

DATA CENTER- IT Cooling

PRODUCT OVERVIEW

▶ CLOSE CONTROL AIR CONDITIONERS

▶ EVAPORATIVE COOLING SYSTEM

▶ AIR CONDITIONERS FOR HIGH DENSITY RACKS AND BLADE SERVERS

▶ DATA CENTER INFRASTRUCTURE

▶ CHILLERS

▶ CONTROL, SUPERVISION AND OPTIMISATION SYSTEMS

▶ ADVANCED SOLUTIONS FOR SMART THERMAL MANAGEMENT



IT COOLING

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



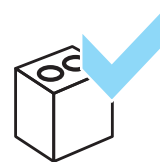
Building on the experience of RC Group and Climaveneta both on HPAC and on chillers, Climaveneta IT Cooling solutions offer the smartest combination of the most advanced technologies such as: full inverter concept, free cooling, heat recovery management, adiabatic cooling.

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.melcohit.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



| Model | Compressor Type | 0 | 50 | Range(kW) | 100 | 150kW |
|---|------------------------------------|------|----|-----------|-----|-------|
| inverter compr./ with remote air cooled condenser | INVERTER AIR COOLED | 3 ▶ | | | | ◀ 155 |
| inverter compr./ with built-in water cooled condenser | INVERTER WATER COOLED | 4 ▶ | | | | ◀ 145 |
| inverter compr./ dual fluid/air cooled | INVERTER DUAL FLUID AIR COOLED | 3 ▶ | | | | ◀ 155 |
| inverter compr./ dual fluid/water cooled | INVERTER DUAL FLUID WATER COOLED | 4 ▶ | | | | ◀ 145 |
| inverter compr./ free cooling/water cooled | INVERTER FREE COOLING WATER COOLED | 4 ▶ | | | | ◀ 145 |
| with remote air cooled condenser | AIR COOLED | 6 ▶ | | | | ◀ 147 |
| with built-in water cooled condenser | WATER COOLED | 7 ▶ | | | | ◀ 155 |
| dual fluid / air cooled | DUAL FLUID AIR COOLED | 10 ▶ | | | | ◀ 147 |
| dual fluid / water cooled | DUAL FLUID WATER COOLED | 7 ▶ | | | | ◀ 155 |
| free cooling / water cooled | FREE COOLING WATER COOLED | 7 ▶ | | | | ◀ 155 |

Close Control Units Chilled Water



| Model | Compressor Type | 0 | 50 | Range(kW) | 150 | 200kW |
|-----------------------------|-----------------|------|----|-----------|-----|-------|
| chilled water | | 7 ▶ | | | | ◀ 211 |
| dual coil | DUAL COIL | 7 ▶ | | | | ◀ 211 |
| high density | HIGH DENSITY | 15 ▶ | | | | ◀ 145 |
| hi-density / hi-temperature | HI-TEMPERATURE | 14 ▶ | | | | ◀ 170 |

Close Control Units Chilled Water 2 Sections



| Model | Compressor Type | 0 | 50 | Range(kW) | 100 | 150 | 200kW |
|---------------|-----------------|------|----|-----------|-----|-----|-------|
| chilled water | CHILLED | 87 ▶ | | | | | ◀ 225 |
| dual coil | DUAL COIL | 87 ▶ | | | | | ◀ 218 |

Close Control Unit for Low Thermal Load Applications



| Model | Compressor Type | 0 | 5 | Range(kW) | 10kW |
|-------------------------------------|-----------------------|-------|---|-----------|--------|
| inverter compressors / air cooled | INVERTER AIR COOLED | 4,3 ▶ | | | ◀ 11,1 |
| inverter compressors / water cooled | INVERTER WATER COOLED | 4,7 ▶ | | | ◀ 11,7 |

Close Control Units for High Temperature, High Delta T

X TYPE

| Model | Compressor Type | 0 | 50 | Range(kW) | 100 | 150kW |
|---------|-----------------|------|----|-----------|-----|-------|
| X Coils | X COILS | 52 ▶ | | | | ◀ 182 |

Close Control Units with Displacement Air Delivery

| Model | Compressor Type | 0 | 20 | Range(kW) | 40kW |
|--|----------------------------------|------|----|-----------|------|
| with remote air cooled condenser | DISPLACEMENT AIR COOLED | 8 ▶ | | | ◀ 44 |
| chilled water | DISPLACEMENT CHILLED | 11 ▶ | | | ◀ 41 |
| inverter compr./with remote air cooled cond. | INVERTER DISPLACEMENT AIR COOLED | 9 ▶ | | | ◀ 53 |

ADVANCED TECHNOLOGIES FOR EFFICIENT DATA CENTERS

Climaveneta Cooling leadership in data center cooling systems is backed by 50 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 inverter compr.

OUTDOOR INVERTER

dry cooler

OUTDOOR

dry cooler with inverter compr.

