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

COMFORT

CHILLERS

FX-W

WATER SOURCE CHILLERS WITH SCREW COMPRESSORS, FROM 124kW TO 399kW

ErP COMPLIANT 2021

climaveneta.com

CLIMAVENETA®
SUSTAINABLE COMFORT

FX-W

ONE UNIT TAKING ON THE MOST CHALLENGING PROJECTS

Water source chillers with screw compressors 124kW - 399kW

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

FX-W features semi-hermetic screw compressors optimized to operate with low compression ratio and R134a refrigerant, dry expansion shell and tube evaporator fully developed by Mitsubishi Electric Hydronics & IT Cooling Systems, shell and tube condenser, electronic expansion valve, and in-house developed management software.

ONE UNIT TO FITS ALL

Compact design for the highest flexibility
A compact structure resulting from a rationalised design of the components inside the chiller leads to more flexibility during the installation phase, both in case of new plants and pre-existing ones.

Reduced maintenance costs
The latest technology for the compressors and top quality heat exchangers provides outstanding reliability aimed at lower maintenance costs.

COMFORT APPLICATIONS

- Commercial premises
- Office buildings
- Hotels and resorts
- Healthcare facilities
- Retail and department stores
- Sports and leisure installations

ENERGY SAVING SOLUTIONS: HEAT RECOVERY SYSTEMS

FX-W chiller will save money not only when the unit is producing cooling. It also offers the opportunity to recover heat when there is a simultaneous need for chilled and hot water by redirecting this heat from the chiller to various heating applications:

- **Restaurants, hotels, resorts, hospitals, residential buildings:** hot water can be used for the kitchen, laundry and bathrooms.
- **Schools, sports facilities and SPAs:** showers, washrooms and swimming pool heating.
- **Offices or residential buildings:** radiant floor heating and restrooms.

HEAT RECOVERY CONFIGURATIONS

-	**Standard unit**	Unit for the production of chilled water.	**Baseline**
D	**Partial heat recovery**	A desuperheater on the compressor discharge line recovers approximately 20% of the unit's capacity.	**60°C**
R	**Total heat recovery**	A devoted refrigerant water heat exchanger recovers all the condensation heat.	**48°C**

FX-W chillers are built around operational reliability, best interior comfort and quick-and-easy installation

PERFECT INDOOR COMFORT

FX-W has been designed for the wellness of indoor spaces. For those projects where quality of acoustical comfort plays a central role, an optional compressor enclosure cuts noise emissions by 5 dB(A).

Advanced control system for the perfect management of all the parameters keeps the occupant comfort always constant and supply a year-round cooling taking into account the type and characteristics of the space occupancy.

ErP 2021 COMPLIANT

Designed to reduce harmful non-environmentally friendly emissions from energy consuming products, a new energy performance ratio has been introduced to allow refrigeration end-users to easily compare chiller efficiency performance: the Seasonal Energy Efficiency Ratio (SEER).

Engineered with selected components and careful design, all FX-W units are compliant with the latest ErP 2021 efficiency targets.

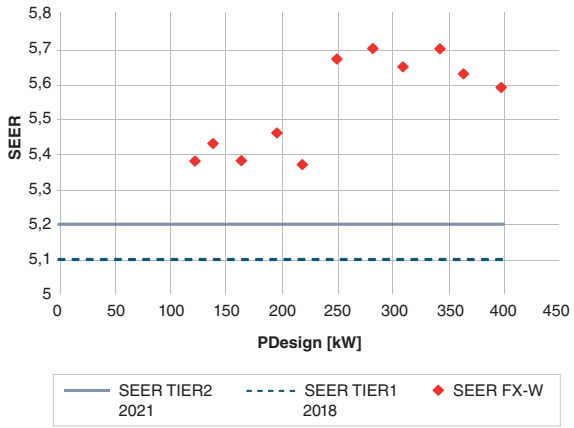
EXTREME EFFICIENCY

FX-W range has been designed to provide utmost efficiency both at full (summer season) and partial load when the building cooling requirements falls (middle-seasons/winter).

