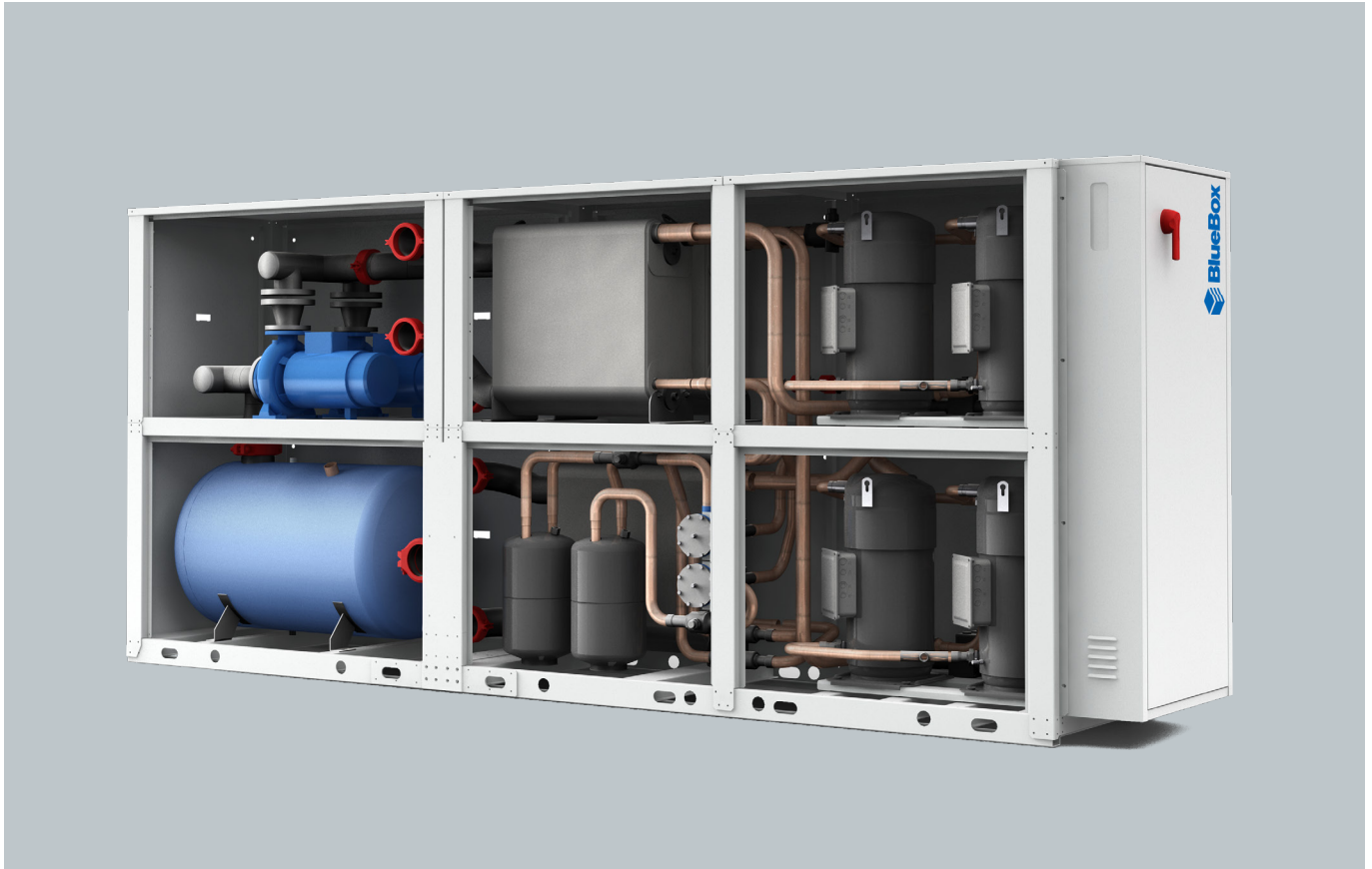


# Tetris W Rev

38÷615 kW



## General

Chillers with heat pump versions for indoor installations. Extended range, versatile applications.

## Configurations

HP: reversible heat pump on refrigerating side

HPW: reversible heat pump on water side

OH: non-reversible heat pump

LC: motoevaporating execution

/LN: silenced unit

/DS: execution featuring a desuperheater

/DC: execution with recovery condenser

## Strengths

- ▶ Tier 2 compliance: sizes up to 400 kW
- ▶ The widest range of capacities and configurations on the market
- ▶ Easy handling: depth ≤ 880 mm
- ▶ Integrated pumps for user, source and total heat recovery (option)
- ▶ Buffer tank (option)
- ▶ BlueThink advanced control with integrated web server. Multilogic function and Blueeye® supervision system. (options)
- ▶ Flowzer: inverter driven pumps (options)



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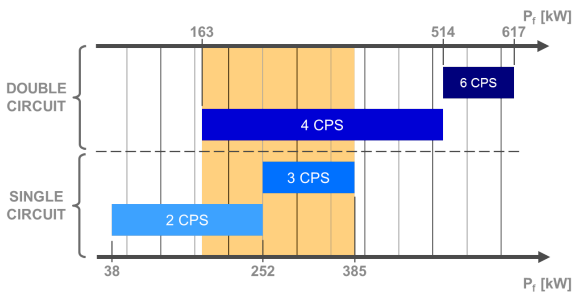


# ONE MACHINE, MANY SOLUTIONS

Tetris W Rev is the result of a platform developed with modular logic, which allows a highly flexible and configurable product to be obtained.

Since this is an indoor unit, the structure has been designed to be as compact as possible: its width of 875mm and height of 1,880mm allow even the largest model to pass easily through the doors of the technical rooms. Furthermore, the unit does not require manifolds for connection of the main heat exchangers and so also the installation space is further reduced.