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

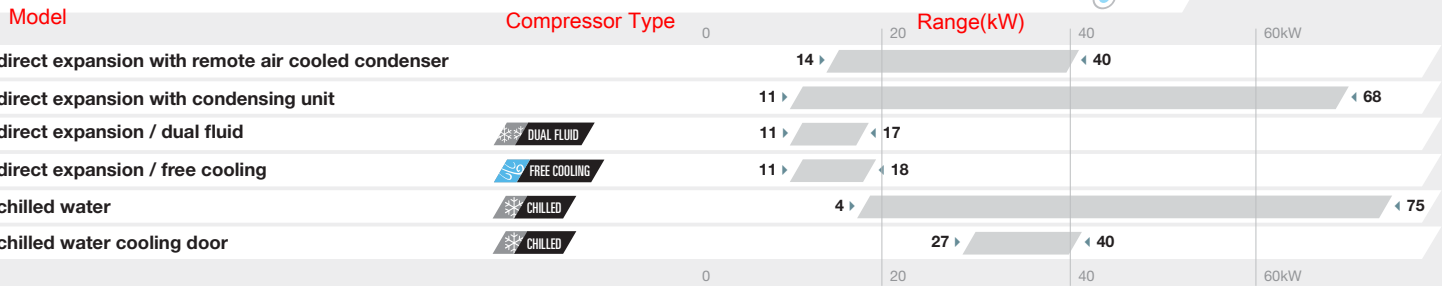
2-Stage Indirect Evaporative Cooling System for Large Data Centers



AIR CONDITIONERS FOR HIGH DENSITY RACKS AND BLADE SERVERS

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

Rack Coolers(In-row) & Cooling Doors



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

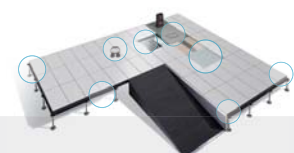
Premium Rack Power Technology



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 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.

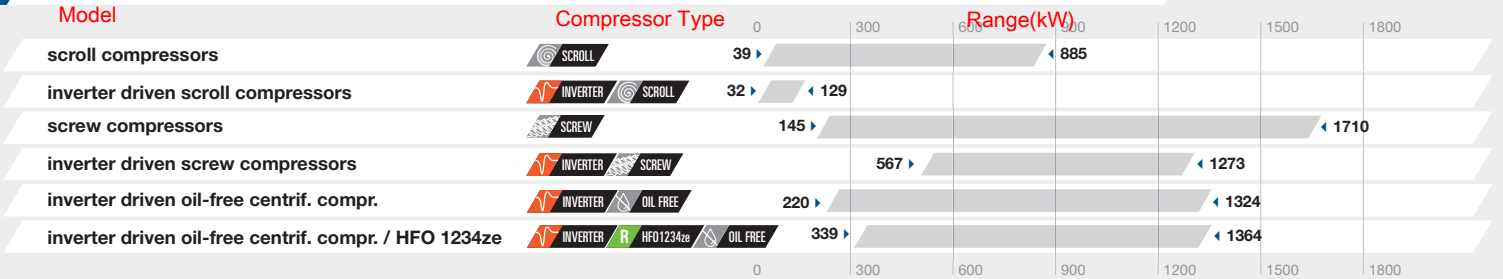
CHILLERS



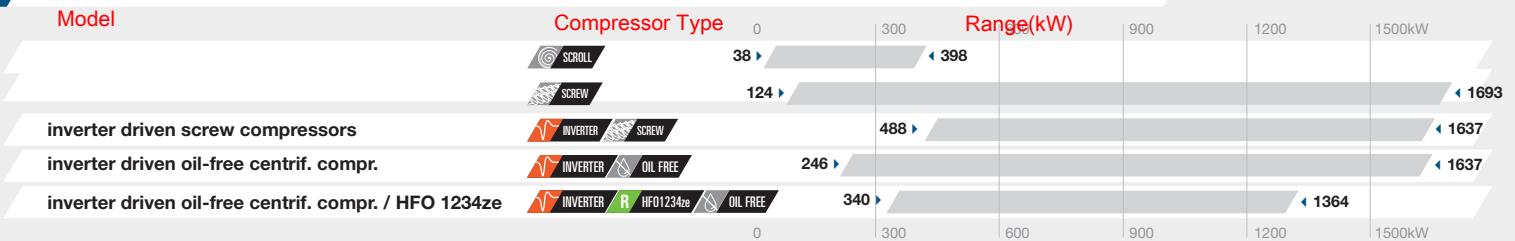
- ▶ Optimised versions for Data Center applications
- ▶ Utmost reliability

