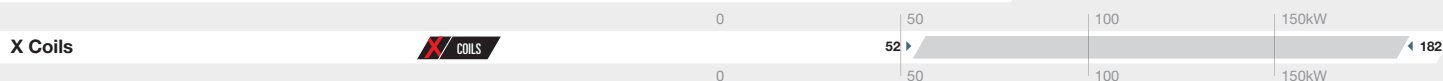


Close Control Unit for Low Thermal Load Applications

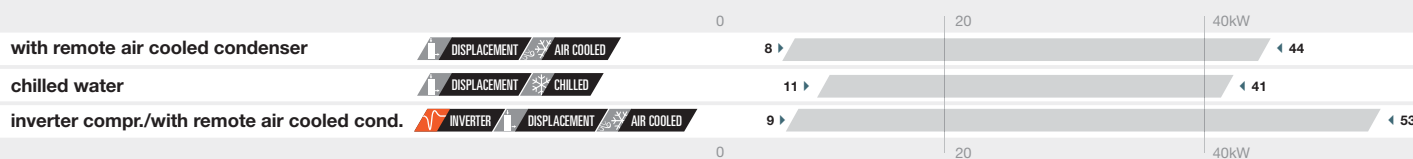


Close Control Units for High Temperature, High Delta T

X TYPE



Close Control Units with Displacement Air Delivery



ADVANCED TECHNOLOGIES FOR EFFICIENT DATA CENTERS

Climaveneta IT Cooling leadership in data center cooling systems is backed by 45 years of experience in the smart integration of premium technologies for complex IT cooling projects.



Magnetic Levitation

An extended range of chillers with magnetic levitation centrifugal compressors from 200kW to 4MW, both air source and water source, available also in free cooling and evaporative free cooling versions, to deliver highest efficiency in every application.

REMOTE CONDENSERS AND DRY COOLERS

- ▶ Optimised to be combined with the close control air conditioners
- ▶ High capacity sensitive cooling

air cooled remote condenser

OUTDOOR

air cooled remote condenser with EC fans

OUTDOOR INVERTER

dry cooler

OUTDOOR

dry cooler with EC fans

OUTDOOR INVERTER



EVAPORATIVE COOLING SYSTEM

- ▶ Variable air flow and cooling capacity
- ▶ Fully aluminum structure (20-year warranty against corrosion)
- ▶ Low pPUE index: 1,025
- ▶ Modular units

2-Stage Indirect Evaporative Cooling System for Large Data Centers

EVAPORATIVE Cooling

evaporative cooling system



AIR CONDITIONERS FOR HIGH DENSITY RACKS AND BLADE SERVERS



- ▶ Maximization of the internal capacity of the infrastructure
- ▶ Elimination of hot spots
- ▶ Minimum floorspace occupancy

Close-coupled air conditioners

Active FreeCooling

ADAPTIVE SET POINT

direct expansion with remote air cooled condenser

14 ▶ ◀ 40

direct expansion with condensing unit

11 ▶ ◀ 68

direct expansion / dual fluid

DUAL FLUID

11 ▶ ◀ 17

direct expansion / free cooling

FREE COOLING

11 ▶ ◀ 18

chilled water

CHILLED

4 ▶ ◀ 75

chilled water cooling door

CHILLED

27 ▶ ◀ 40

DATA CENTER INFRASTRUCTURE

▶ RACKS

High quality cabinets for the protection and housing of servers



Floor-standing cabinets suitable for the housing of the server. The supporting structure is made of sheet steel with a thickness of 20/10 and can reach a capacity of 2000 kg.

▶ Aisle Containment

Aisle Containment solutions for high density applications



This mix results in airflow with an uncontrolled temperature that reduces the performance of the Data Center. Therefore, it is necessary to provide the physical separation of the hot and cold air streams.

▶ PDUs

Premium Rack Power Technology



Power distribution units (PDUs) that manage power usage for servers, storage and network equipment.

▶ Raised Floors

Raised floor solutions for high efficiency data centers



The raised floor is designed to easily adapt to future evolutions of IT spaces, avoiding expensive building work. This solution fulfills the need for versatile design of data centers.

Active FreeCooling

Smart Thermal Energy Management

Active Redundancy

Active Free Cooling

An advanced free cooling system available both as direct and indirect free cooling (no glycol), to exploit the outdoor air to cool the data center.

Smart Thermal Energy Management

An innovative heat recovery system that allows the smart use of rejection heat from the data center for comfort heating and other neighbouring applications.