Tetris W Rev offers a wide range of capacities and configurations: the range covers 31 models divided between single circuit units from 38 to 385kW and dual circuit units from 160 to 618kW. In the capacity range between 163 and 385kW, the customer can choose between the more compact single circuit units and the dual circuit units with higher ESEER values.



Extreme flexibility is also given for combination with different types of sources: evaporative tower, dry-cooler, well, geothermal probe or remote condenser, according to the most suitable and expedient convenient source. Depending on the choice and the type of application, the unit can be completed with the available accessories.

## Built-in hydraulic modules



Tetris W Rev can be equipped with various set-ups of hydraulic modules, designed to have the flexibility required to cover all possible applications. One or two pumps (one as backup to the other) can be requested respectively for the user-side and source-side circuits and also (in the case of /DC version) the heat recovery-side circuit, up to a maximum of four pumps. Also, in combination with the user-side pumps, a buffer tank can be inserted inside the structure.

Each hydraulic module can be coupled with three different types of pump:

- standard, for available discharge heads of about 120kPa
- oversize, for available discharge heads of about 200kPa
- for fluids containing up to 50% glycol

The user-side hydraulic module can also be fitted with one of the Flowzer options, which allows you to make hydronic systems with constant flow rate, constant pressure or with variable flow rate user-side circuit, thanks to the use of inverter technology combined with advanced control. For further details, please refer to the description of Flowzer accessories in the "Hydraulic circuit accessories" chapter

## The 4 forms of heat pump

Tetris W Rev offers four different heat pump set-ups to suit all types of application.

**Tetris W Rev OH** is a high efficiency non-reversible heat pump that is suitable for all applications in which the user needs only heating production. In this set-up, the unit is optimized to operate in heating mode only.

**Tetris W Rev HPW** is a high efficiency water-side reversible heat pump that is suitable for applications in which the user-side circuit and the source-side circuit can be exchanged with each other. Compared to other solutions, water side reversal has the advantage of keeping the heat exchangers in counter-flow in both chiller and heat pump operating modes.

To make the cycle reversal, the fitter must install a system of valves that will allow the two circuits to be exchanged.

If the seasonal mode change is carried out via remote signal or BMS, Tetris W Rev HPW can control motor-driven reversing valves (not supplied) so as to make this operation fully automatic.

**Tetris W Rev /HP** is a high efficiency refrigerator-side reversible heat pump: this version always guarantees separation between source and user fluids, thus also allowing different pumps to be used on the various hydronic circuits, does not require external reversing valves and makes the installation operations easier.

**Tetris W Rev LC/HP** is a reversible condenserless unit that, combined with a remote reversible condenser, allows the hydronic part to be installed in a technical room inside the building and the ventilation part to be installed outside or on the roof. This allows greater flexibility on dimensions and noisiness of the ventilation part and the advantage of not being required to add glycol to the water of the user-side circuit since it is completely indoors.

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# Tetris W Rev

Chillers with heat pump versions for indoor installations . Extended range, versatile applications.

## BODY

The structure consists of a load-bearing frame made of epoxy polyester powder coated steel sheet, coloured with RAL 7035.

All screws and bolts are stainless steel.

## COMPRESSORS

The compressors are hermetic orbiting spiral scroll compressors connected in tandem or trio, fitted with oil level sight glass, oil equalization line and electronic protection.

## USER-SIDE HEAT EXCHANGER

The exchanger is a braze-welded stainless steel plate heat exchanger, insulated with a shroud of closed-cell insulating material.

Models with 2 refrigerant circuits are fitted with dual circuit heat exchanger and therefore with a single pair of hydraulic connections. This has allowed us to:

- maximize the EER and COP levels
- reduce the amount of refrigerant used in the unit
- make the unit lighter and more compact
- make its maintenance easier.

The heat exchanger is fitted with a temperature probe for freeze protection and a paddle flow switch for water flow control.(supplied loose).

## SOURCE-SIDE HEAT EXCHANGER

The exchanger is a braze-welded stainless steel plate heat exchanger, insulated with a shroud of closed-cell insulating material.

Models with 2 refrigerant circuits are fitted with dual circuit heat exchanger and therefore with a single pair of hydraulic connections.

For the OH, HPW and HP version units, the heat exchanger is fitted with a temperature probe for freeze protection and a paddle flow switch for water flow control. (supplied loose).

## REFRIGERANT CIRCUIT

Each refrigerant circuit of the basic unit (cooling only) comprises:

- shut-off valve in the liquid line
- 5/16" charging valves
- liquid sight glass
- replaceable solid cartridge dehydrator filter
- electronic expansion valve
- pressure transducers for reading the high and low pressure values and relevant evaporating and condensing temperatures
- high pressure switches
- low pressure switches (only for models with parametric control)

The pipes of the circuit and the exchanger are insulated with extruded closed-cell expanded elastomer.

Compared to the mechanical expansion valve, the electronic expansion valve allows machine stability to be reached more quickly and better superheating control to maximize the use of the evaporator in all load conditions. This also acts as shut-off valve on the liquid line, as it closes during compressor stops, so preventing dangerous refrigerant migration.

## ELECTRICAL CONTROL PANEL

The electrical control panel is made in a painted galvanized sheet-iron box.

The electrical control panel of the basic unit comprises:

- main disconnect switch
- automatic circuit breakers for compressors with fixed calibration
- fuses to protect the auxiliary circuits
- thermal magnetic circuit breakers for the pumps (if present)
- contactors for compressors and pumps (if present)
- phase monitor
- potential-free general alarm contacts
- single potential free operating contacts for compressors and pumps (if present)
- microprocessor controller with display accessible from the outside

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

The power supply of the unit is 400V/3~/50Hz or 400V/3~+N/50Hz depending on the model and the version

## CONTROL BLUETHINK

### Main controller functions parametric

This is the standard control for models from 3.2 to 27.2 in set-up base, HP, OH, LC, LC/HP. For these units, the advanced control can be ordered as an accessory.

