

Environmental

Protecting the environment Preserving natural systems

Environmental respect Citizen's responsibility

Energy efficiency Use of renewable sources

Sustainability

Social

Equal opportunities

Quality of life

Fair growth Equal access to technology

Economic

Economic Growth Research and Development

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

World Commission on Environment and Development



Sustainability is conceived as a continuous process of environmental, social and economic development.



Environmental Sustainability

Environmental sustainability involves making decisions and taking actions that are in the interests of protecting the natural world, with particular emphasis on preserving the capability of the environment to support human life.



Economic Sustainability

Economic sustainability involves continuous economic growth, providing long-term benefits and using available resources in a way that is both efficient and responsible.



Social Sustainability

Social sustainability is about creating and maintaining quality of life for people, ensuring that all the people have the same access to social resources.



Laws and Regulations

The legislature and international organisations are becoming more and more aware that sustainable development needs to be regulated by laws and programs that aim to integrate social, economic and environmental sustainability.

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Climaveneta has strived to find the best solution to meet the requirements of each project because sustainability is the key strategy for a long-term success.



Premium energy efficiency



The FORMULA i-FX (1+i) is the latest range of chillers specifically designed to operate at very high levels of efficiency at both full and partial loads.

With EER in Class A and unbeatable ESEER values, Climaveneta's new proposal is the best solution available on the market. The unit precisely meets the requested cooling capacity, thus ensuring reduced energy consumption. High-efficiency at different loads also results in a large reduction of CO2 emissions: the i-FX (1+i) range features a 20% reduction of CO2 emissions compared to other Class A chillers.



Reduced energy consumption



We always strive to offer high-efficiency and competitive solutions. It is clearly recognised that a low-consumption unit results in a reduction in both CO2 emissions and energy expenses. These cost savings can be reinvested generating new economic value.

Thanks to cutting-edge technologies, the new FORMULA i-FX (1+i) demonstrates that it is possible to combine the highly-efficient levels with a cost savings of 21% (compared to other new generation class A chillers).



Accessibility is a key concept of social development. This means that technology and innovation must be available and affordable.

The high efficiency level of the FORMULA i-FX (1+i) at all operating conditions allows for the small initial investment required to have a payback period of 2 years (compared to other Class A chillers). The new technology of inverter driven screw chillers has never been so accessible.



Compliance with environmental standards



Climaveneta has always been a pioneer in proposing innovative ideas anticipating the changes established by legislation.

The new FORMULA i-FX (1+i) has been conceived to meet the most challenging standards established by the ASHRAE 90.1-2013 protocol, including the values that are imposed since 2015.

All units are Eurovent certified and all the components are accurately selected, taking into consideration the aims established by the EU Ecodesign directive- including the more demanding values established for 2015, and meeting the objectives required by the Australian MEPS system (Minimum Energy Performance Standard).



A new concept of efficiency:

Fixed speed compressor (1) + Variable speed compressor (i)

Unbeatable efficiency, in every load condition

Maximum reliability, wide operating range, continuous capacity modulation, class A efficiency and ESEER 8,5 value for the i-FX-W (1+i). The advantages of the new i-FX (1+i) FORMULA represent Climaveneta's no-compromise solution.

The advantages of 1+i logic

Always the best combination of compressors

Continuous modulation from 15% to 100%

Perfect leaving water temperature stability

EER in Class A efficiency

ESEER 8,5 for i-FX-W (1+i)

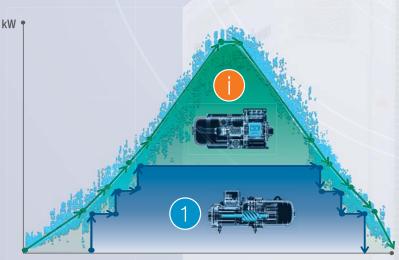
ESEER 4,8 for i-FX(1+i)

Climaveneta has developed a new concept of efficiency: the combination of a fixed speed screw compressor (1) with a variable speed inverter driven screw compressor (+ i). This solution, combined with unique and advanced control logic, improves the best features and benefits of each compressor.

The result is a unit that focuses on efficiency in all load conditions, overcoming the limitations traditionally imposed by the full inverter system on full loads and the fixed speed screw compressors on partial loads.

Premium efficiency thanks to the combination (1+i) compressors

- Cooling load of the variable speed compressor
- Cooling load of the fixed speed compressor
- Total requested cooling load





Dedicated Climaveneta Compressors

The new original compressors are the result of a co-development focused on increasing unit performance. A solution that has been specially designed with Climaveneta's requirements and for the exclusive use by the company.