Active Redundancy

Real active redundancy delivered through the combined adoption of innovative EC PUL fans, inverter DC brushless compressors and a smart algorithm that balances heating load also among stand-by units.

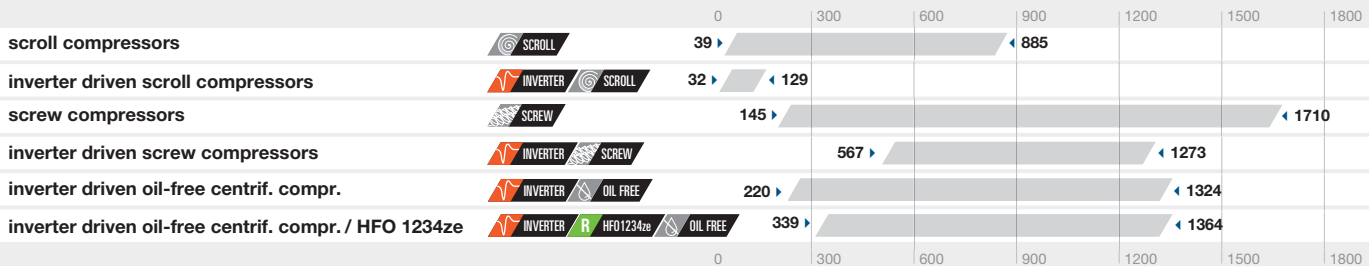
CHILLERS



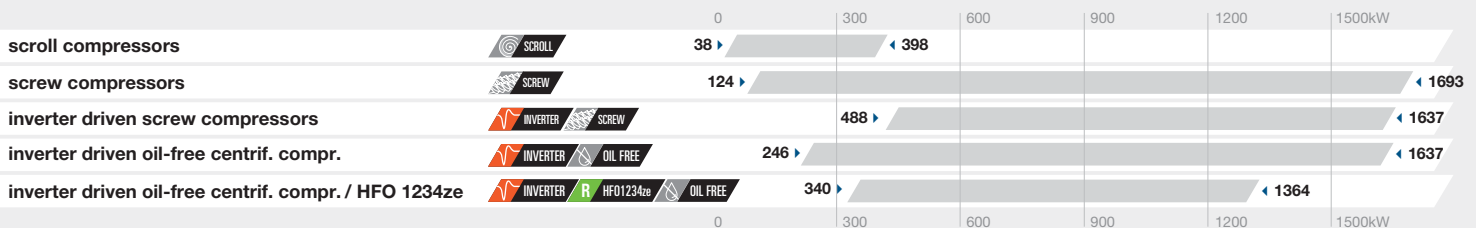
- Optimised versions for Data Center applications
- Utmost reliability

- Complete resiliency and active redundancy
- Patented extended free cooling technology

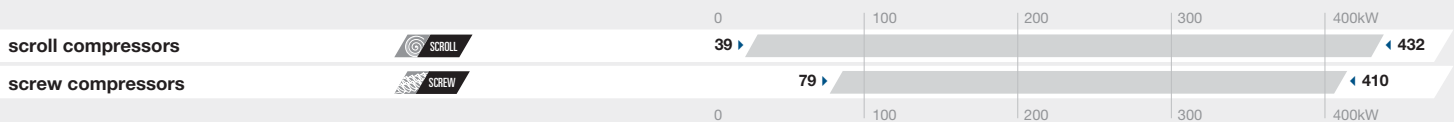
Air Cooled Chillers



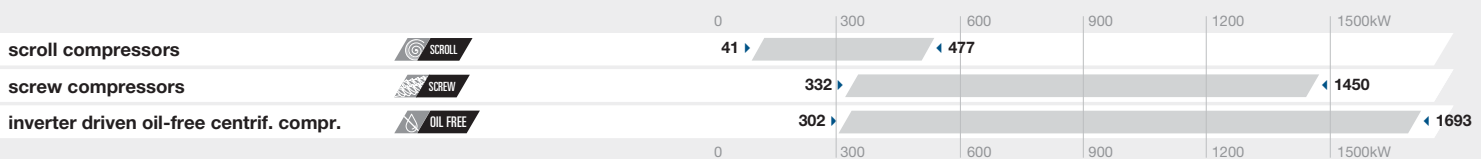
Water Cooled Chillers



Chillers with Remote Condenser



Chillers with Free Cooling



Chillers with Evaporative Free Cooling



X TYPE

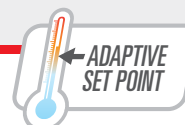
X-type System

The revolutionary double stage design applied to the heat exchangers in order to achieve top level efficiency and pPUE levels down to 1,07.