The control allows the following functions:

- water temperature adjustment, with control of the water entering the user-side heat exchanger
- freeze protection
- compressor timings
- automatic rotation of compressor starting sequence
- recording of the alarm log
- RS485 serial port with Modbus protocol
- digital input for general ON/OFF
- digital input for Summer/Winter selection (only for HP and LC/HP units)

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

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.

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### **Main controller functions advanced**

This is the standard control for all models in HPW set-up and all models with more than two compressors.

The control allows the following functions:

- water temperature adjustment, with control of the water entering the user-side heat exchanger
- freeze protection
- compressor timings
- automatic rotation of compressor starting sequence
- recording of the log of all machine inputs, outputs and states
- automatic rotation of compressor starting sequence
- recording of the alarm log
- RS485 serial port with Modbus protocol
- Ethernet serial port with Modbus protocol and integrated web server preloaded web page
- digital input for general ON/OFF
- digital input for Summer/Winter selection (only for HP, HPW and LC/HP units)

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

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 (only for units with advanced control)**

As standard, the Bluethink controller integrates a webserver with a preloaded web page that is accessed via password.

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

- display of the main functions of the unit such as unit serial n°, size, refrigerant
- display of the general status of the machine: water inlet and outlet temperatures, external air temperature, mode (chiller or heat pump), evaporating and condensing pressures, suction and discharge temperatures
- display of the status of compressors, pumps, expansion valves
- display in real time of the graphs of the main quantities
- display of the graphs of logged quantities
- display of alarm log
- management of users on several levels
- remote ON/OFF
- remote set point change
- remote time band change
- remote summer winter mode selection

### **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
- external air temperature
- superheating at compressor suction.

### **Management of defrost cycles (only for LC/HP versions)**

For defrost management, the control of the unit uses a sliding intervention threshold, depending on the pressures inside the unit and the external air temperature. By putting together all this information, the control can identify the presence of ice on the coil and activates the defrosting sequence only when necessary, so as to maximize the energy efficiency of the unit.

Sliding management of the defrost threshold ensures that, as the absolute humidity of outdoor air decreases, the frequency of the defrost cycles gradually decreases because they are carried out only when the ice formed on the coil actually penalizes performance.

The above applies only when the unit is coupled to a remote condenser combined as per catalogue and supplied from the factory and when this is controlled by the internal unit.

## TESTING

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

The LC and LC/HP version units are electrically tested. For on-site installation, in addition to the electrical and hydraulic connections, it will be necessary to make the refrigerant connection to the remote heat exchanger and charge with the correct refrigerant and oil charge.

## PACKAGING

The unit is made and shipped on a wooden pallet that allows the unit to be handled using a forklift truck.

The unit is wrapped in transparent polyethylene stretch film.

## VERSIONS

In the basic version, the unit is a high efficiency liquid chiller, but includes various types of set-up as an option to meet the requirements of all types of application.

### OH: heat pump for heating only

\*\*non tradotto\*\*

\*\*non tradotto\*\*

\*\*non tradotto\*\*

The standard unit can accommodate up to two pumps on board. With a suitable frame extension (option) it's possible to install more pumps; if this option is selected, then the units cannot be stacked.

The stackability of the machines is only possible by selecting units with similar frame: the single-compressor units can be stacked together, similarly the two-compressors.

\*\*non tradotto\*\*

### HPW: heat pump with hydronic-side reversal

The HPW unit is a heat pump that includes cycle reversal on the hydronic side of the system via special 3-way or 4-way reversing valves outside the unit (not supplied).

In addition to what is present in the basic version, the HPW set-up includes an OK signal in the terminal board for controlling the group of external reversing valves (not supplied).

### HP: reversible heat pump

The HP unit is a reversible heat pump with cycle reversal on the chiller side.

In addition to what is present in the basic version, the HP set-up includes:

- 4-way reversing valve
- paddle flow switch for source-side water flow control (supplied with the unit).

### LC: condenserless unit

The LC unit is a condenserless unit and therefore, compared to the basic unit, is without the source-side heat exchanger and the refrigerant charge.

The unit must be connected to a suitably sized remote heat exchanger.

### LC/HP: reversible condenserless unit

The LC/HP unit is a reversible condenserless unit and therefore, compared to the HP unit, is without the source-side heat exchanger and the refrigerant charge. Compared to the HP unit, it has the suction separator in addition.

The unit must be connected to a suitably sized remote heat exchanger. The heat exchanger must be suitable for operation as condenser and as evaporator and must be fitted with an expansion valve (with relevant bypass valve) sized for operation of the

## OPTIONS

### /DC: unit with total recovery condenser

In addition to the set-up of a chiller only unit, /DC units include:

- a heat recovery condenser for recovering 100% of the condensation heat; The exchanger is a brazed plate heat exchanger
- temperature probe at the inlet of the heat recovery heat exchanger
- a liquid receiver for each refrigerant circuit

This set-up is not available for the OH, HPW, HP and LC/HP units.

### /DS: unit with partial heat recovery

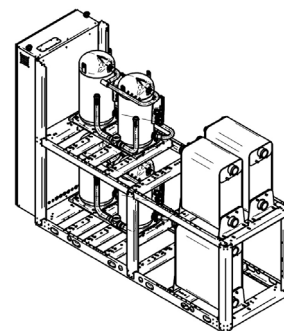
In addition to the set-up of a chiller only unit, /DS units comprise (for each refrigerant circuit) a heat exchanger for partial recovery of condensation heat, placed in series with the source-side heat exchanger. The exchanger is a braze-welded brazed plate heat exchanger

This option is also available for HPW, HP e LC/HP units, but in this case, in the installation, there must be provision for shutting off the heat recovery water circuit during operation in heat pump mode to avoid taking power from the user-side heat exchanger.

