

COMFORT

CHILLERS

FX HFO

**AIR SOURCE CHILLERS
WITH SCREW
COMPRESSORS,
FROM 235 TO 1463 kW**



FX HFO

YOUR SUSTAINABLE SOLUTION FOR COMFORT APPLICATIONS.

EER up to 3,27

ESEER up to 4,42



Air source chiller for outdoor installation 235 - 1463 kW

FX HFO features screw compressors optimized for HFO refrigerant R1234ze, axial fans, micro-channel full-aluminum condensing coils, electronic expansion valve, and single-pass shell and tube evaporator designed by Mitsubishi Electric Hydronics & IT Cooling Systems.

The controller, specifically developed in-house, offers advanced thermoregulation and energy saving functions. The innovative user interface, called KIPLink, is based on Wi-Fi technology and allows you to operate on the unit directly from a mobile device.



POWERFUL ADAPTABILITY

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

The sustainability-driven design of FX HFO meets the highest efficiency targets required by modern projects, delivering a green approach to any centralized air conditioning system.

COMFORT APPLICATIONS

- ✓ Hotels
- ✓ Shopping centres
- ✓ Office buildings
- ✓ Museums
- ✓ Education centres
- ✓ Sport facilities
- ✓ Banks
- ✓ Institutions



UNYIELDING IN EXTREME CONDITIONS

Designed to ensure complete reliability, FX HFO can operate in all climates from -15°C to 52°C and, equipped with highly resistant coil coatings, it can withstand even the harshest industrial or marine environments.



QUICK & EASY INSTALLATION

The integrated hydronic modules allow for easy and fast installations and the advanced water flow controls make the most of the variable-speed pumps, bringing time-saving commissioning, and significant annual energy cuts.



HIGH DEGREE OF CONFIGURABILITY

Thanks to a whole range of configurations and accessories, FX HFO can be easily integrated into ever increasingly complex building systems.

ACOUSTIC VERSIONS

-	Standard	Unit with standard soundproofing equipment.	Baseline
		Unit with compressor acoustical enclosure (Opt. 2301).	-2 dB(A)
		Unit with noise reducer kit (Opt. 2315).	-7 dB(A)
SL	Super low noise	The highest level of noise reduction which cuts noise emissions by 10 to 12 dB(A), without compromising the unit's efficiency.	
			-12 dB(A)

HEAT RECOVERY CONFIGURATIONS

-	Standard unit	Unit for the production of chilled water.
D	Partial heat recovery	Unit for the production of chilled water, equipped with an auxiliary heat exchanger on the compressor discharge for superheat recovery.

ALL-ROUND SUSTAINABILITY



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

Achieving outstanding performance and ensuring long-term sustainability are challenges that modern HVAC systems need to tackle. 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).

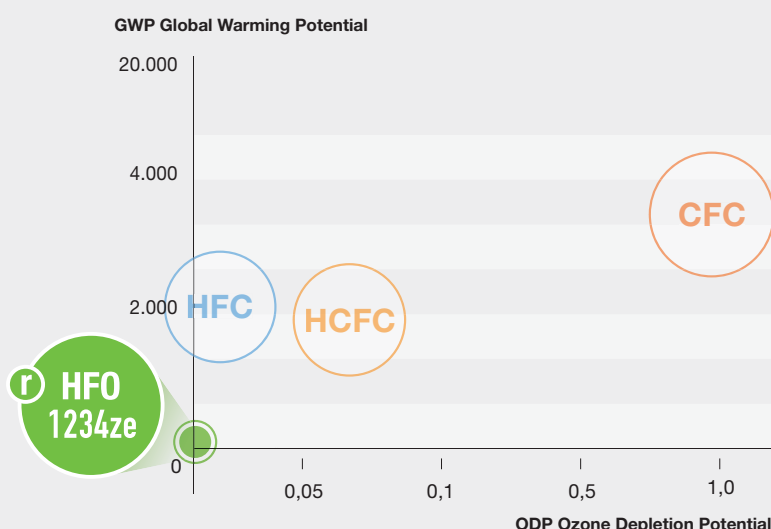
Fully committed to support the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems designed FX HFO, a complete chiller range optimized for HFO refrigerant R1234ze, with nearly zero environmental impact.

Combining brilliant annual efficiency with the use of a low GWP refrigerant, FX HFO 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.



