

**mitsubishi electric**  
**HYDRONICS & IT COOLING SYSTEMS S.p.A.**

PROCESS

WATER SOURCE CHILLERS WITH SCREW COMPRESSORS

# FX-W-G05-Y

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



# FX-W-G05-Y

## THE COMPACT CHILLER FOR THE HIGHEST GREEN EFFICIENCY



Water source chillers with screw compressors  
124 kW - 399 kW

In industrial processes a certain amount of heat is produced due to friction of moving parts or as a result of thermal processes. Process chillers remove the excess heat and, through extremely reliable components, maintain the optimum temperature, 24 hours a day, seven days a week.

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

### PROCESS APPLICATIONS

- ✓ Food industry
- ✓ Chemical and Pharmaceutical
- ✓ Printing industry
- ✓ Plastics
- ✓ Winery

### EXTREME EFFICIENCY

Thanks to devoted technological solutions and accurate design, the FX-W-G05-Y range provides high full load performance and brilliant part load efficiency together, thus reducing the energy consumption of industrial processes and cutting their running costs.

#### ErP 2021 COMPLIANT

FX-W-G05-Y units are compliant with the latest ErP 2021 efficiency targets for process applications, satisfying both SEPR MT (Medium Temperature) and HT (High Temperature) requirements.



#### Single circuit unit

EER\*=4,67

SEPR HT\*= 7,01  
SEPR MT\*= 3,62

#### Dual circuit unit

EER\*=4,69

SEER HT\*= 7,01  
SEPR MT\*= 3,64

\*Average values

### ENERGY SAVING SOLUTIONS: HEAT RECOVERY SYSTEMS

In all industrial segments, heat produced during production processes can be recovered when there is a simultaneous demand for chilled 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

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

# ALL-ROUND SUSTAINABILITY



**FX-W-G05-Y 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-Y, 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-Y tackles both the indirect (due the primary energy consumption) and the direct global warming, thus resulting in the perfect choice for any new, forward-looking cooling system.**



**LOW GWP**  
-56% GWP Vs R134a



**Non-flammable**  
Safety Class A1

## REFRIGERANT BENCHMARK

SCROLL			SCREW		
Refrigerant	GWP*	Flammability**	Refrigerant	GWP*	Flammability**
R410A	2088	NON flammable	R134a	1430	NON flammable
R32	675	MILDLY flammable	R513A	631	NON flammable
R454B	466	MILDLY flammable	R1234ze	7	MILDLY flammable
R452B	698	MILDLY flammable	R1234yf	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-Y, 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).**



### TOTAL RELIABILITY

The FX-W-G05-Y range meets the needs of an industry that cannot afford any cooling interruption. The units are available with one or two independent circuits to guarantee ultimate redundancy and proven dependability. Dedicated features such as Fast Restart and Double power supply ensure uninterruptible operation under any unexpected circumstance.



### COMPACT DESIGN FOR THE HIGHEST FLEXIBILITY

As a result of the rationalized design and assembly of the chiller components, the FX-W-G05-Y units feature a compact self-supporting structure, leading to more flexibility during the installation phase, both in case of new plants and already-existing ones.



### EXTRA DURABILITY AND REDUCED MAINTENANCE COSTS

Particular attention has been paid to intensive use of the unit (24/7, 365 days a year) and long-lasting operation. The latest technology for the compressors and top-quality heat exchangers provide outstanding long-term reliability aimed at lower maintenance costs.

# TECHNOLOGICAL CHOICES

## 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

## Dual circuit units

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



## EXTENDED OPERATING FIELD FOR A VAST ARRAY OF APPLICATIONS

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

- ✓ **2-pass condenser (std):** optimized for water  $\Delta T=5^{\circ}\text{C}$  (typically cooling tower).
- ✓ **4-pass condenser (opt):** optimized for water  $\Delta T>10^{\circ}\text{C}$  (typically open loop sources: groundwater or waterworks).

