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

PROCESS

CHILLERS

FX-W-Y

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

ErP COMPLIANT 2021

climaveneta.com

CLIMAVENETA®
SUSTAINABLE COOLING

FX-W-Y

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-Y 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.

THE PERFECT SOLUTION FOR PROCESS COOLING

In industrial processes a certain amount of heat is produced due to friction or process heating. Chillers employed in industrial applications remove this heat and through extremely reliable components they maintain appropriate temperature levels 24 hours a day, seven days a week.

PROCESS COOLING APPLICATIONS

- **Food industry,** where special attention is paid to safeguarding all the organoleptic properties of the products.
- **Chemical and Pharmaceutical,** during crystallization at low temperature or liquid cooling after sterilization.
- **Printing industry,** removing the heat generated by the friction of the printing rollers and cooling down the paper after it comes out of the ink drying ovens.
- **Plastics,** controlling the temperature of the molding process.
- **Winery,** keeping cooling in the fermentation stage.

ENERGY SAVING SOLUTIONS: HEAT RECOVERY SYSTEMS

In all industrial segments, heat produced during the production processes can be recovered when there is a simultaneous demand for chilled water and hot water. This energy can be reused to:

- Serve comfort workplaces and other areas located close to the industrial facilities.
- Produce domestic hot water or floor heating systems.
- Feed the Air Handling Unit post-heating coil to compensate the amount of heat lost during dehumidification.
- Pre-heat service fluids or incoming raw materials before further processing.

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-Y chillers are built around operational reliability, long-lasting life cycle and quick-and-easy installation

TOTAL RELIABILITY and REDUCED MAINTENANCE COSTS

Engineered with selected components and careful design, the FX-W-Y units are available with one or two independent circuits to guarantee ultimate redundancy and proven dependability.
A compact structure and reduced maintenance costs crown FX-W-Y units as the perfect solution to provide a consistent cooling to the most rugged environments

EXTRA DURABILITY

Particular attention has been paid to the unit intensive use (24/7 365 days a year) and long-lasting operation.
Top-quality components and dedicated features such as Fast Restart or the Double power supply are key for an uninterruptible operation of the chiller under any unexpected circumstance.

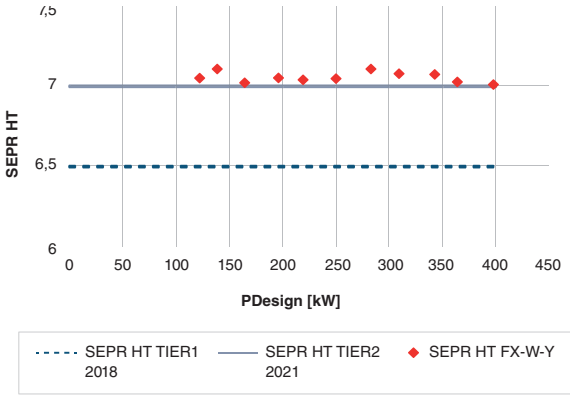
ErP 2021 COMPLIANT

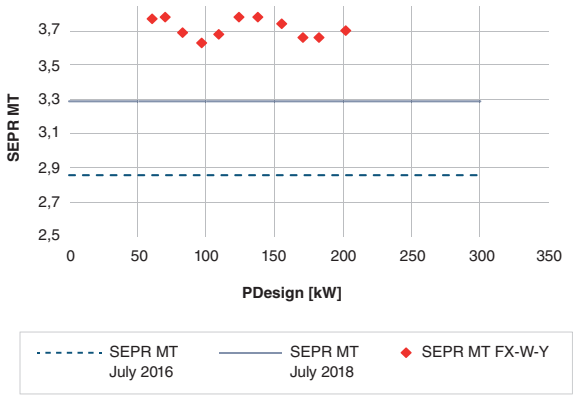
A new energy performance ratio has been introduced to allow refrigeration end-users to easily compare chiller efficiency performance: the Seasonal Energy Performance Ratio (SEPR) for industrial process chillers.
All FX-W-Y units are compliant with the latest ErP 2021 efficiency targets.

EXTREME EFFICIENCY

FX-W-Y units satisfy both SEPR MT (Medium Temperature) and HT (High Temperature) requirements, thus matching the most challenging requirements of different process cooling applications.