The path to a greener world

Starting from the 70s, several international agreements have been made to drive the industry towards eco-friendly refrigerants. The last crucial step was taken in 2016, when the Kigali Amendment to the Montreal Protocol was passed, paving the way for the global phasedown of HFCs.



PROFOUND EXPERTISE



With thousands of units installed worldwide since 2003, Climaveneta air-cooled screw chillers have evolved into the third generation: FX series. The highest manufacturing quality, proven reliability, and full configurability are the reasons behind the success of this range. Today FX HFO combines extensive expertise with the latest technology to deliver you the best value.

TOP-LEVEL PERFORMANCE



Fully customizable with a range of versions and accessories, FX HFO allows custom-made application design for individual projects. Thanks to devoted technological solutions and accurate design, each FX HFO configuration brings high full load performance and brilliant part load efficiency together, thus helping individuals and businesses reduce the energy consumption of their HVAC systems and cut their running costs.

TECHNOLOGICAL CHOICES

W3000TE CONTROL

Fully in-house developed management software.

- ▶ Efficient and reliable operation in all conditions
- ▶ Connectivity with the most commonly used BMS protocols (Opt.)

KIPLink USER INTERFACE

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



Communication based on Wi-Fi technology (no internet connection needed)



An exclusive product of Mitsubishi Electric Hydronics & IT Cooling Systems



Industrial hardware characteristics, tolerates temperatures from -20 to +65°C

Micro-channel coils

New generation full aluminum micro-channel coils, ideally positioned on a "V" block structure to optimize airflow and heat transfer.

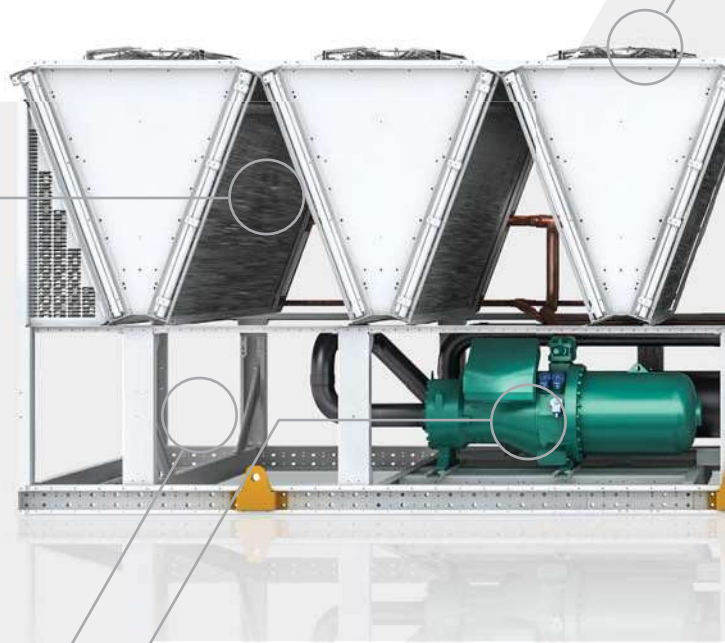
- ▶ Up to 30% of refrigerant charge reduction vs. traditional tube and fin coils.
- ▶ Long Life Alloy (LLA) for higher corrosion resistance and longer life cycle
- ▶ Protective coating available for harsh industrial and marine environments (Opt.)



Built-in pump group (Opt.)

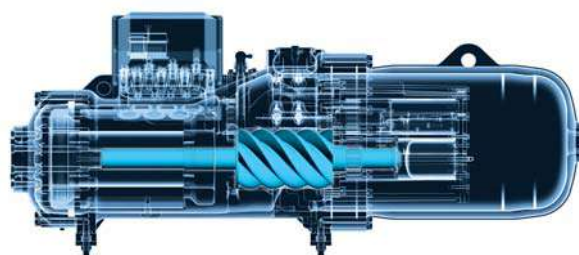
Factory-mounted pumps and pre-plumbed hydraulic components, for the minimum on-site installation time, work and cost.

- ▶ Fix speed and variable speed pumps available, with low or high head
- ▶ Electronic primary flow controls for constant pressure or constant temperature



CSC screw compressors

Dual rotor screw compressors designed according to Mitsubishi Electric Hydronics & IT Cooling Systems specifications and for its exclusive use.



