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

COMFORT

UNITS FOR SIMULTANEOUS AND INDEPENDENT PRODUCTION OF HOT AND COLD WATER







WHEN COMBINING PERFECT COMFORT AND MAXIMUM, EFFICIENCY IS THE BIGGEST CHALLENGE

Modern mixed-use buildings, shopping centres, large business centres, hotels, swimming pools, and wellness centres are characterised by increasingly complex comfort requirements.

Many years of experience in these applications has led Climaveneta to develop its own solution to the main challenges posed by these structures, without making any compromises:





SIMULTANEOUS HEATING AND COOLING

Due to the fact that in a single building there are areas dedicated to different functions with very variable heat loads, combined with a large percentage of glass surfaces, the simultaneous demand for heating and cooling during the year is increasingly common.

GROWING ATTENTION TO COMFORT

The need to guarantee ideal temperature, humidity, and air quality conditions throughout the year means that system solutions must be provided in order to offer a zero-compromise answer for the comfort requirements of different users.

CHALLENGING ENERGY EFFICIENCY AND SUSTAINABILITY TARGETS

Reduced investment and operating costs, respect for progressively stricter regulatory restrictions, attention to environmental impact, and use of renewables are increasingly vital factors not only for the value of the property but also for the feasibility of carrying it out.

AMBITIOUS ARCHITECTURAL SOLUTIONS

Innovative concepts and a systematic quest for excellence push technology and materials to the limit, in order to guarantee excellent usability of the building and strong visual characterization, as well as zero-compromise on the aesthetic front.



MULTI-USE UNITS ARE THE MOST EVOLVED SOLUTION FOR 4-PIPE SYSTEMS

Maximum comfort, simultaneous hot and cold water production, unbeatable energy and system efficiency. The advantages of the INTEGRA all-in-one units installed in a 4-pipe system are limitless.





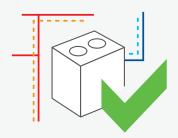
MAXIMUM ENERGY EFFICIENCY

The construction approach that characterizes Climaveneta multi-use units has been designed to maximize their usefulness. The maximum efficiency of the system is reached with simultaneous loads, the energy produced is used to satisfy the hot and cold demands of the total system. In modern buildings with opposite overlapping thermal loads, the INTEGRA units are the greenest and most efficient solution compared to any other.



SELF-ADAPTABILITY WITH SIMULTANEOUS LOADS

Thanks to their advanced control logic, multi-use units are always able to respond to building climate control requirements, especially if overlapping loads occur. The unit can independently produce cooling and heating simultaneously, according the actual needs.



SYSTEM SIMPLIFICATION

The use of a unit that independently produces both heating and cooling eliminates the need for separate heating and cooling resources.

This significantly simplifies the system: plant areas are reduced, hydronic circuits are simplified, maintenance is reduced by half, and control is rationalized.



REDUCTION OF ON-SITE OPERATIONS

A simplified system results in a significant reduction in the operations to be carried out on site. In fact, it is no longer necessary to connect it to the gas network, install and commission auxiliary boilers, or manage areas to be used for conventional heating units. This means substantial savings in terms of time and cost for the client.



TOTAL EFFICIENCY RATIO

TER

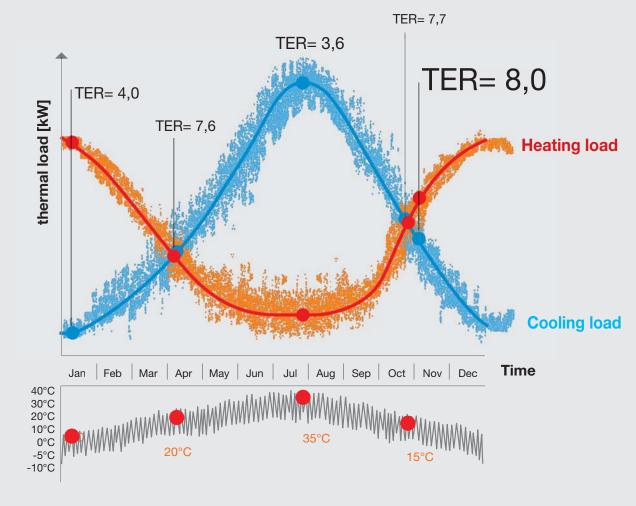
COOLING POWER

+

HEATING

POWER CONSUMPTION

In all cases in which INTEGRA simultaneously produces cold and hot water, the real efficiency of the unit is the sum of the performance in hot and cold water production.



Using traditional ratings such as EER and COP to measure efficiency of 4-pipe units would be limiting.

To objectively measure performance under simultaneous load conditions, Climaveneta, a pioneer in the development of this technology, has conceived TER - total efficiency ratio.

The TER is calculated as the ratio between the sum of the delivered heating and cooling power and electrical power input.

Considered today the most effective way of representing the real efficiency of the unit, the TER reaches its maximum value when the loads are completely balanced.

THE MOST PRECISE WAY TO MEASURE EFFICIENCY

Completely integrated functions and maximum performance synergy require an advanced measurement rating for the total efficiency of the unit: TER - Total Efficiency Ratio.

FOCUS ON: 4-PIPE SYSTEMS



This type of system is suitable for air-conditioning in buildings that require separate areas to be heated and cooled at the same time.

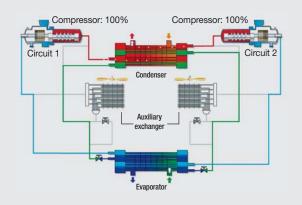
It is combined with centralized solutions capable of producing hot and cold water in the two hydronic circuits of the system, assuring maximum comfort in every room of the building, independently and in any period of the year.

From today, a single intelligent unit is sufficient for the management of these complex systems: INTEGRA.

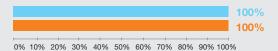




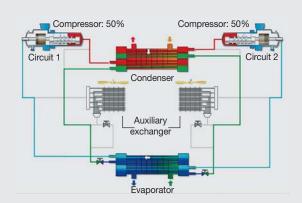
The main feature of INTEGRA units is the ability to manage the overall capacity, which refers to both cooling and heating demands, based on the actual load requirements of the total system. The operational flexibility is total: all combinations of heating and cooling loads can be met.



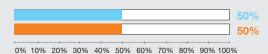
100% cold side / 100% hot side



The two circuits operate at maximum power, evaporating in the cold-side exchanger and condensing in the hot-side one. The source-side heat exchanger (air coil or water exchanger, depending on the type of unit) is not used, which means that in these conditions there is no energy waste.



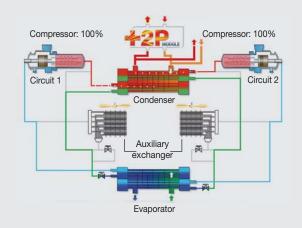
50% cold side / 50% hot side



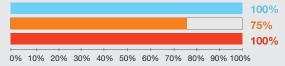
Also in this situation the unit operates like a water-water unit, as all the evaporating and condensing energy is used for the system. Since the system only requires 50% of the total energy, each circuit operates in partial load conditions. In this particular state, the exchangers are oversized, thus achieving an even higher efficiency.

OPERATING MODES WITH +2 PMODULE





100% cold side 75% hot side 100% very hot side

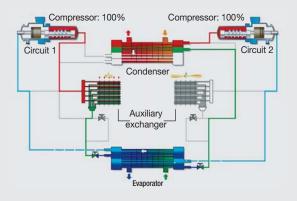


In this state, both the compressors operate at full load in order to meet the demands of the plant. Both circuits evaporate all the refrigerant in the cold-side heat exchanger and condense in the hot-side one, so the auxiliary source-side heat exchanger is not used.

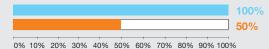
Part of the hot temperature water flow produced in the hot-side heat exchanger is used by the +2P module to produce very hot water (up to 78°C).

OPERATING MODE

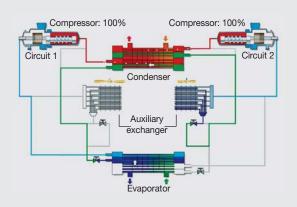
The multi-purpose units are therefore a simple and integrated response for all applications that require simultaneously and independently a hot and a cold load, such as the air conditioning of large plant with complex loads. The following are four of the many possible modes of operation of INTEGRA units.



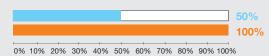
100% cold side / 50% hot side



Both the circuits operate to produce the amount of energy necessary for the cooling of the plant, evaporating all the refrigerant in the cold-side heat exchanger. While one circuit carries out the condensation on the hot-side heat exchanger, thus supplying the total energy necessary to heat the building, the other circuit exchanges the remaining heating energy in the external environment by using the auxiliary source-side heat exchanger (air coil or water exchanger, depending on the type of unit).

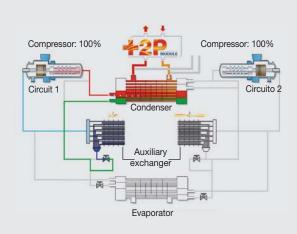


50% cold side / 100% hot side

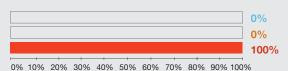


Just like the previous case, in this state both circuits operate differently, to supply the system with the correct amount of required energy. The unit uses two sources to produce the requested hot water flow: in fact, one circuit evaporates the refrigerant in the cold-side heat exchanger, thus producing the cold water demand, while the other circuit uses the auxiliary source-side heat exchanger. In this way both circuits move energy through the hot-side heat exchanger, fulfilling the request for hot water flow.

With the +2P module option, INTEGRA units can simultaneously and independently fulfill 3 different thermal loads (cold, hot and very hot water). The following operating modes are two working examples of INTEGRA units with a +2P module fitted in.



0% cold side0% hot side100% very hot side



This particular state, shows the flexibility of the INTEGRA units with a +2P module: even in the case of no thermal loads (neither cooling, nor heating) requested by the plant, the unit can still provide the very hot water if necessary.

In this case, only one circuit is operating partially in order to provide the right amount of hot water needed by the +2P module. A +2P module can produce very hot water (up to 78°C).





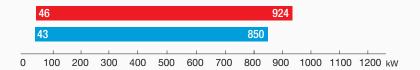
AIR SOURCE

AIR SOURCE UNITS

i-FX-Q2 / NX-Q / NECS-Q / ERACS2-Q



SCROLL

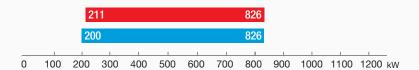


Acoustic versions

B: Standard LN: Low Noise SL: Super low noise CA: High Efficiency

SL-CA: High Efficiency Super Low Noise

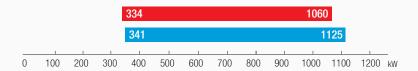




Acoustic versions

CA: High efficiency LN-CA: Low Noise, High Efficiency SL-CA: Super Low Noise, High Efficiency XL-CA: Extra Low Noise, High Efficiency XL-CA-E: Extra Low Noise, High Efficiency-Enhanced

SCREW INVERTER



Acoustic versions

CA: High efficiency SL-CA: Super Low Noise, High Efficiency XL-CA: Extra Low Noise, High Efficiency



The INTEGRA air source units are characterized by their wide operating range, achieved by the efficient energy management of the defrosting activity.



