# Omega Sky Xi LGW

## 184÷684 kW


**General**
Water-condensed liquid chillers and heat pumps for indoor applications; screw compressor with variable compression ratio and inverter for capacity modulation.

**Configurations**
HPW: reversible heat pump version on water side

OH: non-reversible heat pump version

/LN: silenced unit

/DC: execution featuring a desuperheater

**Strengths**

- Maximum efficiency at partial loads: SEER up to 8,2 and SEPR up to 9
- Ecodesign Tier 2 compliant
- Refrigerant R1234ze with GWP<1
- Hybrid Falling Film evaporator with low refrigerant load
- Variable Vi screw compressor with external inverter
- Version with chiller and heat pump, each with optimised operating range
- Hot water production up to 65 ° C
- BlueThink advanced control with integrated web server. Multilogic function and Blueye® supervision system. (options)

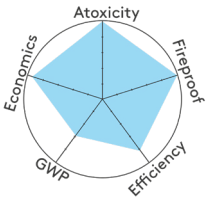
BlueBox by Swegon

## Omega Sky Xi LGW

## THE FUTURE OF REFRIGERANTS THAT REDUCE GREENHOUSE EFFECT

R1234ze

R1234yf



R134a

Propane (R290)

Carbon Dioxide(R744)

To reduce the emission into the atmosphere of gases that contribute to increasing the greenhouse effect, the European Union has set itself the target of reducing the use of F-gases by two-thirds of the 2014 level by 2030. Although these fluids have allowed a drastic reduction in the use of high ODP (Ozone Depletion Potential) refrigerants, their high GWP value and their longevity in the atmosphere (if released, they remain there for hundreds of years) contribute to the increase in global warming up to 8,000 times more than carbon dioxide.

The application of these regulations will lead to a progressive reduction in the use of refrigerants such as R134a and R410A and therefore substitute refrigerant fluids will gradually take hold.

There already exist various alternatives to F-Gases but, for each of them, the safety, investment and sustainability implications need to be carefully considered.

F-gases such as R410A or R134a have the indisputable advantage of being non-toxic and absolutely non-flammable. Paradoxically, the chemical properties that make these refrigerants safe are the same ones that cause such a prolonged resistance of the molecule in the atmosphere and therefore a high GWP.

If, in searching for an alternative, we look at natural refrigerants, such as carbon dioxide (R744), ammonia (R717) or hydrocarbons such as propane (R290), we actually have very low or zero GWP, but their toxicity and/or extreme flammability will have to be accepted. This will turn into higher costs of the machine and of the system in order to guarantee their safety.

In fact, the technological costs arising from the use of the various refrigerants must also be considered:

- units that use carbon dioxide as refrigerant need to work with such high pressure values (even higher than 100bar) that they are potentially explosive. This involves extremely onerous construction choices that justify their use only in the refrigeration field
- units that use ammonia must obligatorily be made completely of steel and use specific compressors and components. To this are added the setting up costs that, in view of the extreme toxicity of the fluid, will have to prevent contamination and poisoning hazards. All this limits the use of this fluid to only extremely high capacity systems, normally above a MW
- for units that use propane, all the necessary countermeasures must be taken to prevent the risk of explosion due to its very high flammability, and this turns into the obligation to use ATEX components, which are extremely costly

## WHY R1234ZE

LGW stands for Low Global Warming Potential and identifies the units using the HFO refrigerant R1234ze.

LGW aims at offering an environmentally and economically sustainable alternative to conventional models based on R134a refrigerant.

R1234ze is a pure compound (Hydro-Fluoro-Olefin) featuring GWP<1 (*), equivalent to natural fluids.

R1234ze is rated as non dangerous (PED group 2 fluid).

It is also classified as A2L according to ASHRAE standard 34:

- Non toxic.
- Lower flammability fluid (or mildly flammable).

Thus LGW units represent the best future-proof choice, especially in Countries that:

- Impose legislation restrictions or bans on units with high GWP refrigerants.
- Offer incentive schemes for systems with low environmental impact.
- Impose specific taxation on high GWP refrigerants - or are likely to do it in the future.

Moreover, its minimum GWP value is decisive for projects:

- Addressed to obtain building certification credits linked to the adoption of best available environmental solutions.
- Adopting voluntary targets to minimize the system's enviromental footprint.

All this is also beneficial to unit’s commissioning, operation and maintenance – leading to overall cost effectiveness.

Specific measures are implemented on LGW models, to ease their adoption into the most stringent projects and enhance the overall safety features.

# Omega Sky Xi LGW

Omega Sky Xi is a water-condensed liquid chiller for indoor applications, available in heat pump version also.

This range features a semi-hermetic, inverter-controlled screw compressor to obtain maximum performances at partial loads, a latest generation Hybrid Falling Film evaporator with low refrigerant load, and a shell and tube condenser.

These elements make Omega Sky Xi an extremely performing machine in all operating conditions, which enables it to largely exceed the targets mandated by the existing regulations and to ensure maximum comfort levels.

## REFRIGERANT

Refrigerant R1234ze (GWP<1*)

(*) GWP (AR5), pursuant to IPCC V, evaluated over a span of 100 years.

## STRUCTURE

Consists of polyester powder coated hot dip galvanised sheet steel profiles (RAL 9005).

The electrical control panel is made in a polyester powder-coated hot dip galvanised sheet steel box (RAL 7035).

## COMPRESSORS

Units fit innovative screw compressors with a variable compression ratio, which ensure optimised operation under all operating conditions.

The BlueThink controller constantly monitors the evaporating and condensing temperatures of the unit and changes the compression ratio of the compressors to obtain the maximum achievable efficiency.

The compressors in use are designed according to an exclusive BlueBox specification in order to achieve maximum efficiency both under partial and full load conditions.

Continuous reduction of the output capacity is implemented with a regulation from 25% to 100% in order to achieve the highest energy efficiency levels on the market, with special reference to cooling applications. The variation of the compression ratio caused by the sliding of the internal slide valve, in combination with capacity reduction of the refrigeration demand by the inverter, allows for the maximisation of the energy efficiency of the unit in all operating conditions.