Single circuit unit:
EER*=4,86
SEER*= 5,4

Dual circuit unit:
EER*= 4,88
SEER*= 5,7

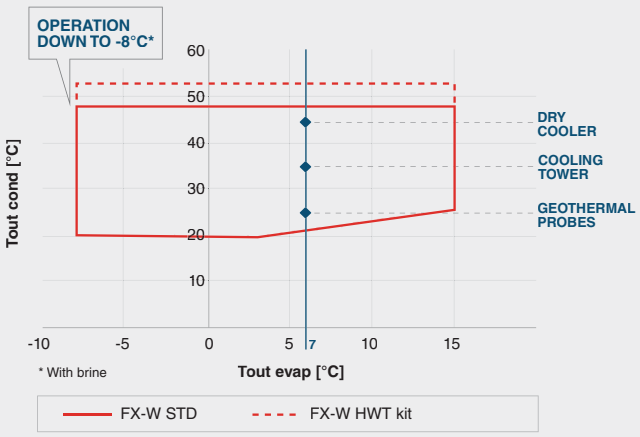
*Average values



EXTENDED OPERATING FIELD FOR A VAST ARRAY OF APPLICATIONS

Dedicated heat exchangers and wide operating limits make FX-W suitable for a vast range of fields.

- **2-pass condenser (std):** compatible with water with small rise of temperature (typically tower water).
- **4-pass condenser (opt):** compatible with water with high delta temperature from open loop sources (typically, groundwater or waterworks).
- **Cu/Ni 90/10 tubes condenser (opt) for seawater:** to provide protection against corrosion and guarantee a reliable operation and optimal condensation.



Precise condensation control
FX-W range provides several solutions for the control of the condenser water system. A 0-10V signal is provided as standard to regulate an external modulating valve or the dry-cooler EC fans. Options include a pressostatic valve for regulating the water flow as a function of the condensing pressure, or the 0-10V signal with relay for external inverter driven pump speed control. A 2 or 3-way modulating valve can be offered as customized accessory following a technical verification.
Hydraulic connections kits are available for both the evaporator and condenser.

TECHNOLOGICAL CHOICES

Dual circuit units

from 250kW cooling capacity for increased reliability and easier maintenance operations.

Compressors enclosure (opt.)

in peraluman panels with 30mm polyester acoustic insulation (-5 dB(A)).

Shell and tube condenser

2 passes optimized for ΔT=5°C or
4 passes optimized for ΔT >10°C

Frame in polyester-painted galvanized steel

- Very easy maintenance operation thanks to the rationalized positioning of components
- Easy transport, lifting and handling
- Compact footprint (width<950mm for single circuit units)

W3000TE CONTROL and USER-FRIENDLY USER INTERFACE

Fully in-house software developed by Mitsubishi Electric Hydronics & IT Cooling Systems.

- 19 supported languages.
- Optional serial cards with the most common protocols are available: ModBus, Bacnet MS/TP RS485, Bacnet Over IP, Echelon Lonworks.
- “QUICK MIND” logic: a self-adapting algorithm that activates or deactivates the compressors only when a change in the system load moves the flow temperature out of the setpoint neutral zone.
- Diagnostics: “BLACK BOX” function for saving more than 100 machine variables for a rapid trouble-shooting.
- Demand limit option: it restricts the maximum number of resources that can be activated by the unit and limits the chiller capacity during period of peak energy usage. This function is available for double circuit units.

The Large keyboard with a wide LCD display and LED icons is fitted on all the FX-W units ensuring a quick and easy setting of the unit.

The unit can also be configured with the touch interface with a 7” WVGA color display and a front USB port. The touch-screen’s technology is characterized by an easy-to-access data, and an effective graphical representation of the main figures.

Trusted reliability, simplified installation, maximized performance: FX-W has been designed to perfectly fit comfort applications needs.

VPF control logic

The VPF control series (Variable Primary Flow system) adjusts the pump speed on the basis of the plant's thermal load and dynamically optimizes the unit's thermoregulation for variable flow operation. This system ensures both the highest pump energy savings and chiller stable operation.

VPF: constant ΔP on the plant side
For systems with the primary circuit only.

VPF.D: constant ΔT on the plant side
For systems with primary and secondary circuits separated by a hydraulic decoupler.