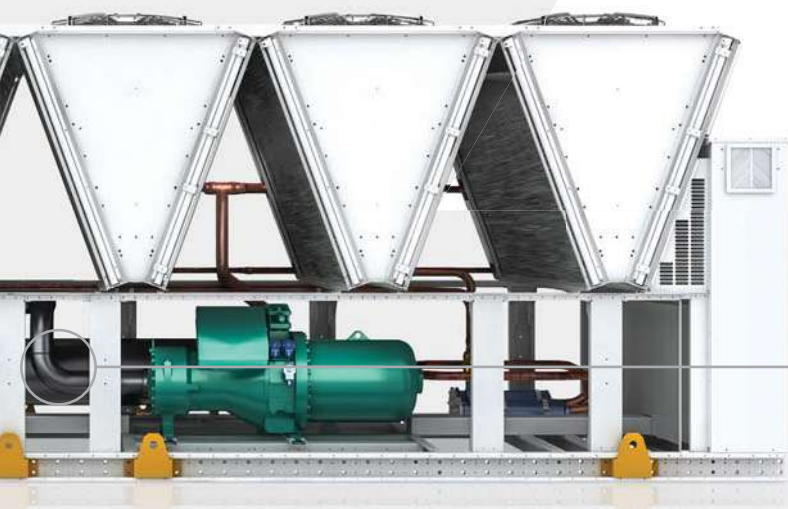
FX HFO brings advanced technology and know-how together in customizable packages to aid design, specification, installation, and on-going operations.

**r HFO
1234ze**

Variable speed fans

High performing axial fans equipped with autotransformer for speed adjustment.

- ▶ Precise air-flow management, reduced power consumption and lower sound levels at part load
- ▶ Totally independent ventilation system for each refrigerant circuit
- ▶ EC fans available with proprietary algorithm for energy savings and very low ambient operation (Opt.)



HFO refrigerant

4th generation refrigerant HFO 1234ze, with negligible greenhouse effect and zero impact on the ozone layer.

Negligible GWP

HFO 1234ze GWP_{100 year} < 1
(R134a GWP_{100 year} = 1300)
GWP values according to IPCC rev. 5th

Rapid molecule disintegration in the atmosphere

HFO 1234ze = 2 weeks
(R134a = 14 years)

Approved by international standards

ASHRAE 34, ISO 817:
A2L classification (non toxic, mildly flammable)

Compatible with common construction materials

No special components
No extra cost

In-line with environmental regulation objectives

No future retrofit required

Shell and tube evaporator

Dry expansion, single pass 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

Innovative internal geometry

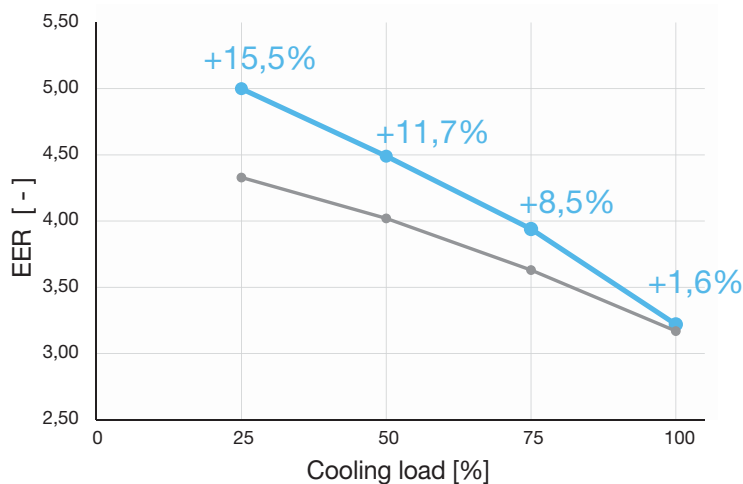
Thanks to its specific design, aimed at optimizing the internal volumes for partial load operation, the CSC compressors deliver excellent performance in all the different operating conditions.

Enhanced lubrication system

A special oil management valve calibrates the oil circulation and delivers a remarkable increase of the compressor efficiency at partial loads.

Extreme durability

The brilliantly engineered mechanics include carbon steel bearings guaranteed for a lifetime of 150.000 hours.



—●— Chiller with CSC screw compressors —●— Chiller with traditional screw compressors

The graph shows the chiller efficiency with the variation of the load rate and air temperature (ESEER operating conditions).

CORE FEATURES FOR ALL YOUR EQUIPMENT NEEDS

W3000TE control and KIPLink innovative interface

The logic behind FX HFO is the W3000TE control software. Characterized by advanced functions and algorithms, **W3000TE features proprietary settings** that ensure faster adaptive responses to different dynamics, in all operating modes. 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

Monitor each component while moving around the unit for maintenance operations. View and change all parameters with easy-to-understand screenshots and dedicated tooltips. Get devoted "help" message for alarm reset and trouble shooting.



