

i-NX-Y

**AIR COOLED LIQUID CHILLERS
FOR OUTDOOR INSTALLATION
FROM 43,9-129 kW**



i-NX-Y

HIGHEST EFFICIENCY TO SERVE ANY INDUSTRIAL PROCESS



Air cooled chiller for outdoor installation 43,9-129 kW



Thanks to the 1+i philosophy both the fixed speed scroll compressor and the scroll inverter compressor are combined in the same circuit. This technology ensures maximum benefit in terms of efficiency at partial loads compared to a solution with separate circuits.

A flexible and reliable unit that adapts to the most diverse load conditions thanks to the accurate temperature control combined with inverter technology.

THE IDEAL SOLUTION FOR PROCESS APPLICATIONS

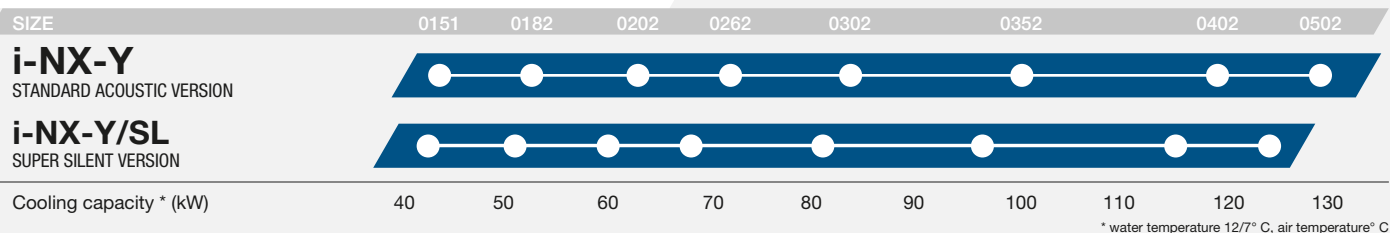
In industrial processes, a certain amount of heat is generated by the friction of moving parts in machinery or because of thermal processes occurring in plants (e.g. molding processes).

The cooling units of industrial applications remove this heat and, through extremely reliable components, maintain temperatures below the values that could compromise the operation of the machines.

INDUSTRIAL PROCESSES

- ✓ **FOOD INDUSTRY**, where particular attention is paid to the protection of the nutritional properties of the products.
- ✓ **CHEMICAL AND PHARMACEUTICAL INDUSTRY**, during crystallization at low temperatures or in the liquid cooling phase after sterilization.
- ✓ **PRINTING INDUSTRY**, to remove the heat generated by the rollers and to bring the paper and ink back to ambient temperatures.
- ✓ **PLASTIC MATERIALS**, checking the re-solidification temperatures of the plastic after its transformation.
- ✓ **WINE INDUSTRY**, actively cooling the must and regulating the fermentation process.
- ✓ **INDUSTRIAL PROCESSES**, for the cooling of fluids for manufacturers of machines for working metals, wood, and glass.

WIDE RANGE OF POWERS AND VERSIONS



ACOUSTIC CONFIGURATIONS

- Standard	Baseline
Units with standard sound level	
Kit Low Noise	-2 dB(A)

SL Super Low Noise	-7 dB(A)
Special acoustic insulation for the compressor and the pumps (if present) compartment, reduction of fan speed and increased condensing section.	
Zero compromises in terms of unit efficiency.	

HEAT RECOVERY CONFIGURATIONS

- Standard	Baseline
Units for the production of chilled water	

D Partial heat recovery	60°C
The desuperheater on the compressor discharge line allows for the recovery of about 20% of the capacity.	

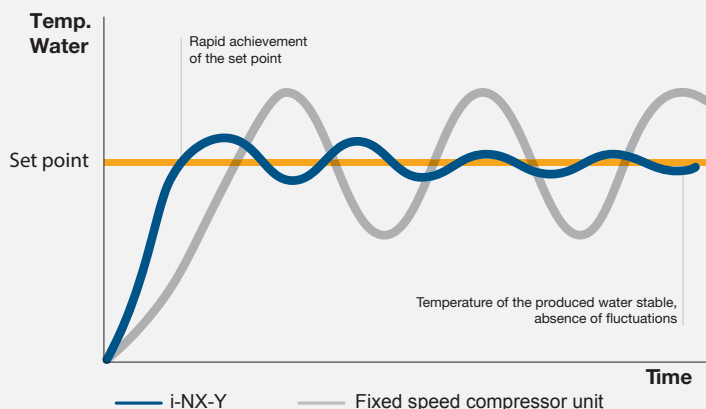
Hot water to be used to produce DHW or combined with air handling units (AHU), preheating service fluids or raw materials for further processing.