Compact screw compressors, optimized for low pressure ratio applications

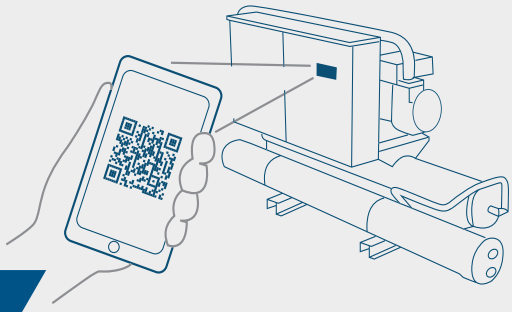
- 25% minimum capacity step (opt. for two circuit units).
- Long-life bearings (more than 150.000h at full load)
- Part winding start
- Three-stage oil separator

Electronic expansion valve

managed by proprietary dedicated logics, to guarantee an excellent flow control and a highly precise temperature control.

Dry expansion shell and tube evaporator fully developed by Mitsubishi Electric Hydronics & IT Cooling Systems

- Internally grooved copper tubes for enhanced heat exchange
- Low pressure drops
- Fully protected against ice formation



KIPlink USER INTERFACE

Innovative Wi-Fi interface for an easy and enhanced unit management.

As an option, the direct control over the unit comes through the innovative KIPlink interface. Based on Wi-Fi technology, KIPlink gets rid of the standard keyboard and allows one to operate on the unit directly from a mobile device (smartphone, tablet, notebook) just by scanning the QR code positioned on the side of the unit.

- Communication based on Wi-Fi technology (no internet connection needed)
- User-friendly components monitoring
- Real-time graphs and key trends

FX-W 0551-1752

Chiller, water source for indoor installation, from 124kW to 399kW.

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

VPF VAR.PRIM.FLOW
R HFC R-134a
COOLING
T SHELL & TUBES
SCREW

FX-W			0551	0651	0751	0851	0951	1102	1302	1402	1502	1602	1752
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE													
COOLING ONLY (GROSS VALUE)													
Cooling capacity	(1)	kW	124	140	166	198	222	252	285	312	345	366	401
Total power input	(1)	kW	24,5	27,3	34,1	38,9	44,2	49,0	54,6	61,5	68,4	73,0	83,2
EER	(1)	kW/kW	5,07	5,15	4,88	5,10	5,02	5,15	5,22	5,07	5,05	5,02	4,81
COOLING ONLY (EN14511 VALUE)													
Cooling capacity	(1)(2)	kW	124	140	166	198	221	251	284	311	344	365	399
EER	(1)(2)	kW/kW	4,90	4,97	4,69	4,90	4,82	4,96	5,03	4,88	4,88	4,85	4,66
ESEER	(1)	kW/kW	5,53	5,57	5,48	5,51	5,44	5,75	5,75	5,70	5,69	5,63	5,59
Cooling energy class			B	B	B	B	B	B	B	B	B	B	B
ENERGY EFFICIENCY													
SEASONAL EFFICIENCY IN COOLING (Reg. UE 2281/ 2016)													
Ambient refrigeration													
PDesign	(7)	kW	124	140	166	198	221	251	284	311	344	365	399
SEER	(7)(8)		5,38	5,43	5,38	5,46	5,37	5,67	5,70	5,65	5,70	5,63	5,59
Performance ηs	(7)(9)	%	207	209	207	211	207	219	220	218	220	217	215
EXCHANGERS													
HEAT EXCHANGER USER SIDE IN REFRIGERATION													
Water flow	(1)	l/s	5,94	6,72	7,95	9,48	10,60	12,07	13,63	14,91	16,51	17,51	19,16
Pressure drop	(1)	kPa	19,8	19,7	27,6	33,0	41,2	41,0	38,5	46,1	32,0	36,0	43,0
HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION													
Water flow	(1)	l/s	7,09	7,99	9,55	11,29	12,67	14,36	16,18	17,79	19,70	20,92	23,03
Pressure drop	(1)	kPa	21,8	25,6	30,6	26,6	26,2	22,4	26,3	28,9	32,5	28,5	24,5
REFRIGERANT CIRCUIT													
Compressors nr.		N°	1	1	1	1	1	2	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1	2	2	2	2	2	2
Refrigerant charge		kg	22,0	32,0	30,0	56,0	54,0	44,0	64,0	62,0	60,0	86,0	110
NOISE LEVEL													
Sound Pressure	(3)	dB(A)	75	75	76	76	76	77	77	78	78	78	78
Sound power level in cooling	(4)(5)	dB(A)	92	92	93	93	93	95	95	96	96	96	96
SIZE AND WEIGHT													
Length	(6)	mm	2600	2600	2600	3000	3000	3000	3000	3000	3200	3200	3200
Width	(6)	mm	940	940	940	940	940	1100	1100	1100	1200	1200	1200
Height	(6)	mm	1500	1500	1500	1500	1500	1600	1600	1600	1700	1700	1700
Operating weight	(6)	kg	1090	1150	1320	1470	1470	1770	1880	2040	2320	2450	2590