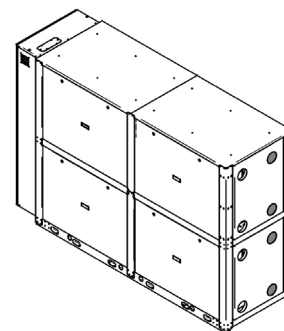
### /LN: silenced unit

Units in LN set-up are fully panelled with epoxy polyester powder coated steel sheet panels coloured with RAL 7035 and lined with matting made of sound absorbing and soundproofing material.

Example of non /LN unit



Example of /LN unit





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## HYDRAULIC MODULES

All the units can be equipped with hydraulic module in various combinations on the user side, on the source side and in combination with the total heat recovery heat exchanger. Refer to the table of configurations that are not possible to check for availability of specific set-ups.

Hydraulic modules with one pump have:

- one pump
- a gate valve on the delivery side of the pump
- an expansion vessel

Hydraulic modules with two pumps have:

- two pumps
- a check valve on the delivery side of each pump
- a gate valve on the outlet of the delivery manifold
- an expansion vessel

In the version with 2 pumps, these are always with one on standby while the other is working. Switching over between the pumps is automatic and is done by time (to balance the hours of operation of each one) or in the event of failure.

Hydraulic modules with tank also have:

- a gate valve at the inlet of the pump or the suction manifold
- a tank with drain valve and air valve

### User-side hydraulic modules

The hydraulic circuit inside the unit is fully insulated with closed-cell insulating material..

The module can have the following configurations:

- /1P: hydraulic module with one pump
- /1PS: hydraulic module with one pump and buffer tank
- /2P: hydraulic module with two pumps
- /2PS: hydraulic module with two pumps and buffer tank

All the above-mentioned modules have pumps with standard discharge head.

The following are also available:

modules /1PM, /1PMS, /2PM and /2PMS that have pumps with increased available discharge head  
modules /1PG, /1PGS, /2PG and /2PGS that have pumps suitable for operating with glycol up to 50%

### Source-side hydraulic modules

The source side pumps are normally switched off and they are switched on a few seconds before the start of first compressor.

When reaching the set point, a few seconds after switching off the last compressor, the source side pumps are switched off again.

The hydraulic circuit inside the unit is fully insulated with closed-cell insulating material. (only for units in HP or HPW set-up).

The module can have the following configurations:

- /1S: hydraulic module with one pump
- /2S: hydraulic module with two pumps

All the above-mentioned modules have pumps with standard discharge head.

The following are also available:

modules /1SM and /2SM that have pumps with increased available discharge head

modules /1SG and /2SG that have pumps suitable for operating with glycol up to 50%

### Total heat recovery-side hydraulic modules

The hydraulic circuit inside the unit is fully insulated with closed-cell insulating material..

The module can have the following configurations:

- /1R: hydraulic module with one pump
- /2R: hydraulic module with two pumps

All the above-mentioned modules have pumps with standard discharge head.

The following are also available:

modules /1RM and /2RM that have pumps with increased available discharge head

modules /1RG and /2RG that have pumps suitable for operating with glycol up to 50%

## CONTROLS AND SAFETY DEVICES

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

- high pressure switch with manual reset
- high pressure safety device with automatic reset, for a limited number of occurrences, managed by the controller
- low pressure safety device with automatic reset and limited tripping managed by the controller
- high pressure safety valve
- antifreeze probe at outlet of each evaporator
- compressor overtemperature protection
- mechanical paddle flow switch (supplied loose)

# TECHNICAL SPECIFICATIONS

## TETRIS W REV

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	38,2	43,4	49,8	55,2	64,0	71,9	82,0	99,6
Total absorbed power	(1)	kW	8,0	9,1	10,4	11,4	13,1	14,7	16,6	20,2
EER	(1)		4,77	4,75	4,78	4,86	4,88	4,90	4,93	4,94
ESEER	(9)		5,57	5,55	5,63	5,70	5,65	5,65	5,66	5,72
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	50%	50%	50%	50%	50%	50%	50%	50%
Refrigerant charge	(8)	kg	3,8	4	4,5	7,5	7,7	7,8	8	8,5
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	6,6	7,5	8,6	9,5	11,1	12,4	14,2	17,2
Head loss	(1)	kPa	22	23	22	21	26	32	32	35
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	7,9	9,0	10,3	11,4	13,2	14,8	16,9	20,5
Head loss	(1)	kPa	34	39	39	42	46	33	35	36
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(5)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(4)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(5)	dB(A)	50	52	53	55	55	56	56	58
<b>Dimensions and weights**</b>										
Length		mm	1633	1633	1633	1633	1633	1633	1633	1633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	1880	1880	1880	1880	1880	1880
Operating weight	(6)	kg	460	470	580	670	700	740	770	800

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

(6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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.

(8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

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

\*\* Basic unit without included accessories

## TETRIS W REV

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	113,0	130,5	144,3	160,5	181,9	199,5	221,3	250,7
Total absorbed power	(1)	kW	23,0	26,5	29,3	32,6	37,3	41,6	45,8	51,5
EER	(1)		4,91	4,93	4,93	4,92	4,88	4,80	4,83	4,87
ESEER	(9)		5,69	5,65	5,71	5,67	5,68	5,63	5,73	5,68
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	43%	50%	44%	50%	45%	50%	50%	50%
Refrigerant charge	(8)	kg	10	11,5	12	14	15	15	21	21
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	19,5	22,5	24,9	27,7	31,4	34,5	38,2	43,3
Head loss	(1)	kPa	35	33	33	33	39	44	49	52
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	23,3	26,9	29,7	33,1	37,5	41,3	45,8	51,8
Head loss	(1)	kPa	38	40	43	46	49	51	35	36
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(5)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(4)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	59	60	62	62	63	64	64	64
<b>Dimensions and weights**</b>										
Length		mm	1633	1633	2017	2017	2017	2017	2017	2834
Depth		mm	792	792	872	872	872	872	872	872
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight	(6)	kg	860	880	1220	1260	1340	770	800	1030

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

(6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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.