Highest operating reliability, unbeatable energy efficiency, fast-and-easy installation: these are the distinguishing features of i-NX-Y

QUICK SETUP AND STABLE WATER TEMPERATURE

Thanks to the accurate temperature control combined with the inverter technology and the electronic expansion valve, the following is obtained:

- ✓ rapid start-up of unit, crucial in process applications to achieve the required water temperature within a short time.
- ✓ stable water temperature, which is fundamental for guaranteeing the quality of the product resulting from the process activity.

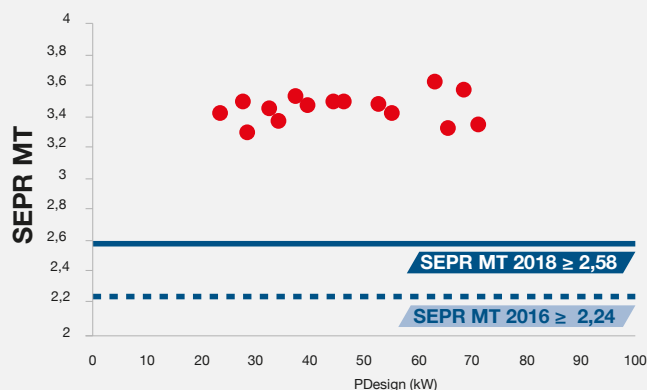
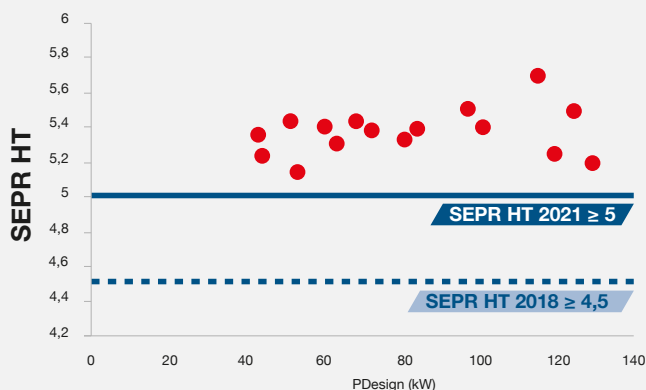


ErP READY



The process chiller works in cooling mode for 75% of the time at air temperatures below 16°C and with high thermal loads that are constant throughout the year. The ErP directive includes seasonal energy efficiency indices, the Seasonal Energy Performance Ratio (SEPR), dedicated to process applications that really highlight the efficiency and environmental impact of cooling systems.

Thanks to inverter technology, i-NX-Y complies with the ErP directive. The unit exceeds the minimum SEPR HT requirements for high temperature processes and SEPR MT for medium temperature processes, becoming in fact the best solution for all applications in the industrial sector.

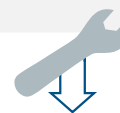


THE SOLUTION DEDICATED TO YOUR PLANT



The wide availability of configurations and accessories guarantees an easy adaptability of the i-NX-Y units to any application need in commercial or industrial systems.

SIMPLIFIED INSTALLATION



The availability of the integrated hydronic group provides quick and easy installation. Combined with this, the evolved logic of controlling the pump speed reduces the start-up times of the system and of the electric consumption, ensuring unit operation even in critical conditions.



i-NX-Y meets the minimum efficiency requirement contained in the ASHRAE 90.1 - 2013 provisions, which can help obtain LEED certification, thus increasing the prestige of the building.



All units in the i-NX-Y range have Eurovent certified performances.

TECHNOLOGICAL CHOICES

CONTROLLER W3000TE

The W3000TE controller is equipped with internally developed algorithms from Mitsubishi Electric Hydraulics & IT Cooling Systems.

► Temperature control

It is characterized by continuous capacity modulation, based on sequential regulation + DIP referred to the water delivery temperature (neutral zone regulation + DIP on the output probe for size 0151).