Energy Storage System

Energy storage function

INTEGRA heat pumps are equipped with dedicated control functions, specially developed by Climaveneta in order to further enhance the key characteristics of

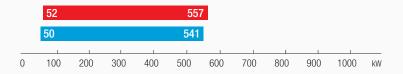
Thanks to the dynamic detection of all control parameters, the energy storage function allows the unit to promote its heat recovery function whenever is possible. Thus, INTEGRA can smartly interpret the plant requirements, always favouring the most efficient operation mode.



UNITS WITH WATER SOURCE NECS-WQ / ERACS2-WQ



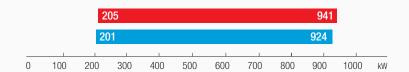




Acoustic versions

B:Standard + compressors' acoustic enclosure [up to -10 dB(A)]





Acoustic versions

B:Standard + compressors' acoustic enclosure 'Basic' [up to -10 dB(A)] + compressors' acoustic enclosure 'Plus' [up to -16 dB(A)]

PLUG & PLAY

These units are coupled with natural water sources (ground water or surface water) to which the unit may be directly connected, without using an intermediate heat exchanger, hence improving the overall efficiency.



For all applications with natural water source, it is key to reduce the flow rates to a minimum. This makes it possible to cut the operating costs of pumping and reduce the discharge costs of drained water. Thanks to the "Water Saving function" the water flow rate directed to the auxiliary heat exchanger is reduced in proportion to the unit's partialisation, ensuring the maximum overall efficiency of the system.



Special Qi function

INTEGRA units in special QI execution are designed and created to exchange heat using the most convenient source between air or water. In this way, for some periods of the year, it is possible to stop the pumps for draining the water from the well, reducing the impact both of the pump consumption and the costs related to the use of public water. Qi evolved technology can manage the operation with a double heat source in the best way.





FULL INVERTER TECHNOLOGY

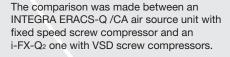
THE HIGHEST ENERGY EFFICIENCY, ALWAYS.

The inverter technology with continuous variable speed shows its advantages particularly when applied to multi-purpose units.

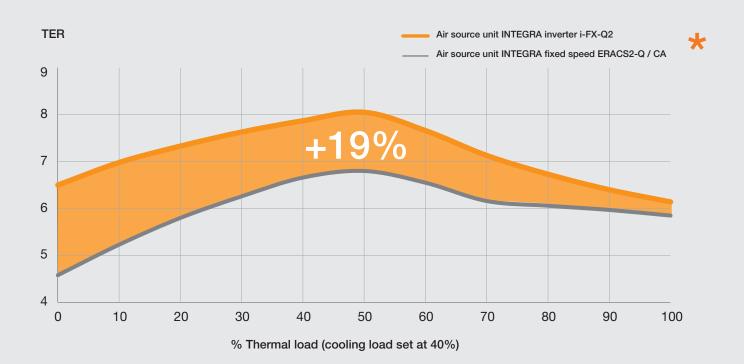


The new inverter driven i-FX-Q₂ units always reach higher efficiencies than fixed speed units, with any combination of cold / hot load, and in any season. The presence of Variable Speed Drive (VSD) compressors allows the INTEGRA unit, i-FX-Q₂ to effectively follow each combination of thermal loads required by the system, with increasingly higher TER efficiencies (up to 19%) compared to those units with fixed speed compressors.

Cooling load [%](*)	Thermal load [%](*)	Median increase in TER VSD vs. fixed speed	
0%	0%-100%	+14%	
20%	0%-100%	+18%	
40%	0%-100%	+19%	k
60%	0%-100%	+17%	
80%	0%-100%	+9%	
100%	0%-100%	+5%	
Average value		+14%	



^{*} Load refers to the maximum cooling capacity of the unit in the following conditions: Evaporator water (in / out) = 12/7 ° C Condenser water (in / out) = 40/45 ° C Air room temperature = 15 ° C







FULL INVERTER TECHNOLOGY THE HIGHEST ENERGY EFFICIENCY, ALWAYS.



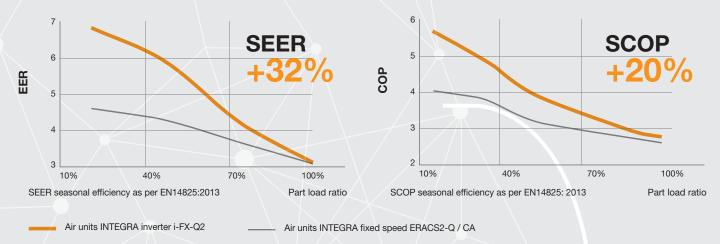
UNBEATABLE EFFICIENCY AT PARTIAL LOADS

In traditional comfort applications the HVAC plant usually works at full load only for few hours every year. Most of the time the unit works at partial loads.

It is in this situation that the efficiency achieved by the units with inverter technology is much higher than traditional fixed speed units:

SCOP up to +20% SEER up to +32%

The minimum efficiency requirements of the EU regulation, ErP 2009/125 / EC, are also pinpointed in TIER 2021



HIGHEST ACOUSTICAL COMFORT

The more you increase the partialisation activity the lower your sound emissions will be, thanks to capacity of inverter technology to continually modulate the compressor rotation. Most of the time the units are characterized by lower capacities compared to fixed speed compressor units, this always ensures the highest acoustical comfort.

The sound emissions can be further reduced thanks to dedicated versions and a vast array of accessories.



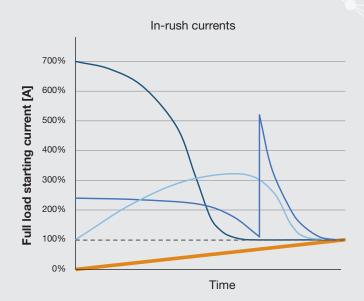
Sound Power of the two units partialisation 100 98 96 94 92 90 88 86 10% 40% 70% 100% Partialisation SEER values as per EN14825: 2013 Part load ratio

NO IN-RUSH CURRENT

The inverter technology involves a start-up phase with very low in-rush current, lower than any other mode (direct start, star / delta, part winding or soft start). The absence of sudden peaks and abrupt changes in the starting torque, in addition to eliminating possible disturbances to the electricity power network, reduces the stress to zero on the electrical components and improves the reliability of the system.

The frequency converters chosen by Climaveneta are characterized by values of Displacement Power Factor of between 0.97 and 0.99. The resulting unit power factor at rated nominal operating conditions is always higher than that of similar technology without an inverter unit. The need to install power factor correction devices of the loads is therefore reduced.

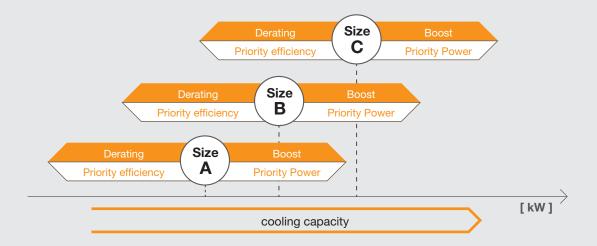




FLEXIBILITY IN SELECTING UNITS

Thanks to specific technical solutions and proprietary control functions, Climaveneta's inverter units can be selected at various speed conditions, which is different from the nominal ones.

Whatever the needs to be met: maximum operating efficiency, reducing the initial investment, future power increase of the plant, it is always possible to identify the most suitable units.







4-PIPE AIR SOURCE UNIT, INVERTER-DRIVEN SCREW COMPRESSORS AND EC FANS. COOLING CAPACITY FROM 443-1083 kW











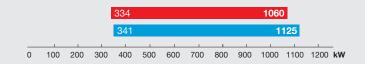
VERSIONS:

CA Class A Efficiency

SL-CA Super Low noise, Class A Efficiency

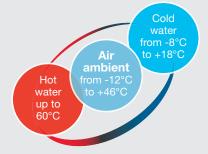
XL-CA Extra Low noise, Class A Efficiency

i-FX-Q₂ is a multi-purpose outdoor unit able to simultaneously produce chilled and hot water by means of two independent hydronic circuits. Thanks to the full inverter technology of the screw compressors and the EC fans, these units effectively follow each combination of thermal loads, always providing the exact thermal energy required by the system. This results in top-level efficiency values and very low energy consumption throughout the year, whatever the cooling mode and the weather condition.



Main accessories:

- ▶ "LT" kit for working down to -12°C in heat pump mode
- NOISE REDUCER (only on not silenced versions)
- ▶ Special fan diffusers
- Thicker soundproofing cladding
- ▶ Hydronic group
- ▶ VPF (Variable Primary Flow) system
- ▶ Set-up for remote connectivity with
- ModBus, Echelon, Bacnet, Bacnet over-IP.
- → Touch Screen visual display
- ▶ Leak detector







Extended working range

An extended working range which ensures the working operation of the unit all year long and in any working mode.

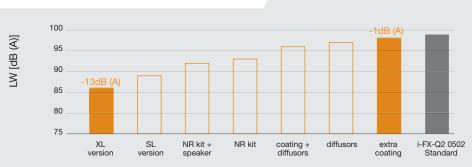
Full inverter technology

Independent circuits with screw compressors inverters and EC standard fans.

HFO refrigerant

Use of innovative green refrigerants, with minimal environmental impact (very low GWP).