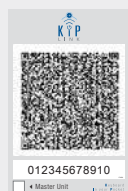
Real-time graphs and trends

Monitor the immediate labor status of the compressors, heat exchangers, cooling circuits and pumps. View the real-time graphs of the key operating variable trends.



Data logger function

View history of events and use the filter for a simple search. Enhance diagnostics with data and graphs of 10 minutes before and after each alarm. Download all the data for detailed analysis.



How to access the unit with KIPLink

Direct access to the W3000TE control is achieved by scanning the QR-code positioned on the front side of the FX HFO unit.



LED switch

The three-colour LED button positioned on the electrical board allows the user to switch the unit on/off and visualize the general status of the equipment without using any mobile device.

In addition (Opt. 1442, 1444) or in substitution (Opt. 6194, 6195) to the KIPLink, FX HFO can be provided with: a 7" color touch screen interface or with a keyboard with large display and LED icons. In these cases, the LED switch is not provided. Remote keyboard is possible (Opt. C9261063, C9261064, C926108911, C926108913).

Witness Testing

Test your chiller before its installation and make its performance totally reliable.

Performance WITNESS TEST

Performance Witness testing is available as additional service in order to allow the final user to see the unit being tested under specific conditions. Carried out within modern and sophisticated facilities, this service gives the customer the possibility to choose among different witness test options in order to:

- ▶ Verify unit operation under severe conditions
- ▶ Detect sound emissions
- ▶ Check performance, both at full and partial loads
- ▶ Test the unit with low outdoor air temperature operation
- ▶ Time the fast restart



Hydronic modules and flow controls

The FX HFO units can be equipped with a factory-mounted complete pump group, which **optimizes hydraulic and electrical installation** space, time and costs, or simply with terminals to control the external pumps with the unit control logic.

Factory-mounted pump group

2 pumps (duty/standby) provide low or high head (available head approx. 100 or 200 kPa).

Fixed speed pumps

2-pole motor:

Opt. 4711 (LH) / 4712 (HH)

4-pole motor:

Opt. 4708 (LH) / 4709 (HH)

Variable speed pumps

2-pole motor:

Opt. 4722 (LH) / 4723 (HH)

4-pole motor:

Opt. 4719 (LH) / 4721 (HH)

Terminals for external pump control

The unit controls the activation or the activation and speed of 1 or 2 external pumps.

ON/OFF signal

Opt. 4702 (1 pump) / 4703 (2 pumps)

Modulating signal

Opt. 4713 (1 pump) / 4714 (2 pumps)

For a quick and easy commissioning, it is possible to set the speed of the inverter driven pumps directly from the control of the unit and adjust the flow rate according to the actual plant head losses (Opt. 4862).



Close-coupled pumps by Grundfos

SiC/SiC (silicon carbide) primary seal pairing, extremely resistant against wear, abrasive particles and wear.

EPDM bellows seal prevent the risk of deposits, such as rust, on the shaft.

Pull-out design: during maintenance the power head can be pulled out without removing the pump housing from the pipework.

In-line or end-suction models were chosen based on dimensions and performances



VPF control logic

The VPF control series (Variable Primary Flow) doesn't only **adjust the pump speed on the basis of the plant's thermal load**, but also **dynamically optimizes the unit's thermoregulation** for variable flow operation, thus ensuring both the highest pump energy savings and chiller stable operation.

VPF: constant ΔP on the plant side

For systems with only the primary circuit.
Opt. 4864 or 4865 for single unit system
Opt. 4866 for multi-unit system

VPF.D: constant ΔT on the plant side

For systems with primary and secondary circuits separated by a hydraulic decoupler.
Opt. 4867 for single unit system
Opt. 4868 for multi-unit system

Operating limits

☐ Standard unit

☒ Required: Kit HT (Opt. 1955)

☒ Required: EC fans (Opt. 808)

☒ Required: DBA device (coil flooding) (Opt. 813)
EC fans (Opt. 808)

Air temp. < -10°C: Double insulation on heat exchangers (Opt. 2631)
LWT < 0°C: Compressor liquid injection (Opt. 871)