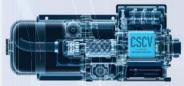
Fixed Speed Compressor



The new generation of fixed speed compressors is the result of our commitment to avoid the efficiency loss in part-load operation: the new compressor features a better lubrication system and an innovative internal geometry that allows a jump in performance at partial loads.



Variable Speed Compressor



The new inverter driven compressor is compact, with an oil separator, frequency inverter and cooling system integrated all within a single casing. The Vi control allows automatic adaptation to the different operating conditions thus ensuring that different refrigeration load levels are always at the highest values of energy efficiency.

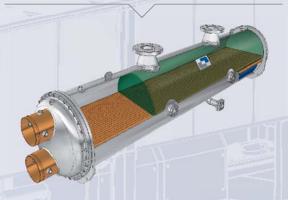
High-performance fans





Both the fans and the ducts meet the performance requirements specified in the European Eco-Design Regulation. As an option, fans are available with special ducts featuring an innovative profile, which increases the efficiency of the ventilation system in line with the most challenging objectives set out in regulations starting in 2015. The new fans, with ducts having a convergent-divergent profile that incorporate straightening vanes for the air flow, lead to the availability of ESP static pressure up to 130 Pa. They are the perfect solution for critical installations where air flow channeling is necessary.

-FX-W (1+i)



Innovative design of the heat exchangers

The flooded evaporator and the shell and tube condenser, both fully designed and built by Climaveneta, present an exclusive design aimed to maximise the cooling power and optimise the operation of the compressors.

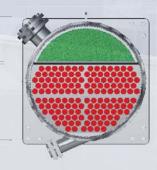
The shell and tube condenser is designed in order to guarantee reduced pressure drops on the water side and to decrease the pumping costs as much as possible. In the evaporator the complete flooding of the tubes is guaranteed also during partial load conditions by an electronic expansion valve, managed by proprietary control logics.

On the evaporator the presence of refrigerant fluid in the shell side and water in the tube side allows:

- Minimisation of pressure drops
- Perfect unified temperature as well as complete refrigerant evaporation
- No surface for the over-heating
- Easy cleaning operations

Lubricant separation and recovery

Thermal exchange



Perfect lubricant recovery

Unique design of the heat exchangers that provides the perfect separation and complete recovery of the lubricant in order to guarantee proper lubrication of the compressors and the relevant cleaning of the shell and tube exchanging surfaces.



High efficiency chiller, air source for outdoor installation. 567 - 1273 kW





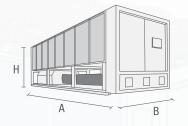
Excellence in results

Compliance with the most strict European standards

All i-FX (1+i) units are certified by the EUROVENT program for units with capacities over 600 kW. Climaveneta is among the principal players in the air conditioning sector participating in this non- compulsory certification program. This is consistent with Climaveneta's commitment to transparency as the best guarantee of quality and reliability for our partners and customers.

Accessories:

- Hydronic group
- VPF (Variable Primary Flow) kit: variable flow pumps with on board regulation
- Noise reducer (non-silenced versions only)
- EC fans with electronic DC brushless motor
- Axial fans with External Static Pressure (ESP) up to 130 Pa
- Remote control keyboard (distance up to 200m and up to 500m)
- Set-up for remote connectivity with ModBus/Echelon protocol cards



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 EN14511-3:2011
- 3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units, in compliance with ISO 3744 for non-certified units.
- 5 Unit in standard configuration/execution, without optional accessories.





