In addition to managing capacity modulation, BlueThink also controls all safety devices so that the compressor can operate within its operating limits at all times and simultaneously safeguard its operation and reliability. Compressor lubrication is ensured by the pressure difference between the delivery and the suction lines, thanks to the regulation action performed by BlueThink.

All the compressors are fitted with check valve on delivery side, metal mesh filter on suction side and electronic protection with temperature sensors directly inserted in the windings and on the delivery pipe.

Startup in compressors featuring an inverter is of the "Direct On Line" type with an inverter-controlled acceleration ramp that minimises inrush currents.

In addition to the obvious energy savings arising from greater efficiency, the use of a full inverter unit also brings advantages in terms of installation:

- For these units, the cosφ (power factor) is always greater than 0.95, therefore making external power factor correction systems unnecessary.
- The maximum inrush current of the unit is always lower than its maximum absorbed current (calculated in the worst operating condition), therefore making the power cables and line protection devices less onerous.

All the compressors are fitted as standard with a spare oil heater and a delivery valve.

## SOURCE-SIDE HEAT EXCHANGER

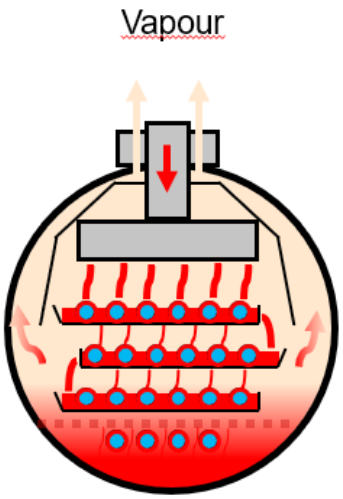
Shell-and-tube heat exchanger, with single water passage on tube side. Steel shell, and tube bundle made with copper tubes. The heads can be removed for tube inspection and cleaning. Victaulic couplings on water side (complete with nipple for connection).

## USER-SIDE HEAT EXCHANGER

Latest generation shell and tube heat exchanger Hybrid Falling Film with two passes.

The new technology combines the features of a traditional flooded evaporator and the Falling Film evaporator, thus ensuring low approach temperatures and a low refrigerant charge.

Below is a sample cross-section of the evaporator.



The heat exchanger consists of a steel shell insulated with closed-cell foam material, while the tube bundle is made with copper tubes. The heads can be removed for tube inspection and cleaning. Victaulic couplings on water side (complete with nipple for connection). On the hydraulic connections of the heat exchanger, there are also pipe taps for the differential pressure switch, and wells for the temperature probes.

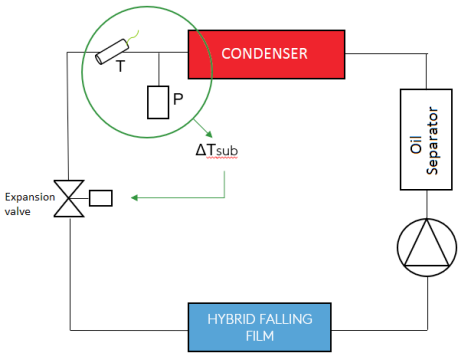
## REFRIGERANT CIRCUIT

The refrigerant circuit of the unit comprises:

- discharge valve for each compressor
- charging valves
- liquid sight glass
- replaceable solid cartridge dehydrator filter on the liquid line;
- a hermetic dehydrator filter on the oil recovery line;
- oil optical level;
- electronic expansion valve
- pressure transducers for reading the high and low pressure values and relevant evaporating and condensing temperatures
- pressure transducer and a temperature probe designed to sense the subcooling value after the condenser;
- a high pressure switch;
- a high and low pressure safety valve;
- an oil separator in the discharge line;
- oil receiver
- jet pumps for oil recovery from the evaporator.
- oil flow switch
- pressure transducer warning about oil return
- sensor warning about low oil level
- sensor warning about low fluid level in evaporator

The suction pipes in the refrigerant circuit and the heat exchanger on the user side are insulated with an extruded closed-cell expanded elastomer.

With reference to the Hybrid Falling Film technology, the refrigerant subcooling value is checked through the measurement of the temperature and pressure downline of the condenser, as shown in the picture below:




The electronic expansion valve is designed to offer enhanced stability during operation and to maximise the use of evaporation under all load conditions. This also acts as shut-off valve on the liquid line, thereby preventing hazardous refrigerant migrations during compressor stops.

The basic version does not include the R1234ze refrigerant detector. The refrigerant detector is standard equipment for the LN version.

## ELECTRICAL CONTROL PANEL

The electrical control panel is made in a painted galvanised sheet-iron box with forced ventilation and IP21 protection rating.

The electrical control panel of the basic unit comprises:

- main disconnect switch
- fuses to protect the compressors and the auxiliary circuits
- compressor contactors
- phase monitor
- potential-free general alarm contacts
- single potential free operating contacts
- microprocessor controller with display accessible from the outside
- Capacitive backup battery for electronic expansion valve
- AC inverter fitted outside the panel

All the electrical cables inside the panel are numbered and the terminal board dedicated to the customer's connections is coloured orange so that it can be quickly identified in the panel.

Standard power supply of the unit is 400V/3~/50Hz

## CONTROL BLUETHINK

Programmable microprocessor control, having proprietary control algorithms.

The control allows the following functions:

- Inverter management
- Vi management
- Electronic valve management
- water temperature adjustment, with outgoing water control
- freeze protection
- compressor timings
- recording of the log of all machine inputs, outputs and states
- automatic rotation of compressor starting sequence
- recording of the alarm log
- management of capacity reduction of the compressors during starting, switching off and load tracking
- management of capacity reduction of the compressors in the event of operation outside the limits

### Connection resources

The control includes the following connection resources:

- RS485 serial port with Modbus protocol
- Ethernet serial port with Modbus protocol; access to integrated web server
- digital input for remote setting of state (on/off)
- digital input for setting of summer/winter mode (only for HPW version)
- digital input for selection of double set point

By default, the serial connections present as standard are enabled only for reading from BMS. Enabling of writing from BMS is to be requested when ordering.