Evaporative Cooling

The latest AHR solution with 2-stage indirect adiabatic free-cooling section. pPUE down to 1,025.



Adaptive set point

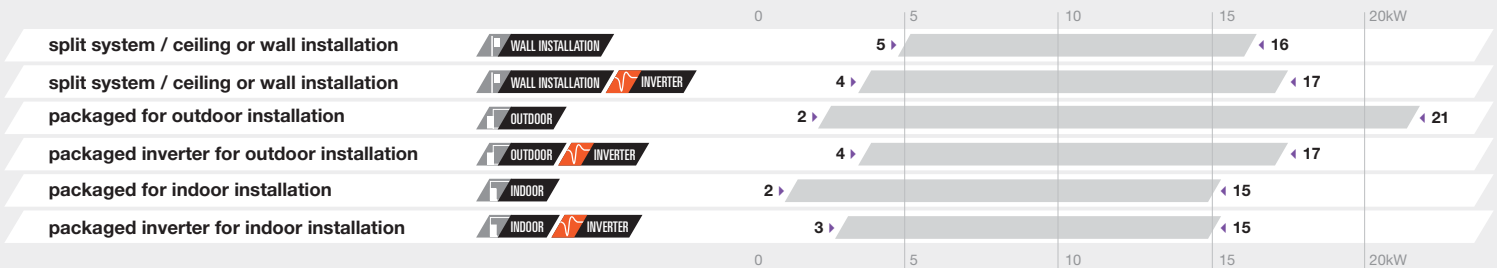
An advanced algorithm instantaneously detects the real thermal loads of indoor units and conveys this information to chiller, for selection of the most efficient operating mode (e.g. dynamic variation of chillers set points and operating mode, free cooling mode, active redundancy mode).

TELECOM SOLUTIONS



- ▶ Reliability and extended operation
- ▶ High capacity sensitive cooling
- ▶ Black out management
- ▶ Minimum noise emissions

Air Conditioners for Telecom Applications With Free Cooling and Full DC Inverter Technology



CONTROL, SUPERVISION AND OPTIMISATION SYSTEMS



- ▶ **Supervision and Monitoring Systems**
The ultimate solutions for supervision, remote monitoring, service, and preventive maintenance
- ▶ **FWS3 / FWS3000** remote monitoring systems
- ▶ **Climaveneta Cloud - Cloud based remote monitoring system**
- ▶ **WS3000**
Remote monitoring system for service and proactive maintenance



- ▶ **Optimisation systems**
- ▶ **ClimaPRO_DCO**
Data Center Optimisation system
Data Center IT cooling system optimiser for real time, smart management of energy indexes for the single units and the entire plant room.



- ▶ **Control Systems**
- ▶ **DATA MANAGER 3000**
Specialized group control for Data Center air conditioners



- ▶ **Human Machine Interfaces**
- ▶ **KIPLink**
Control interface for smart phones and tablets

ADVANCED SOLUTIONS FOR SMART THERMAL MANAGEMENT



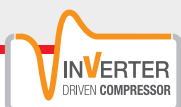
Units for Simultaneous and Independent Production of Hot and Cold Water

Full range of air and water cooled units, with screw and scroll compressors, full inverter driven, for innovative system design allowing smart use of rejection heat from the data center for comfort heating and other neighbouring applications.

- ▶ Rejection heat becomes a valuable resource for other applications

- ▶ Highest energy efficiency
- ▶ Reduced footprint
- ▶ Rational system design

39kW ▶ 850kW



Inverter Driven Compressor

The possibility to modulate cooling capacity results in increased efficiency as well as in the possibility to effectively implement smart management solutions such as active redundancy.



Green HFO Refrigerants

Following on vast experience in using green refrigerants, Climaveneta has already employed extensively green HFO refrigerants such as HFO1234ze and HFO1234yf in many ranges, in order to continue to be at the forefront with green best practices.



V-AIR

High efficiency EC technology fans are extensively adopted for their advantages both in internal units as well as in remote condensers with energy reduction up to 15% compared to traditional EC fans.



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



mitsubishi electric hydronics & it cooling systems s.p.a.

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