-FX (1+i) /CA			2602	2662	2722	3152	3602	3902	4212	4513	4953	540
ower supply			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/
ERFORMANCE												
OOLING ONLY (GROSS VALUE)												
cooling capacity	(1)	kW	567	631	700	785	858	951	1045	1127	1196	1273
otal power input	(1)	kW	181	201	224	249	273	302	333	359	380	405
ER	(1)		3,13	3,14	3,13	3,15	3,14	3,15	3,14	3,14	3,15	3,14
SEER	(1)		4,81	4,81	4,78	4,79	4,84	4,79	4,82	4,84	4,79	4,82
COOLING ONLY (EN14511 VALUE) Cooling capacity	(1)(2)	kW	566	629	698	783	855	949	1042	1123	1192	126
ER	(1)(2)	K.VV	3,10	3,10	3,10	3,12	3,10	3,11	3,10	3,10	3,11	3,10
SEER	(1)(2)		4,62	4,62	4,62	4,61	4,63	4,61	4,61	4,60	4,60	4,60
Cooling energy class	(./(=/		A	A	Α	Α	A	A	A	A	A	A
XCHANGERS												
IEAT EXCHANGER USER SIDE IN REFRIGE	RATION											
Vater flow	(1)	m³/h	97,7	109	121	135	148	164	180	194	206	219
ressure drop	(1)	kPa	36,0	35,4	31,1	34,5	41,2	36,7	44,3	51,6	43,6	49,
OMPRESSORS												
Compressors No.		N°	2	2	2	2	2	2	2	3	3	3
ircuits No.		N°	2	2	2	2	2	2	2	3	3	3
IOISE LEVEL	(0)	ID(A)	67			00		70	71	70	70	70
loise Pressure	(3)	dB(A)	67 100	68 101	68 101	68 101	69 102	70 103	71 104	72 105	72 105	72 105
loise Power SIZE AND WEIGHT	(4)	dB(A)	100	101	101	101	102	103	104	100	103	10
NEIGHT	(5)	mm	7000	7900	7900	7900	9860	10790	11720	12630	12630	1263
	(5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	226
	(5)	mm	2530	2530	2530	2530	2530	2530	2530	2530	2530	253
perating weight	(5)	kg	6130	7170	7460	7970	9110	10080	10140	11640	12570	129
-FX (1+i) /CA with NR kit			2602	2662	2722	3152	3602	3902	4212	4513	4953	540
ower supply			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
PERFORMANCE			400/0/00	400/0/00	400/0/00	400/0/00	400/0/00	400/0/00	400/0/00	+00/0/00	400/0/00	400/0
COOLING ONLY (GROSS VALUE)												
Cooling capacity	(1)	kW	550	617	684	761	833	926	1020	1104	1157	123
otal power input	(1)	kW	179	199	220	246	272	296	327	353	378	40
ER	(1)		3,08	3,10	3,11	3,09	3,07	3,13	3,12	3,13	3,06	3,0
SEER	(1)		4,80	4,80	4,77	4,78	4,83	4,78	4,82	4,83	4,79	4,8
COOLING ONLY (EN14511 VALUE)												
cooling capacity	(1)(2)	kW	549	615	683	759	831	924	1017	1100	1154	123
ER	(1)(2)		3,04	3,07	3,08	3,06	3,03	3,10	3,08	3,08	3,03	3,0
SEER	(1)(2)		4,62	4,62	4,62	4,61	4,63	4,61	4,61	4,60	4,60	4,6
Cooling energy class XCHANGERS			В	В	В	В	В	A	В	В	В	В
ieat exchanger USER Side in Refrigei	DATION											
Vater flow	(1)	m³/h	94,7	106	118	131	143	159	176	190	199	213
ressure drop	(1)	kPa	33,8	33,8	29,7	32,4	38,9	34,8	42,3	49,5	40,8	46,
COMPRESSORS	(1)	Νu	30,0	55,6	20,1	02,1	55,5	0 1,0	,0	.5,0	.5,0	10,
Compressors No.		N°	2	2	2	2	2	2	2	3	3	3
Circuits No.		N°	2	2	2	2	2	2	2	3	3	3
IOISE LEVEL												
loise Pressure	(3)	dB(A)	62	63	63	63	64	65	65	66	66	66
loise Power	(4)	dB(A)	0.5	0.0	96	96		98	98	99	99	00
	(4)	uD(A)	95	96	90	96	97	90	30			95
IZE AND WEIGHT	` ` `											
ı	(5)	mm	7000	7900	7900	7900	9860	10790	11720	12630	12630	126
3	(5) (5)	mm	7000 2260	7900 2260	7900 2260	7900 2260	9860 2260	10790 2260	11720 2260	12630 2260	12630 2260	126
}	(5) (5) (5)	mm mm mm	7000 2260 2530	7900 2260 2530	7900 2260 2530	7900 2260 2530	9860 2260 2530	10790 2260 2530	11720 2260 2530	12630 2260 2530	12630 2260 2530	126 226 253
3	(5) (5)	mm	7000 2260	7900 2260	7900 2260	7900 2260	9860 2260	10790 2260	11720 2260	12630 2260	12630 2260	1263 226 253
}	(5) (5) (5)	mm mm mm	7000 2260 2530	7900 2260 2530	7900 2260 2530	7900 2260 2530	9860 2260 2530	10790 2260 2530	11720 2260 2530	12630 2260 2530	12630 2260 2530	126 226 253
}	(5) (5) (5)	mm mm mm	7000 2260 2530	7900 2260 2530	7900 2260 2530	7900 2260 2530	9860 2260 2530	10790 2260 2530	11720 2260 2530	12630 2260 2530	12630 2260 2530	1263 226 253 1306
o B Deparating weight	(5) (5) (5) (5)	mm mm mm	7000 2260 2530 6180	7900 2260 2530 7220	7900 2260 2530 7510	7900 2260 2530 8040	9860 2260 2530 9200	10790 2260 2530 10160	11720 2260 2530 10230	12630 2260 2530 11730	12630 2260 2530 12680	1263 226 253 1306
perating weight	(5) (5) (5) (5)	mm mm mm kg	7000 2260 2530 6180	7900 2260 2530 7220	7900 2260 2530 7510	7900 2260 2530 8040	9860 2260 2530 9200	10790 2260 2530 10160	11720 2260 2530 10230	12630 2260 2530 11730	12630 2260 2530 12680	1263 226 253 1306
