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

COMFORT

CHILLERS

FX-W-G05

R513A

ErP COMPLIANT 2021

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

climaveneta.com

CLIMAVENETA®

FX-W-G05

THE COMPACT CHILLER FOR THE HIGHEST GREEN EFFICIENCY

Water source chillers with screw compressors 124 kW - 399 kW

Modern multi-use buildings, shopping centers, business premises, and healthcare facilities are just some of the examples where increased comfort, reduced running costs and the lowest ecological footprint are required at the same time.

FX-W-G05 is brilliantly engineered to be at the forefront of green innovation in comfort cooling applications, providing customers top-level efficiency for the most advanced projects.

COMFORT APPLICATIONS

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

ErP 2021 COMPLIANT

EXTREME EFFICIENCY

FX-W-G05 range has been designed to provide utmost efficiency at both full loads in the summer, and partial loads in the spring and fall when the building cooling requirements decrease.

ErP 2021 COMPLIANT
Engineered with selected components and careful design, all FX-W-G05 units are compliant with the latest ErP 2021 efficiency targets for comfort applications.

Single circuit unit	Dual circuit unit
EER*=4,67	EER*=4,69
SEER*= 5,37	**SEER*= 5,60**

*Average values

ENERGY SAVING SOLUTIONS: HEAT RECOVERY SYSTEMS

FX-W-G05 chillers 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**

ALL-ROUND SUSTAINABILITY

R513A

FX-W-G05 is the result of Mitsubishi Electric Hydronics & IT Cooling Systems' extensive approach to sustainability.

Increasing concerns about the global warming impact of chillers and heat pumps is driving new regulatory policies to push towards even more efficient units with the lowest carbon footprint.

Today, an all-round approach is the only way to effectively reduce the Total Equivalent Warming Impact (TEWI).

Fully committed to support the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems designed FX-W-G05, a complete chiller range with reduced environmental impact, optimized for R513A refrigerant.

Combining brilliant annual efficiency with the use of a low GWP refrigerant, FX-W-G05 tackles both the indirect (due to primary energy consumption) and the direct global warming, thus resulting in the perfect choice for any new, forward-looking cooling system.

R513A

LOW GWP
-56% GWP Vs R134a

Non-flammable
Safety Class A1

REFRIGERANT BENCHMARK

SCROLL

Refrigerant	GWP*	Flammability
R410A	2088	NON flammable
R32	675	MILDLY flammable
R454B	466	MILDLY flammable
R452B	698	MILDLY flammable

SCREW

Refrigerant	GWP*	Flammability
R134a	1430	NON flammable
R513A	631	NON flammable
1234ze	7	MILDLY flammable
1234yf	4	MILDLY flammable

*IPCC AR4 **ASHRAE 34 - ISO 817

New regulations like the EU F-gas and the Kigali Amendment to the Montreal Protocol, are driving the industry towards new eco-friendly refrigerants, with reduced greenhouse effect.

Unfortunately, the majority of low GWP refrigerants raises another critical issue: flammability.

The new refrigerant R513A, chosen for FX-W-G05, is a brilliant exception: it offers a -56% GWP reduction compared to the R134a's while ensuring complete non-toxicity and non-flammability (Class A1 of ASHRAE 34, ISO 817).

PERFECT INDOOR COMFORT

The advanced control system is engineered to maintain optimal comfort conditions all year-round according occupancy needs and variations.
For those projects where quality of acoustical comfort is key, an optional compressor enclosure cuts noise emissions by 5 dB(A).

COMPACT DESIGN FOR THE HIGHEST FLEXIBILITY

The compact structure resulting from the rationalised design and assembly of the chiller components leads to more flexibility during the installation phase, both in case of new plants and existing ones.

REDUCED MAINTENANCE COSTS

The latest technology for the compressors and top quality heat exchangers provide outstanding long-term reliability aimed at lower maintenance costs.

TECHNOLOGICAL CHOICES

Dual circuit units

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

Compressors enclosure (opt.)

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

Frame in polyester-painted galvanized steel

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

Shell-and-tube condenser

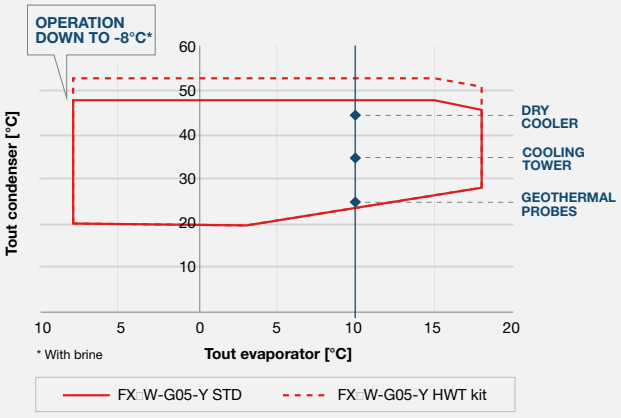
- **2 (std) or 4 (opt.) passes condenser:** to provide the best flexibility for various types of cooling water sources
- **Cu/Ni 90/10 tubes condenser (opt.) for seawater:** to provide protection against corrosion and guarantee reliable operation and optimal condensation

EXTENDED OPERATING FIELD FOR A VAST ARRAY OF APPLICATIONS

Dedicated heat exchangers and wide operating limits make FX-W-G05 suitable for a vast range of applications.