(8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

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

\*\* Basic unit without included accessories

## TETRIS W REV

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	309,2	345,0	383,5	162,6	196,8	224,7	253,1	286,8
Total absorbed power	(1)	kW	64,2	71,1	79,4	33,3	40,4	45,9	51,9	58,7
EER	(1)		4,82	4,85	4,83	4,88	4,87	4,90	4,88	4,89
ESEER	(9)		5,75	5,75	5,71	5,81	5,87	5,86	5,88	5,88
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(7)	%	33%	33%	33%	25%	25%	21%	25%	22%
Refrigerant charge	(8)	kg	27	31	33	18	18	20,5	25	27
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	53,4	59,6	66,3	28,1	34,0	38,8	43,7	49,5
Head loss	(1)	kPa	53	53	54	28	30	30	29	32
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	64,0	71,3	79,3	33,6	40,7	46,4	52,3	59,2
Head loss	(1)	kPa	49	41	44	32	33	38	41	44
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(5)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(4)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	64	64	66	58	59	62	62	64
<b>Dimensions and weights**</b>										
Length		mm	2834	2834	2834	2834	2834	2834	2834	3334
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight	(6)	kg	1210	1270	1350	1500	1580	1630	1710	2030

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

(6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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.

(8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

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

\*\* Basic unit without included accessories

## TETRIS W REV

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Cooling</b>									
Refrigeration capacity	(1)	kW	319,0	363,3	408,4	453,8	512,9	544,8	615,0
Total absorbed power	(1)	kW	65,6	75,2	84,4	93,0	103,8	111,9	125,8
EER	(1)		4,86	4,83	4,84	4,88	4,94	4,87	4,89
ESEER	(9)		5,86	5,85	5,83	5,93	6,00	5,87	5,92
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(7)	%	25%	23%	25%	25%	25%	15%	17%
Refrigerant charge	(8)	kg	29	42	43	44	45	55,5	56
<b>User-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	55,0	62,7	70,5	78,2	88,4	93,9	106,1
Head loss	(1)	kPa	31	44	46	28	30	31	34
<b>Source-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	65,9	75,1	84,4	93,7	105,7	112,5	126,9
Head loss	(1)	kPa	49	53	55	46	48	52	54
<b>Noise levels</b>									
Sound power lev.	(4)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(5)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(4)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(5)	dB(A)	64	65	65	66	66	66	66
<b>Dimensions and weights**</b>									
Length		mm	3334	2.820	2.820	2.820	2.820	3.320	3.320
Depth		mm	872	880	880	880	880	880	880
Height		mm	1880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	2150	1.500	1.580	1.630	1.710	2.030	2.150

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

(6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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.

(8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

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

\*\* Basic unit without included accessories

**TETRIS W REV /HP**

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	34,8	40,0	43,2	50,6	59,3	68,0	76,2	88,7
Total absorbed power	(1)	kW	8,2	9,4	10,2	11,6	13,4	15,2	17,1	20,8
EER	(1)		4,22	4,24	4,22	4,38	4,42	4,48	4,45	4,27
ESEER	(9)		4,92	5,00	5,00	5,12	5,11	5,14	5,08	4,91
<b>Heating</b>										
Heating capacity	(2)	kW	43,3	49,8	53,2	60,6	71,8	81,7	90,6	107,9
Total absorbed power	(2)	kW	10,1	11,6	12,3	14,1	16,5	18,9	20,9	25,0
COP	(2)		4,27	4,28	4,31	4,29	4,34	4,33	4,34	4,31
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	50%	50%	50%	50%	50%	50%	50%	50%
Refrigerant charge	(8)	kg	3,8	4	4,5	7,5	7,7	7,8	8	8,5
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	6,0	6,9	7,5	8,7	10,2	11,8	13,2	15,3
Head loss	(1)	kPa	19	20	19	19	23	66	28	31
Water flow rate	(2)	m³/h	7,4	8,5	9,1	10,4	12,3	14,0	15,5	18,5
Head loss	(2)	kPa	28	30	28	26	32	40	39	45
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	7,3	8,4	9,1	10,6	12,4	14,2	16,0	18,7
Head loss	(1)	kPa	48	50	48	45	53	44	34	38
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(5)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(4)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(5)	dB(A)	50	52	53	55	55	56	56	58
<b>Dimensions and weights**</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	1.633	1.633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	967	967	967	967	967	967
Operating weight	(6)	kg	330	340	380	400	410	440	450	460

- (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 external air temperature of 35°C and user-side heat exchanger water inlet-outlet temperature of 12/7°C. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

## TETRIS W REV /HP

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	101,3	114,3	128,8	143,5	164,4	185,1	205,4	236,9
Total absorbed power	(1)	kW	23,6	26,4	29,8	33,1	38,0	42,6	47,8	51,7
EER	(1)		4,29	4,33	4,32	4,33	4,33	4,34	4,30	4,58
ESEER	(9)		4,94	4,93	5,00	4,94	5,00	5,06	5,07	5,19
<b>Heating</b>										
Heating capacity	(2)	kW	122,3	137,7	155,7	173,4	198,9	223,1	251,6	282,2
Total absorbed power	(2)	kW	28,3	31,7	35,9	40,0	45,7	51,6	57,4	63,4
COP	(2)		4,32	4,34	4,34	4,33	4,35	4,32	4,38	4,45
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	43%	50%	44%	50%	45%	50%	50%	50%
Refrigerant charge	(8)	kg	10	11,5	12	14	15	15	21	21
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	17,5	19,7	22,2	24,8	28,4	32,0	35,4	40,8
Head loss	(1)	kPa	30	29	29	29	34	38	33	11
Water flow rate	(2)	m³/h	20,9	23,6	26,7	29,7	34,1	38,2	43,1	48,5
Head loss	(2)	kPa	43	41	41	42	49	54	49	16
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	21,4	24,1	27,2	30,3	34,7	39,0	43,4	49,6
Head loss	(1)	kPa	37	35	34	35	40	45	44	14
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(5)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(4)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	59	60	62	62	63	64	64	64
<b>Dimensions and weights**</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	2.017	2.017
Depth		mm	792	792	792	792	792	792	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	570	660	700	730	760	800	910	960