operating weight -FX (1+i) /SL -FX	(5) (5) (5) (5)	mm mm mm kg	7000 2260 2530 6180 2602 400/3/50	7900 2260 2530 7220 2662 400/3/50	7900 2260 2530 7510 2722 400/3/50	7900 2260 2530 8040 3152 400/3/50	9860 2260 2530 9200 3903 400/3/50	10790 2260 2530 10160 3953 400/3/50	11720 2260 2530 10230 4013 400/3/50	12630 2260 2530 11730 4063 400/3/50	12630 2260 2530 12680 4953 400/3/50	1263 226 253 1300 540 400/3
operating weight -FX (1+i) /SL ower supply -ERFORMANCE -COUING ONLY (GROSS VALUE)	(5) (5) (5) (5) (5)	mm mm mm kg	7000 2260 2530 6180 2602 400/3/50	7900 2260 2530 7220 2662 400/3/50	7900 2260 2530 7510 2722 400/3/50	7900 2260 2530 8040 3152 400/3/50	9860 2260 2530 9200 3903 400/3/50	10790 2260 2530 10160 3953 400/3/50	11720 2260 2530 10230 4013 400/3/50	12630 2260 2530 11730 4063 400/3/50	12630 2260 2530 12680 4953 400/3/50	1263 226 253 1300 540 400/3
operating weight -FX (1+i) /SL ower supply -ER ONLY (GROSS VALUE) -Cooling capacity -ER	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm mm kg	7000 2260 2530 6180 2602 400/3/50	7900 2260 2530 7220 2662 400/3/50 609 3,01	7900 2260 2530 7510 2722 400/3/50	7900 2260 2530 8040 3152 400/3/50 750 3,00	9860 2260 2530 9200 3903 400/3/50 802 2,97	10790 2260 2530 10160 3953 400/3/50 878 2,95	11720 2260 2530 10230 4013 400/3/50	12630 2260 2530 11730 4063 400/3/50	12630 2260 2530 12680 4953 400/3/50 1140 2,97	1263 226 253 1300 540 400/3
Piperating weight FX (1+i) /SL ower supply ERFORMANCE COOLING ONLY (GROSS VALUE) Cooling capacity ER SEER	(5) (5) (5) (5) (5)	mm mm mm kg	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70	1263 226 253 1300 540 400/3 120 2,9 4,7
pperating weight -FX (1+i) /SL ower supply ERFORMANCE COOLING ONLY (GROSS VALUE) cooling capacity ER SEER Cooling energy class	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm mm kg	7000 2260 2530 6180 2602 400/3/50	7900 2260 2530 7220 2662 400/3/50 609 3,01	7900 2260 2530 7510 2722 400/3/50	7900 2260 2530 8040 3152 400/3/50 750 3,00	9860 2260 2530 9200 3903 400/3/50 802 2,97	10790 2260 2530 10160 3953 400/3/50 878 2,95	11720 2260 2530 10230 4013 400/3/50	12630 2260 2530 11730 4063 400/3/50	12630 2260 2530 12680 4953 400/3/50 1140 2,97	1263 226 253 1300 540 400/3 120 2,9 4,7
Poperating weight Interpretating weight Int	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm kg	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	1263 2266 2533 1300 5400 400/3 1200 2,9 4,7 B
Operating weight I Departing weight I Depart	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm kg V/ph/Hz kW	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	1263 2266 2533 1300 5400 400/3 1200 2,99 4,77 B
Piperating weight FX (1+i) /SL ower supply ERFORMANCE OOLING ONLY (GROSS VALUE) cooling capacity ER SEER Cooling energy class COMPRESSORS COMPRESSORS Compressors No. Circuits No.	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm kg	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	1263 2266 2533 1300 5400 400/3 1200 2,99 4,77 B
pperating weight In presenting weight In present weight In presenting weight In present weight In present	(5) (5) (5) (5) (5) (1) (2) (1) (2) (1) (2)	mm mm kg V/ph/Hz kW	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	1263 2266 2533 1306 400/3 120 2,9 4,7 B
In operating weight In operat	(5) (5) (5) (5) (5) (1) (2) (1) (2)	mm mm kg V/ph/Hz kW	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	1263 2266 2533 1306 400/3 120 2,9 4,7 B
Jeperating weight Jeperating we	(5) (5) (5) (5) (5) (1) (2) (1) (2) (1) (2) (1) (2)	mm mm kg V/ph/Hz kW N° N° dB(A)	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 22530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B 3 3 3	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B 3 3 3	1263 226 253 1306 540 400/3 120 2,99 4,7/ B
In operating weight In operat	(5) (5) (5) (5) (5) (1) (2) (1) (2) (1) (2)	mm mm kg V/ph/Hz kW	7000 2260 2530 6180 2602 400/3/50 542 2,98 4,70 B	7900 2260 2530 7220 2662 400/3/50 609 3,01 4,70 B	7900 2260 2530 7510 2722 400/3/50 677 3,03 4,70 B	7900 2260 2530 8040 3152 400/3/50 750 3,00 4,70 B	9860 2260 2530 9200 3903 400/3/50 802 2,97 4,70 B	10790 2260 2530 10160 3953 400/3/50 878 2,95 4,70 B	11720 2260 2530 10230 4013 400/3/50 944 3,01 4,70 B	12630 2260 2530 11730 4063 400/3/50 1015 3,00 4,70 B	12630 2260 2530 12680 4953 400/3/50 1140 2,97 4,70 B	