- **2-pass condenser (std):** optimized for water ΔT=5°C (typically cooling tower).
- **4-pass condenser (opt):** optimized for water ΔT>10°C (typically open loop sources: groundwater or waterworks).

Hydraulic connection kits are available for the condenser.



PRECISE CONDENSATION CONTROL

FX-W-G05 range provides several solutions for the control of the condenser water system.
A 0-10V signal is provided as standard to control 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.

In addition, 2-way modulating valves can be offered as an accessory to control the condenser water flow.

Advanced technologies smartly combined with the green R513A refrigerant: the perfect match for offering the highest efficiency levels.

R513A

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

VPF control logic

VPF VARIABLE PRIMARY FLOW

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.

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

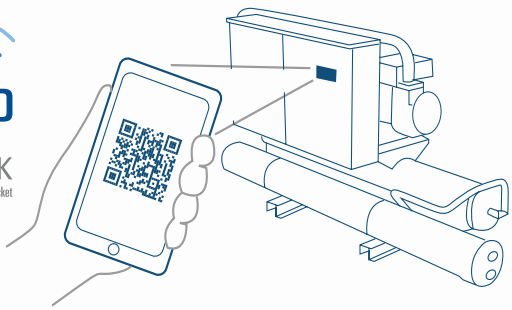
- Internally grooved copper tubes for enhanced heat exchange
- Low pressure drops
- Fully protected against ice formation

W3000TE CONTROL AND USER-FRIENDLY INTERFACE

The logic behind FX-W-G05 is the W3000TE control software. Characterized by advanced functions and algorithms, **W3000TE features proprietary settings** ensure faster adaptive responses to different dynamics, in all operating conditions:

- Efficient and reliable operation in all conditions
- Connectivity with the most commonly used BMS protocols (Opt.)
- Demand limit option (available for double circuit units).

KIP LINK
Keyboard In your Pocket



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).

Easier on-site operation

Real-time graphs and trends

Data logger function

FX-W-G05 0551-1752

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

VPF VAR.PRIM.FLOW
R R513A
COOLING
T SHELL & TUBES
SCREW

FX-W-G05			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	124,3	140,5	166,3	198,2	221,7	252,4	285,1	311,9	345,2	366,2	400,6
Total power input	(1)	kW	25,50	28,41	35,57	40,52	46,10	51,04	56,86	64,04	71,26	76,05	86,66
EER	(1)	kW/kW	4,875	4,947	4,671	4,894	4,809	4,949	5,011	4,873	4,842	4,812	4,621
ESEER	(1)	kW/kW	5,970	5,950	5,960	5,940	5,930	6,320	6,240	6,220	6,120	6,110	6,090
COOLING ONLY (EN14511 VALUE)													
Cooling capacity	(1)(2)	kW	123,9	140,1	165,8	197,5	220,8	251,4	284,1	310,7	344,2	365,1	399,2
EER	(1)(2)	kW/kW	4,710	4,780	4,500	4,720	4,630	4,770	4,840	4,690	4,690	4,660	4,480
ESEER	(1)(2)	kW/kW	5,530	5,510	5,480	5,460	5,440	5,730	5,670	5,630	5,600	5,630	5,580
Cooling energy class			B	B	C	B	C	B	B	B	B	B	C
ENERGY EFFICIENCY													
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)													
Ambient refrigeration													
Prated,c	(7)	kW	124	140	166	198	221	251	284	311	344	365	399
SEER	(7)(8)		5,37	5,37	5,36	5,40	5,35	5,64	5,62	5,58	5,61	5,61	5,57
Performance ηs	(7)(9)	%	207	207	206	208	206	218	217	215	216	217	215
EXCHANGERS													
HEAT EXCHANGER USER SIDE IN REFRIGERATION													
Water flow	(1)	l/s	5,944	6,719	7,954	9,479	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	7,133	8,045	9,611	11,37	12,75	14,45	16,29	17,90	19,83	21,06	23,19
Pressure drop	(1)	kPa	22,1	25,9	31,0	27,0	26,5	22,7	26,6	29,3	33,0	28,9	24,8
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	24,0	34,0	32,0	59,0	57,0	47,0	68,0	66,0	63,0	91,0	116
NOISE LEVEL													
Sound Pressure	(3)	dB(A)	75	75	76	76	76	78	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	2400	2600	2700	3000	3000	3000	3100	3100	3200	3200	3200
Width	(6)	mm	920	920	950	960	960	1100	1100	1100	1100	1200	1200
Height	(6)	mm	1500	1500	1500	1500	1500	1500	1500	1500	1600	1600	1600
Operating weight	(6)	kg	1050	1110	1280	1450	1460	1710	1820	1990	2280	2430	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 Parameter calculated according to [REGULATION (EU) N. 2016/2281]
8 Seasonal energy efficiency ratio
9 Seasonal space cooling energy efficiency
The units highlighted in this publication contain HFC R513A (XP10) [GWP_{100} 631] 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 of 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.

CONNECTIVITY

M-Net interface kit:
Interface module to allow the integration of the unit with Mitsubishi Electric proprietary communication protocol M-Net.

“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

University 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

Hospital

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

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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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