

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

COMFORT

CHILLERS

HEAT PUMPS

i-FX2-W **G04** ///

**WATER SOURCE CHILLERS AND HEAT PUMPS
WITH VSD SCREW COMPRESSORS AND
NEARLY ZERO GWP REFRIGERANT,
FROM 398 TO 1241 kW**

r HFO
1234ze



HYBRID
FALLING FILM



melcohit.com

 **CLIMVENETA**[®]

i-FX2-W^{G04}

THE NEW CHILLER AND HEAT PUMP RANGE FOR THE GREENEST COMFORT



Water-source chillers and heat pumps with VSD screw compressors
From 398 to 1241 kW



The i-FX2-W-G04 range is engineered to be at the forefront of green innovation in comfort cooling applications, providing the best efficiency for the most advanced projects, thanks to the full-inverter technology and the HFO R1234ze refrigerant.

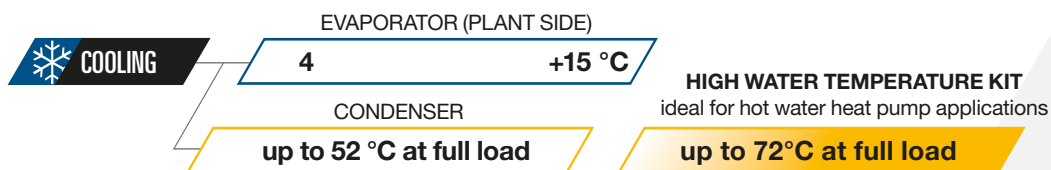
A COMPLETE NEW GENERATION OF CHILLERS

EFFICIENCY

	EER	SEER
i-FX2-W	5,15	8,65

EER: 12/7°C, air 30/35°C (EN14511 values)
SEER: Regulation (EU) N. 2016/2281

WIDE OPERATING RANGE FOR COMFORT APPLICATIONS



ACOUSTIC OPTIONS

Standard	Low sound power levels already in the standard version.	Baseline
Compressors' acoustical enclosure	Unit with compressor acoustical enclosure	-6 dB(A)
Integral acoustical enclosure	Unit with an integral acoustical enclosure, for best-in-class sound power levels	-16 dB(A)



ALL-ROUND SUSTAINABILITY

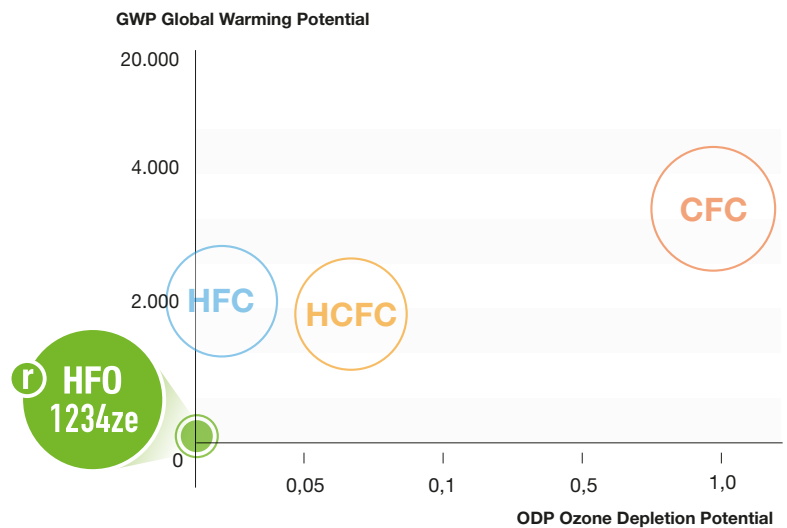
Fully committed to supporting the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems designed i-FX2-W-G04, a complete chiller and heat pump range optimized for HFO refrigerant R1234ze, with nearly zero environmental impact.

Combining brilliant annual efficiency with the use of a low GWP refrigerant, i-FX2-W-G04 tackles both the indirect (due to the primary energy consumption) and the direct global warming impact, thus resulting the perfect choice for any new, forward-looking cooling system.

The environmental impact of the refrigerants is measured by two parameters:

- ▶ **ODP:** Ozone Depletion Potential
- ▶ **GWP:** Global Warming Potential

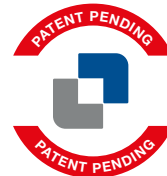
While in the past the focus was on reducing ODP values to 0, new regulations encourage Member States to work harder on GWP.



LEADING PROPRIETARY TECHNOLOGY



Equipped with condensers and the new **Hybrid falling film evaporator by MEHITS**



FULL INVERTER TECHNOLOGY



The new i-FX2-W-G04 showcases the latest variable speed technology:

- dual screw compressors with integrated refrigerant cooled inverter motor and variable Vi technology
- optimized for low condensing pressures
- especially suitable for water-cooled chillers

i-FX2-W-G04 ADJUSTS THE ROTATIONAL SPEED AND THE INTERNAL GEOMETRY TO:

- ✓ perfectly match the cooling load of the plant in any condition
- ✓ offer stepless and accurate capacity control
- ✓ ensure premium efficiency values, thus cutting operating costs

TECHNOLOGICAL CHOICES

Advanced technologies smartly combined with the green R1234ze HFO: the perfect match for offering the highest efficiency levels.