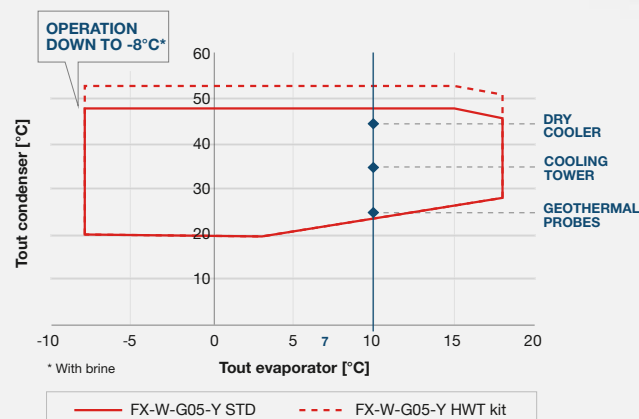
Hydraulic connection kits are available for the condenser.

## PRECISE CONDENSATION CONTROL

FX-W-G05-Y 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.



### 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



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  $\Delta P$  on the plant side**  
For systems with the primary circuit only.

**VPF.D: constant  $\Delta T$  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

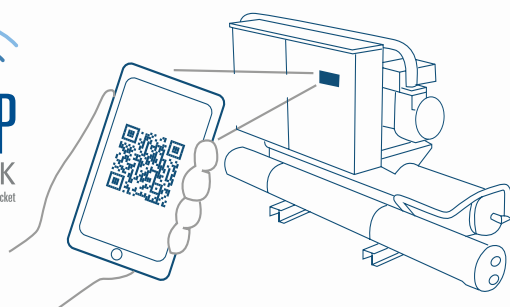
## W3000TE CONTROL AND USER-FRIENDLY INTERFACE

The logic behind FX-W-G05-Y 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).



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-Y 0551-1752

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



FX-W-G05-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
<b>PERFORMANCE</b>													
<b>COOLING ONLY (GROSS VALUE)</b>													
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
<b>COOLING ONLY (EN14511 VALUE)</b>													
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
<b>ENERGY EFFICIENCY</b>													
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>													
<b>Process refrigeration at high temperature</b>													
Prated,c	(7)	kW	123,9	140,1	165,8	197,5	220,8	251,4	284,1	310,7	344,2	365,1	399,2
SEPR	(7)(9)		7,00	7,04	7,00	7,02	7,00	7,01	7,03	7,02	7,02	7,00	7,00
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>													
<b>Process refrigeration at medium temperature</b>													
Prated,c	(8)	kW	60,20	67,00	81,50	94,90	107,1	121,4	135,0	150,0	166,4	177,4	195,8
SEPR	(8)(9)		3,65	3,70	3,63	3,55	3,58	3,70	3,69	3,65	3,58	3,59	3,63
<b>EXCHANGERS</b>													
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>													
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
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>													
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
<b>REFRIGERANT CIRCUIT</b>													
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
<b>NOISE LEVEL</b>													
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
<b>SIZE AND WEIGHT</b>													
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:

- Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- Values in compliance with EN14511-3:2013.
- 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.
- Sound power on the basis of measurements made in compliance with ISO 9614.
- Sound power level in cooling, indoors.

- Unit in standard configuration/execution, without optional accessories.
  - Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
  - Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]
  - Seasonal energy efficiency ratio
- The units highlighted in this publication contain HFC R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.

Certified data in EUROVENT

## DEFINED FEATURES FOR MISSION CRITICAL APPLICATIONS

Committed to achieve the best standards, FX-W-G05-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" <sup>(2)</sup>
2	710"	130" <sup>(2)</sup>

<sup>(2)</sup> 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



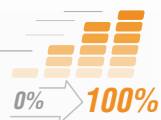
### Winery

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

## DOUBLE POWER SUPPLY



Ensure immediate cooling start-up within 25”

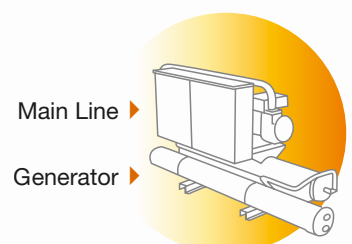


Full load resumption in a shorter time compared to standard unit restart

**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-G05-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.





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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