- (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 external air temperature of 35°C and user-side heat exchanger water inlet-outlet temperature of 12/7°C. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

## TETRIS W REV /HP

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	283,4	311,1	349,3	150,9	179,2	204,1	229,8	268,6
Total absorbed power	(1)	kW	61,9	69,1	77,1	33,4	40,4	45,7	51,3	57,2
EER	(1)		4,58	4,50	4,53	4,52	4,43	4,47	4,48	4,70
ESEER	(9)		5,29	5,20	5,21	5,32	5,27	5,28	5,33	5,58
<b>Heating</b>										
Heating capacity	(2)	kW	334,7	377,2	415,4	182,7	216,2	246,5	273,4	308,6
Total absorbed power	(2)	kW	74,5	85,9	94,6	40,8	48,8	55,8	62,1	69,4
COP	(2)		4,49	4,39	4,39	4,48	4,43	4,42	4,40	4,45
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(7)	%	33%	33%	33%	25%	25%	21%	25%	22%
Refrigerant charge	(8)	kg	27	31	33	18	18	20,5	25	27
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	48,8	53,6	60,2	26,1	30,9	35,2	39,7	46,3
Head loss	(1)	kPa	13	15	17	33	30	33	34	30
Water flow rate	(2)	m³/h	57,4	64,7	71,3	31,3	37,0	42,2	46,8	52,9
Head loss	(2)	kPa	18	21	23	48	44	48	47	39
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	59,3	65,3	73,2	31,6	37,7	42,9	48,3	55,9
Head loss	(1)	kPa	16	18	20	9	10	12	13	15
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(5)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(4)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	64	64	66	58	59	62	62	64
<b>Dimensions and weights**</b>										
Length		mm	2.017	2.017	2.017	2.017	2.017	2.834	2.834	2.834
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	1.260	1.290	1.380	820	860	1.100	1.280	1.350

- (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 external air temperature of 35°C and user-side heat exchanger water inlet-outlet temperature of 12/7°C. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories



## TETRIS W REV /HP

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Cooling</b>									
Refrigeration capacity	(1)	kW	279,9	328,2	364,8	409,9	465,5	492,1	547,9
Total absorbed power	(1)	kW	66,0	73,6	84,1	95,1	105,8	111,3	125,4
EER	(1)		4,24	4,46	4,34	4,31	4,40	4,42	4,37
ESEER	(9)		5,09	5,29	5,11	5,20	5,28	5,26	5,24
<b>Heating</b>									
Heating capacity	(2)	kW	346,1	393,2	443,7	508,0	558,1	592,3	663,3
Total absorbed power	(2)	kW	78,8	88,8	100,2	116,2	128,0	133,1	150,4
COP	(2)		4,39	4,43	4,43	4,37	4,36	4,45	4,41
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(7)	%	25%	23%	25%	25%	25%	15%	17%
Refrigerant charge	(8)	kg	29	42	43	44	45	55,5	56
<b>User-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	48,3	56,6	62,9	70,7	80,3	84,8	94,5
Head loss	(1)	kPa	30	32	22	24	26	27	29
Water flow rate	(2)	m³/h	59,3	67,4	76,1	87,1	95,7	101,6	113,7
Head loss	(2)	kPa	46	46	32	37	37	38	43
<b>Source-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	59,3	69,0	77,0	86,6	98,0	103,5	115,4
Head loss	(1)	kPa	47	19	30	34	36	29	42
<b>Noise levels</b>									
Sound power lev.	(4)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(5)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(4)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(5)	dB(A)	64	65	65	66	66	66	66
<b>Dimensions and weights**</b>									
Length		mm	2.834	2.834	2.834	2.834	2.834	3.334	3.334
Depth		mm	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	1.450	1.530	1.610	1.650	1.720	2.040	2.150

- (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 external air temperature of 35°C and user-side heat exchanger water inlet-outlet temperature of 12/7°C. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

**TETRIS W REV OH**

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Heating</b>										
Heating capacity	(1)	kW	41,9	48	52,1	60,6	69,8	77,9	88,9	107,3
Total absorbed power	(1)	kW	9,7	11,1	11,9	13,7	16,4	18,4	20,5	24,5
COP	(1)		4,3	4,3	4,4	4,4	4,3	4,2	4,3	4,4
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(2)	%	50%	50%	50%	50%	50%	50%	50%	50%
Refrigerant charge	(6)	kg	3,8	4	4,5	7,5	7,7	7,8	8	8,5
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	7,2	8,2	8,9	10,4	11,9	13,3	15,2	18,4
Head loss	(1)	kPa	28,3	33,5	31,4	39,5	44,6	27,7	35,4	37,6
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	5,6	6,4	6,9	8,1	9,2	10,3	11,8	14,3
Head loss	(1)	kPa	15,5	16,6	14,3	15,2	18,1	21,9	22,2	24,1
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(5)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(4)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(5)	dB(A)	50	52	53	55	55	56	56	58
<b>Dimensions and weights**</b>										
Length		mm	1633	1633	1633	1633	1633	1633	1633	1633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	967	967	967	967	967	967
Operating weight	(7)	kg	330	340	380	400	400	440	460	470

(1) Source-side heat exchanger inlet-outlet water temperature 0/-3°C; user-side heat exchanger inlet-outlet water temperature 60/65°C. Values compliant with standard EN 14511

(2) 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.

(3) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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 (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.