### Main functions of the webserver

As standard, the Bluethink controller integrates a web server with preloaded web page, which is accessed via password and user management on several levels.

The web page allows the following functions to be carried out (some available only for users with advanced level rights):

- display of the main characteristics of the unit such as serial number, size, refrigerant
- display of the general status of the machine: water inlet and outlet temperatures on user side and source side, mode, evaporating and condensing pressures, suction and discharge temperatures
- display of the status of compressors and electronic expansion valves
- display of graphs of the main quantities, as trends in real time and also as log data
- display of alarm log
- remote setting of (on/off)
- remote setting of set point
- remote setting of time band
- remote setting of summer/winter mode

### Human-Machine Interface

The control has a graphic display that allows the following information to be displayed:

- water inlet and outlet temperature
- set temperature and differential set points
- description of alarms
- hour meter of operation and number of start-ups of the unit, the compressors and the pumps (if present)
- high and low pressure values, and relevant condensing and evaporating temperatures
- superheating at compressor suction.

For further details on available functions and on displayed information, you can refer to the specific documentation of the control.

## CONTROLS AND SAFETY DEVICES

All the units are fitted with the following control and safety components:

- high pressure switch with manual reset for each compressor
- high pressure safety device with automatic reset, for a limited number of occurrences, managed by the controller via specific pressure transducer
- low pressure safety device with automatic reset, for a limited number of occurrences, managed by the controller via specific pressure transducer
- high pressure safety valve
- Low pressure safety valve
- operation probe at the outlet of the user-side heat exchanger that also acts as antifreeze probe
- thermal overload protection for compressors
- water differential pressure switch installed at the factory
- flow switch for oil level detection
- pressure differential on oil filter
- low oil level detection
- low fluid level detection in evaporator

## TESTING

All the units are factory-tested and supplied complete with oil and refrigerant.

## CERTIFICATIONS AND REFERENCE STANDARDS

The manufacturer has implemented and keeps the Management Systems listed below and it is certified against them:

- Quality Management System according to standard UNI EN ISO 9000;
- Environmental Management System according to standard UNI EN ISO 14000;
- Health and Safety Management System according to standard BS OHSAS 18000 (as converted into UNI EN ISO 45000).

These management systems ensure that the company puts in place any and all actions and initiatives to define and monitor the standards defined by its Management, which are stated in its Quality, Environmental and Safety policies.

To meet the safety requirements, the unit was designed and manufactured in compliance with the directives and product regulations below:

- PED Directive: safety criteria to be followed when designing pressure equipment; Units are PED-approved, cat. IV;
- Machinery Directive: safety criteria to be followed when designing machinery;
- Low Voltage Directive: safety criteria to be followed when designing electrical machine parts;
- Electromagnetic Compatibility Directive: electromagnetic compatibility criteria to be followed when designing electrical machine parts;
- WEEE Directive: criteria for product management at the end of its life cycle as waste with a view to environmental protection.

The units are manufactured, tested and checked with reference to the European standards specified in the Declaration of CE Conformity, in accordance with the requirements and procedures of our Quality System.

The installation, use and storage of units featuring mildly flammable refrigerants (A2L pursuant to standard ASHRAE 34), such as R1234ze, must meet the European standards and regulations and the local laws, where applicable.

For further details, please refer to the "Instruction manual for operation and maintenance".

### Responsibilities and obligations exclusive to the installer:

- to carry out a specific risk assessment according to the European regulations/standards above and/or the local laws in order to define the necessary measures for conformity;
- to comply with the requirements and to take the measures resulting from the outcomes of the risk assessment, pursuant to the relevant regulations and standards.

## VERSIONS

Alongside the basic version of the unit, there are the following versions

### OH: non-reversible heat pump

This is a heat pump for heating only. Compared to the basic version, both user-side and source-side heat exchangers are insulated.

### HPW: reversible heat pump on water side.

This reversible heat pump is suitable for applications in which the user-side circuit and the source-side circuit can be exchanged with each other. Therefore, the fitter must make provision for a system of valves that will allow exchange of the two hydraulic circuits. If the seasonal mode change is carried out via remote signal or BMS, the unit can control motor-driven reversing valves (not supplied) so as to make this operation fully automatic.

Compared to the basic version, both user-side and source-side heat exchangers are insulated.

## OPTIONS

### /LN: low noise version

The unit includes a soundproofing compartment on the compressor consisting of a rigid outer cowling made of galvanised and painted sheet metal (RAL 7035), lined with sound absorbing matting with high acoustic impedance material in between.

The compressor compartment is supplied with a R1234ze refrigerant detector and a pushing fan designed to take the air from outside the compartment and push it inside the compartment until it comes out of the outlet grille specifically installed on the compartment side opposite the fan.

If the gas detector senses leaking refrigerant, the machine electronic controller causes all the fitted and operating compressors to instantly stop and an alarm message to appear on the display.

In addition, the alarm signal is provided on a clean contact in the terminal board of the electrical panel of the unit: this allows, after prior preparation by the installer, to disconnect the unit from voltage to prevent any source of ignition.

### /DC: unit with total recovery condenser

In addition to the basic version, the following elements are included in the chiller unit only:

- a recovery section of condensation heat (100%), featured inside the condenser;
- a temperature probe at the inlet of the heat recovery heat exchanger
- potential free contact in the electrical control panel for activation of heat recovery. When required by the system, through the closing of a contact, the controller automatically manages activation of heat recovery. Heat recovery management is carried out through a control on the temperature of the return water. The controller also automatically manages safety deactivation of heat recovery, if the condensing pressure becomes too high, and switches to using the source-side heat exchanger.