ACOUSTICAL CASINGS



Super silent

Up to 8 different acoustic casings for a total sound emission control (of -1dB (A) up to -13 dB (A) compared to the standard configuration).

i-FX-Q2 CA			0502	0532	0602	0652	0702	0802	0902	1002	1102
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											
SELECTION RANGE											
Cooling capacity range	(1)	kW	400-520	429-536	456-570	517-671	598-712	630-787	786-982	881-1036	1046-1125
EER (up to)	(1)	kW/kW	3.34	3.30	3.36	3.25	3.24	3.32	3,25	3.22	3.03
Heating capacity range	(3)	kW	379-492	394-492	421-526	491-638	570-678	606-757	745-931	836-983	986-1060
COP (up to)	(3)	kW/kW	3.45	3.42	3.42	3,47	3,45	3.51	3.50	3.51	3,49
SELECTION RATED			0, 10	0,	0,	0,	0,.0	5,5 .	0,00	0,01	0,10
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)(10)	kW	488	531	570	627	689	787	915	985	1083
Total power input	(1)(10)	kW	155	168	182	199	219	251	288	312	360
EER	(1)(10)	kW/kW	3,14	3,15	3,14	3,15	3,14	3,13	3,18	3,16	3,01
COOLING ONLY (EN14511 VALUE)	()(-)	1000,1000	0,11	0,.0	0,	5,.5	3,	5,.5	0,10	0,.0	0,01
Cooling capacity	(1)(2)(10)	kW	486	529	568	625	687	786	912	982	1079
EER	(1)(2)(10)	kW/kW	3,10	3,10	3.10	3,10	3.10	3.10	3.14	3.12	2,97
HEATING ONLY (GROSS VALUE)	() ()	,	0,.0	0,.0	0,.0	0,.0	3,.0	0,.0	0,	0,.2	2,01
Total heating capacity	(3)(10)	kW	458	486	526	593	652	757	862	928	1018
Total power input	(3)(10)	kW	133	143	154	171	189	216	248	265	292
COP	(3)(10)	kW/kW	3,44	3,40	3,42	3.47	3.45	3.51	3.47	3.50	3.48
HEATING ONLY (EN14511 VALUE)			-,	-, .	-,	-,	-,	-,0.	-,	-,00	-, .
Total heating capacity	(2)(3)(10)	kW	460	487	527	594	654	759	865	931	1020
COP	(2)(3)(10)	kW/kW	3,42	3,38	3,41	3,45	3,43	3,49	3,44	3,48	3,46
COOLING WITH TOTAL HEAT RECOV		1000/1000	0,12	0,00	0,11	0, 10	0, 10	0, 10	0,11	0, 10	0,10
Cooling capacity	(4)(10)	kW	489	533	571	624	683	785	914	987	1102
Total power input	(4)(10)	kW	137	151	161	174	193	221	258	274	310
Recovery heat exchanger capacity	(4)(10)	kW	617	675	722	788	864	993	1157	1245	1393
TER	(4)(10)	kW/kW	8.08	8.01	8.04	8,11	8,02	8.03	8,02	8,13	8,06
ENERGY EFFICIENCY	,		-,				-,	-,	-,	-,	-,
SEASONAL EFFICIENCY IN COOLING	(Reg Ell 20:	16/2281)									
Ambient refrigeration	(neg. EU 20	10/2201)									
Prated.c	(12)	kW				625	687	786	912	982	1079
SEER	(12)(13)	KVV				4,93	4.95	4,95	4,57	4,52	4.45
Performance ηs	(12)(14)	%	-			194	195	195	180	178	175
	. ,. ,		_			134	195	195	100	170	173
SEASONAL EFFICIENCY IN HEATING	(Reg. EU 613 (5)(10)	/2013) kW	340	364	390						
PDesign SCOP	(5)(10)(15)	KVV	3,91	3,92	3,89			-			
Performance ηs	(5)(10)(16)	%	153	154	153						
Seasonal efficiency class	(5)(10)	70	-	-	-						
EXCHANGERS	(0)(10)		_								
	FDIOFDATIO										
HEAT EXCHANGER USER SIDE IN RE		N I/s	23.31	OF 41	27.26	29.97	32.95	37.65	43.76	47.12	51.77
Water flow	(1)(10)	kPa	40.8	25,41 51.6	32.5	40.5	45.4	29.0	39.7	47,12	- /
Pressure drop		кРа	40,0	51,6	32,5	40,5	45,4	29,0	39,1	42,3	51,4
HEAT EXCHANGER USER SIDE IN HE		1/-	00.40	00.47	05.00	00.01	04.40	00.55	44.04	44.01	10 11
Water flow	(3)(10)	l/s kPa	22,13 22,5	23,47 25,4	25,38	28,61 27,0	31,49	36,55 32,2	41,61	44,81	49,14
Pressure drop	(3)(10)	KPa	22,5	25,4	21,4	27,0	32,0	32,2	41,7	34,9	30,0
REFRIGERANT CIRCUIT		N.10	0	0		0	0		0	0	0
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Regulation										STEPLESS	
Refrigerant		len	R134a	R134a	R134a	R134a	R134a	R134a 325	R134a	R134a	R134a
Refrigerant charge		kg	230	235	240	260	260	325	350	470	470
NOISE LEVEL	(0)(4.0)	dD(A)	67	67	60	60	60	60	70	70	70
Sound Pressure	(6)(10)	dB(A)	67	67	68	69	69	68	70	70	70
Sound power level in cooling	(7)(8)(10)	dB(A)	100	100	101	102	102	101	103	103	103
Sound power level in heating	(7)(9)(10)	dB(A)	100	100	101	102	102	101	103	103	103
SIZE AND WEIGHT	44		0450	0450	0000	0050	40.400	40.100	40.400	44000	11000
A	(11)	mm	8150	8150	8900	9650	10400	10400	10400	11900	11900
В	(11)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(11)	mm	2530	2530	2530	2530	2530	2530	2530	2530	2530
Operating weight	(11)	kg	8350	8380	9080	9590	10060	11010	12310	14110	14150

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 Plant (side) heat exchanger water (in/out) 40° C/45°C; Source (side) heat exchanger air (in) 7° C -87% R.H.
- 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 5 Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate
- conditions [REGULATION (EU) N. 813/2013] 6 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.

 7 Sound power on the basis of measurements made in compliance with ISO 9614.
- 8 Sound power level in cooling, outdoors.

- 9 Sound power level in heating, outdoors. 10 Unit performance with inverter compressor at nominal speed.
- 11 Unit in standard configuration/execution, without optional accessories.

 12 Seasonal energy efficiency of the cooling environment in AVERAGE climatic conditions
- [REGULATION (EU) N. 2016/2281] 13 Seasonal space heating energy index
- 14 Seasonal energy efficiency of the space cooling 15 Seasonal performance coefficient

- 16 Seasonal space heating energy efficiency
 The units highlighted in this publication contain HFC R134a [GWP100 1430] fluorinated greenhouse gases.

KIPlink, the keyboard in your pocket

KIPlink is the innovative system that allows you to directly control the unit via smartphone or tablet through the QR code and using the Wi-Fi directly installed in the equipment.

Thanks to dedicated visuals and graphics, KIPlink allows the user to directly access the same functions as with a traditional keyboard.

KIPlink is installed as standard in all i-FX-Q2 units.









NX-Q

Air source unit for 4-pipe systems, for outdoor installation 43,9-169 kW



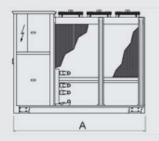
NX-Q			0152P	0182P	0202P	0252P	0262P	0302P	0402P	0502P	0602P
Power supply		V/ph/Hz	400/3+N/50								
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	43.9	50.8	58.1	64.0	71.6	85.5	111	138	169
Total power input	(1)	kW	12,7	14,8	17,6	19,2	22,2	25,6	33,4	42,3	56,5
EER	(1)	kW/kW	3,46	3,43	3,30	3,33	3,23	3,34	3,31	3,26	2,98
COOLING ONLY (EN14511 VALUE)			,		,	,			,		
Cooling capacity	(1)(2)	kW	43,8	50,6	57,9	63,8	71,4	85,2	110	137	168
EER	(1)(2)	kW/kW	3,41	3,38	3,26	3,28	3,18	3,29	3,27	3,21	2,94
ESEER	(1)(2)	kW/kW	4,17	4,11	4,02	4,15	3,97	4,05	4,03	3,97	3,68
HEATING ONLY (GROSS VALUE)			,		,	,			,		
Total heating capacity	(3)	kW	46,4	53,2	60,6	67,3	75,2	90,1	115	145	177
Total power input	(3)	kW	13,5	15,3	17,5	19,3	21,4	25,6	32,7	41,3	52,1
COP	(3)	kW/kW	3,44	3,48	3,46	3,49	3,51	3,52	3,52	3,51	3,40
HEATING ONLY (EN14511 VALUE)				,	,		,	,	,	,	
Total heating capacity	(2)(3)	kW	46,6	53,4	60,8	67,6	75,5	90,4	116	145	178
COP	(2)(3)	kW/kW	3,41	3,44	3,43	3,46	3,48	3,49	3,49	3,47	3,37
COOLING WITH TOTAL HEAT RECOVER	Y			-							
Cooling capacity	(4)	kW	44.0	51,1	58,9	64,3	73,1	86,9	112	140	176
Total power input	(4)	kW	11,6	13,4	15,7	17,3	19,8	23,4	30,5	39,5	50,7
Recovery heat exchanger capacity	(4)	kW	54,9	63,7	73,7	80,5	91,7	109	141	177	224
TER		kW/kW	8,53	8,57	8,45	8,37	8,32	8,37	8,28	8,01	7,90
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN HEATING (Re	a. EU 81	3/2013)									
PDesign	(5)	kW	33,2	38,2	43,6	49,4	55,6	65,8	83,0	106	135
SCOP	(5)(14)		3,59	3,60	3,63	3,75	3,77	3,71	3,69	3,66	3,64
Performance ηs	(5)(15)	%	141	141	142	147	148	145	144	143	143
Seasonal efficiency class	(5)		A+	A+	A+	A+	A+	A+	-	-	-
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFR	GERATIO	ON									
Water flow	(1)	I/s	2,10	2,43	2,78	3,06	3,42	4,09	5,29	6,59	8,06
Pressure drop	(1)	kPa	14,7	19,7	15,8	19,2	17,1	19,4	22,3	26,2	31,8
HEAT EXCHANGER USER SIDE IN HEAT	ING										
Water flow	(3)	l/s	2,24	2,57	2,93	3,25	3,63	4,35	5,56	6,99	8,56
Pressure drop	(3)	kPa	16,7	21,9	17,5	21,6	19,3	21,9	24,6	29,5	35,9
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	20,8	22,4	22,9	30,2	30,9	37,2	53,2	64,8	66,6
NOISE LEVEL											
Sound Pressure	(6)	dB(A)	53	53	53	53	53	54	55	56	56
Sound power level in cooling	(7)(8)	dB(A)	85	85	85	85	85	86	87	88	88
Sound power level in heating	(7)(9)	dB(A)	85	85	85	85	85	86	87	88	88
SIZE AND WEIGHT		, ,									
A	(10)	mm	2625	2625	2625	2625	2625	3250	3875	4500	4500
В	(10)	mm	1350	1350	1350	1350	1350	1350	1350	1350	1350
Н	(10)	mm	2070	2070	2070	2070	2070	2070	2070	2070	2070
Operating weight	(10)	kg	850	870	890	960	970	1130	1430	1670	1730

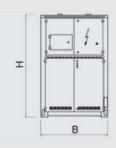
Notes:

- 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.
- 3 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H.
- 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.
- Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION (EU) N. 813/2013]
 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.
- Sound power level in cooling, outdoors.

- 11 Seasonal energy efficiency of the cooling environment in AVERAGE climatic conditions [REGULATION (EU) N. 2016/2281]
- 12 Seasonal space heating energy index
- 13 Seasonal energy efficiency of the space cooling 14 Seasonal performance coefficient

15 Seasonal space heating energy efficiency
The units highlighted in this publication contain HFC R410A [GWP100 2088] fluorinated greenhouse gases.