-FX(1+i) Case Study

Milan Residential Building in Via Bernina

20.0

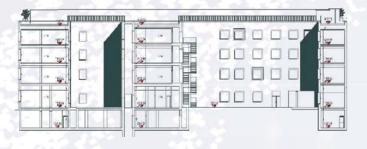
150

Comfort Cooling

Project

Renovation of an existing building with 3 floors plus the ground floor. The aim of the project was to reduce the energy consumption.

The refurbishment included an outer insulation cladding, new glass windows with reduced energy losses and the correction of most thermal bridges.





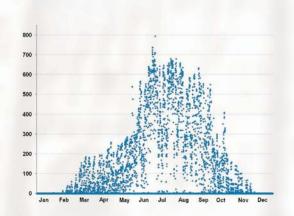
m

Cooling load

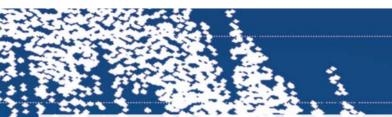
The primary cooling circuit feeds a 2,5 m³ storage tank. The secondary circuit serves fan coils and air handling units (AHU).

The load required by the primary cooling circuit is characterised by high variability, depending on the season.

The cooling requirement of the building (office building in the tertiary sector) is all year round, 6 out of 7 days, from 10am to 8pm.



The new i-FX (1+i), with wide continuous modulation capacity always at the highest levels of efficiency, as the best solution for all types of applications.



FOCS2/CA versus i-FX (+i)

The units selected in this application are a FOCS2/CA and i-FX (1+i).

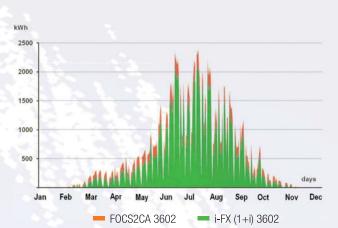
The diagram shows that i-FX (1+i) achieves annual energy savings of 21%, when compared with a class A chiller of the latest design.

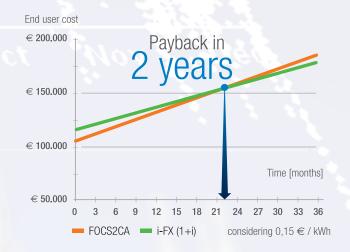
Results

Considering an energy cost equal to 0,15 €/kWh, the i-FX (1+i) solution, due to its unbeatable advantage in terms of energy efficiency, results in a payback period of 2 years.

The renovation to improve the energy performance can be assessed according to the international Green Building LEED certification system.

The facility with i-FX (1+i) involves the acquisition of 5 LEED points, against the 2 points acquired by the FOCS2/CA unit.







-FX(1+i) Case Study

Milan Rubber industry

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Project

The company, located just outside the city, specialises in the production of technical rubber mouldings.

Leader in its field, the factory has more than 120 employees.



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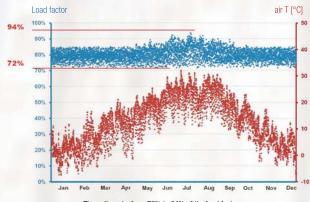
Cooling load

For process cooling, the provision of a constant cooling load is required, 7 days a week, from 6 am to 10 pm.

ın

Load factor

Depending on the changing ambient air temperatures recorded during the year, the chiller chosen to produce the constant cooling load, works with a variable load factor: the solution i-FX (1+i) can be an effective choice.



