## MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.

# 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
- UNITS FOR SIMULTANEOUS AND INDEPENDENT PRODUCTION OF HOT AND COLD WATER



## **CLIMAVENETA'S MISSION**



With over 50 years experience in the HVAC industry, Climaveneta 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 specialized brand for data center cooling, merging the experience of Climaveneta with RC's in this segment.

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 companies. 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

specialized manufacturing hubs

Vast portfolio of proprietary & patented technologies

Worldwide distribution and service network

Sales network

Manufacturing hubs or R&D labs

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



COUNTLESS SUCCESSFUL PROJECTS WORLDWIDE



Wiit Spa - Milano, Italy Tier IV certified

**Data Center proRZ** Munich, Germany





CLIMAVENETA 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 companies 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 were 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











#### **CLOSE CONTROL AIR CONDITIONERS**



- ▶ Highest energy efficiency
- Total dependability
- Ideal for high temp. IT environments









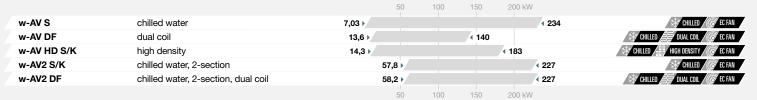




#### Direct expansion close control units

			50	100 150 kW	
b-AV DX / t-AV DX	with remote air cooled condenser	6,37 ▶		√ 14	9 AIR COOLED AXIAL & EC FAN
b-AV DW / t-AV DW	with built-in water cooled condenser	7,89 >		<b>√</b> 4 1	56 ✓ WATER COOLED AXIAL © EC FAN
t-AV DF DX	dual fluid / air cooled	12,2 >		∢ 136	AIR COOLED 🎊 🗗 DUAL FLUID / 🗲 EC FAN
t-AV DF DW	dual fluid / water cooled	11,2 }		∢ 145	√ WATER COOLED 🎊 🌮 DUAL FLUID / 🌠 EC FAN
t-AV FC DW	free cooling / water cooled	7,88 >		4	157 WATER COOLED SP FREE COOLING CE FAN
i-AV DX	inverter compr./ with remote air cooled condenser	10,4 >		<b>135</b>	INVERTER AIR COOLED C EC FAN
i-AV DW	inverter compr./with built-in water cooled condenser	11 ≯		<b>◆ 140</b>	INVERTER A WATER COOLED CE FAN
i-AV DF DX	inverter compr./dual fluid/air cooled	12,3 >		142	INVERTER AIR COOLED A DUAL FLUID CE FAN
i-AV DF DW	inverter compr./dual fluid/water cooled	12,3 >		<b>√ 147</b>	INVERTER WATER COOLED ** DUAL FLUID FE FAN
i-AV FC DW	inverter compr./free cooling/water cooled	11 ▶		<b>140</b>	INVERTER WATER COOLED FREE COOLING CE FAN

#### Chilled water close control units



#### Close control units for low thermal load applications



#### Close control units for high temperature, high Delta T



#### Close control units with displacement air delivery

		10 20	30 40 50 KVV	
t-AV DL DX	with remote air cooled condenser	7,63 >	<b>√ 42,6</b>	AIR COOLED CFAN
w-AV DL	chilled water	11,6 >	∢ 41,3	★ CHILLED / EC FAN
i-AV DL DX	inverter compr. / with remote air cooled cond.	21,7 >	4 53	INVERTER & AIR COOLED / EC FAN
		10 20	30 40 50 kW	

#### REMOTE CONDENSERS AND DRY COOLERS

			50	100	150	200	250	300 kW	
BVE DX-A	air cooled remote condenser with AC axial fans	9,50 >						4 302	OUTDOOR AXIAL
BVE DX-E	air cooled remote condenser with EC axial fans	9,50 >						∢ 302	OUTDOOR / EC AXIAL
BVE DX-PF-E	air cooled remote condenser with EC plug fans	9,90 🕨			4	156			OUTDOOR OF CENTRIF.
BVE DC-A	dry cooler with AC axial fans	6,40 ▶				172 €			OUTDOOR AXIAL
BVE DC-PF-E	dry cooler with EC plug fans	6,80 ▶		₹ 89					OUTDOOR OF CENTRIE.
			50	100	150	200	250	300 kW	

## ADVANCED TECHNOLOGIES FOR EFFICIENT DATA CENTERS

Climaveneta IT 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.

#### 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

				00 100	
CRCX	direct expansion with remote air cooled condenser	8,81 >		<b>4</b> 68,4	AIR COOLED CF EC FAN
CRCC	chilled water	16,1 >		₹ 74,7	CHILLED FEC FAN SEC AXIAL
CRCD	direct expansion / dual fluid	9,53 > ( 17,7			ST DUAL FLUID FEC FAN
CRCF	direct expansion / free cooling	11,1 > 14,6			FREE COOLING AIR COOLED FE EC FAN FE EC AXIAL
CRCX ROW	direct expansion / with integrated compressor	23,5 >	∢ 37,1		AIR COOLED FEC FAN
CCD	chilled water unit for in-rack conditioning	26,6 ▶	₹ 39,1		CHILLED AXIAL CECAXIAL
		20	40	60 kW	

#### **DATA CENTER INFRASTRUCTURE**

#### RACK

High quality cabinets for the protection and housing of servers

#### AISLE CONTAINMENT

Aisle Containment solutions for high density applications

#### PDUs

Premium Rack Power Technology

#### RAISED FLOORS

Raised floor solutions for high efficiency data centers



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 solutions for the physical separation of the hot and cold air streams.