► Connectivity

Supervision is possible through different options, with proprietary devices or with integration in third-party systems through ModBus, Bacnet, Bacnet-over-IP, or Echelon LonWorks protocols.
For systems with multiple units it is possible to adjust the resources through ClimaPRO, to calculate consumption and performance by optimizing the operation of the entire HVAC system.

► Diagnostics

Includes a complete management of alarms, with 'black box' functions (via PC) and alarms history (via display or even PC) for a better analysis of the unit's behavior.

User interface W3000Compact



W3000Compact keyboard

- Functional keys.
- Large LCD display
- Quick and easy consultation and maintenance on the unit by means of a multi-level menu.
- As an option, the innovative KIPLink interface is available (replacing or in addition to the Compact keyboard) which allows the unit to be managed directly from a mobile device.

Refrigerant circuit

- 1 + i single circuit to guarantee the best energy efficiency.
- Crankcase heater on each compressors.
- Electronic expansion valve for rapid commissioning and extension of operating limits.

Structure

Structure consisting of load-bearing elements and aesthetic curtain panels made of hot dip galvanized steel panels, painted with polyester powders, RAL 7035.

- Maximum accessibility to all internal components
- High resistance to atmospheric agents
- Easy handling, lifting, and transport thanks to the standard eyebolts.

Evaporator

- Brazed heat exchanger plate made of AISI 316 stainless steel, externally coated with a anti-condensation mat in a closed cell neoprene (CFC and HCFC-free).
- Electric resistance thermostat and differential pressure switch to protect against ice formation inside the unit.
- Low pressure drops and optimized energy exchange.



Maximum quality of every single component, attention to detail, and advanced application of inverter technology: i-NX-Y is the ideal solution for all comfort applications.

Fans

High efficiency axial electric fans with standard speed modulation (DVV).

- ▶ Precise airflow management, reduced energy consumption, and lower sound level at partial loads.
- ▶ Condensation control for an extended operating range.

UP TO + 8% SEASONAL EFFICIENCY



Fans with EC motor (opt.)

- ▶ Continuous regulation of the air flow.
- ▶ Reduction of consumption and increased efficiencies at partial loads

Microchannel coil

Aluminum microchannel coils arranged in a V structure for optimal air distribution and energy exchange.

- ▶ Reduction of refrigerant charge compared to the traditional Cu / Al battery
- ▶ Less weight of the unit
- ▶ Protective e-coating available as an option for industrial and marine environments.

Integrated hydronic unit (opt.)



The integrated hydronic group assembled in the factory encompasses the main hydraulic components for a quick and easy installation, reducing start-up times.

- ▶ Single or twin in-line pumps available, high or low head, fixed or variable speed.
- ▶ Advanced control logic of the variable water flow rate with pumps controlled by VPF inverter. This reduces the electric consumption, ensuring the operation of the unit even in critical conditions.

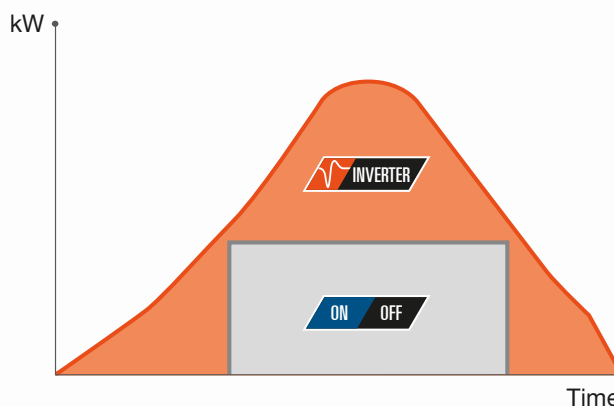


PHILOSOPHY INVERTER 1+i



i-NX-Y has been designed according to the exclusive 1+i philosophy, in which the fixed speed scroll compressor and the scroll inverter compressor are combined not only in the same unit but also in the same refrigerating circuit.