Partial load operating limits

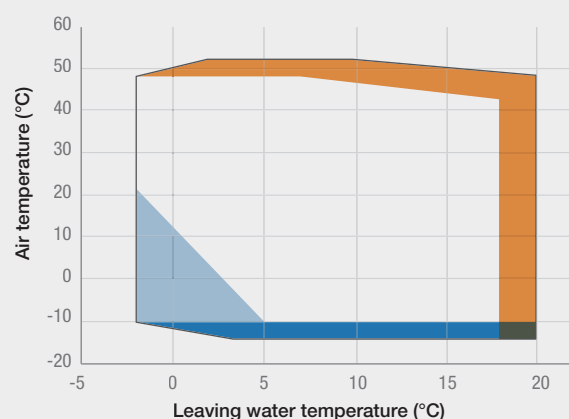
In case of higher outdoor air temperature, FX HFO automatically partializes its resources to ensure uninterrupted operation (HPTC function).

Operating limits when working partialized (water *7°C):

FX HFO /A, FX HFO /SL-A 55°C

+kit HT (all versions) 57°C

Full load operating limits



ACCESSORIES

EC fans

EC fans (Opt. 808): Electronically commutated fans with brushless motor to continuously adjust the speed in order to minimise energy consumption and noise emissions, especially at part loads (+1% of EER, +4-5% of ESEER).

+5%
ESEER

Noise reduction

Compressor acoustical enclosure (Opt. 2301):
Enclosure realised with painted sheet metal panels lined with an acoustic insulation.
Sound power reduction: -2 dB(A).

Noise Reducer kit (Opt. 2315):
The kit includes dedicated fans' speed calibration together with the soundproofing of the most critical components.
Sound power reduction: -7 dB(A).



Coils and coatings

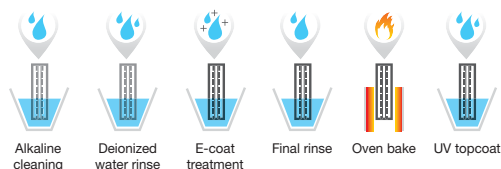
MICROCHANNEL COILS

Al - Regular (std)

Al - E-coating (Opt. 876)



E-coating process



TUBE & FIN COILS

Cu/Al - Regular (Opt. 879)

Cu/Al - Pre-painted fins (Opt. 894)

Cu/Al - High pressure spray coating (Opt. 895 / RFQ)

Fin Guard Silver SB *

Opt. 895

Polyurethane resin with aluminum fillers

- ✓ 3000 h ASTM B117
- ✓ UV rays - excellent

* Thermoguard

PoluAl XT *

RFQ

Polyurethane resin with aluminum fillers

- ✓ 4000 h ASTM B117
- ✓ UV rays - excellent

* Blygold

Heresite P-413C *

RFQ

Phenolic resin

- ✓ 6000 h ASTM B117
- ✓ UV rays - good

* Heresite Protective Coating, LLC

Cu/Cu - Tube & fin coil (Opt. 881)

FURTHER OPTIONS

Auxiliary input

4-20 mA (Opt. 6161): Enables remote set-point adjustments (analog input).

Double set-point (Opt. 6162): Enables the remote switch between 2 set-points (digital input).

Demand limit (Opt. 6171): Limits the unit's power absorption for safety reasons or in temporary situations (digital input).

Electrical

Compressor rephasing (Opt. 3301): The capacitors on the compressors' line increase the unit's power factor.

Automatic circuit breakers for compressors (Opt. 3411) or all major electrical loads (Opt. 3412): Protects the compressors or the compressors and fans from possible current peaks, over-current switches are provided in place of the standard fuses.

Soft-starter (Opt. 1511): Manages the inrush current enabling lower motor windings' mechanical wear, avoidance of mains voltage fluctuations during starting and favorable sizing for the electrical system.

BMS connection

Serial card interface module to allow integration with BMS protocols:

Modbus (Opt. 4181) / LonWorks (Opt. 4182) / BACnet MS/TP (Opt. 4184) / BACnet over IP (Opt. 4185)

Energy Meter

Energy meter for BMS (Opt. 5924): Acquires electrical data and the power absorbed by the unit and send them the BMS for energy metering (Modbus RS485).

Refrigerant circuit

Dual pressure relief valves with switch (Opt. 1961): One valve is isolated from the refrigerant circuit while the other is in service. The user can work on the isolated valve for periodic maintenance or replacement, without removing the refrigerant from the circuit.