The unit works from 72% to 94% of the load factor

The new i-FX (1+ i), with wide continuous modulation capacity, always at the highest levels of efficiency, as the best solution for all types of



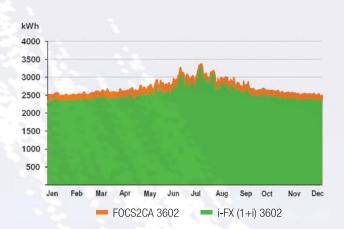
FOCS2/CA versus i-FX(1+i)

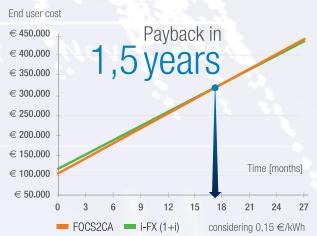
The units selected to meet the needs of this application are a FOCS2/CA and i-FX (1+i).

i-FX (1+i) achieves annual energy savings of 5%, compared to a class A chiller of the latest design.

Results

Considering an energy cost equal to 0,15€/kWh, the i-FX (1+i) solution, due to its clear advantage in terms of energy efficiency, results in a payback period of 1,5 years.







-FX-W(1+i) 1402 - 4652

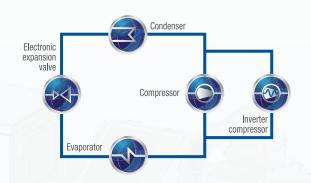
High efficiency water source chillers for indoor installation. 488 - 1784 kW



i-FX-W is the new water cooled chiller by Climaveneta with 1+i innovative logics that combines fixed speed and variable speed screw compressors, thus ensuring continuous modulation of loads and a perfect leaving water stability. All the units come with an exclusive flooded evaporator and a shell and tube condenser, specifically conceived and developed in-house by Climaveneta. Their exclusive design ensures a perfect heat exchange coefficient and provides EER results not only above class A but also among the highest values available on the market of water chillers with screw compressors.

Developed to answer to the most stringent design conditions, i-FX-W(1+i) is highly configurable thanks to a full range of accessories:

- ✓ VPF or VPF,D signal
- ✓ compressors' soundproofing (noise power reduction of 6dB(A))
- ▼ EMC electromagnetic compatibility for residential environments
- ✓ fast restart
- ✓ /H version (heat pump reversible on hydraulic side)
- refrigerant leak detector, available in 3 versions, one with refrigerant migration in case of leakages



Two compressors in one single refrigerant circuit

The fixed screw compressor and the inverter one are not only combined in the same unit, but also on the same refrigerant circuit.

A revolutionary solution ensuring higher efficiency at partial loads in comparison with a proposal with independent circuits.



The accurate design of electrical and electronic components ensures:













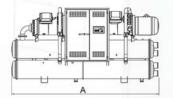




i-FX-W (1+i)			1402	1752	1902	2152	2602	3002	3402	3852	4252	4652
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/5
PERFORMANCE												
COOLING ONLY (GROSS VALUE)												
Cooling capacity	(1)	kW	488	610	661	752	917	1049	1189	1351	1486	1637
Cooling capacity max.	(1)	kW	532	665	721	819	999	1143	1296	1472	1607	1784
Total power input	(1)	kW	87,6	107	116	132	161	184	206	233	260	289
EER	(1)	kW/kW	5,57	5,70	5,69	5,68	5,68	5,71	5,76	5,79	5,71	5,66
ESEER	(1)	kW/kW	8,52	8,57	8,47	8,62	8,63	8,55	8,56	8,60	8,44	8,39
COOLING ONLY (EN14511 VALUE)												
Cooling capacity	(1)(2)	kW	487	608	659	750	914	1046	1186	1348	1482	1632
EER	(1)(2)		5,37	5,49	5,48	5,47	5,48	5,52	5,58	5,62	5,52	5,47
ESEER	(1)(2)		7,46	7,51	7,40	7,53	7,53	7,59	7,65	7,74	7,49	7,44
Cooling energy class			Α	А	Α	Α	Α	Α	А	Α	А	-
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRI	GERATION											
Water flow	(1)	m³/h	84,0	105	114	129	158	181	205	233	256	282
Pressure drop	(1)		30,5	34,7	33,8	33,2	37,1	37,5	31,9	30,9	37,3	45,3
HEAT EXCHANGER SOURCE SIDE IN RE	FRIGERATION	I										
Water flow	(1)	m³/h	98,8	123	133	152	185	212	240	272	300	331
Pressure drop	(1)		37,4	35,4	41,7	41,5	38,7	30,0	33,3	29,6	35,9	29,5
COMPRESSORS												
Compressors No.	N°	en.	2	2	2	2	2	2	2	2	2	2
Circuits No.	N°		890	- 1	1	1	1	1	1	1	1	1
NOISE LEVEL												
Noise Pressure	(3)	dB(A)	80	79	79	81	81	81	80	80	82	82
Noise Power	(4)	dB(A)	98	98	98	100	100	100	100	100	102	102
SIZE AND WEIGHT					9	P 45%		92 74	923			
A	(5)	mm	2950	3350	3350	3350	4500	4500	4600	4650	4650	4650
В	(5)	mm	1380	1450	1450	1480	1420	1420	1450	1510	1510	1510
Н	(5)	mm	2000	2270	2270	2270	2270	2270	2350	2500	2500	2500
Operating weight	(5)	kg	3340	4190	4280	4680	6420	7260	7960	8490	8580	8970