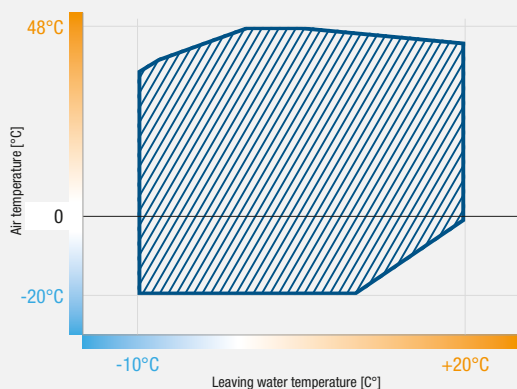
- ▶ Continuous power modulation.
- ▶ Energy distribution according to the real needs of the building.
- ▶ Maximum efficiency in any load condition.
- ▶ High temperature stability of the chilled water.
- ▶ Proprietary logic for the correct management of the oil level inside each compressor.



DISTINCTIVE FEATURES OF THE i-NX-Y

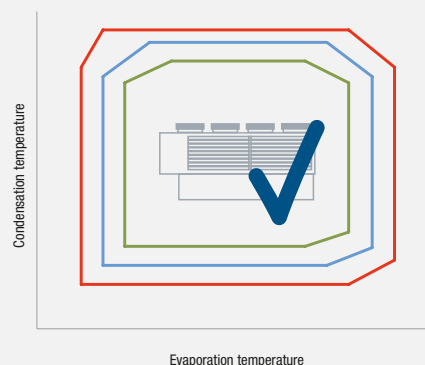
EXTENDED OPERATING LIMITS

Full load operation is guaranteed up to 48 °C outdoor air temperature during the summer season, and up to -20 °C during the winter season thanks to dedicated accessories which depend on the operating conditions. The unit can produce chilled water with evaporator outlet temperatures from -10 °C to 20 °C.



OPERATION UNDER CONTROL

Thanks to the advanced proprietary logics, multiple parameters are constantly checked (temperatures, pressures, rpm) ensuring that the compressor is always kept safe, in all conditions. The result is a better reliability of the unit.



REDUCED MAINTENANCE COSTS

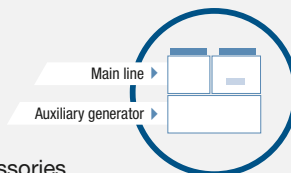
Compact structure, accurate design and dedicated components to ensure perfect unit operation, reducing the risk of malfunction and maintenance costs.

TOTAL RELIABILITY

Particular attention was paid to the intensive use of the unit (24/7) and to business continuity. High quality components and dedicated functions such as, double power supply, are key to the constant operation of the unit under any circumstances.

SPECIFIC CHARACTERISTICS FOR MISSION CRITICAL APPLICATIONS

Operating times of a unit depend largely on the redundancy of the electrical system.



i-NX-Y can be configured with accessories that ensure system reliability and optimize unit operation in case of emergency. Through the optional Automatic Transfer Switch (ATS), the i-NX-Y can be connected to two different power supply lines: in the event of a power failure on the main line, the ATS* automatically switches to the secondary line, ensuring uninterrupted power supply of the unit.

*ATS: Automatic Transfer Switch

KIPLink user interface (optional)

The innovative Wi-Fi interface for easy and effective unit management.



The innovative KIPLink interface is available as an option that replaces the traditional on-board keyboard and allows the user to manage and control the unit directly from a mobile device (smartphone, tablet, or notebook) by scanning the QR code positioned on the unit.

- ▶ Communication based on Wi-Fi functionality (internet connection is not required)
- ▶ User-friendly monitoring of device status
- ▶ Graphs and trends in real time
- ▶ Proprietary logic for the correct management of the oil level inside each compressor

NETWORK ANALYZER

We cannot improve what we cannot measure.

The Network Analyzer option allows you to monitor the electrical consumption of the chiller and to communicate it via serial to the supervision system for energy metering. Knowing the power consumption, you can adopt the appropriate strategies to optimize the efficiency of the cooling plant.



ACCESSORIES

Hydraulic modules and flow control

i-NX-Y can be equipped with a hydronic module complete with the main hydraulic components, making it possible to reduce and facilitate installation, start-up, and optimize space requirements. Connections also available separately to manage external pumps at fixed or variable speed.

Pump group

Single or twin in-line pumps available, high or low head (approximately 100kPa or 200kPa), with fixed or variable speed. A pump group with a buffer tank is also provided in case the minimum system volume is not guaranteed.