VSD SCREW COMPRESSORS

VSD screw compressors optimized for water source applications, with integrated frequency converter and Variable Vi technology

2 independent refrigerant circuits on all sizes to ensure:

- ▶ Total reliability
- ▶ Very low continuous minimum capacity ratio
- ▶ Easy maintenance

CSVW COMPRESSORS

Variable Speed Drive

Integrated and compact frequency converter, refrigerant cooled, for outstanding seasonal efficiency and wide capacity regulation.

Smart variable Vi logic

The integrated Vi slider adapts the internal geometry to the current operating condition, thus ensuring the best efficiency.

Extra durability achieved thanks to dedicated components:

- Envelope control function, 3-stage warning and alarm system, safe-torque-off function.
- Carbon steel bearings granted for a lifetime of over 150.000 hours.

High efficiency high speed motor

For unprecedented full and part load efficiencies and extremely wide and accurate capacity regulation.



TECHNICAL DATA

i-FX2-W G04



HYBRID FALLING FILM EVAPORATOR

HYBRID
FALLING FILM



By combining brilliant efficiencies and reduced refrigerant charge, the new hybrid falling film evaporator used in i-FX2-W-G04 is at the forefront of green innovation. **Fully developed and manufactured by MEHITS, it is characterized by:**

- ▶ Top-level approach aligned with the best flooded technologies
- ▶ Very low pressure drops across all the range thanks to the optimized design
- ▶ Down to -50% refrigerant charge reduction compared to a traditional flooded evaporator
- ▶ Application flexibility thanks to its configurability
E.g. Hydraulic connections on opposite sides and 16 bar water-side pressure options
- ▶ Complete reliability in any condition thanks to the proprietary oil separation and recovery solutions



Compared to traditional flooded evaporators

SHELL&TUBE CONDENSER

The new shell&tube condensers, fully developed and manufactured by MEHITS, are designed for minimum pressure drops, both on the water and refrigerant sides.

The integrated oil separation and recovery system ensures complete reliability in any load condition.

- ▶ Application flexibility thanks to its configurability

E.g. Hydraulic connections on opposite sides and 16 bar water-side service pressure options



TECHNICAL DATA

i-FX2-W/HG04



KIPlink: LOCAL AND REMOTE MONITORING FUNCTIONS

An exclusive product of Mitsubishi Electric Hydronics & IT Cooling Systems.

Monitor and control the unit from a LAN device (PC, laptop, mobile phone) with a simple web browser.

MAIN FEATURES

- ▶ Easier on-site operation
- ▶ Real-time graphs and trends
- ▶ Data logger function

1

WI-FI
Proximity Smart Keyboard



2

LAN via TCP/IP
Local Monitoring



3

REMOTE via VPN
Same as local monitoring



CUSTOMER VPN

Secure accessibility to LAN

Customer in charge of cyber security

AS OPTION, i-FX2-W-G04 IS AVAILABLE WITH:



◀ Touch screen
interface
+ KIPlink



◀ User-friendly
Large Keyboard
+ KIPlink

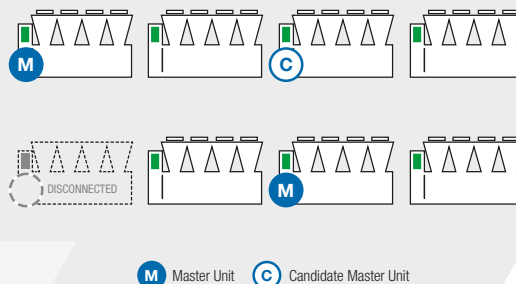
Touch Screen interface and large keyboard are available to substitute KIPlink.

SMART LAN FUNCTIONS

i-FX2-W-G04 features embedded LAN logics for an easy connection between a group of chillers.

- ▶ Up to 8 chillers connected to the same group.
- ▶ Load sharing and Sequencing.
- ▶ Selectable units' start-up sequence.
- ▶ Stand by unit management with automatic unit rotation.
- ▶ Dynamic master with succession priority.
One master unit is elected to coordinate the group and if it becomes disconnected the candidate unit takes full control.
- ▶ Resource priority management.

MASTER SUCCESSION PRIORITY



FURTHER OPTIONS

Set-point adjustment

4-20 mA: Enables remote set-point adjustments (analog input).

Double set-point: Enables the remote switch between 2 set-points (digital input).

Control functions

External capacity cap: Limits the unit's cooling capacity to a specific % value, by acting on active resources and their operating frequencies. The unit can exceed this limit in specific conditions.

U.L.C. User Limit Control: Controls a mixing valve (not included) to ensure a safe start-up and operation of the unit even in critical conditions.

Remote probe: Controls the unit's and pump's activation on the base of the water temperature of the buffer tank or hydraulic decoupler.

Demand limit: Limits the unit's power absorption for safety reasons or in temporary situations (digital input).