NECS-Q

Air source unit for 4-pipe systems, for outdoor installation 142-311 kW

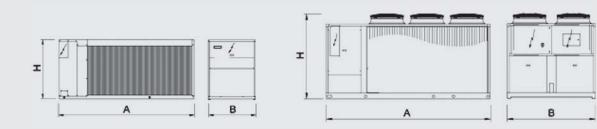


NECS-Q / B			0604	0704	0804	0904	1004	1104	1204
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	150	166	189	211	240	277	311
Total power input	(1)	kW	58.9	69,0	75,8	85,2	95,6	107	120
EER	(1)	kW/kW	2.54	2.41	2,49	2.48	2.51	2.58	2.58
COOLING ONLY (EN14511 VALUE)		,	_,	_,	_,	_,	_,-,-	_,	_,
Cooling capacity	(1)(2)	kW	149	166	188	210	239	276	310
EER	(1)(2)	kW/kW	2,50	2,37	2,45	2,44	2,48	2,54	2,54
ESEER	(1)(2)	kW/kW	_,						
HEATING ONLY (GROSS VALUE)	() ()	,							
Total heating capacity	(3)	kW	167	185	209	234	266	306	344
Total power input	(3)	kW	58.0	64,9	72,1	79.8	92,0	104	116
COP	(3)	kW/kW	2.88	2.86	2,90	2,93	2,90	2,94	2.96
HEATING ONLY (EN14511 VALUE)	(-)	,	_,00	_,,,,	2,00	2,00	2,00	_,,,,,	_,,,,
Total heating capacity	(2)(3)	kW	168	186	210	235	268	308	346
COP	(2)(3)	kW/kW	2.86	2.83	2.87	2.91	2.87	2,91	2.93
COOLING WITH TOTAL HEAT RECOV		KTT/KTT	2,00	2,00	2,07	2,01	2,07	2,01	2,00
Cooling capacity	(4)	kW	151	173	194	220	246	280	317
Total power input	(4)	kW	49.8	57.1	64.5	72.1	79.8	92.8	105
Recovery heat exchanger capacity	(4)	kW	198	226	255	288	321	368	415
TER	(- /	kW/kW	7,00	6,99	6,96	7,04	7,10	6,98	6,99
ENERGY EFFICIENCY		10071000	7,00	0,00	0,00	7,04	7,10	0,00	0,00
SEASONAL EFFICIENCY IN HEATING	/Dam Ell 04	2/0042)							
PDesign	(Keg. EU 61	3/2013) kW	127	143	157	172	205	231	255
SCOP	(5)(14)	KVV	3,25	3.24	3.34	3,20	3,21	3.27	3.25
Performance ns	(5)(14)	%	127	127	131	125	125	128	127
Seasonal efficiency class	(5)	70	-	-	-	-	-	-	-
EXCHANGERS	(5)								
HEAT EXCHANGER USER SIDE IN RE			7 4 7	7.05	0.00	10.00	11 10	10.05	11.00
Water flow	(1)	l/s	7,17	7,95	9,03	10,09	11,48	13,25	14,86
Pressure drop	. ,	kPa	41,9	43,0	43,7	42,8	44,4	47,3	47,2
HEAT EXCHANGER USER SIDE IN HE		17	0.07	0.05	10.10	11.00	10.00	4470	10.00
Water flow	(3)	l/s	8,07	8,95	10,10	11,30	12,86	14,79	16,60
Pressure drop	(3)	kPa	56,9	59,2	61,4	61,9	66,5	65,7	67,5
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	4	4	4	4	4
No. Circuits		N°	2	2	2	2	2	2	2
Refrigerant charge		kg	41,0	42,0	56,0	61,0	63,0	80,0	108
NOISE LEVEL									
Sound Pressure	(6)	dB(A)	60	60	60	61	62	63	63
Sound power level in cooling	(7)(8)	dB(A)	92	92	92	93	94	95	95
Sound power level in heating	(7)(9)	dB(A)	92	92	92	93	94	95	95
SIZE AND WEIGHT									
A	(10)	mm	3110	3110	3110	4110	4110	4110	4110
В	(10)	mm	2220	2220	2220	2220	2220	2220	2220
Н	(10)	mm	2150	2150	2150	2150	2150	2150	2150
Operating weight	(10)	kg	1600	1840	2120	2320	2480	2680	2860

- 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 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H.
- 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.
- Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION (EU) N. 813/2013]
 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.

- Sound power level in cooling, outdoors.
 Sound power level in heating, outdoors.
 Unit in standard configuration/execution, without optional accessories.
- 11 Seasonal energy efficiency of the cooling environment in AVERAGE climatic conditions [REGULATION (EU) N. 2016/2281]
- 12 Seasonal space heating energy index
 13 Seasonal energy efficiency of the space cooling
 14 Seasonal performance coefficient

15 Seasonal space heating energy efficiency
The units highlighted in this publication contain HFC R410A [GWP100 2088] fluorinated greenhouse gases.







NECS-Q

Air source unit for 4-pipe systems, for outdoor installation 332-850 kW



NECS-Q / CA Power supply PERFORMANCE			1314	1414											2040
					1017	17 10	1816	2016		2416	2418	2618	2818	3018	3218
PERFORMANCE		V/ph/Hz							400/3/50)					
COOLING ONLY (GROSS VALUE)															
,	(1)	kW	362	387	425	471	524	559	581	637	680	724	775	813	850
	(1)	kW	122	128	145	157	173	185	192	217	230	244	256	272	289
	(1)	kW/kW	2,96	3,03	2,94	3,01	3,04	3,03	3,03	2,94	2,95	2,96	3,03	2,99	2,94
COOLING ONLY (EN14511 VALUE)															
	1)(2)	kW	361	385	423	470	522	557	579	635	677	720	773	810	846
	1)(2)	kW/kW	2,91	2,98	2,89	2,97	2,99	2,99	2,99	2,89	2,91	2,91	2,99	2,94	2,89
	1)(2)	kW/kW													
HEATING ONLY (GROSS VALUE)															
	(3)	kW	394	420	462	507	546	603	630	693	729	788	840	882	924
	(3)	kW	120	127	140	155	166	183	189	210	221	239	253	266	280
	(3)	kW/kW	3,30	3,31	3,30	3,28	3,29	3,30	3,32	3,30	3,29	3,29	3,33	3,31	3,30
HEATING ONLY (EN14511 VALUE)															
	2)(3)	kW	396	422	464	509	549	606	633	696	732	792	843	886	928
	2)(3)	kW/kW	3,26	3,28	3,26	3,25	3,26	3,27	3,29	3,27	3,26	3,26	3,30	3,28	3,27
COOLING WITH TOTAL HEAT RECOVE															
Cooling capacity	(4)	kW	355	379	423	460	500	547	568	636	667	711	758	802	848
Total power input	(4)	kW	107	113	126	139	150	163	170	189	200	213	226	240	252
	(4)	kW	455	485	542	590	640	700	728	814	854	911	971	1027	1085
TER		kW/kW	7,55	7,66	7,64	7,55	7,63	7,67	7,64	7,68	7,62	7,61	7,63	7,63	7,67
ENERGY EFFICIENCY															
SEASONAL EFFICIENCY IN COOLING	(Reg. I	EU 2016/2	281)												
Ambient refrigeration															
	(11)	kW	-	-	-	-	-	557	579	635	677	720	773	810	846
SEER (1:	1)(12)		-	-	-	-	-	4,26	4,22	4,16	4,10	4,13	4,24	4,23	4,14
	1)(13)	%	-	-	-	-	-	167	166	164	161	162	167	166	163
SEASONAL EFFICIENCY IN HEATING															
	(5)	kW	283	317	363	376	390	-	-	-	-	-	-	-	-
	5)(14)		3,75	3,86	3,73	3,86	3,77	-	-	-	-	-	-	-	-
	5)(15)	%	147	151	146	152	148	-	-	-	-	-	-	-	-
	(5)		-	-	-	-	-	-	-	-	-	-	-	-	-
EXCHANGERS															
HEAT EXCHANGER USER SIDE IN REF															
Water flow	(1)	l/s	17,32	18,49	20,32	22,54	25,06	26,74	27,80	30,46	32,51	34,60	37,07	38,87	40,63
Pressure drop	(1)	kPa	56,4	49,2	59,4	41,5	51,3	44,5	48,1	49,3	50,7	57,4	44,5	48,9	53,5
HEAT EXCHANGER USER SIDE IN HEAT															
Water flow	(3)	l/s	19,02	20,27	22,30	24,48	26,38	29,12	30,41	33,44	35,18	38,05	40,54	42,57	44,60
Pressure drop	(3)	kPa	68,0	59,1	71,5	48,9	56,8	52,7	57,5	59,4	59,3	69,4	53,3	58,7	64,4
REFRIGERANT CIRCUIT															
Compressors nr.		N°	4	4	4	6	6	6	6	6	8	8	8	8	8
No. Circuits		N°	2	2	2	3	3	3	3	3	4	4	4	4	4
Refrigerant charge		kg	99,0	106	106	139	139	152	158	158	185	198	211	211	211
NOISE LEVEL															
	(6)	dB(A)	65	65	65	64	65	65	65	66	66	66	67	67	67
	7)(8)	dB(A)	97	97	97	97	98	98	98	99	99	99	100	100	100
	7)(9)	dB(A)	97	97	97	97	98	-	-	-	-	-	-	-	-
SIZE AND WEIGHT															
	(10)	mm	5080	5080	5080	6255	7430	7430	7430	7430	9780	9780	9780	9780	9780
	(10)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450
	(10)	kg	3850	3950	3980	5460	5740	5890	5970	6020	7350	7500	7700	7740	7770

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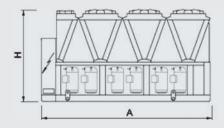
 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C. Values in compliance with EN14511-3:2013.

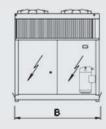
 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H. Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.

 Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION (EU) N. 813/2013]

 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.
- 6





- 8 Sound power level in cooling, outdoors.
 9 Sound power level in heating, outdoors.
 10 Unit in standard configuration/execution, without optional accessories.
 11 Seasonal energy efficiency of the cooling environment in AVERAGE climatic conditions [REGULATION (EU) N. 2016/2281]
 12 Seasonal space heating energy index
 13 Seasonal energy efficiency of the space cooling
 14 Seasonal space heating energy efficienty
 15 Seasonal space heating energy efficiency
 16 Seasonal space heating energy efficiency
 17 Seasonal space heating energy efficiency
 18 Seasonal space heating energy efficiency
 19 Seasonal space heating energy efficiency
 10 Seasonal space heating energy efficiency
 11 Seasonal space heating energy efficiency



ERACS2-Q

Air source unit for 4-pipe systems, for outdoor installation 199-826 kW



EDAGGO O / OA			1062	1162	1362	1562	1762	1962	2022	2222	2422	2622	2722	3222
ERACS2-Q / CA			1002	1102	1302	1502	1702			2222	2422	2022	2122	3222
Power supply		V/ph/Hz						4 00 0	35/6 0					
PERFORMANCE														
COOLING ONLY (GROSS VALUE)	(1)													
Cooling capacity	(1)	kW	210	248	302	329	380	425	483	525	554	624	701	826
Total power input	(1)	kW	72,1	84,8	101	109	129	144	156	167	176	201	222	264
EER	(1)	kW/kW	2,91	2,93	2,98	3,01	2,95	2,95	3,10	3,14	3,16	3,10	3,15	3,13
COOLING ONLY (EN14511 VALUE	,													
Cooling capacity	(1)(2)	kW	209	247	301	328	379	424	482	524	552	623	700	824
EER	(1)(2)	kW/kW	2,88	2,89	2,94	2,97	2,91	2,92	3,07	3,11	3,12	3,08	3,12	3,10
ESEER	(1)(2)	kW/kW												
HEATING ONLY (GROSS VALUE)	(0)	1347	010	050	000	000	000	10.1	100	F 44	F74	015	744	000
Total heating capacity	(3)	kW	218	258	308	339	396	434	492	541	571	615	711	826
Total power input	(3)	kW	67,0	80,7	92,2	101	122	131	149	159	169	178	207	240
COP	(3)	kW/kW	3,25	3,20	3,35	3,35	3,25	3,32	3,31	3,41	3,38	3,46	3,43	3,44
HEATING ONLY (EN14511 VALUE)			0.10	050	0.10	0.10	00=	105	100	E 10		010	710	
Total heating capacity	(2)(3)	kW	218	259	310	340	397	435	493	543	572	616	713	828
СОР	(2)(3)	kW/kW	3,23	3,17	3,32	3,32	3,23	3,31	3,29	3,38	3,36	3,44	3,41	3,42
COOLING WITH TOTAL HEAT REC		1347	200	0.40	005	000	001	100	10.1	500	550	001	704	000
Cooling capacity	(4)	kW	209	248	305	329	381	428	484	522	550	631	701	826
Total power input	(4)	kW	60,6	72,2	87,1	92,5	111	122	134	145	153	170	193	228
Recovery heat exchanger capacity	(4)	kW	266	316	386	416	486	542	609	658	694	791	883	1041
TER		kW/kW	7,83	7,81	7,93	8,06	7,80	7,97	8,18	8,14	8,12	8,35	8,19	8,17
ENERGY EFFICIENCY	INO (Dec.)	TI 1 004 0 (00)	١4١											
SEASONAL EFFICIENCY IN COOL	ING (Reg. I	EU 2016/228	51)											
Ambient refrigeration	(4.4)	1.3.4.7											700	824
Prated,c SEER	(11)	kW	-	-		-			-			-	4.17	4,20
	(11)(12)	%											164	165
Performance ηs SEASONAL EFFICIENCY IN HEAT	(11)(13)			-	-	-	-	-	-	-	-	-	104	100
PDesign		kW	155	210	219	241	282	311	359	387	353	398		
SCOP	(5) (5)(14)	KVV	3,41	3,21	3,45	3,53	3,40	3,54	3,48	3,60	3,60	3,61		
Performance ns	(5)(14)	%	133	125	135	138	133	139	136	141	141	141		
Seasonal efficiency class	(5)(15)	70	-	-	-	-	-	-	-	- 141	-	- 141		
EXCHANGERS	(3)		-											-
HEAT EXCHANGER USER SIDE IN	I DEEDIGE	PATION												
Water flow	(1)	l/s	10.04	11,88	14,46	15,75	18.19	20,33	23,09	25,11	26,49	29,84	33.54	39.48
Pressure drop	(1)	kPa	28.8	40.2	36.6	43.4	40.3	27,9	26.7	29.0	32.3	23,1	30.5	30.9
HEAT EXCHANGER USER SIDE IN		NFa	20,0	40,2	50,0	40,4	40,0	۷, اے	20,1	20,0	02,0	20,1	50,5	30,3
Water flow	(3)	l/s	10.51	12.47	14.89	16,37	19.10	20.95	23.75	26.13	27,55	29.67	34.34	39.85
Pressure drop	(3)	kPa	31,5	44.3	38.8	46.9	44,4	29.6	28.2	31,4	34,9	22,8	31,9	31.5
REFRIGERANT CIRCUIT	(0)	IXI U	01,0	77,0	00,0	70,0	77,7	20,0	20,2	01,4	04,0	22,0	01,0	31,0
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	83.0	97.0	132	132	160	167	210	240	250	254	312	360
NOISE LEVEL		1.9	55,5	0.,0	. 32	. 32	. 50	. 51	_,0	_ 10	_50		012	555
Sound Pressure	(6)	dB(A)	65	65	65	66	66	66	66	68	68	68	68	69
Sound power level in cooling	(7)(8)	dB(A)	97	97	97	98	99	99	99	101	101	101	101	102
Sound power level in heating	(7)(9)	dB(A)	97	97	97	98	99	99	99	101	-	-	-	-
SIZE AND WEIGHT	(-)(-)													
A	(10)	mm	4610	4610	5610	5610	6610	6610	6300	7200	7200	7200	8400	9700
В	(10)	mm	2220	2220	2220	2220	2220	2220	2260	2260	2260	2260	2260	2260
H	(10)	mm	2150	2420	2430	2430	2430	2430	2350	2350	2350	2350	2350	2350
Operating weight	(10)	kg	3600	3870	4620	5040	5520	5670	7580	8060	8160	8600	9160	11380
- p	()	9	2230	55.5		50.5	3023	55.5		0000	0.00	0000	0.00	

- 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 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H.

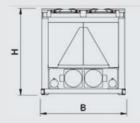
 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.

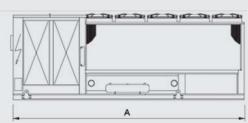
 5 Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION [CU] N. 813/2013]

 6 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.

 7 Sound power on the basis of measurements made in compliance with ISO 9614.

- 8 Sound power level in cooling, outdoors.
 9 Sound power level in heating, outdoors.
 10 Unit in standard configuration/execution, without optional accessories.
 11 Seasonal energy efficiency of the cooling environment in AVERAGE climatic conditions [REGULATION (EU) N. 2016/2281]
 2 Seasonal space heating energy index
 13 Seasonal energy efficiency of the space cooling
 14 Seasonal energy efficiency of the space in the space cooling
 15 Seasonal space heating energy efficiency
 16 The units highlighted in this publication contain HFC R410A [GWP₁∞ 2088] fluorinated greenhouse gases.









NECS-WQ

Water source unit for 4-pipe systems. 48,4-520 kW

NECS-WQ			0152	0182	0202	0252	0262	0302	0412	0512	
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	_
PERFORMANCE		τ, ρ	.00,0,00	.00,0,00	100,0,00	.00,0,00	.00,0,00	.00,0,00	.00,0,00	.00,0,00	
COOLING ONLY (GROSS VALUE)											1
	(1)	kW	48.4	55.6	64.6	73.4	82.8	97.0	127	158	
Cooling capacity											
Total power input	(1)	kW	8,56	9,73	11,2	13,2	14,7	17,4	22,8	28,2	
EER	(1)	kW/kW	5,65	5,71	5,77	5,56	5,63	5,57	5,56	5,59	
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	48,2	55,4	64,3	73,1	82,4	96,6	126	157	
EER	(1)(2)	kW/kW	5,45	5,53	5,59	5,39	5,45	5,40	5,38	5,41	
HEATING ONLY (GROSS VALUE)											
Total heating capacity	(3)	kW	52,1	59,7	69,3	79,0	88,9	104	135	169	
Total power input	(3)	kW	12,4	13,8	16,2	18,5	20,4	23,9	31,0	38,4	
COP	(3)	kW/kW	4,20	4,33	4,28	4,27	4,36	4,37	4,35	4,40	
HEATING ONLY (EN14511 VALUE)			,	,	,	ŕ	,	ŕ	,	ŕ	
Total heating capacity	(2)(3)	kW	52.4	60.0	69.6	79.4	89.3	105	136	170	
COP	(2)(3)	kW/kW	4.10	4.23	4.19	4.18	4,26	4.27	4,25	4,30	
COOLING WITH TOTAL HEAT RECOVER		1 V V / 1 V V	7,10	7,20	7,10	7,10	7,20	Τ,∠Ι	7,20	7,00	
	(4)	kW	40,4	46,7	54,1	61,7	69,7	82,0	106	133	
Cooling capacity Total power input	(4)	kW	12.4	13.8	16.2	18.5	20,4	23.9	31,0	38.4	
			,	- , -	- /	- / -		- / -		/	
Recovery heat exchanger capacity	(4)	kW	52,1	59,7	69,3	79,0	88,9	104	135	169	
TER		kW/kW	7,46	7,71	7,62	7,61	7,77	7,80	7,75	7,85	
ENERGY EFFICIENCY											4
SEASONAL EFFICIENCY IN HEATING (Re	eg. EU 81	3/2013)									
PDesign	(5)	kW	62,2	71,1	82,8	94,4	106	125	162	202	
SCOP	(5)(14)		5,71	5,88	5,93	5,74	5,79	5,79	5,73	5,72	
Performance ηs	(5)(15)	%	220	227	229	222	224	224	221	221	
Seasonal efficiency class	(5)		A++	-	-	-	-	-	-	-	
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFR	IGERATIO	ON									1
Water flow	(1)	I/s	2.31	2.66	3.09	3.51	3.96	4.64	6.06	7.54	
Pressure drop	(1)	kPa	28.4	25,6	25,0	28,7	31,9	33,8	39,1	42,4	
HEAT EXCHANGER SOURCE SIDE IN RE			20,4	20,0	20,0	20,1	01,0	00,0	00,1	7∠,⊤	
Water flow		l/s	0.85	0.97	1.13	1.28	1.45	1.70	2.22	2.76	
	(1)			- , -		, -	, -	, -	,	, -	
Pressure drop	(1)	kPa	3,79	3,42	3,32	3,85	4,26	4,53	5,25	5,68	
HEAT EXCHANGER USER SIDE IN HEAT											
Water flow	(4)	l/s	2,51	2,88	3,35	3,82	4,29	5,04	6,51	8,15	
Pressure drop	(4)	kPa	33,5	30,1	29,3	34,0	37,5	39,8	45,1	49,5	
HEAT EXCHANGER SOURCE SIDE IN HE	ATING										
Water flow	(3)	l/s	1,38	1,60	1,85	2,11	2,38	2,80	3,61	4,53	
Pressure drop	(3)	kPa	10,1	9,25	8,95	10,4	11,5	12,3	13,9	15,3	
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	
No. Circuits		N°	2	2	2	2	2	2	2	2	
Refrigerant charge		kg	5,60	6,40	7,40	8,20	8,80	10,0	14,0	16,4	
NOISE LEVEL		Ng.	0,00	0,40	7,40	0,20	0,00	10,0	14,0	10,4	
	(C)	-ID(A)	40	40	40	40	4.4	4.5	40	47	
Sound Pressure	(6)	dB(A)	42	43	43	43	44	45	46	47	
Sound power level in cooling	(7)(8)	dB(A)	73	74	74	74	75	76	77	78	
Sound power level in heating	(7)(9)	dB(A)	73	74	74	74	75	76	77	78	
SIZE AND WEIGHT											
Α	(10)	mm	1220	1220	1220	1220	1220	1220	1220	1220	
В	(10)	mm	877	877	877	877	877	877	877	877	
Н	(10)	mm	1496	1496	1496	1496	1496	1496	1496	1496	
	(10)	kg	450	470	490	505	525	550	745	825	

- Note

 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 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H.