# TECHNICAL SPECIFICATIONS

## OMEGA SKY Xi LGW

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 | 45.1 | 54.1 | 61.1 | 73.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cooling** | | | | | | | | | | | | |
| Refrigeration capacity | (1) | kW | 184 | 221 | 264 | 295 | 337 | 383 | 431 | 524 | 592 | 684 |
| Total absorbed power | (1) | kW | 38 | 44 | 52 | 58 | 66 | 75 | 83 | 100 | 112 | 137 |
| EER | (1) | | 4,84 | 5,04 | 5,06 | 5,08 | 5,1 | 5,14 | 5,17 | 5,26 | 5,28 | 5 |
| ESEER | (10) | | 7,02 | 7,31 | 7,4 | 7,49 | 7,65 | 7,76 | 7,71 | 7,73 | 7,67 | 6,8 |
| Eurovent efficiency class | (1) | | B | B | A | A | A | A | A | A | A | B |
| **User-side heat exchanger** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (1) | m³/h | 32 | 38 | 45 | 51 | 58 | 66 | 74 | 90 | 102 | 118 |
| Head loss | (1) | kPa | 30 | 31 | 33 | 29 | 30 | 30 | 31 | 32 | 30 | 28 |
| **Source-side heat exchanger** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (1) | m³/h | 38 | 46 | 54 | 60 | 69 | 79 | 88 | 107 | 121 | 141 |
| Head loss | (1) | kPa | 15 | 15 | 14 | 14 | 14 | 15 | 13 | 16 | 21 | 24 |
| **Compressors** | | | | | | | | | | | | |
| Compressors/Circuits | | n°/n° | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| Minimum capacity reduction step | (7) | % | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 |
| Refrigerant charge | (6) | kg | 58 | 59 | 85 | 90 | 88 | 88 | 119 | 122 | 145 | 144 |
| **Noise levels** | | | | | | | | | | | | |
| Sound power lev. | (4) | dB(A) | 99 | 99 | 100 | 100 | 101 | 101 | 102 | 102 | 104 | 106 |
| Sound pressure lev. | (5) | dB(A) | 81 | 81 | 82 | 82 | 83 | 82 | 83 | 83 | 85 | 87 |
| Sound power levels LN | (4) | dB(A) | 94 | 94 | 95 | 95 | 96 | 96 | 97 | 97 | 99 | 101 |
| Sound pressure levels LN | (5) | dB(A) | 76 | 76 | 77 | 77 | 78 | 77 | 78 | 78 | 80 | 82 |
| **Dimensions and weights**** | | | | | | | | | | | | |
| Length | | mm | 3700 | 3700 | 3800 | 3800 | 3800 | 3900 | 3900 | 4100 | 4150 | 4250 |
| Depth | | mm | 1500 | 1500 | 1550 | 1550 | 1550 | 1550 | 1550 | 1670 | 1670 | 1850 |
| Height | | mm | 2050 | 2050 | 2100 | 2100 | 2100 | 2150 | 2150 | 2300 | 2400 | 2400 |
| Operating weight | | kg | 2215 | 2335 | 2694 | 2832 | 2987 | 3381 | 3509 | 4260 | 4742 | 5460 |

(1) Source-side heat exchanger inlet/outlet water temperature 30/35°C; user-side heat exchanger inlet/outlet water temperature 12/7°C. Values compliant with standard EN 14511

(4) Unit operating at nominal operating capacity, without any accessories, with source/side heat exchanger inlet-outlet water temperature 30/35°C and user-side heat exchanger inlet/outlet water temperature 12/7°C. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable. Binding values. See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions in note 4), related to a distance of 1 m from the unit in free field with directivity factor Q=2. Non-binding values.

(6) Theoretical values referred to the basic unit (without DC). The amount of gas actually charged in the unit may differ.

(7) Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

(10) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories

** Basic unit without included accessories

## OMEGA SKY Xi LGW HPW

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 | 45.1 | 54.1 | 61.1 | 73.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cooling** | | | | | | | | | | | | |
| Refrigeration capacity | (1) | kW | 184 | 221 | 264 | 295 | 337 | 383 | 431 | 524 | 592 | 684 |
| Total absorbed power | (1) | kW | 38 | 44 | 52 | 58 | 66 | 75 | 83 | 100 | 112 | 137 |
| EER | (1) | | 4,84 | 5,04 | 5,06 | 5,08 | 5,1 | 5,14 | 5,17 | 5,26 | 5,28 | 5 |
| ESEER | (10) | | 7,02 | 7,31 | 7,4 | 7,49 | 7,65 | 7,76 | 7,71 | 7,73 | 7,67 | 6,8 |
| Eurovent efficiency class | (1) | | B | B | A | A | A | A | A | A | A | B |
| **Heating** | | | | | | | | | | | | |
| Heating capacity | (2) | kW | 200 | 238 | 284 | 317 | 366 | 416 | 466 | 567 | 637 | 726 |
| Total absorbed power | (2) | kW | 47 | 54 | 64 | 71 | 81 | 91 | 102 | 122 | 138 | 167 |
| COP | (2) | | 4,27 | 4,4 | 4,42 | 4,44 | 4,5 | 4,57 | 4,57 | 4,63 | 4,63 | 4,36 |
| Eurovent efficiency class | (2) | | B | B | B | B | A | A | A | A | A | B |
| **Evaporator** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (1) | m³/h | 32 | 38 | 45 | 51 | 58 | 66 | 74 | 90 | 102 | 118 |
| Head loss | (1) | kPa | 30 | 31 | 33 | 29 | 30 | 30 | 31 | 32 | 30 | 28 |
| Water flow rate | (2) | m³/h | 44 | 53 | 63 | 71 | 82 | 94 | 105 | 128 | 144 | 161 |
| Head loss | (2) | kPa | 60 | 62 | 65 | 58 | 59 | 59 | 63 | 64 | 60 | 58 |
| **Condenser** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (1) | m³/h | 38 | 46 | 54 | 60 | 69 | 79 | 88 | 107 | 121 | 141 |
| Head loss | (1) | kPa | 15 | 15 | 14 | 14 | 14 | 15 | 13 | 16 | 21 | 24 |
| Water flow rate | (2) | m³/h | 34 | 41 | 49 | 55 | 63 | 71 | 80 | 98 | 110 | 125 |
| Head loss | (2) | kPa | 13 | 13 | 12 | 12 | 12 | 13 | 11 | 14 | 18 | 21 |
| **Compressors** | | | | | | | | | | | | |
| Compressors/Circuits | | n°/n° | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| Minimum capacity reduction step | (7) | % | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% |
| Refrigerant charge | (6) | kg | 58 | 59 | 85 | 90 | 88 | 88 | 119 | 122 | 145 | 144 |
| **Noise levels** | | | | | | | | | | | | |
| Sound power lev. | (4) | dB(A) | 99 | 99 | 100 | 100 | 101 | 101 | 102 | 102 | 104 | 106 |
| Sound pressure lev. | (5) | dB(A) | 81 | 81 | 82 | 82 | 83 | 82 | 83 | 83 | 85 | 87 |
| Sound power levels LN | (4) | dB(A) | 94 | 94 | 95 | 95 | 96 | 96 | 97 | 97 | 99 | 101 |
| Sound pressure levels LN | (5) | dB(A) | 76 | 76 | 77 | 77 | 78 | 77 | 78 | 78 | 80 | 82 |
| **Dimensions and weights**** | | | | | | | | | | | | |
| Length | | mm | 3700 | 3700 | 3800 | 3800 | 3800 | 3900 | 3900 | 4100 | 4150 | 4250 |
| Depth | | mm | 1500 | 1500 | 1550 | 1550 | 1550 | 1550 | 1550 | 1670 | 1670 | 1850 |
| Height | | mm | 2050 | 2050 | 2100 | 2100 | 2100 | 2150 | 2150 | 2300 | 2400 | 2400 |
| Operating weight | | kg | 2215 | 2335 | 2694 | 2832 | 2987 | 3381 | 3509 | 4260 | 4742 | 5460 |