EER*=4,87 SEPR HT*= 7,06 SEPR MT*= 3,71
*Average values

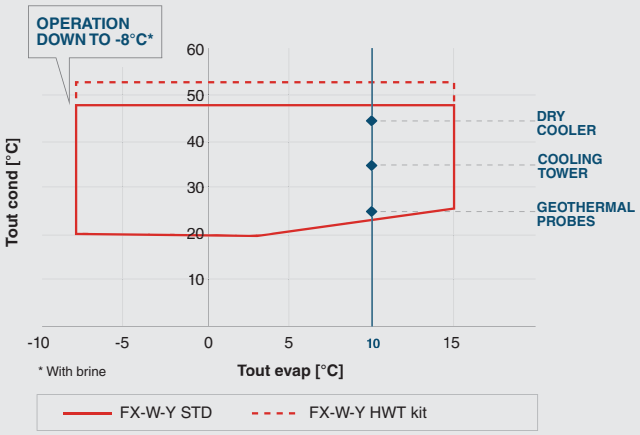




EXTENDED OPERATING FIELD FOR A VAST ARRAY OF APPLICATIONS

Dedicated heat exchangers and wide operating limits make FX-W-Y 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-Y 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-Y 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-Y 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

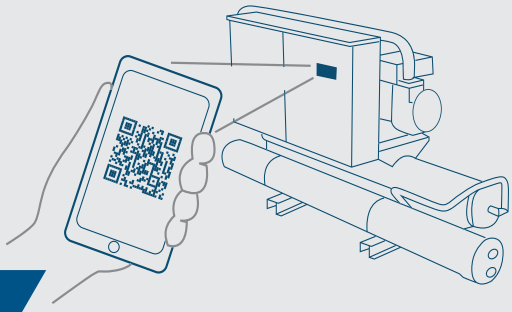
- 25% minimum capacity step (opt. for two circuit units).
- Long-life bearings (more than 150.000h at full load)
- Part winding start
- Three-stage oil separator

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-Y 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-Y			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	32	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	(2)	kW	124	140	166	198	221	251	284	311	344	365	399
EER	(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	(2)	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)													
High temperature process cooling													
PDesign	(7)	kW	124	140	166	198	221	251	284	311	344	365	399
SEPR HT	(7)(9)		7,05	7,11	7,02	7,05	7,04	7,05	7,11	7,08	7,08	7,03	7,01
SEASONAL EFFICIENCY IN COOLING (Reg. UE 1095/2015)													
Medium temperature process cooling													
Pdesign	(8)	kW	61,9	68,8	83,7	97,6	110,1	124,8	138,6	154,1	170,9	182,2	201,1
SEPR MT	(8)(9)		3,77	3,78	3,69	3,63	3,68	3,78	3,78	3,74	3,67	3,67	3,70
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	19,7	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 high temperature process cooling [REGULATION (EU) N. 2281/2016]
8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 1095/2015]
9 Seasonal Energy Efficiency of Process Cooling
The units highlighted in this publication contain HFC R134a [GWP100 1430] fluorinated greenhouse gases.

Certified data in EUROVENT

DEFINED FEATURES FOR MISSION CRITICAL APPLICATIONS

Committed to achieve the best standards, FX-W-Y is equipped with advanced features that ensure the system reliability and maximize the equipment uptime in case of emergency circumstances.

FAST RESTART

Reliable chiller operation and restart

FAST RESTART is the control function that provides a quick resumption of the cooling resources after a power failure in order to re-establish, in the quickest time possible, the correct chilled water temperature.

Ramp-up time for 100% cooling capacity

N. compressors	Standard unit	Unit with fast restart
1	520”	120” (2)
2	710”	130” (2)

(2) if condensing control valve is present, add 30”.
Values refer to a unit working at standard conditions.

“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.

Seat Industries
2016 Martorell - Spain

Automotive

Cooling capacity: 2213 kW
Installed machines:
3x FOCS/B air cooled chiller,
3x AW Close Control Units,
1x FOCS-W water cooled chiller

BBGR Sezanne
Sezanne - France

Industrial technology

Cooling capacity:
251 kW
Installed machines:
1x FOCS-W water cooled chiller

SSAB
2017 Luleå - Sweden

Steel Industrial Process

Cooling capacity:
2213 kW
Installed machines:
1x water cooled FOCS-W chiller

Nolato Polymer
2017 Ängelholm - Sweden

Plastic Industrial Process

Cooling capacity:
327 kW
Installed machines:
1x FOCS-W 1302

BBI Solutions
Cape Town - South Africa

Chemical Pharmaceutical

Cooling capacity:
298 kW
Installed machines:
1x FOCS-W water cooled chiller

Cantina Sociale di Avio
Avio - Italy

Winery

Cooling capacity:
502 kW
Installed machines:
2x FOCS-W water cooled chiller

DOUBLE POWER SUPPLY

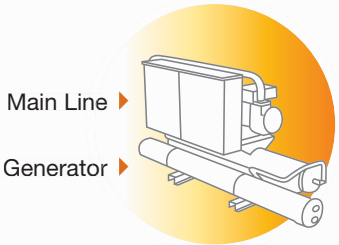
Ensure immediate cooling start-up within 25”

Full load resumption in a shorter time compared to standard unit restart

Uptime depends on redundancy. For a chiller working 24/7, a secure source of electrical energy is fundamental to keep services running.

With the Automatic Transfer Switch (ATS) option, FX-W-Y can be connected to two separate power lines to enhance the system dependability.

When the primary source fails, the ATS automatically switches over to the backup line, granting an uninterrupted power supply to the unit.



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CLIMAVENETA®

eco Changes 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.

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