Compressor suction valve (Opt. 1901): Installed on each compressor suction line, it simplifies maintenance activity (discharge valves are present as per standard).

Refrigerant leak detector

Leak detector (Opt. 3431): Factory installed device. In case of a gas leak detection it raises an alarm.

Leak detector + compressor off (Opt. 3433): Factory installed device. In case of a gas leak detection it raises an alarm and stops the units.

Hydraulic

Water flow switch (Opt. 1801): Designed to protect the unit where the water flow across the evaporator is not sufficient and falls outside of the operating parameters.

Delta T > 8°C (Opt. 2881): Evaporator designed to operate with low primary circuit water flow.

Flanged hydraulic connections (Opt. 2911): Grooved coupling with flanged counter-pipe.

Structure

Anti-intrusion grilles (Opt. 2021): Perimeter metal grilles to protect against the intrusion of solid bodies into the unit structure.

Rubber type (Opt. 2101) or spring type (Opt. 2102) anti-vibration mountings: Reduce vibrations, keeping noise transmission to a minimum.

Packing

Reinforcing bars (Opt. 1971): Steel brackets used to strengthen the unit structure. Suggested in case of long truck transport.

Nylon packing (Opt. 9966): FX HFO is covered with a protective nylon layer and provided with the lifting eye-plates, to load the unit into a truck.

Container packing (Opt. 9979): FX HFO is covered with a protective nylon layer, provided with structural reinforcing bars and equipped with both lifting eye-plates and handling devices to load it on a container (metal slides, front handling bar).

**FX HFO 1502 - 7823**

Chiller, air source for outdoor installation,
from 235 to 1463 kW.



FX HFO /A			1502	1702	1802	1922	2202	2602	2702	2722	3602
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	238	270	293	340	377	415	483	533	632
Total power input	(1)	kW	74,0	85,0	92,0	104	118	132	153	168	199
EER	(1)	kW/kW	3,21	3,17	3,19	3,27	3,18	3,15	3,17	3,18	3,17
ESEER	(1)	kW/kW	4,31	4,27	4,34	4,25	4,27	4,36	4,30	4,34	4,31
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	237	269	292	339	376	413	482	532	630
EER	(1)(2)	kW/kW	3,17	3,13	3,16	3,23	3,14	3,11	3,13	3,14	3,12
ESEER	(1)(2)	kW/kW	4,14	4,12	4,21	4,12	4,12	4,18	4,17	4,18	4,13
Cooling energy class			A	A	A	A	A	A	A	A	A
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2281/2016)											
Ambient refrigeration											
PDesign	(7)	kW	237	269	292	339	376	413	482	532	630
SEER	(7)(8)		4,14	4,15	4,25	4,17	4,16	4,17	4,22	4,24	4,20
Performance η_s	(7)(9)	%	163	163	167	164	163	164	166	166	165
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	11,36	12,90	14,02	16,24	18,04	19,84	23,12	25,51	30,21
Pressure drop	(1)	kPa	33,0	31,4	20,7	27,8	34,3	41,5	29,7	36,2	44,6
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	66,0	66,0	68,0	71,0	71,0	74,0	76,0	76,0	121
NOISE LEVEL											
Sound Pressure	(3)	dB(A)	66	67	67	68	68	68	68	70	69
Sound power level in cooling	(4)(5)	dB(A)	98	99	99	100	100	100	100	102	102
SIZE AND WEIGHT											
Length	(6)	mm	4000	4000	4000	4000	4000	5250	5250	5250	6500
Width	(6)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(6)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(6)	kg	3640	3665	3740	3980	4610	5060	5120	5120	6760