(1) Source-side heat exchanger inlet/outlet water temperature 30/35°C; user-side heat exchanger inlet/outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) Source-side heat exchanger inlet/outlet water temperature 10/7°C; user-side heat exchanger inlet/outlet water temperature 40/45°C. Values compliant with standard EN 14511

(4) Unit operating at nominal operating capacity, without any accessories, with source/side heat exchanger inlet-outlet water temperature 30/35°C and user-side heat exchanger inlet/outlet water temperature 12/7°C. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable. Binding values. See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions in note 4), related to a distance of 1 m from the unit in free field with directivity factor Q=2. Non-binding values.

(6) Theoretical values referred to the basic unit (without DC). The amount of gas actually charged in the unit may differ.

(7) Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

(10) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories

** Basic unit without included accessories

## OMEGA SKY Xi LGW OH

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 | 45.1 | 54.1 | 61.1 | 73.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Heating** | | | | | | | | | | | | |
| Heating capacity | (2) | kW | 200 | 238 | 284 | 317 | 366 | 416 | 466 | 567 | 637 | 726 |
| Total absorbed power | (2) | kW | 47 | 54 | 64 | 71 | 81 | 91 | 102 | 122 | 138 | 167 |
| COP | (2) | | 4,27 | 4,4 | 4,42 | 4,44 | 4,5 | 4,57 | 4,57 | 4,63 | 4,63 | 4,36 |
| Eurovent efficiency class | (2) | | B | B | B | B | A | A | A | A | A | B |
| **Source-side heat exchanger** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (2) | m³/h | 44 | 53 | 63 | 71 | 82 | 94 | 105 | 128 | 144 | 161 |
| Head loss | (2) | kPa | 60 | 62 | 65 | 58 | 59 | 59 | 63 | 64 | 60 | 58 |
| **User-side heat exchanger** | | | | | | | | | | | | |
| Quantity | | n° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Water flow rate | (2) | m³/h | 34 | 41 | 49 | 55 | 63 | 71 | 80 | 98 | 110 | 125 |
| Head loss | (2) | kPa | 13 | 13 | 12 | 12 | 12 | 13 | 11 | 14 | 18 | 21 |
| **Compressors** | | | | | | | | | | | | |
| Compressors/Circuits | | n°/n° | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| Minimum capacity reduction step | (7) | % | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% |
| Refrigerant charge | (6) | kg | 58 | 59 | 85 | 90 | 88 | 88 | 119 | 122 | 145 | 144 |
| **Noise levels** | | | | | | | | | | | | |
| Sound power lev. | (4) | dB(A) | 99 | 99 | 100 | 100 | 101 | 101 | 102 | 102 | 104 | 106 |
| Sound pressure lev. | (5) | dB(A) | 81 | 81 | 82 | 82 | 83 | 82 | 83 | 83 | 85 | 87 |
| Sound power levels LN | (4) | dB(A) | 94 | 94 | 95 | 95 | 96 | 96 | 97 | 97 | 99 | 101 |
| Sound pressure levels LN | (5) | dB(A) | 76 | 76 | 77 | 77 | 78 | 77 | 78 | 78 | 80 | 82 |
| **Dimensions and weights**** | | | | | | | | | | | | |
| Length | | mm | 3700 | 3700 | 3800 | 3800 | 3800 | 3900 | 3900 | 4100 | 4150 | 4250 |
| Depth | | mm | 1500 | 1500 | 1550 | 1550 | 1550 | 1550 | 1550 | 1670 | 1670 | 1850 |
| Height | | mm | 2050 | 2050 | 2100 | 2100 | 2100 | 2150 | 2150 | 2300 | 2400 | 2400 |
| Operating weight | | kg | 2215 | 2335 | 2694 | 2832 | 2987 | 3381 | 3509 | 4260 | 4742 | 5460 |

(2) Temperature of input-output water to/from source-side heat exchanger 10/7°C; temperature of input-output water to/from user-side heat exchanger 40/45°C. Values compliant with standard EN 14511

(4) Unit operating at nominal operating capacity, with no options of any kind, with source-side heat exchanger input/output water temperature of 10/7°C and user-side heat exchanger water inlet-outlet temperature of 47/55°C. Climate profile Average, with reference to the 2013/813 regulation and the EN 14825 standard.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 1 m from the unit in free field with directivity factor Q=2. Non-binding values.

(6) Theoretical values referred to the basic unit (without DC). The amount of gas actually charged in the unit may differ.