- 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 EN14511-3:2011
 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 Unit in standard configuration/execution, without optional accessories





Power Factor and **Displacement Power Factor**

DPF (Displacement Power Factor) above 0,97 in every load condition

PF (Power Factor) of 0,9 at full load



Optimised compressors

Screw compressors optimised for applications with low condensing temperature. This enhances their efficiency and makes the ESEER/IPLV values achieved exceed by far the common standard of compact screw compressors.

-FX-W (1+i) Comparison between technologies

The solution

The i-FX-W (1+i) unit achieves efficiencies both at full and partial loads that are among the highest available on the market.

Such a great performance level comes from the use of cutting-edge compressors optimised for low condensing pressures, but also from the accurate design of high-performing heat exchangers.



Comfort cooling

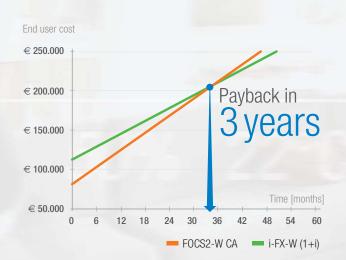
The project

In a typical comfort application, the cooling load requirements are highly variable and mostly depend on the season. For this reason, the selected unit is intended to operate at full load conditions for a short time, and the rest of the time the compressors unload to achieve the required set point.

Cooling load

We have taken into consideration an installation that needs to air-condition 9 months a year, from 10 a.m. to 12 p.m., 6 days a week. The following thermal loads have been supposed according to the ESEER distribution:

100% load for 3% of the time 75% load for 33% of the time 50% load for 41% of the time 25% load for 23% of the time



Comparison between technologies

We have supposed to match the load requests with two high-efficiency FOCS2-W/CA and i-FX-W(1+i) units. i-FX-W(1+i), thanks to an uncomparable ESEER level, ensures an annual energy savings of around 23%. Considering an energy cost of 0,15 \leq /kWh, the i-FX-W(1+i), thanks to its high efficiency, achieves payback levels within 3 years.

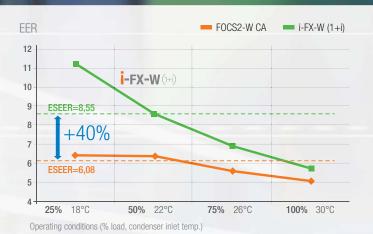
At a glance	Power input saving	Payback period	
	000/	0.0000	
	23%	3 years	

Highest energy efficiency both at full and partial loads. The latest i-FX-W (1+i) units represent the perfect solution for those applications where flexibility, efficiency and minimum environmental impact are the main project requirements.

Always the highest efficiency

The chart shows that i-FX-W (1+i) features an efficiency level that is much higher than a traditional class A chiller. The EER increased efficiency at full load is around 13%, while the advantages in terms of seasonal efficiency (ESEER) are around 40%.

As a result the water cooled chiller, thanks to the innovative 1+i technology, is the ideal solution for applications with different needs of both comfort and process cooling type.



Process cooling

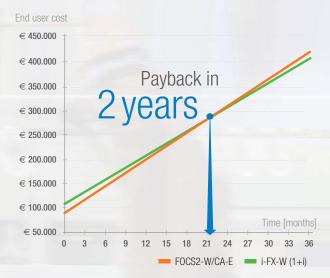
The project

In industrial process applications, the thermal loads are constant as they are not connected to seasonal needs but to the production facility requirements.

Cooling load

We have considered an industrial process facility working 11 months a year, 5 days a week, in three shifts. The following thermal loads have been supposed to match the requirements of the process application:

90% load for the 70% of the time 75% load for the 30% of the time



Comparison between technologies

We have supposed to match the load requests with two high-efficiency FOCS2-W/CA-E and i-FX-W(1+i) units. i-FX-W(1+i), thanks to an uncomparable ESEER level, ensures an annual energy savings of around 17%.

Considering an energy cost of 0,15 €/kWh, the i-FX-W(1+i), thanks to its high efficiency, achieves payback levels within 24 months.