(6) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

(7) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

\*\* Basic unit without included accessories

## TETRIS W REV OH

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Heating</b>										
Heating capacity	(1)	kW	121,3	136,2	155,9	173,1	196,3	216	241,2	271,3
Total absorbed power	(1)	kW	27,8	31,2	35,4	39,5	45,1	50,3	56,9	63,1
COP	(1)		4,4	4,4	4,4	4,4	4,4	4,3	4,2	4,3
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(2)	%	40%	50%	40%	50%	50%	50%	50%	50%
Refrigerant charge	(6)	kg	10	11,5	12	14	15	15	21	21
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	20,8	23,3	26,7	29,6	33,6	37	41,4	46,5
Head loss	(1)	kPa	33,7	34,6	44,4	46	44,5	53,1	30	35,2
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	16,1	18,1	20,8	23	26,1	28,6	31,8	35,9
Head loss	(1)	kPa	23,9	21,3	23	22,8	27	30,3	33,9	35,8
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(5)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(4)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	59	60	62	62	63	64	64	64
<b>Dimensions and weights**</b>										
Length		mm	1633	1633	1633	1633	1633	1633	1633	1633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight	(7)	kg	580	670	700	740	770	800	860	880

(1) Source-side heat exchanger inlet-outlet water temperature 0/-3°C; user-side heat exchanger inlet-outlet water temperature 60/65°C. Values compliant with standard EN 14511

(2) 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.

(3) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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 (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.

(6) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

(7) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

\*\* Basic unit without included accessories

## TETRIS W REV OH

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Heating</b>										
Heating capacity	(1)	kW	338,5	385,4	428,1	175,9	212,8	242,1	271,9	309,1
Total absorbed power	(1)	kW	76,4	88,4	97,2	40,3	48,2	54,6	61,4	69,7
COP	(1)		4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(2)	%	30%	30%	30%	30%	30%	20%	30%	20%
Refrigerant charge	(6)	kg	27	31	33	18	18	20,5	25	27
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	58	66,1	73,4	30,2	36,5	41,5	46,6	53
Head loss	(1)	kPa	37,3	37	39	31,2	28,3	32,4	36,9	39,1
<b>Source-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	45,2	51,3	57,1	23,4	28,4	32,3	36,3	41,3
Head loss	(1)	kPa	38	39,2	40,1	19,5	20,9	20,9	20	22,3
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(5)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(4)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	64	64	66	58	59	62	62	64
<b>Dimensions and weights**</b>										
Length		mm	2017	2017	2017	2017	2017	2834	2834	2834
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight	(7)	kg	1220	1260	1340	770	800	1030	1210	1270

(1) Source-side heat exchanger inlet-outlet water temperature 0/-3°C; user-side heat exchanger inlet-outlet water temperature 60/65°C. Values compliant with standard EN 14511

(2) 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.

(3) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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 (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.

(6) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

(7) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

\*\* Basic unit without included accessories

## TETRIS W REV OH

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Heating</b>									
Heating capacity	(1)	kW	346,4	393,8	442,4	495,6	553,7	590,6	665,2
Total absorbed power	(1)	kW	78	89,7	100,3	116,4	127,6	133,5	150,3
COP	(1)		4,4	4,4	4,4	4,3	4,3	4,4	4,4
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(2)	%	30%	20%	30%	30%	30%	20%	20%
Refrigerant charge	(6)	kg	29	42	43	44	45	55,5	56
<b>User-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	59,4	67,5	75,8	85	94,9	101,3	114
Head loss	(1)	kPa	43,8	43,4	43,2	39,8	38,7	33,9	44
<b>Source-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	46,3	52,5	59	65,4	73,4	78,8	88,8
Head loss	(1)	kPa	21,9	30,8	32,2	19,5	20,7	21,8	23,8
<b>Noise levels</b>									
Sound power lev.	(4)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(5)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(4)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(5)	dB(A)	64	65	65	66	66	66	66
<b>Dimensions and weights**</b>									
Length		mm	2834	2834	2834	2834	2834	3334	3334
Depth		mm	872	872	872	872	872	872	872
Height		mm	1880	1880	1880	1880	1880	1880	1880
Operating weight	(7)	kg	1350	1500	1580	1630	1710	2030	2150

(1) Source-side heat exchanger inlet-outlet water temperature 0/-3°C; user-side heat exchanger inlet-outlet water temperature 60/65°C. Values compliant with standard EN 14511

(2) 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.

(3) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

(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 (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.

(6) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

(7) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.

\*\* Basic unit without included accessories

**TETRIS W REV HPW**

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	38,2	43,4	49,8	55,2	64	71,9	82	99,6
Total absorbed power	(1)	kW	8	9,1	10,4	11,4	13,1	14,7	16,6	20,2
EER	(1)		4,77	4,75	4,78	4,86	4,88	4,9	4,93	4,94
ESEER	(9)		5,57	5,55	5,63	5,7	5,65	5,65	5,66	5,72
<b>Heating</b>										
Heating capacity	(2)	kW	41,9	48	52,1	60,7	69,8	78	88,9	107,3
Total absorbed power	(2)	kW	9,8	11,2	12	13,8	16,5	18,5	20,5	24,6
COP	(2)		4,28	4,3	4,35	4,41	4,24	4,22	4,33	4,36
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	50%	50%	50%	50%	50%	50%	50%	50%
Refrigerant charge	(8)	kg	3,8	4	4,5	7,5	7,7	7,8	8	8,5
<b>Evaporator</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	6,6	7,5	8,6	9,5	11,1	12,4	14,2	17,2
Head loss	(1)	kPa	22	23	22	21	26	32	32	35
<b>Condenser</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	7,9	9	10,3	11,4	13,2	14,8	16,9	20,5
Head loss	(1)	kPa	34	39	39	42	46	33	35	36
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(5)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(4)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(5)	dB(A)	50	52	53	55	55	56	56	58
<b>Dimensions and weights**</b>										
Length		mm	1.633	1633	1.633	1.633	1.633	1.633	1.633	1.633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	967	967	967	967	967	967
Operating weight	(6)	kg	330	340	380	400	410	440	450	460