Operating map

HWT kit: Enables condenser leaving water temperatures at full load operation up to 72°C. Perfect for heat pump or heat recovery applications.

Connectivity

Serial card interface module to allow integration with BMS protocols:

Modbus / LonWorks / BACnet MS/TP / BACnet over IP / Konnex / Modbus TCP/IP/ SNMP

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

Multi Manager options to allow easy connection between a group of chillers

Energy Meter

Energy meter for BMS: Acquires electrical data and the power absorbed by the unit and sends them the BMS for energy metering (Modbus RS485).

Energy meter for W3000+: The electrical data acquired is available directly on the unit's control.

Acoustical enclosures

Compressors acoustical enclosure: the compressors are enclosed in an acoustical enclosure.

Integral acoustical enclosure: a complete enclosure is provided, in order to achieve very low sound power levels.

Refrigerant leak detection

Internal refrigerant leak control: new proprietary algorithm that is able to check, by reading and interpretation of the internal parameters of the refrigerant circuits, if there is a refrigerant leak, without needing an external leak detector.

Leak detector + migration: Refrigerant leak detection and migration system. If the device detects a leak the unit stops and stores the remaining refrigerant inside the evaporator.

Hydraulic

Water flow switch: Designed to protect the unit when the water flow across the evaporator is not sufficient and falls outside of the operating parameters.

16 BAR Evaporator and/or Condenser: Exchangers with higher water-side pressure (std 10 bar) for high water column applications.

Evaporator and/or Condenser hydraulic connections on opposite sides

Structure

Rubber type anti-vibration mountings: Reduce vibrations, keeping noise transmission to a minimum.

“ BY FAR THE BEST PROOF IS EXPERIENCE ”

Sir Francis Bacon
British Philosopher (1561 - 1626)

AJACCIO HOSPITAL

2016-2018 Ajaccio - France

Application: Healthcare / Hospitals	Plant type: Hydronic System - Air to Air System	Installed units: 4x i-FX-W (1+i) 3402, 640x fan coils, 83x Wizard, 16x ACU, ClimaPRO
Certifications: HQE - Excellent	Cooling capacity: 4000 kW	Air flow: 72000

PROJECT

The new Ajaccio Hospital, located on the east side of the city with a scenic view of the sea, has replaced the old one and has become the main medical centre for the whole island. With its 340 beds, the hospital offers all types of facilities for patient care, including the emergency room, radiology, general medicine, surgery with eight operating theaters, gynecology and obstetrics, intensive care, and cardio-vascular divisions.

CHALLENGE

The Hospital was built in strict compliance with environmental and energy saving standards, according to the French certification HQE (Haute Qualité Environnementale).

SOLUTION

In the new Ajaccio Hospital, 4 Climaveneta high efficiency water cooled chillers i-FX-W (1+i) 3402 for a total cooling capacity of about 4,000 kW were installed. For the air distribution in the hospital 640 fan coil units, belonging to a-LIFE and a-HWD2 ranges, were chosen, while the air treatment is provided by 60 Wizard air handling units. Moreover 23 AHUs have been installed as extractors. The supply contract also included 16 Accurate close control units, which are installed in the data center of the hospital. The whole HVAC system is managed by ClimaPRO, Climaveneta's management and optimization system.



TO LEARN MORE ABOUT THIS PROJECT

<https://www.melcohit.com/EN/Projects/5071/Ajaccio-Hospital.html>



MORE THAN 1000 PROJECTS ALL OVER THE WORLD

GIOIA22

2019-2021 Milan - Italy

Application: Office Buildings	Plant type: Hydronic System	Heating capacity: 3600 kW	1x NECS-WQ 0604, 1x EW-HT /0412, 3x WW-HT /0071,
Certifications: LEED – Platinum	Cooling capacity: 3800 kW	Installed units: 3x FX-WQ-G01/3202,	1x WW-HT/0101, ClimaPRO

PROJECT

Gioia22 is the new high-rise that will take the place of the former Inps headquarters, in Milan. It consists of 26 floors over 120 metres and 4 basement levels for a total gross area of 68,432 square metres and will be used for office space. The internal layout has been carefully studied both from an architectural and electrical and mechanical plant point of view, to ensure maximum flexibility and the well-being of the occupants.

CHALLENGE

Gioia22 is the most technological and eco-sustainable office building in Italy and has achieved the LEED Platinum Shell & Core certification. The new tower will also have 6,000 square metres of photovoltaic panels that will allow a 75% energy reduction compared to the most recent office buildings in Milan.

SOLUTION

The air conditioning system also contributes to the project's green approach, ensuring the total absence of local emissions. The HVAC system consists of four multi-purpose water-condensed heat pumps, Climaveneta branded: 3 FX-WQ-G01/3202 and 1 NECS-WQ 0604 connected to 5 heat pumps for the production of domestic hot water at very high temperatures: 1 EW-HT 0412, 3 WW-HT 0071 and 1 WW-HT 0101, all Climaveneta branded. The HVAC plant room will be managed and optimized by ClimaPRO



TO LEARN MORE ABOUT THIS PROJECT

<https://www.melcohit.com/EN/Projects/6483/GIOIA22.html>





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