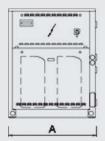
 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.

 5 Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION (UE) N. 811/2013]
- 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.
 Sound power level in cooling, outdoors.
 Sound power level in heating, outdoors.
 Unit in standard configuration/execution, without optional accessories

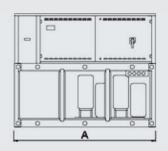
The units highlighted in this publication contain HFC R134a [GWP100 1430]

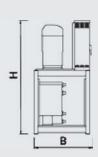


NECS-WQ			0612	0604	0704	0804	0904	1004	1104	1204
		\								
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity	(1)	kW	205	193	224	254	284	315	363	412
Total power input	(1)	kW	36,6	34,7	40,1	45,5	50,9	56,4	64,8	73,0
EER	(1)	kW/kW	5,60	5,57	5,59	5,59	5,58	5,59	5,60	5,64
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	204	192	223	253	283	314	362	410
EER	(1)(2)	kW/kW	5,43	5,40	5,43	5,43	5,43	5,44	5,45	5,49
HEATING ONLY (GROSS VALUE)										
Total heating capacity	(3)	kW	219	208	240	270	303	338	388	440
Total power input	(3)	kW	49,9	47,7	54,7	61,8	69,2	76,8	88,4	99,6
СОР	(3)	kW/kW	4,39	4,36	4,38	4,37	4,38	4,40	4,39	4,41
HEATING ONLY (EN14511 VALUE)										
Total heating capacity	(2)(3)	kW	220	209	241	271	305	339	390	442
СОР	(2)(3)	kW/kW	4,29	4,27	4,29	4,28	4,30	4,31	4,31	4,33
COOLING WITH TOTAL HEAT RECOVERY						- / -			-	
Cooling capacity	(4)	kW	172	163	188	212	238	266	305	346
Total power input	(4)	kW	49,9	47,7	54,7	61,8	69,2	76,8	88,4	99,6
Recovery heat exchanger capacity	(4)	kW	219	208	240	270	303	338	388	440
TER		kW/kW	7,83	7,79	7,82	7,80	7,83	7,86	7,84	7,89
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN COOLING (Re	g. EU 20	16/2281)								
Ambient refrigeration										
Prated,c	(11)	kW	-	-	-	-	-	297	342	387
SEER	(11)(12)		-	-	-	-	-	5,14	5,24	5,25
Performance ηs	(11)(13)	%	-	-	-	-	-	198	202	202
SEASONAL EFFICIENCY IN HEATING (Reg	g. EU 81	3/2013)								
PDesign	(5)	kW	262	248	289	325	360	-	-	-
SCOP	(5)(14)		5,76	5,80	5,65	5,77	5,93	-	-	-
Performance ηs	(5)(15)	%	222	224	218	223	229	-	-	-
Seasonal efficiency class	(5)		-	-	-	-	-	-	-	-
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIC	GERATIO	ON								
Water flow	(1)	l/s	9,79	9,24	10,72	12,16	13,58	15,08	17,35	19,69
Pressure drop	(1)	kPa	44,0	41,7	44,1	43,7	43,0	43,9	43,7	44,2
HEAT EXCHANGER SOURCE SIDE IN REF	RIGER/	NOITA								
Water flow	(1)	l/s	3,58	3,38	3,93	4,45	4,97	5,52	6,35	7,20
Pressure drop	(1)	kPa	5,89	5,60	5,91	5,85	5,77	5,89	5,86	5,91
HEAT EXCHANGER USER SIDE IN HEATIN	NG									
Water flow	(4)	l/s	10,57	10,05	11,56	13,04	14,64	16,30	18,74	21,22
Pressure drop	(4)	kPa	51,2	49,3	51,3	50,2	50,0	51,3	51,0	51,4
HEAT EXCHANGER SOURCE SIDE IN HEA	ATING									
Water flow	(3)	l/s	5,88	5,58	6,43	7,24	8,14	9,07	10,42	11,82
Pressure drop	(3)	kPa	15,8	15,2	15,8	15,5	15,5	15,9	15,8	15,9
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	4	4	4	4	4	4	4
No. Circuits		N°	2	2	2	2	2	2	2	2
Refrigerant charge		kg	21,2	22,6	25,0	30,4	31,2	33,2	37,4	40,2
NOISE LEVEL										
Sound Pressure	(6)	dB(A)	48	54	55	56	57	58	59	59
Sound power level in cooling	(7)(8)	dB(A)	79	86	87	88	89	90	91	91
Sound power level in heating	(7)(9)	dB(A)	79	86	87	88	89	0	0	0
SIZE AND WEIGHT										
A	(10)	mm	1220	2560	2560	2560	2560	2560	2560	2560
В	(10)	mm	877	891	891	891	891	891	891	891
H	(10)	mm	1496	1810	1810	1810	1810	1810	1810	1810
Operating weight	(10)	kg	910	975	1165	1365	1445	1610	1710	1810













ERACS2-WQ

Water source unit for 4-pipe systems 189-870 kW

ERACS2-WQ			0802	1002	1102	1302	1502	
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	
PERFORMANCE		.,						
COOLING ONLY (GROSS VALUE)								
Cooling capacity	(1)	kW	189	234	268	318	363	
Total power input	(1)	kW	35,7	44,9	50,6	59,7	68,7	
EER	(1)	kW/kW	5,31	5,22	5,30	5,32	5,29	
COOLING ONLY (EN14511 VALUE)			,	· · · · · · · · · · · · · · · · · · ·	,	,	,	
Cooling capacity	(1)(2)	kW	189	233	267	317	362	
EER	(1)(2)	kW/kW	5,19	5,09	5,15	5,20	5,18	
HEATING ONLY (GROSS VALUE)	. , ,	,	-,	-,	-,	-,	-,	
Total heating capacity	(3)	kW	205	255	291	344	393	
Total power input	(3)	kW	45,7	56,9	65,8	76,3	86,9	
COP	(3)	kW/kW	4,49	4,48	4,43	4,51	4,52	
HEATING ONLY (EN14511 VALUE)	(-)	10071000	1, 10	1, 10	1, 10	1,01	1,02	
Total heating capacity	(2)(3)	kW	206	256	293	346	394	
COP	(2)(3)	kW/kW	4,42	4,40	4,33	4,42	4,44	
		KVV/KVV	4,42	4,40	4,33	4,42	4,44	
COOLING WITH TOTAL HEAT RECOVE		1.147	160	004	000	070	011	
Cooling capacity	(4)	kW	162	201	229	272	311	
Total power input	(4)	kW	45,7	56,9	65,8	76,3	86,9	
Recovery heat exchanger capacity	(4)	kW	205	255	291	344	393	
TER		kW/kW	8,05	8,01	7,91	8,08	8,10	
ENERGY EFFICIENCY								
SEASONAL EFFICIENCY IN COOLING (Reg. EU 20	16/2281)						
Ambient refrigeration								
Prated,c	(12)	kW	-	-	-	-	349	
SEER	(12)(13)		-	-	-	-	5,15	
Performance ηs	(12)(14)	%	-	-	-	-	198	
SEASONAL EFFICIENCY IN HEATING (I								
PDesign	(5)	kW	249	309	353	418	-	
SCOP	(5)(15)	1177	5,59	5,56	5,18	5,45	-	
Performance ηs	(5)(16)	%	215	214	199	210	-	
Seasonal efficiency class	(5)	70	-	-	-	-	-	
PDesign	(6)	kW	220	274	315	368	-	
SCOP	(6)(15)	N.V.	4,33	4,46	3,97	4,26	-	
Performance ηs	(6)(16)	%	165	170	151	162		
Seasonal efficiency class	(6)	/0	-	-	-	-		
EXCHANGERS	(0)							
	DIOED 4 TI							
HEAT EXCHANGER USER SIDE IN REF				44.00	40.00	45.00	47.00	
Water flow	(1)	I/s	9,06	11,20	12,82	15,20	17,38	
Pressure drop	(1)	kPa	27,6	34,9	46,8	40,4	36,5	
HEAT EXCHANGER SOURCE SIDE IN F			0.0:				2.11	
Water flow	(1)	l/s	3,34	4,14	4,73	5,61	6,41	
Pressure drop	(1)	kPa	3,76	4,78	6,38	5,50	4,98	
HEAT EXCHANGER USER SIDE IN HEA	TING							
Water flow	(4)	I/s	9,91	12,30	14,06	16,61	18,96	
Pressure drop	(4)	kPa	33,1	42,1	56,3	48,3	43,5	
HEAT EXCHANGER SOURCE SIDE IN H	IEATING							
Water flow	(3)	I/s	5,55	6,88	7,83	9,31	10,63	
Pressure drop	(3)	kPa	10,4	13,2	17,5	15,2	13,7	
REFRIGERANT CIRCUIT		2	.,	-,-	,-	-,=	,	
Compressors nr.		N°	2	2	2	2	2	
No. Circuits		N°	2	2	2	2	2	
Refrigerant charge			46,0	56,0	56,0	58,0	75,0	
		kg	40,0	50,0	50,0	50,0	70,0	
NOISE LEVEL	(7)	dD(A)	60	60	G.F.	GF.	GE.	
Sound Pressure	(7)	dB(A)	62	63	65	65	65	
Sound power level in cooling	(8)(9)	dB(A)	94	95	97	97	97	
Sound power level in heating	(8)(10)	dB(A)	94	95	97	97	0	
SIZE AND WEIGHT								
Α	(11)	mm	3680	3680	3680	3680	3680	
В	(11)	mm	1170	1170	1170	1170	1170	
H	(11)	mm	1950	1950	1950	1950	1950	
Operating weight	(11)	kg	2420	2470	2880	3580	3690	

- Note

 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.