FX HFO /A			4202	4802	4822	6002	6022	6603	7203	7223	7823
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	727	840	900	984	1065	1152	1271	1384	1452
Total power input	(1)	kW	229	269	280	311	335	363	405	434	461
EER	(1)	kW/kW	3,17	3,13	3,22	3,16	3,18	3,17	3,14	3,19	3,15
ESEER	(1)	kW/kW	4,32	4,31	4,30	4,36	4,39	4,33	4,34	4,36	4,37
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	724	838	897	981	1062	1149	1267	1379	1447
EER	(1)(2)	kW/kW	3,12	3,10	3,18	3,12	3,14	3,13	3,10	3,14	3,11
ESEER	(1)(2)	kW/kW	4,13	4,19	4,13	4,20	4,22	4,18	4,19	4,19	4,19
Cooling energy class			A	A	A	A	A	A	A	A	A
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2281/2016)											
Ambient refrigeration											
PDesign	(7)	kW	724	838	897	981	1062	1149	1267	1379	1447
SEER	(7)(8)		4,23	4,29	4,24	4,29	4,31	4,27	4,25	4,30	4,30
Performance η_s	(7)(9)	%	166	169	167	169	169	168	167	169	169
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	34,77	40,19	43,05	47,05	50,95	55,11	60,78	66,17	69,44
Pressure drop	(1)	kPa	47,0	30,6	45,4	41,9	46,1	40,5	40,2	47,7	52,5
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	3	3	3	3
No. Circuits		N°	2	2	2	2	2	3	3	3	3
Refrigerant charge		kg	129	133	152	167	167	209	218	228	247
NOISE LEVEL											
Sound Pressure	(3)	dB(A)	70	71	71	73	73	73	73	73	73
Sound power level in cooling	(4)(5)	dB(A)	103	104	104	106	106	106	106	106	106
SIZE AND WEIGHT											
Length	(6)	mm	7750	7750	9000	10400	10400	11650	11650	12900	12900
Width	(6)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(6)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(6)	kg	7535	7820	8145	9040	9044	11932	11950	12600	12750

Notes:

- Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
- Values in compliance with EN14511-3:2013.
- Average sound pressure level at 10m 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.

5 Sound power level in cooling, outdoors.

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

Certified data in EUROVENT



FX HFO /SL-A			1502	1702	1802	1922	2202	2602	2702	2722	3602
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	235	266	289	337	372	415	477	528	623
Total power input	(1)	kW	72,7	84,1	91,3	103	118	129	152	168	198
EER	(1)	kW/kW	3,23	3,17	3,17	3,26	3,15	3,21	3,14	3,14	3,14
ESEER	(1)	kW/kW	4,33	4,29	4,34	4,28	4,27	4,40	4,31	4,36	4,31
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	234	265	288	336	370	413	475	527	621
EER	(1)(2)	kW/kW	3,18	3,13	3,14	3,23	3,11	3,17	3,11	3,10	3,10
ESEER	(1)(2)	kW/kW	4,17	4,14	4,24	4,15	4,13	4,22	4,18	4,20	4,14
Cooling energy class			A	A	A	A	A	A	A	A	A
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2281/2016)											
Ambient refrigeration											
PDesign	(7)	kW	234	265	288	336	370	413	475	527	621
SEER	(7)(8)		4,16	4,16	4,27	4,18	4,16	4,21	4,23	4,25	4,20
Performance η_s	(7)(9)	%	163	163	168	164	163	165	166	167	165
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	11,22	12,73	13,82	16,11	17,77	19,83	22,79	25,25	29,78
Pressure drop	(1)	kPa	32,2	30,6	20,1	27,4	33,3	41,5	28,9	35,5	43,3
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	66,0	66,0	68,0	71,0	71,0	76,0	76,0	76,0	121
NOISE LEVEL											
Sound Pressure	(3)	dB(A)	55	55	55	56	57	57	57	58	58
Sound power level in cooling	(4)(5)	dB(A)	87	87	87	88	89	89	89	90	91
SIZE AND WEIGHT											
Length	(6)	mm	4000	4000	4000	4000	4000	5250	5250	5250	6500
Width	(6)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(6)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(6)	kg	3640	3665	3740	3980	4610	5050	5120	5120	6760