(7) Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

** Basic unit without included accessories

# ECODESIGN

## INTRODUCTION

The Ecodesign/ErP Directive (2009/125/EC) lays down new standards for more efficient energy use.

The Directive contains various regulations; as regards chiller products and heat pumps, the regulations of interest are the following:

- Regulation 2013/813, for small heat pumps (Pdesign ≤ 400 kW)
- Regulation 2016/2281, for chillers and heat pumps with Pdesign > 400 kW
- Regulation 2013/811, for heat pumps with Pdesign ≤ 70 kW.

The last-mentioned regulation (2013/811) regards the labelling (Ecolabel certification) of small heat pumps.

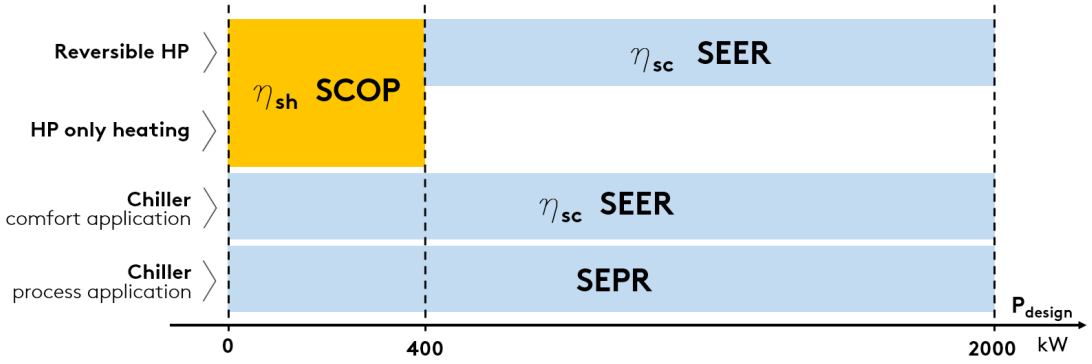
The other two regulations (2013/813 and 2016/2281) set seasonal efficiency targets that the products must comply with to be sold and installed in the European Union (essential requirement for CE marking).

These efficiency limits are defined through ratios, which are respectively:

- ηsh (SCOP), with reference to regulation 2013/813
- ηsc (SEER) for comfort applications and SEPR for process applications, with reference to regulation 2016/2281.

As regards regulation 2016/2281, with effect from 1st January 2021, the required minimum efficiency limit will be raised (Tier 2) from the current threshold (Tier 1).

The figure below schematically illustrates the correspondence between product and reference energy ratio.




Some notes and clarifications:

For comfort applications, regulation 2016/2281 sets the ηsc (SEER) ratio in two different operating conditions:

- SEER calculated with machine inlet/outlet water temperature of 12/7°C (low temperature application),
- SEER calculated with machine inlet/outlet water temperature of 23/18°C (medium temperature application).

The minimum efficiency requirement is the same, but can be met at condition 12/7°C or at condition 23/18°C, depending on the application envisaged for the machine.

Regulation 2013/813 distinguishes two different types: at low temperature and at medium temperature.

The following refer to the application at low temperature: (low temperature application) all heat pumps whose maximum delivery temperature for heating purposes is lower than 52°C with source at temperature of -7°C and -8°C wet bulb (air-water unit) or inlet 10°C (water-water unit), at the reference design conditions for an average climate.For these, the efficiency ratio is "low temperature application" (outlet water temperature 35°C).

For all the other heat pumps, the efficiency ratio is related to "medium temperature application" (outlet water temperature 55°C).

The ratios must be calculated according to the reference European heating season in average climatic conditions.

The minimum efficiency requirements set by the regulations are indicated below.

REGULATION 2016/2281, comfort application

| TYPE OF UNIT | | MINIMUM REQUIREMENT | | | |
|---|---|---|---|---|---|
| | | Tier 1 | | Tier 2 (2021) | |
| **SOURCE** | **Pdesign** | **ηsc [%]** | **SEER** | **ηsc [%]** | **SEER** |
| air | < 400kW | 149 | 3,8 | 161 | 4,1 |
| air | ≥ 400kW | 161 | 4,1 | 179 | 4,55 |
| water | < 400kW | 196 | 5,1 | 200 | 5,2 |
| water | ≥ 400kW and < 1500kW | 227 | 5,875 | 252 | 6,5 |
| water | ≥ 1500kW | 245 | 6,325 | 272 | 7 |

REGULATION 2016/2281, process application

| TYPE OF UNIT | | MINIMUM REQUIREMENT | |
|---|---|---|---|
| | | Tier 1 | Tier 2 (2021) |
| **SOURCE** | **Pdesign** | **SEPR** | **SEPR** |
| air | < 400kW | 4,5 | 5 |
| air | ≥ 400kW | 5 | 5,5 |
| water | < 400kW | 6,5 | 7 |
| water | ≥ 400kW and < 1500kW | 7,5 | 8 |
| water | ≥ 1500kW | 8 | 8,5 |

REGULATION 2013/813

| SOURCE | APPLICATION | MINIMUM REQUIREMENT | |
|---|---|---|---|
| | | **ηsh [%]** | **SCOP** |
| air | low temperature application | 125 | 3,2 |
| water | low temperature application | 125 | 3,325 |
| air | medium temperature application | 110 | 2,825 |
| water | medium temperature application | 110 | 2,95 |

The conformity of the product must be checked according to the type of application, whether comfort or process, and at the required outlet water temperature.

The two schematic tables below, respectively for comfort application and for process application, indicate the reference of the required conformity according to the type of product and the set point temperature (reference to regulations 2016/2281 and 2013/813).

Important note: for mixed comfort and process applications, the reference application for conformity is the comfort application.