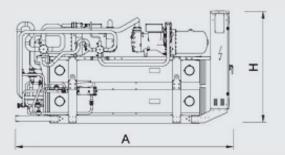
 3 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C 87% R.H.

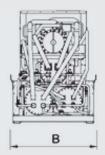
 4 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.

 5 Seasonal space heating energy efficiency class LOW TEMPERATURE in AVERAGE climate conditions [REGULATION (UE) N. 811/2013]
- 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.
 Sound power level in cooling, outdoors.
 Sound power level in heating, outdoors.
 Unit in standard configuration/execution, without optional accessories

The units highlighted in this publication contain HFC R134a [GWP100 1430] fluorinated greenhouse gases.











INTEGRA-INVERTER CASE STUDY

- **London**
- Mixed-use building

THE PROJECT

Plant renovation of a multifunctional complex in London.

The building is composed of 7 floors of over 1488 m2 each and has both areas for commercial activities and offices.

The HVAC system is a 4-pipe system.

A comparison of the different systems solutions:



Solution

1. Traditional system (high efficiency chiller + boiler)

2. INTEGRA fixed speed solution

ERACS2-Q SL-CA 2422

3. INTEGRA full inverter solution

i-FX-Q2 SL-CA 0602

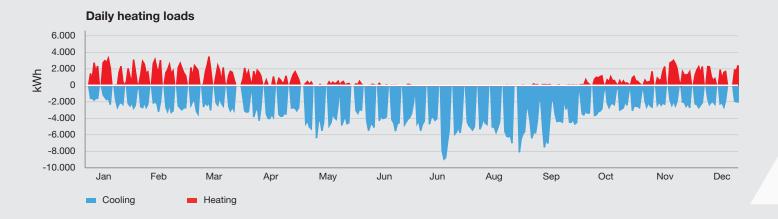
HEATING LOADS AND UNITS CONSIDERED

Maximum power used for sizing: Cooling: 509 kW – Set point: 7°C

Heating: 476 kW – Set point: 45°C

Operating methods in the analysis:

In operation from 9:00 to 19:00, Monday to Friday.



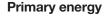
The new INTEGRA inverter units, thanks to their ability to continuously modulate the compressors speed, and their use of special control logic, allow the unit to satisfy the demands of the plant reaching unbeatable efficiencies.

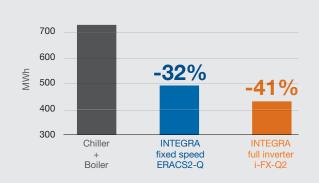
RESULTS

Comparison between traditional system and INTEGRA solutions

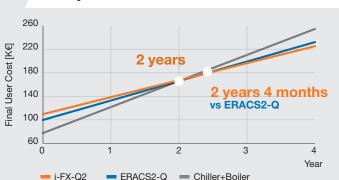
Assuming the cost of electricity is equal to 0,15 € / kWh and the cost of natural gas is 0,42 €/m3, both INTEGRA solutions are much more efficient than a traditional HVAC plant of chiller + boiler.

The consumption of primary energy is reduced by more than 1/3, allowing the return on investment in about two years for both solutions.



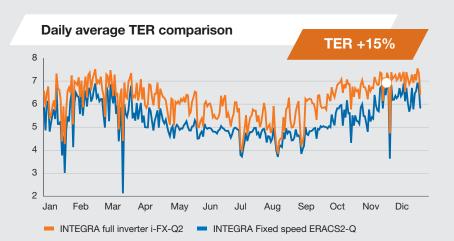


Payback



Comparison between INTEGRA Full inverter and INTEGRA Fixed speed solutions

The variable speed drive technology (VSD) applied to INTEGRA i-FX-Q2 allows an average annual increase of 15% TER and then a payback of 2 years and 4 months with respect to the INTEGRA fixed speed solution.



AT A GLANCE

	Reduction of primary energy*	Reduction of CO2 emissions*	Payback*
INTEGRA full inverter i-FX-Q2	298.046 kWh	61.338 Kg = 1 car that runs 360.800 km	_ 2 years
INTEGRA fixed speed ERACS2-Q	235.564 kWh	47.647 Kg = 1 car that runs 280.300 km	_ Z years

*Compared to the traditional chiller+boiler solution

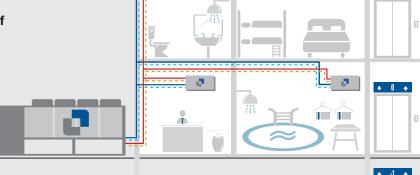






COMFORT APPLICATIONS

- Auto adaptability to variable loads
- Highest efficiency in all load conditions
- Plant simplification and reduction of technical spaces
- ✓ A gas network is no longer needed
- Smart management of thermal energy



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В

Ideal for:

- → Residential applications
- → Environments with complex and variable thermal loads
- ✓ Areas with large glass surfaces

To cool and simultaneously heat mixed-use environments is a frequent trend in the building and constructions segment. In these cases, the use of a smart INTEGRA heat pumps is key for producing hot and cold water simultaneously and

independently, matching any kind of load combinations whilst ensuring optimal comfort and highest energy efficiency all year long.



IT COOLING

- ✓ Two in one unit
- Smart management of thermal energy
- √ Zero kW/h wasted

INTEGRA heat pumps are ideal solutions for mixed-use buildings featuring variable thermal and cooling capacities.

In a typical IT Cooling application with a data center located within an office building, INTEGRA heat pumps are the perfect solution to recover the thermal energy of IT equipment and transfer it to other office areas nearby.

Ideal for:

- ✓ IT Rooms with offices connected
- Multifunctional spaces in combination with other Climaveneta units

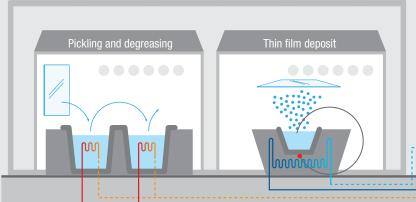
The thermal energy can therefore be reused, turning it into a precious economic asset.

A forward-looking system that combines perfect comfort with zero energy waste, improving the energy class of the building and providing large annual energy savings.

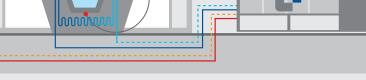
THE VERSATILE AND MULTI-FUNCTIONAL HEAT PUMP FOR ALL APPLICATIONS



INDUSTRIAL PROCESS



- → A single unit for multiple uses
- Large energy savings
- Enhanced reliability and reduced maintenance



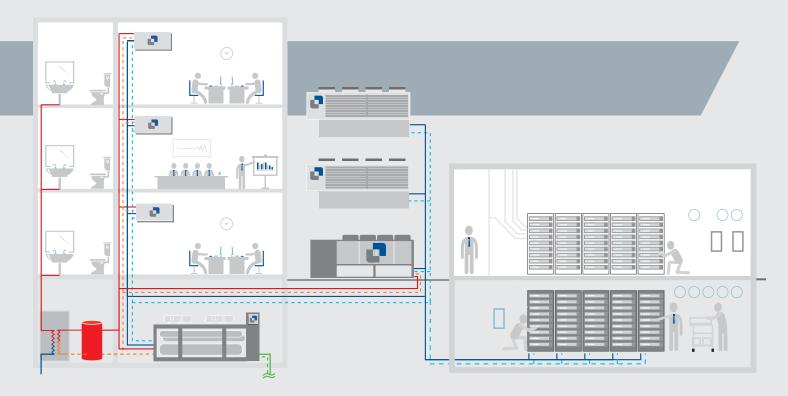
Most industrial applications are characterized by processes requiring simultaneous and variable heating and cooling. The capacity of INTEGRA to manage and efficiently balance both hot and cold loads allows you to respond to all the process requirements and those of the office spaces nearby, by means of one single heat pump.

The diagram above shows a typical industrial application of thin film deposit on surfaces, in particular in the process of mirror manufacturing. This process requires thermal energy during clean-up and preparation of the surfaces to be treated and cooling energy in the thin film deposition step.

INTEGRA is the ideal solution to meet both thermal demands, all by itself. All these advantages can be achieved without the installation of an auxiliary plant and with the guarantee of premium efficiency all year long.

Ideal for:

- ✓ Industrial processes that require cooling and heating
- Industrial complexes that need to be air-conditioned and that have adjacent offices







An integrated module for the independent production of high temperature water (up to 78°C). From 70 to 279 kW





+2P it is the innovative solution for the production of high temperature water (up to 78 °C). Designed as a fully integrated module, +2P is installed inside the unit for support and grants efficiencies without compromise. The multipurpose heat pump with integrated +2P module is therefore able to satisfy,

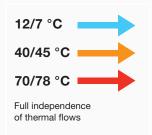
independently and simultaneously, 3 different thermal requirements at 3 different temperatures, without limiting operational flexibility.

Thanks to +2P, other supplementary sources will no longer be necessary for the production of high temperature water

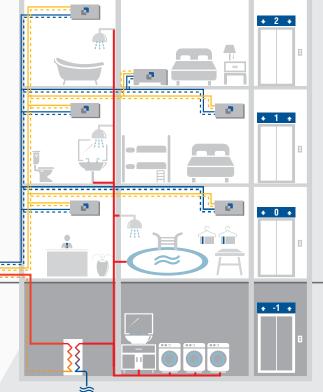
The INTEGRA +2P solution is ideal in all cases where there is the need to achieve independently and simultaneously 3 thermic loads (cold, warm, and hot water):

- Centralized HVAC systems for residential and public buildings that require cooling, heating and sanitary hot water
- → Hospitals/ Healthcare centres
- → Hotels with laundry and spa facilities
- ✓ Industrial processes

The +2P module is available in different sizes so as to ensure maximum flexibility and adaptability to the different installation requirements.

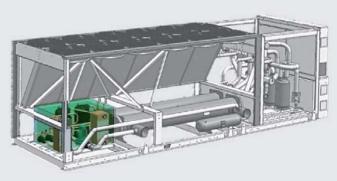








is a two-circuit solution that ensures absolute reliability in operation and continuity of service.



CC	OP
+2P 200 kW	+2P 285 kW
3,79	4,08
2,34	2,43
4,83	4,83
1,83	1,95
	3,79 2,34 4,83

Efficiency values of the +2P module are calculated considering the 200kW size and the 285kW size, combined with a INTEGRA unit ERACS2Q/SL-CA (size 3222, nominal cooling capacity = 790kW, nominal thermal capacity = 815 kW)

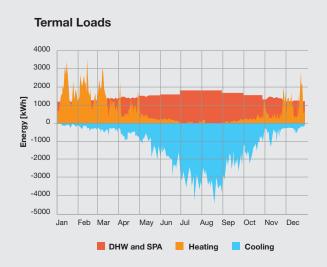
CASE STUDY RETROFIT OF AN EXISTING PLANT

INTEGRA and +2P, module, together to improve system performance and increase efficiency.