"By far the best proof is experience"

Sir Francis BaconBritish philosopher (1561 - 1626)



National Sports Club of India

2013 - Mumbai (India)

Application:

Sport structures

Plant type: Hydronic System

Cooling capacity: 2476 kW

Installed machines: 1x FOCS2/CA 4822.

1x i-FX/CA 5403





Project

Located near the Mumbai city centre, the new sport facility is the result of a refurbishment promoted by the National Sports Club of India, the most prestigious Indian institution associated with promoting games and sports within the country.

The club offers many recreational facilities like swimming pools, squash courts, badminton courts, numerous tennis courts, wellness centres and high grade restaurants.

Challenge

The facility consists of several structures and indoor areas that account for nearly 50% of the whole project. All the indoor areas show the most diverse requirements and cooling needs. The main challenge for Climaveneta was to provide a suitable solution able to answer all of the variable flexibility and technology needs.

Solution

To meet all the flexibility and variability needs required by each project, Climaveneta has chosen 2 highly efficient water cooled chillers from the FOCS2 and i-FX(1+i) range.

The perfect combination between these two units is the ideal solution to ensure ideal temperature and humidity conditions, together with good air quality, ensuring perfect comfort throughout the year.

Moreover, the incomparable advantage of i-FX(1+i) in terms of high energy efficiency has contributed to a strong energy expense reduction while ensuring a quick return on investment at the same time.





Landsea Greentown

2013 - Shanghai (China)

Application:

Office and residential buildings

Plant type: Hydronic System

Cooling capacity: 1607 kW

Heating capacity: 1177 kW

Installed machines:

5x water cooled chiller with screw compressors



Project

Situated in the Changning district, just 15 minutes from the Shanghai city center, the new Landsea Greentown covers a total area of about 26.000 square meters. It is an eco-sustainable residential development that integrates the prosperity and technology typical of Shanghai with the most advanced principles of green architecture.

Challenge

To obtain a homey and livable environment, great importance has been given to the dynamic simulation of living within the community. The outcome is a mixture of luxury two or three bedroom apartments distributed over two buildings.



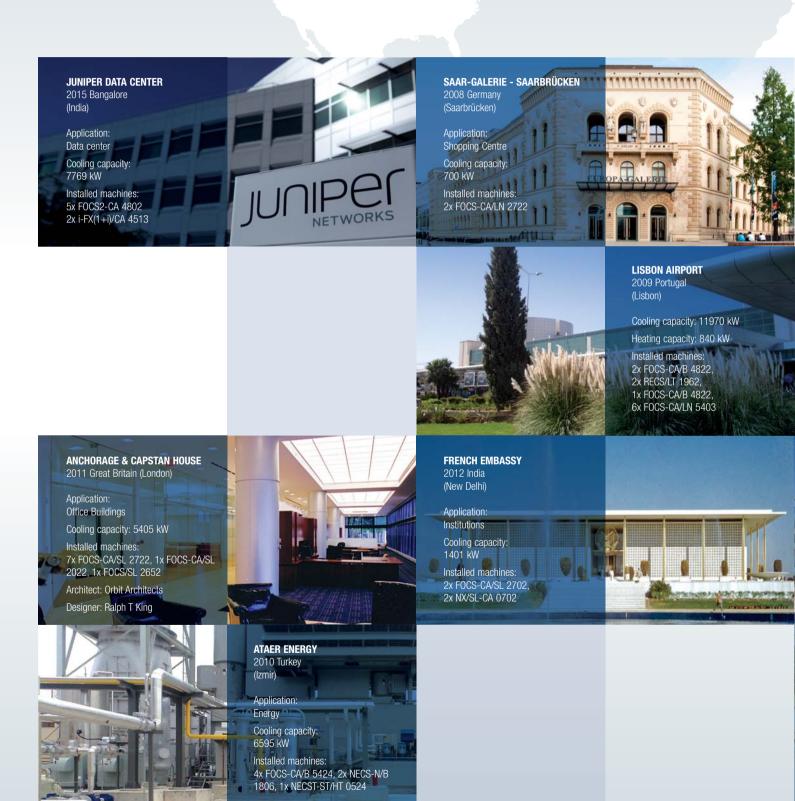
Solution

The comfort inside the new residences is guaranteed by 5 FOCS-W units, supplied by Climaveneta. The heart of the HVAC system consists of 4 units for the production of chilled water and a unit with a heat pump, reversible on the water side.

This smart combination between technologies ensures perfect comfort all year round, with a significant reduction in energy consumption and operating costs.



More than 1000 projects all over the world



Every project is characterised by different usage conditions and system specifications for many different latitudes. All these projects share high energy efficiency, maximum integration and total reliability due to the unique Climaveneta experience.





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