Fixed speed pumps

n° 1 Pump 2P Low Prev. (FIX SPEED)
n° 1 PUMP 2P High Prev. (FIX SPEED)
n° 2 PUMPS 2P Low Prev. (FIX SPEED)
n° 2 PUMPS 2P High Prev. (FIX SPEED)

Variable speed pumps

n° 1 PUMP 2P Low Prev. (VAR. SPEED)
n° 1 PUMP 2P High Prev. (VAR. SPEED)
n° 2 PUMPS 2P Low Prev. (VAR. SPEED)
n° 2 PUMPS 2P High Prev. (VAR. SPEED)

Buffer tank

Connections for external pump groups

Dedicated terminals available for the management of 1 or 2 external pumps at fixed or variable speed.

ON / OFF Signal

1 pump / 2 pumps

Modulating signal

1 pump / 2 pumps



VPF

VPF CONTROL LOGICS

The logic of the VPF (Variable Primary Flow) series regulates the speed of the pumps following the thermal load and at the same time positively influencing the unit's thermoregulation algorithm, optimizing it for variable flow operation. In this way maximum energy savings, stability of operation, and reliability are always guaranteed.

VPF: constant ΔP on the plant side

For systems composed of the primary circuit only

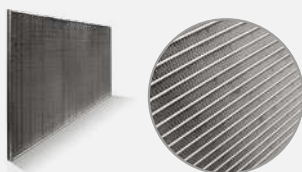
VPF.D: constant ΔT on the plant side

For systems composed of primary and secondary circuits separated by hydraulic circuit breaker

COILS AND COATINGS

MICROCHANNEL

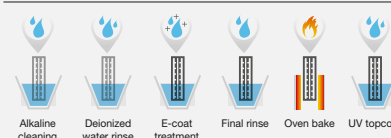
Al - Regular (std)



Al - E-coating

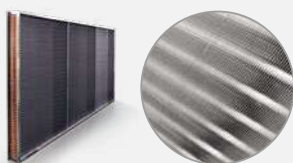


E-coating process



COPPER & ALUMINUM

Al - Regular (std)



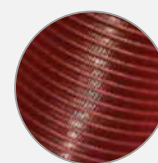
Cu/Al - Pre-painted fins

- Fins treated with protective polyester resin paint.
- Over 1000h of salt spray protection as per ASTM B117.
- Resistance to UV rays.

Cu/Al - Fin guard silver treatment

- Polyurethane resin with aluminum fillers.
- 3000h salt spray corrosion resistance according to ASTM B117.
- Resistance to UV rays.

Cu/Cu - Tube & fin coil





i-NX-Y 0151P - 0502P

Liquid chiller with source
air for outdoor installation
43,9-129 kW



i-NX-Y			0151P	0182P	0202P	0262P	0302P	0352P	0402P	0502P
Power supply		V/ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity	(1)	kW	43,9	52,9	63,1	72,1	83,8	101	120	129
Total power input	(1)	kW	15,7	18,8	21,4	25,0	29,2	35,2	41,9	46,8
EER	(1)	kW/kW	2,80	2,81	2,95	2,88	2,87	2,87	2,86	2,76
ESEER	(1)	kW/kW	4,56	4,55	4,51	4,54	4,51	4,66	4,58	4,53
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	43,6	52,6	62,7	71,7	83,4	100	119	129
EER	(1)(2)	kW/kW	2,73	2,75	2,88	2,82	2,82	2,82	2,80	2,72
ESEER	(1)(2)	kW/kW	4,27	4,19	4,17	4,23	4,24	4,36	4,27	4,25
Cooling energy class			C	C	C	C	C	C	C	C
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)										
Process refrigeration at high temperature										
Prated,c	(7)	kW	43,6	52,6	62,7	71,7	83,4	100	119	129
SEPR HT	(7)(9)		5,21	5,13	5,29	5,36	5,38	5,40	5,26	5,21
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)										
Refrigerazione di processo a media temperatura										
Prated,c	(8)	kW	24,0	28,7	34,1	39,4	45,9	55,0	65,4	71,0
SEPR MT	(8)(9)		3,44	3,31	3,37	3,47	3,51	3,43	3,33	3,36
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow	(1)	l/s	2,10	2,53	3,02	3,45	4,01	4,82	5,73	6,18
Pressure drop	(1)	kPa	37,2	41,2	42,3	39,4	35,0	36,2	42,9	38,9
REFRIGERANT CIRCUIT										
Compressors nr.		N°	1	2	2	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1	1	1	1
Refrigerant charge		kg	7,00	7,20	8,90	9,40	9,50	12,5	12,9	13,5
NOISE LEVEL										
Sound Pressure	(3)	dB(A)	51	52	53	53	54	55	57	57
Sound power level in cooling	(4)(5)	dB(A)	83	84	85	85	86	87	89	89
SIZE AND WEIGHT										
A	(6)	mm	2000	2000	2625	2625	2625	3250	3250	3250
B	(6)	mm	1350	1350	1350	1350	1350	1350	1350	1350
H	(6)	mm	2070	2070	2070	2070	2070	2170	2170	2170
Operating weight	(6)	kg	600	660	750	780	810	1060	1070	1080