PROJECT

Renewal of the thermal plant of an historic building converted into a hotel in the central coastal area of the Mediterranean Sea.

	Set	Current	Retrofit
Cooling	12/7°C	Air cooled chiller	
Heating	40/45°C	Gas	INTEGRA PRODULE
DHW and SPA	60/65°C	Boiler	



RESULTS

The use of integrated + 2P module allows you to achieve, with a single unit, 3 different thermal requirements, providing enhanced efficiencies and reduced costs with respect to the current plant, with annual savings of 30.4% and a reduction of 10.3% of primary energy consumption.

Primary energy consumption



Terms

Seasonal efficiency of gas boiler 85% Fuel cost 0,77 €/lt

Annual operating costs



Cost of Electricity Production 0,12 €/kWh_el Efficiency Electricity 46%



Annual cost

Annual CO₂ emissions

-10,3%

-30,4%

-42,4%



"BY FAR THE BEST PROOF IS EXPERIENCE"

Sir Francis Bacon

British philosopher (1561 - 1626)



TRADITIONAL SYSTEM
BASED ON CHILLER + BOILER

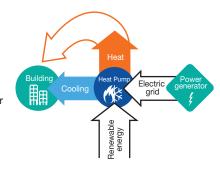
VS

NEW SYSTEM BASED ON SMART HEAT PUMPS WITH HEAT RECOVERY



- ▶ 3 boilers for heating, total capacity 1380kW
- ▶ 2 air-cooled chillers, total capacity 2180 kW

- ▶ 1 ERACS2-Q/SL-CA/S air source heat pump providing heating and cooling
- ▶ 1x TECS2/SL-CAE/S air cooled chiller with magnetic levitation compressors
- ▶ 1x ClimaPRO system



350 Euston Road

London - Great Britain 2015

Application:
Office buildings
Plant type:
Hydronic System
Cooling capacity:
1022 kW

Heating capacity: 541 kW

Installed machines:

1x ERACS2-Q/SL-CA/S 2222, 1x TECS2/SL-CAE/S 0512,

1x ClimaPRO











CASE STUDY

In order to investigate the advantages of replacing a traditional HVAC system based on existing boilers and chillers with smart heat pumps with heat recovery, an official case study was conducted.

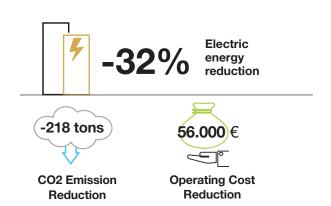
Starting from the energy analysis of the previous system, the data revealed that the building was characterized by a high cooling demand, even during the winter, together with a considerable overlap of heating and cooling requirements, as is frequently the case in office buildings.

PROJECT

350 Euston Road is a grade A seven-storey office building that forms part of Regent's Place, a 13 acre, fully managed estate in the heart of London. Owned by British Land and managed by Broadgate Estates, the building features the latest sustainable design for a lively mix of retail, leisure and public spaces. In this high-demanding context, the replacement of the previous HVAC system was aimed to be in line with the energy targets established by the property owner.

SOLUTION

The units selected to serve the building's requirements were: one ERACS2-Q SLCA 2722 unit, from the INTEGRA range, and one TECS2/SL-CAE/S 0512 chiller with magnetic levitation compressors. The results of the study revealed that replacing existing old chillers and boilers with heat recovery heat pumps would lead to significant enhancements in terms of environmental, economic, and energy related aspects. After one year the new system has resulted in 218 less tons of CO2 emissions and a reduction of primary energy consumption of around 50%, thus leading to an annual cost savings of 56000 €.





Primary energy reduction



reduction



Gran Theatre de Rabat



The futuristic building has been designed by Zaha Hadid Architects and its shape is inspired by the nearby Bouregreg River. The project, part of a national programme of cultural development, includes a 1800-seat theatre, an open-air amphiteater with a capacity of 7,000 people, a second experimental performance / rehearsal spaces and a restaurant for 350 people.

To combine perfect internal comfort and high energy performance of the building, the HVAC system has been designed starting from Climaveneta high efficiency units: 2 multi-purpose heat pumps NECS-Q/B 3218 and 1 air cooled chiller NECS/B 3218.

SOLUTION

The system is so able to provide the ideal temperature and humidity level inside the building all year round, even producing simultaneous cooling and heating when necessary, thanks to the multi-purpose units installed. The system has a total cooling capacity of 2,500 kW, so granting an ideal temperature even in the Moroccan hot summers.



AB Medica

Milan - Italy 2014

Application:Office Building

Cooling capacity: 1250 kW

Heating capacity: 1144 kW

CHALLENGE

Installed machines:

1x ERACS2-WQ 3202 S,

1x ERACS2-Q 1762 XL-CA-E-S,

1x ClimaPRO

The work is almost finished on the new headquarters for AB MedicaSpA, specialised in the production and marketing of medical technology, bio-materials and surgical devices.

The particular lot conformation and the constraints imposed by the highway have guided the design towards the triangular frame similar to a nautical hull that slides through artificial hills functioning as thermal and acoustic insulation. The building has been given technologically advanced systems that exploit renewable energy associated with ground source water and air, representing the advantages of a Class A building.

SOLUTION

PROJECT

The energy analysis conducted on this building's plant system has led to the design of a heating and cooling system with a hybrid heat pump: a multi-purpose water condensed heat pump, ERACS2-WQ 3202 S, that exploits ground source water and a multi-purpose air condensed heat pump, ERACS2-Q 1762 XL-CA-E.

Depending on the energy request by the building, the external air temperature and the resulting power plant efficiency, the control system activates one of the two heat pumps.

The plant has been completed with the installation of ClimaPRO, the new management and optimisation system by Climaveneta, designed to minimise energy consumption and to simplify the maintenance of the central heating and cooling system.





The New BNL Roma Tiburtina Headquarters



The new BNL Headquarters, designed by 5+1AA Alfonso Femia Gianluca Peluffo, is located near the Rome Tiburtina high speed railroad station. The building – 67.000 sqm including 20.000 underground – is centered around employees well-being. It will provide 3.800 ergonomic workplaces and a vast range of facilities for employees including gym, service center, nursery school, restaurants.

BNL Rome Tiburtina fits well in the urban context where the building is located, and combines the values of environmental, economical and social sustainability.

SOLUTION

To satisfy with utmost efficiency the heating and cooling needs of the buildings, the HVAC designer selected 5 Climaveneta INTEGRA multiuse ERACS2-Q 3.222 units, 4 of which equipped with +2P MODULE (a patented solution with 2 additional pipes for hot water for domestic usage at temperatures up to 80°C) and 1 Super Low noise version, Class A Efficiency FOCS2/SL-CA chiller.



Botswana Innovation Hub

Gaborone - Botswana 2015

Application: Office Building

Cooling capacity: 2803 kW

Heating capacity: 2133 kW

Installed machines: 3x ERACS2-Q XL-CA 2722, 1x i-FX (1+i) CA 2722,

1x ClimaPRO



Botswana Innovation Hub is strategically located, near the Sir Seretse Khama International Airport in Gaborone, Botswana's capital city and center of business activities in the country. The new development, an area of 57 hectares, will serve as a magnet for technology and business and will be able to compete on the global market.

The building is designed to conserve energy and be as efficient as possible.

The project of the Innovation Hub in Botswana includes large roof overhangs created specifically to bring shade to interior spaces, mechanisms for the collection and reuse of water, and both active and passive solar systems to harness solar energy.



SOLUTION

The air-conditioning system is based on three INTEGRA units: ERACS2-Q XL-CA 2722 and 1 chiller with high efficiency air condensed air cooled i-FX (1+i) CA 2722. The whole system is managed and optimized by ClimaPRO, the new Climaveneta controller, able to actively optimize the entire refrigeration system through the management and control of each component directly involved in the production and distribution of thermal loads.



MORE THAN 1000 PROJECTS ALL OVER THE WORLD



Application: Office buildings

Cooling capacity: 850 kW

Heating capacity: 868 kW

Installed machines: 2x ERACS2-Q/CA 1962 Application:

Abele Ajello Hospital 2015 - 2016 Marzara Del Vallo

Healthcare / Hospitals

Plant type:

Cajamar Almeria

2014 Almeria - Spain

Hydronic System

Cooling capacity:
2387 kW

Heating capacity: 2477 kW

Installed machines: 3x i-FX-Q/LN-CA/S 0802



Certifications: BREEAM Excellent

Application: Mixed-Use Development

Cooling capacity: 1200 kW

Installed machines: 2x ERACS-Q/SL 2722 Application:
Office Buildings
Plant type:

Hydronic System

Cooling capacity: 1805 kW

Heating capacity: 856 kW

Installed machines: 2x TECS2/SL-CA-E/S 0512, 1x i-FX-Q/SL-CA/S 0802, 1x ClimaPRO



Application: Museums

Cooling capacity: 3625 kW

Heating capacity: 3834 kW

Installed machines: 4x ERACS2/WQ 3202, 1x ClimaPRO, 1x EW-HT 0152, 2x NECS-W 0262



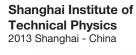
Application: Mixed-Use Development

Plant type: Hydronic System

Cooling capacity: 254 kW

Heating capacity: 270 kW

Installed machines: 2x NECS WQ 0412 Every project is characterized by different usage conditions and system specifications for many different latitutdes. All these projects share high energy efficiency, maximum integration, and total reliability due to the unique experience of Climaveneta branded solutions.





Application: Schools and Universities

Cooling capacity: 3880 kW

Heating capacity: 4250 kW

Installed machines:

3x smart heat pumps for heating and cooling, 3x reversible air cooled heat pumps



Application: Hotel and resorts

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Plant type:

Hydronic System

Cooling capacity: 1469 kW

Heating capacity: 1027 kW

Installed machines: 2x ERACS2-WQ 1902, 1x TECS2-W LC 0511



Investor:

IBM

Application: Offices

Cooling capacity:

1687 kW

Heating capacity:

1821 kW

nstalled machines:

2x ERACS-Q/B 1762, 3x ERACS-Q/B 1562



Application:

Institutions

Plant type: Hydronic System

Cooling capacity:

9952 kW

Heating capacity: 3764 kW

Installed machines:

4x ERACS2-WQ 3202, 4x TECS2-W/HC H 1614

Universo Group 2014 Neuchatel Switzerland

Investor: Swatch Group

Application: Office buildings

Cooling capacity: 1208 kW

Heating capacity: 1230 kW Installed machines: 3x ERACS2-WQ 2152 with VPF-D system, 3x ERACS2-WQ 1902 with VPF-D system,

2x Manager 3000



Application: Hotel

Cooling capacity: 9952 kW

Heating capacity: 3764 kW

Installed machines: 1x ERACS2-WQ 2702, 1x NECS-WQ 1204, 1x FOCS3-W 2101







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.

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

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