Notes:
1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
2 Values in compliance with EN14511-3:2013.
3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614.
5 Sound power level in cooling, indoors.
6 Unit in standard configuration/execution, without optional accessories.
7 Seasonal energy efficiency of the cooling environment In AVERAGE climatic conditions [REGULATION (EU) N.2281/2016]
8 Seasonal space cooling energy index
9 Seasonal energy efficiency of space cooling

The units highlighted in this publication contain HFC R134a [GWP100 1430] fluorinated greenhouse gases.

Certified data in EUROVENT

FURTHER OPTIONS

ELECTRICAL

Numbered wiring:
Electrical board wires are identified by numbered labels also indicated in the unit's wiring scheme to facilitate maintenance interventions to the electrical board connections.

Compressor rephasing:
Capacitors installed on the compressors' power inlet line to increase the unit's average cos(phi).

Automatic circuit breakers:
Over-current switches provided in place of standard fuses to protect the compressor from possible current peaks.

Soft-starter:
Electronic device to manage the inrush current of the compressor.

HEAT EXCHANGERS

Double insulation on exchangers:
Heat exchangers thermal insulation 19mm thick.

4 Passes condenser:
Source side heat exchanger compatible with water with high delta temperature.

Cu/Ni 90/10 water condenser:
Source side heat exchanger with pipes made of copper nickel alloy for seawater applications.

AUXILIARY INPUT

Auxiliary signal 4-20mA:
Analog input signal that enables the main setpoint variation according to the value of current applied.

Remote signal double set-point:
Analog input signal that allows to change the operating set-point switching only among 2 fixed set-points.

Remote Demand Limit:
Voltage free digital input to temporarily limit the units power consumption.

REFRIGERANT LEAK DETECTOR

Leak detector:
Factory installed device. In case of a gas leak detection it raises an alarm.

Leak detector+migration:
Factory installed device. In case of a gas leak detection it raises an alarm and stores the remaining refrigerant inside the condenser.

STRUCTURE

Compressor acoustical enclosure:
Soundproofing enclosure for compressor(s) section made of hot galvanised metal sheets and acoustic insulation.

Rubber type antivibration mountings:
Reduce vibrations, keeping noise to a minimum.

“BY FAR THE BEST PROOF IS EXPERIENCE”

Sir Francis Bacon
British philosopher
(1561 - 1626)

Every project is characterised by different needs and system specifications for various climates. All these projects share high energy efficiency, maximum integration, and total reliability resulting from the Climaveneta brand experience.

Acuario Club Hotel
2017 Havana - Cuba

Hotel and resorts

Cooling capacity: 651 kW
Installed machines:
3x FOCS-W water cooled chillers

Beijing Golden
2012 Beijing- China

Campus

Cooling capacity: 11544 kW
Heating capacity: 12100 kW
Installed machines:
5x water cooled chillers with screw compressors, 2x water cooled chillers with screw compressors and total heat recovery

Las Piedras
2014-2017
Montevideo - Uruguay

Shopping Centre

Cooling capacity: 3417 kW
Installed machines:
10x WIZARD air handling units;
3x FOCS2-W / CA high efficiency chilled water units

Hospital City of Hyvinkaa
2017 Hyvinkaa-Finland

Hospitals

Cooling capacity: 1005 kW
Installed machines:
1x FOCS-W 1502 water cooled chiller,
1x i-FX-W (1+i) water cooled chiller with inverter technology,
3x ABU close control units

Service Centre Credito Valtellinese
2014 Milan - Italy

Bank Office Building

Cooling capacity: 680 kW
Installed machines:
2x FOCS-W water cooled chillers

Boxer
2017 Harrismith
South Africa

Supermarket

Cooling capacity: 298kW
Installed machines:
FOCS-W water cooled chiller

FX-W_ENG_11-2017

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