ADDITIONAL OPTIONS

ELECTRICAL EQUIPMENT

Compressor re-phasing

Power factor correction capacitors are installed on the compressors supply to increase the unit cos (phi).

Phase sequence control

Protects loads from failures resulting from a reversed phase start.

Phase sequence control and over / under voltage

Protects the loads from faults arising from a reversed phase start, and checks the lowering and exceeding of a set voltage in a three-phase network.

Soft-starter

Electronic static starter for compressor starting management.

AUXILIARY INPUTS

4-20mA auxiliary signal

Analog input that modifies the working setpoint of the unit based on the current value applied to its input.

Double set-point remote signal

Digital input to change the unit working setpoint by opening or closing a remote contact.

Demand Limit remote control input

Clean digital input (voltage free) that limits the power absorbed by the unit.

Compressor operation signal

Digital output for remote operation of compressors.

Water set point compensation for outdoor air temperature

The external air probe can change the unit's working setpoint according to summer and winter climatic curves (only for reversible units).

Hydraulic separator water temperature probe

The unit turns on according to the water temperature read by the probe present in the hydraulic decoupler (in systems composed of primary and secondary circuits), reducing the energy consumption of pump operation to monitor the water temperature.

Night function

Limits the sound level of the unit, reducing the frequency of the compressor and fan speed.

U.L.C. - Control of user limits

This option guarantees the start and operation of the unit even in critical conditions that usually generate a block of the system. The W3000TE controller can manage a 3-way modulating valve, not supplied, through a 0-10V signal, which allows the unit to operate with water temperatures within the permitted operating limits, independently avoiding protection interventions and alarms, that can arise during the start-up phase

MANAGEMENT, CONTROL, AND REMOTE CONNECTIVITY SYSTEMS

Serial / LonWorks / BACnet MS / TP / BACnet over IP card to allow integration into supervisory systems

ClimaPRO ModBUS RS485 - MID, ClimaPRO BacNET over IP

This accessory allows data to be collected concerning the electrical energy absorbed by the unit and shared with the ClimaPRO system by means of ModBUS or BacNET serial communication. This specific energy meter model is MID certified and the value of energy detected can therefore be used by the user for tax purposes for energy calculation.

Network analyzer for BMS

Detects data of electrical energy absorbed by the unit and communicates it via the RS-485 bus to the BMS, for energy metering.