COMFORT APPLICATION

| **PRODUCT** | OUTLET WATER TEMPERATURE | COMPLIANCE INDEX | REGULATION |
|---|---|---|---|
| **Chiller** | < 18°C | SEER/ηsc low temperature application | 2016/2281 |
| | ≥ 18°C | SEER/ηsc medium temperature application | 2016/2281 |
| **Heat pumps (reversible and only heating) Pdesign≤400kW** | | SCOP/ηsh | 2013/813 |
| **Reversible heat pumps Pdesign>400kW** | < 18°C | SEER/ηsc low temperature application | 2016/2281 |
| | ≥ 18°C | SEER/ηsc medium temperature application | 2016/2281 |
| **Heat pumps only heating Pdesign>400kW** | | - | - |

- = exemption from Ecodesign

PROCESS APPLICATION

| **PRODUCT** | OUTLET WATER TEMPERATURE | COMPLIANCE INDEX | REGULATION |
|---|---|---|---|
| **Chiller** | ≥ +2°C , ≤ 12°C | SEPR | 2016/2281 |
| | > 12°C | - | - |
| | > -8°C , < +2°C | - | - |

- = exemption from Ecodesign

Some specifications and notes follow.

## Partly completed machinery

The term partly completed machinery refers to all units without a user-side or source-side heat exchanger, and therefore to all LC, LE, LC/HP and LE/HP versions. Since these are "non-complete" machines, conformity with Ecodesign depends on combination with the remote heat exchanger.

All the partly completed machinery is CE marked and accompanied by a declaration of conformity. Installation in European Union countries is therefore allowed; correct selection and installation of the remote heat exchanger must be ensured, in accordance with the above cases.

## EC fans:

The only option that positively affects the performance of the unit, by increasing its seasonal energy efficiency ratio, is the VEC accessory.

A unit equipped with EC fans has a higher SEER (ηsc) than the configuration with standard fans.

# RANGE OMEGA SKY Xi LGW

The Ecodesign/ErP Directive (2009/125/EC) lays down new standards for more efficient energy use.
Several regulations are part of the directive, and set mandatory seasonal efficiency targets for sale in the European Union.
The unit therefore, to be CE marked and sold in the EU market, must comply with the minimum requirements imposed by the regulations in question.

Regarding the Omega Sky Xi LGW range, the reference regulations in the various configurations are:
- Regulation 2016/2281, for chillers and heat pumps with Pdesign > 400 kW

Minimum efficiency requirements are imposed through seasonal energy efficiency indices, respectively:
- ηsc (SEER) for comfort applications
- SEPR for process applications.

As regards the 2016/2281 regulation starting from 1 January 2021, the minimum required efficiency limit will be raised (Tier 2) compared to the current standard (Tier 1).
With reference to the Omega Sky Xi LGW range, below is a list of concerned regulations relating to the different units in their various configurations:

**Omega Sky Xi LGW:**
- regulation 2016/2281

**Omega Sky Xi LGW OH:**
- Regulation 2013/813, from size 19.1 to 39.1
- As these are heat pumps for heating applications only with Pdesign>400kW, sizes from 45.1 onwards are exempt from conformity requirements; All OH units are CE marked.

**Omega Sky Xi LGW HPW:**
- Regulation 2016/2281, from size 45.1 to 73.1
- Regulation 2013/813, from size 19.1 to 39.1

The tables below give information on the conformity of the units and the seasonal energy performance ratios with regard to the reference regulation.

## OMEGA SKY Xi LGW

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 | 45.1 | 54.1 | 61.1 | 73.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **REGULATION 2016/2281** | | | | | | | | | | | | |
| Pdesign | (1) | kW | 184 | 221 | 264 | 295 | 337 | 383 | 431 | 524 | 592 | 684 |
| **COMFORT** | | | | | | | | | | | | |
| ηsc | (1) | % | 280% | 294% | 302% | 307% | 316% | 317% | 318% | 319% | 317% | 291% |
| SEER | (1) | | 7,21 | 7,56 | 7,75 | 7,88 | 8,1 | 8,12 | 8,15 | 8,18 | 8,12 | 7,48 |
| Compliance Tier 1 | (1) | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Compliance Tier 2 (2021) | (1) | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **PROCESS** | | | | | | | | | | | | |
| SEPR | (3) | | 8,14 | 8,46 | 8,51 | 8,56 | 8,67 | 8,8 | 8,85 | 8,95 | 8,94 | 7,89 |
| Compliance Tier 1 | (3) | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Compliance Tier 2 (2021) | (3) | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

Y = unit in compliance with Ecodesign at the indicated condition.

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

## OMEGA SKY Xi LGW HPW

| | | | 45.1 | 54.1 | 61.1 | 73.1 |
|---|---|---|---|---|---|---|
| **REGULATION 2016/2281** | | | | | | |
| Pdesign | (1) | kW | 431 | 524 | 592 | 684 |
| **COMFORT** | | | | | | |
| ηsc | (1) | % | 318% | 319% | 317% | 291% |
| SEER | (1) | | 8,15 | 8,18 | 8,12 | 7,48 |
| Compliance Tier 1 | (1) | | Y | Y | Y | Y |
| Compliance Tier 2 (2021) | (1) | | Y | Y | Y | Y |
| **PROCESS** | | | | | | |
| SEPR | (3) | | 8,85 | 8,95 | 8,94 | 7,89 |
| Compliance Tier 1 | (3) | | Y | Y | Y | Y |
| Compliance Tier 2 (2021) | (3) | | Y | Y | Y | Y |

Y = unit in compliance with Ecodesign at the indicated condition.

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

## OMEGA SKY Xi LGW HPW

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 |
|---|---|---|---|---|---|---|---|---|
| **REGULATION 2013/813** | | | | | | | | |
| Pdesign | (1) | kW | 201 | 239 | 285 | 318 | 363 | 386 |
| ηsh | (1) | % | 164 | 170% | 172% | 174% | 177% | 179 |
| SCOP | (1) | | 4,3 | 4,45 | 4,48 | 4,55 | 4,62 | 4,66 |
| Compliance | (1) | | Y | Y | Y | Y | Y | Y |

Y = unit in compliance with Ecodesign at the indicated condition.