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

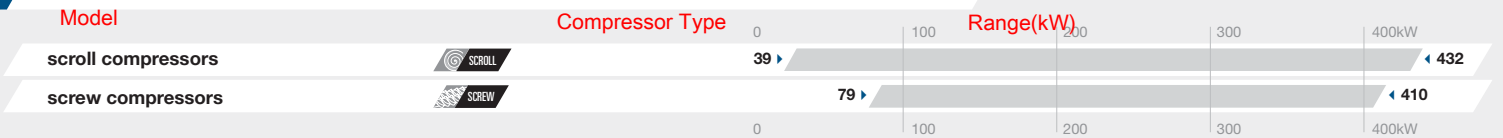
Air Cooled Chillers



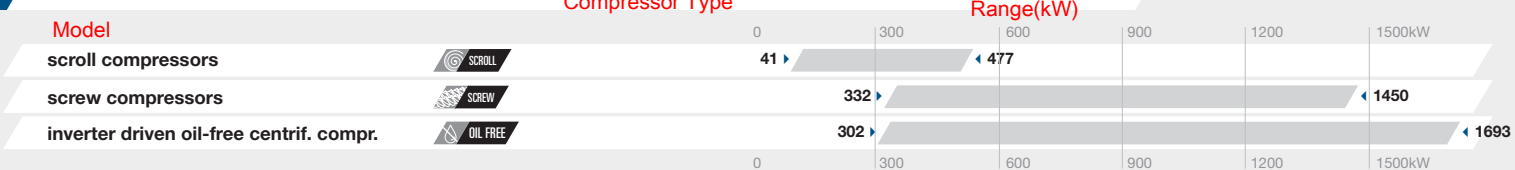
Water Cooled Chillers



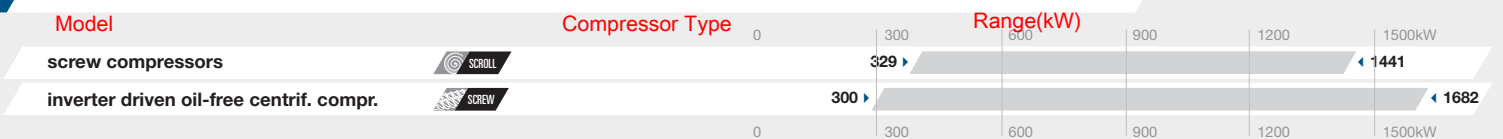
Chillers with Remote Condenser



Chillers with Free Cooling



Chillers with Evaporative Free Cooling



X TYPE

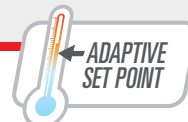
X-type System

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).

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
- ▶ **RC 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.



Corporate office:-

CLIMAVENETA CLIMATE TECHNOLOGIES (P) LTD

No. 180, 1st & 2nd Floor, 5th Main, 9th Cross,
Indiranagar 1st Stage, Bangalore - 560038
PH: +91 80 42466900
E-mail : sales@climaveneta.in

Factory Address :-

Climaveneta Climate Technologies (P) Limited

No. 1105, Keerthi Pradhan Logistics Park,
Belluru Village, Narasapur Hobli,
Kolar – 563 133 Karnataka India

Branch Offices:-

Delhi :-

106 & 107, Edmonton Mall, 1st Floor, Hotel Bristol,
DLF City Phase-1, Gurgaon - 122002, Haryana
Phone : +91 124 4277902
E-mail : sales.delhi@climaveneta.in

Mumbai :-

Unit No.114, 1st Floor, Plot No.-57, Andheri
Universal Industrial Estate, Jai Prakash Road,
Next to A.H.Wadia School, Andheri (West),
Mumbai - 400058
Phone : +91 022 26252561 / 26252581
E-mail : sales.mumbai@climaveneta.in

Chennai :-

'Palani Enclave, No. 6/9, G-1, Ground Floor, Anna
Swamy Street, Pallavaram, Chennai - 600043
Phone : +91 44 48549430
Phone : +91 44 24351174 / 24351170
E-mail : sales@climaveneta.in

Hyderabad :-

Flat No. 204, Prestige Rai Towers, 6-3-664/B,
Somajiguda, Hyderabad - 500082
Phone : +91 40 23414005
Phone : +91 40 40172808
E-mail : sales@climaveneta.in

Kerala :-

No. 65/4578-A 4, Ground Floor, Poovelil
Buildings, 2nd Cross Road, Manapatty Parambu,
Kaloor Ernakulam - 682017
E-mail : sales@climaveneta.in

Ahmedabad :-

Mitsubishi Electric India Pvt Ltd

204-209, 2nd Floor, 31 FIVE Corporate
Road, Prahlad Nagar, Ahmedabad,
Gujarat - 380015
E-mail : sales.ahmedabad@climaveneta.in

Kolkata :-

Suite No. 418 & 419, Unit No. 407, 4th Floor,
Lords Building, 7/1, Lord Sinha Road,
Kolkata - 700071
E-mail : sales.kolkata@climaveneta.in



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.

CLIMAVENETA INDIA

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