FX HFO /SL-A			4202	4802	4822	6002	6022	6603	7203	7223	7823
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	718	831	892	971	1054	1137	1261	1379	1463
Total power input	(1)	kW	228	258	280	310	335	363	400	431	467
EER	(1)	kW/kW	3,14	3,22	3,18	3,14	3,15	3,13	3,15	3,20	3,13
ESEER	(1)	kW/kW	4,33	4,31	4,31	4,36	4,41	4,33	4,37	4,42	4,42
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	715	829	889	968	1051	1134	1257	1375	1460
EER	(1)(2)	kW/kW	3,10	3,18	3,14	3,10	3,10	3,10	3,11	3,16	3,11
ESEER	(1)(2)	kW/kW	4,15	4,16	4,15	4,21	4,23	4,19	4,22	4,24	4,29
Cooling energy class			A	A	A	A	A	A	A	A	A
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2281/2016)											
Ambient refrigeration											
PDesign	(7)	kW	715	829	889	968	1051	1134	1257	1375	1460
SEER	(7)(8)		4,23	4,26	4,25	4,29	4,32	4,27	4,27	4,35	4,44
Performance η_s	(7)(9)	%	166	167	167	169	170	168	168	171	175
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	34,33	39,74	42,66	46,44	50,42	54,36	60,32	65,92	69,95
Pressure drop	(1)	kPa	45,8	38,7	44,6	40,8	45,1	39,4	39,6	47,3	31,1
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	3	3	3	3
No. Circuits		N°	2	2	2	2	2	3	3	3	3
Refrigerant charge		kg	129	152	152	167	167	209	228	247	249
NOISE LEVEL											
Sound Pressure	(3)	dB(A)	59	60	61	61	61	61	61	62	62
Sound power level in cooling	(4)(5)	dB(A)	92	93	94	94	94	94	94	95	95
SIZE AND WEIGHT											
Length	(6)	mm	7750	9000	9000	10400	10400	11650	12900	12900	12900
Width	(6)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(6)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(6)	kg	7535	8100	8145	9040	9044	11932	12500	12700	12800

Notes:

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
- 2 Values in compliance with EN14511-3:2013.
- 3 Average sound pressure level at 10m 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, outdoors.

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

Certified data in EUROVENT

“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.

LISBON AIRPORT

2016 Lisbon - Portugal

Application:

Airports

Plant type:

Hydronic System

Cooling capacity: 12065 kW

Heating capacity: 1112 kW

Air flow: 35000 m³/h

Installed machines:

3x FOCS2/CA air cooled high efficiency chillers,

6x FOCS2/SL-CA air cooled low noise chillers,

2x RECS/LT air cooled heat pumps,

2x WHISPER-E rooftop units

PROJECT

Only 7 km from the Portuguese capital, Lisbon Airport opened in 1942 but between 2007 and 2016 it underwent several improvements and expansions. Today Lisbon airport is the main international gateway to Portugal, a major European hub and it is the 22nd largest airport in Europe in terms of passengers.

CHALLENGE

In order to improve the quality of the infrastructure and meet the comfort needs of the increasing number of travellers also the air conditioning systems had to be improved with highly efficient and reliable solutions.

SOLUTION

The HVAC system is among the strong points of the new infrastructure. It is mainly based on several large Climaveneta chillers and heat pumps. Going into detail, 3 FOCS2/CA, 6 FOCS2/SL-CA and 2 RECS/LT have been installed in the first stage of the work and 2 WHISPER-E rooftop units with advanced enthalpic heat recovery were selected later on to grant perfect comfort in the new Terminal 2. All together they provide the highest energy efficiency both for the very high cooling loads as well as for the heating needs of the different airport buildings.



UEFA

2017 Nyon - Switzerland

Sport structures

Cooling capacity: 512 kW
Installed machines:
2x FOCS2-W HFO screw compressor
chillers with HFO refrigerant

FICO Eataly World

2017 Bologna - Italy

Supermarket

Cooling capacity: 6324 kW
Installed machines:
2x TECS2 high efficiency oil-free
compressor chillers,
2x FOCS2 screw compressor chillers,
1x FX screw compressor chiller

Watermark Livingston Business Park

2017 Livingston - Great Britain

Office Buildings - Mixed-Use Development

Cooling capacity: 1412 kW
Installed machines:
3x TECS HFO oil-free compressor chillers
with HFO refrigerant

Soclima

2017 Foetz - Luxembourg

Office building

Cooling capacity: 1016 kW
Installed machines:
1x FOCS2-W HFO screw compressor
chiller with HFO refrigerant,
1x TECS2-W HFO oil-free compressor
chiller with HFO refrigerant

Woolworths Brookvale

2017 Brookvale - Australia

Supermarket

Cooling capacity:

466 kW

Installed machines:

1x FX screw compressor chiller



Siemens

2017 Zurich - Switzerland

Office Building

Cooling capacity: 1015 kW

Heating capacity: 1340 kW

Installed machines:

2x FOCS2-W HFO screw compressor chillers with HFO refrigerant



Hotel Atlantic

2017 Stavanger - Norway

Hotel and resorts

Cooling capacity: 675 kW

Installed machines:

2x FOCS2-W HFO screw compressor chillers with HFO refrigerant



Genève Plage

2015 Geneve - Switzerland

Sport structures

Heating capacity: 700 kW

Installed machines:

2x TECS2-W HFO oil-free compressor chillers with HFO refrigerant





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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