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(1) User-side heat exchanger water inlet/outlet temperature 47/55°C (SCOP MT), Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

## OMEGA SKY Xi LGW OH

| | | | 19.1 | 21.1 | 26.1 | 30.1 | 36.1 | 39.1 |
|---|---|---|---|---|---|---|---|---|
| **REGULATION 2013/813** | | | | | | | | |
| Pdesign | (1) | kW | 201 | 239 | 285 | 318 | 363 | 386 |
| ηsh | (1) | % | 164 | 170% | 172% | 174% | 177% | 179 |
| SCOP | (1) | | 4,3 | 4,45 | 4,48 | 4,55 | 4,62 | 4,66 |
| Compliance | (1) | | Y | Y | Y | Y | Y | Y |

Y = unit in compliance with Ecodesign at the indicated condition.

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(1) User-side heat exchanger water inlet/outlet temperature 47/55°C (SCOP MT), Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

# INSTALLATION ADVICE

The units described in this document are, by nature, strongly affected by the characteristics of the system, the working conditions and the installation site.

Remember that the unit must be installed by a qualified and skilled technician, and in compliance with the national legislation in force in the destination country.

The installation must be done in such a way that it will be possible to carry out all routine and non-routine maintenance operations.

Before starting any work, you must carefully read the "Installation, operation and maintenance manual" of the machine and do the necessary safety checks to prevent any malfunctioning or hazards.

We give some advice below that will allow you to increase the efficiency and reliability of the unit and therefore of the system into which it is inserted.

## Water characteristics

To preserve the life of the exchangers, the water is required to comply with some quality parameters and it is therefore necessary to make sure its values fall within the ranges indicated in the following table:

| | |
|---|---|
| **Total hardness** | 2,0 ÷ 6,0 °f |
| **Langelier index** | - 0,4 ÷ 0,4 |
| **pH** | 7,5 ÷ 8,5 |
| **Electrical conductivity** | 10÷500 µS/cm |
| **Organic elements** | - |
| **Hydrogen carbonate (HCO3-)** | 70 ÷ 300 ppm |
| **Sulphates (SO42-)** | < 50 ppm |
| **Hydrogen carbonate / Sulphates (HCO3-/SO42-)** | > 1 |
| **Chlorides (Cl-)** | < 50 ppm |
| **Nitrates (NO3-)** | < 50 ppm |
| **Hydrogen sulphide (H2S)** | < 0,05 ppm |
| **Ammonia (NH3)** | < 0,05 ppm |
| **Sulphites (SO3), free chlorine (Cl2)** | < 1 ppm |
| **Carbon dioxide (CO2)** | < 5 ppm |
| **Metal cations** | < 0,2 ppm |
| **Manganese ions (Mn++)** | < 0,2 ppm |
| **Iron ions ( Fe2+ , Fe3+)** | < 0,2 ppm |
| **Iron + Manganese** | < 0,4 ppm |
| **Phosphates (PO43-)** | < 2 ppm |
| **Oxygen** | < 0,1 ppm |

Installation of water filters on all the hydraulic circuits is obligatory.

The supply of the most suitable filters for the unit can be requested as accessory. In this case, the filters are supplied loose and must be installed by the customer following the instructions given in the installation, operation and maintenance manual.

## Glycol mixtures

With temperatures below 5°C, it is mandatory to work with water and anti-freeze mixtures, and also change the safety devices (anti-freeze, etc.), which must be carried out by qualified authorised personnel or by the manufacturer.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Liquid outlet temperature or minimum ambient temperature** | °C | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 |
| **Freezing point** | °C | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
| **Ethylene glycol** | % | 6 | 22 | 30 | 36 | 41 | 46 | 50 | 53 | 56 |
| **Propylene glycol** | % | 15 | 25 | 33 | 39 | 44 | 48 | 51 | 54 | 57 |

The quantity of antifreeze should be considered as % on weight

## Minimum water content in the system

For correct operation of the unit, it is necessary to ensure a buffering on the system such as to comply with the minimum operating time considering the greater between the minimum OFF time and the minimum ON time. In short, these contribute to limiting the number of times the compressors are switched on per hour and to preventing undesired deviations from the set point of the delivered water temperature.

Larger amounts of water are in any case always preferable, because they allow a smaller number of starts and switch-offs of the compressors, less wear of them and an increase in the efficiency of the system as a consequence of a reduction in the number of transients.

$$V_{min} = \frac{P_{tot} \cdot 1.000}{N} \cdot \frac{300}{\Delta T \cdot \rho \cdot c_p} + P_{tot} \cdot 0{,}8$$

where

Vmin is the minimum water content of the system [l]

Ptot is the total cooling capacity of the machine [kW]

N: number of capacity reduction steps

ΔT: differential allowed on the water temperature. Unless otherwise specified, this value is considered to be 2.5K

ρ: density of the heat-carrying fluid. Unless otherwise specified, the density of water is considered

cp: specific heat of the heat-carrying fluid. Unless otherwise specified, the specific heat of water is considered

Considering the use of water and grouping together some terms, the formula can be re-written as follows:

$$V_{min} = \frac{P_{tot}}{N} \cdot 28{,}66 + P_{tot} \cdot 0{,}8$$

For the N values, consider the following convention:

- for units with 1 compressor N = 4

## Installation site

To determine the best installation site for the unit and its orientation, you should pay attention to the following points:

- compliance with the clearance spaces indicated in the official dimensional drawing of the unit must be guaranteed so as to ensure accessibility for routine and non-routine maintenance operations
- you should consider the origin of the hydraulic pipes and their diameters because these affect the radiuses of curvature and therefore the spaces needed for installing them
- you should consider the position of the cable inlet on the electrical control panel of the unit as regards the origin of the power supply
- if the installation includes several units side by side, you should consider the position and dimensions of the manifolds of the heat exchangers

Once the best position for the unit has been identified, you must check that the support slab has the following characteristics:

- its dimensions must be proportionate to those of the unit: if possible, longer and wider than the unit by at least 30 cm and 15/20cm higher than the surrounding surface
- it must be able to bear at least 4 times the operating weight of the unit
- must allow the unit to be installed in a level position

The units are designed and built to reduce to a minimum the level of vibration transmitted to the ground, but it is in any case advisable to use rubber or spring anti-vibration mounts, which are available as accessory and should be requested when ordering.

The anti-vibration mounts must be fixed to the machine before positioning the unit on the ground.

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