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



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.

#### **EVAPORATIVE COOLING SYSTEMS**



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



#### 2-Stage indirect evaporative cooling system for large data centers

EVIS	evaporative cooling system	80 🕨					∢ 320
		'		130	200	230	SUU KVV



#### **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**



- ▶ Highest energy efficiency
- ▶ Ideal for IT environments
- Lowest noise emissions





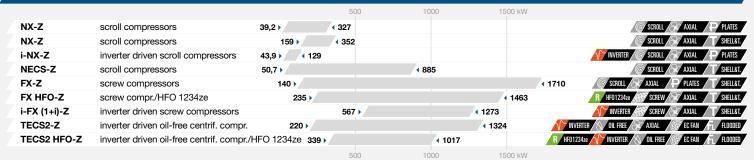




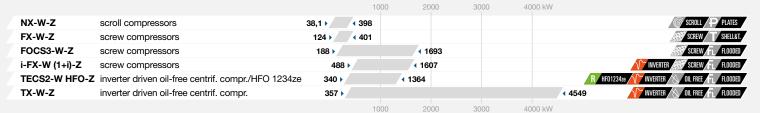




#### Air cooled chillers



#### Water cooled chillers



#### Condenserless chillers

			500	1000	1500	2000 KVV	
HE-Z	scroll compressors	4,70 ▶ ◀ 32,4					SCROLL PLATES
NECS-ME-Z	scroll compressors	39,5 ▶	<b>4</b> 432				SCROLL P PLATES
FOCS-ME-Z	screw compressors	79,2 ▶				₹ 2240	SCREW SHELL&T.

#### Air cooled chillers with free-cooling technology

			500	1000	1500 kW	
NECS-FC-Z	scroll compressors	41,5 >	4 477			SCROLL / AXIAL / PP PLATES
FX-FC-Z	screw compressors	332 >			<b>1450</b>	SCREW AXIAL T SHELL&T.
TECS-FC-Z	inverter driven oil-free centrif. compr.	302 >			<b>1693</b>	OIL FREE C FAN FL FLOODED

#### Air cooled chillers with evaporative free-cooling technology

		300	1000	1300 KVV	
FX-EFC-Z	screw compressors	330 >		1441	SCREW AXIAL T SHELL&T.
TECS-EFC-Z	inverter driven oil-free centrif. compr.	300 ▶		1682	OIL FREE C AXIAL FL FLOODED
		500	1000	1500 kW	

#### **ANCILLARY PRODUCTS**



#### **Remote condensers**

		200	400	000	OUU KVV	
NHCR / NCE / FCE	7,90 >				∢ 929	AXIAL





#### 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 et points and operating mode, free cooling mode, active redundancy mode).

#### **TELECOM SOLUTIONS**



- Reliability and extended operation
- High capacity sensitive cooling
- Black out management







#### Air conditioners for telecom applications with free-cooling and full DC inverter technology

			)	10	15 2	U KVV	
MED	packaged for outdoor installation 1,95 >					₹ 20,6	OUTDOOR CENTRIE. EC FAN
i-MED	packaged for outdoor installation / inverter techn.		8,56 >		∢ 17,6	<b>√</b> IN\	VERTER OUTDOOR CENTRIE. EC FAN
MID	packaged for indoor installation 1,95 >				14,8		INDOOR CENTRIE CE FAN
i-MID	packaged for indoor installation /inverer techn.		8,51 >		∢ 18,1	<b>√</b> II	IVERTER NIDOOR CENTRIE. EC FAN
HCAT	split system / ceiling or wall installation	4,94 ▶			4 16,8		WALL INSTALLATION CENTRIE. EC FAN
i-HCAT	split system / ceiling or wall installation /inverter ted	ch.	8,64 >		∢ 17,3	INVERTER	WALL INSTALLATION CENTRIE.
				10	15	0.1444	

## UNITS FOR SIMULTANEOUS AND INDEPENDENT PRODUCTION OF HOT AND COLD WATER



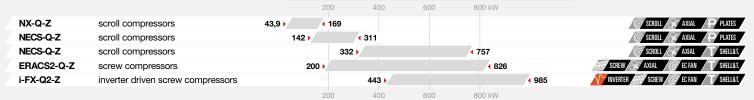
- Smart heat recovery system
- A single unit for multiple uses
- > System simplification







#### Air source heat pumps



#### Water source heat pumps

# CONTROL, SUPERVISION AND OPTIMISATION SYSTEMS





#### **Group devices**

▶ ClimaPRO DCO Plant Room Optimisation System

Plant Room Optimiser for real time, smart management of energy indeces for the single units and the entire plant room.

DATA CENTRE MANAGER Specialized group control for the data center air conditioners.





#### Supervision and monitoring systems

- FWS3 / FWS3000
- Remote monitoring systems.
- CV Cloud

Cloud based remote monitoring system.

WS3000

Remote monitoring system for service and proactive maintenance.

#### **Human Machine Interfaces**

KIPlink

Control interface for smart phones and tablets.



#### **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.





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.

Head Office: Via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy Tel (+39) 0424 509 500 - Fax (+39) 0424 509 509 www.climaveneta.com www.melcohit.com