i-NX-Y / SL			0151P	0182P	0202P	0262P	0302P	0352P	0402P	0502P
Power supply			V/ph/Hz 400/3+N/50 400/3+N/50 400/3+N/50 400/3+N/50 400/3/50 400/3/50 400/3/50 400/3/50							
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity	(1)	kW	42,6	51,2	60,1	68,1	81,2	96,7	115	124
Total power input	(1)	kW	14,4	17,8	20,9	24,5	28,3	33,9	39,3	44,3
EER	(1)	kW/kW	2,96	2,88	2,88	2,78	2,87	2,85	2,93	2,81
ESEER	(1)	kW/kW	4,48	4,58	4,49	4,55	4,54	4,75	4,78	4,70
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	42,3	50,9	59,8	67,7	80,8	96,3	115	124
EER	(1)(2)	kW/kW	2,89	2,81	2,81	2,73	2,82	2,80	2,88	2,76
ESEER	(1)(2)	kW/kW	4,21	4,26	4,20	4,25	4,26	4,48	4,50	4,43
Cooling energy class			C	C	C	C	C	C	C	C
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)										
Process refrigeration at high temperature										
Prated,c	(7)	kW	42,3	50,9	59,8	67,7	80,8	96,3	115	124
SEPR HT	(7)(9)		5,34	5,42	5,40	5,41	5,33	5,50	5,69	5,50
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)										
Refrigerazione di processo a media temperatura										
Prated,c	(8)	kW	23,1	27,7	32,6	37,4	44,4	52,7	63,0	68,4
SEPR MT	(8)(9)		3,43	3,50	3,46	3,52	3,50	3,48	3,62	3,59
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow	(1)	l/s	2,04	2,45	2,87	3,26	3,88	4,62	5,50	5,95
Pressure drop	(1)	kPa	35,1	38,7	38,3	35,2	32,9	33,2	39,6	36,0
REFRIGERANT CIRCUIT										
Compressors nr.		N°	1	2	2	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1	1	1	1
Refrigerant charge		kg	8,10	8,30	8,70	9,20	11,8	12,3	14,7	15,2
NOISE LEVEL										
Sound Pressure	(3)	dB(A)	45	45	46	46	47	48	50	50
Sound power level in cooling	(4)(5)	dB(A)	77	77	78	78	79	80	82	82
SIZE AND WEIGHT										
A	(6)	mm	2625	2625	2625	2625	3250	3250	3875	3875
B	(6)	mm	1350	1350	1350	1350	1350	1350	1350	1350
H	(6)	mm	2070	2070	2070	2070	2170	2170	2170	2170
Operating weight	(6)	kg	700	760	790	820	980	1090	1180	1200

Notes:

1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.

2 Values in compliance with EN14511-3:2013.

3 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

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

5 Sound power level in cooling, outdoors.

6 Unit in standard configuration/execution, without optional accessories.

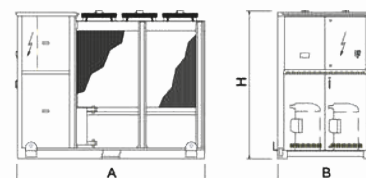
7 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]

8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]

9 Seasonal space heating energy index

The units highlighted in this publication contain HFC R410A [GWP₁₀₀ 2088] fluorinated greenhouse gases.

Certified data in EUROVENT



REFRIGERANT CIRCUIT

Working range of unit:

The option includes a thermostatic valve suitable for the water temperature produced to obtain the best performance in any condition.

Tout < 0 °C (0 / -10 °C) opt. 87 °, Tout > 10 °C (10 / + 18 °C) opt. 87°C, Double SET (12/7, -5 / -10 °C) opt. 87D.

HYDRAULIC CIRCUIT

Antifreeze pipes and pumps, antifreeze pipes, pumps and tank

Water flow switch

STRUCTURE

Soundproofing kit

Soundproofing of the compressor compartment and pump casing, in polyester fibers (Fiberform), reducing the sound level of the unit.

Anti-intrusion grid

Prevents the intrusion of foreign bodies inside the structure.

Rubber anti-vibration mounts

“BY FAR THE BEST PROOF IS EXPERIENCE”

Sir Francis Bacon

British Philosopher (1561 - 1626)

Every project is characterised by different needs and system specifications for various climates. All these projects share high energy efficiency, maximum integration, and total reliability resulting from the Climaveneta brand experience.



ADAC LANDSBERG AM LECH - GERMANY


Period: 2007

Application: Automotive

Plant type: Hydronic System

Cooling capacity: 240 kW

Installed machines: 1x air cooled chiller



FORST LAGUNDO, BOLZANO - ITALY

Period: 2012 - 2017

Application: Food & Drink

Plant type: Hydronic System

Installed machines: 2x BRAT2 0091T, 4x i-LIFE2 402 DFMO, 4x i-CHD 706 U-2T, 1x NX/CA 0562P, 1x i-FX-W (1+I) 1402, 2x 2 NECS-WQ 0152, 21x i-Life2

MAGNAPLAST PLANT

2010 Emstek - Germany

Application:
Plastic

Plant type:
Hydronic System

Cooling capacity:
300 kW

Installed machines:
1x NECS/B 1004



TASSAL SALMON TASMANIA - AUSTRALIA

Period: 2014 - 2015

Application: Food & Drink

Plant type: Hydronic System

Cooling capacity: 4316 kW

Installed machines: 2x FOCS-W 5203,
2x i-FX(1+i)/CA 3602





for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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