- (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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

## TETRIS W REV HPW

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	113	130,5	144,3	160,5	181,9	199,5	221,3	250,7
Total absorbed power	(1)	kW	23	26,5	29,3	32,6	37,3	41,6	45,8	51,5
EER	(1)		4,91	4,93	4,93	4,92	4,88	4,8	4,83	4,87
ESEER	(9)		5,69	5,65	5,71	5,67	5,68	5,63	5,73	5,68
<b>Heating</b>										
Heating capacity	(2)	kW	121,3	136,2	155,9	173,1	196,4	216	241,3	271,3
Total absorbed power	(2)	kW	28	31,4	35,5	39,6	45,3	50,4	57,2	63,3
COP	(2)		4,34	4,34	4,39	4,37	4,34	4,28	4,22	4,29
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(7)	%	43%	50%	44%	50%	45%	50%	50%	50%
Refrigerant charge	(8)	kg	10	11,5	12	14	15	15	21	21
<b>Evaporator</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	19,5	22,5	24,9	27,7	31,4	34,5	38,2	43,3
Head loss	(1)	kPa	35	33	33	33	39	44	49	52
<b>Condenser</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	23,3	26,9	29,7	33,1	37,5	41,3	45,8	51,8
Head loss	(1)	kPa	38	40	43	46	49	51	35	36
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(5)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(4)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	59	60	62	62	63	64	64	64
<b>Dimensions and weights**</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	2.017	2.017
Depth		mm	792	792	792	792	792	792	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	570	660	700	730	760	800	910	960

- (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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

## TETRIS W REV HPW

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	309,2	345	383,5	162,6	196,8	224,7	253,1	286,8
Total absorbed power	(1)	kW	64,2	71,1	79,4	33,3	40,4	45,9	51,9	58,7
EER	(1)		4,82	4,85	4,83	4,88	4,87	4,9	4,88	4,89
ESEER	(9)		5,75	5,75	5,71	5,81	5,87	5,86	5,88	5,88
<b>Heating</b>										
Heating capacity	(2)	kW	338,8	385,5	428,2	175,9	212,8	242,2	272	309,2
Total absorbed power	(2)	kW	77	88,8	97,7	40,4	48,4	54,8	61,7	69,9
COP	(2)		4,4	4,34	4,38	4,35	4,4	4,42	4,41	4,42
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(7)	%	33%	33%	33%	25%	25%	21%	25%	22%
Refrigerant charge	(8)	kg	27	31	33	18	18	20,5	25	27
<b>Evaporator</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	53,4	59,6	66,3	28,1	34	38,8	43,7	49,5
Head loss	(1)	kPa	53	53	54	28	30	30	29	32
<b>Condenser</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	64	71,3	79,3	33,6	40,7	46,4	52,3	59,2
Head loss	(1)	kPa	49	41	44	32	33	38	41	44
<b>Noise levels</b>										
Sound power lev.	(4)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(5)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(4)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(5)	dB(A)	64	64	66	58	59	62	62	64
<b>Dimensions and weights**</b>										
Length		mm	2.017	2.017	2.017	2.017	2.017	2.834	2.834	2.834
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	1.260	1.290	1.380	820	860	1.100	1.280	1.350

- (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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories



## TETRIS W REV HPW

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Cooling</b>									
Refrigeration capacity	(1)	kW	319	363,3	408,4	453,8	512,9	544,8	615
Total absorbed power	(1)	kW	65,6	75,2	84,4	93	103,8	111,9	125,8
EER	(1)		4,86	4,83	4,84	4,88	4,94	4,87	4,89
ESEER	(9)		5,86	5,85	5,83	5,93	6	5,87	5,92
<b>Heating</b>									
Heating capacity	(2)	kW	346,5	394,1	442,7	495,8	554,1	591,3	665,7
Total absorbed power	(2)	kW	78,3	90,2	101	116,8	128,2	134,5	151,1
COP	(2)		4,42	4,37	4,38	4,25	4,32	4,4	4,41
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(7)	%	25%	23%	25%	25%	25%	15%	17%
Refrigerant charge	(8)	kg	29	42	43	44	45	55,5	56
<b>Evaporator</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	55	62,7	70,5	78,2	88,4	93,9	106,1
Head loss	(1)	kPa	31	44	46	28	30	31	34
<b>Condenser</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	65,9	75,1	84,4	93,7	105,7	112,5	126,9
Head loss	(1)	kPa	49	53	55	46	48	52	54
<b>Noise levels</b>									
Sound power lev.	(4)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(5)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(4)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(5)	dB(A)	64	65	65	66	66	66	66
<b>Dimensions and weights**</b>									
Length		mm	2.834	2.834	2.834	2.834	2.834	3.334	3.334
Depth		mm	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880
Operating weight	(6)	kg	1.450	1.530	1.610	1.650	1.720	2.040	2.150

- (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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.
- (6) The weight refers to the unit without any accessory. The introduction of some accessories such as hydraulic modules or recovery exchangers can lead to increased weight that can exceed 10%. For further details refer to the specific drawing of the selected configuration.
- (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.
- (8) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.
- (9) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories
- \*\* Basic unit without included accessories

**TETRIS W REV LC**

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	32,7	37,3	40,7	47,7	54,8	61,5	70,5	85,5
Total absorbed power	(1)	kW	10,2	11,8	12,5	14,4	16,8	18,9	21	25,1
EER	(1)		3,2	3,16	3,25	3,32	3,25	3,26	3,36	3,41
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(2)	%	50%	50%	50%	50%	50%	50%	50%	50%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	5,7	6,5	7	8,3	9,5	10,6	12,2	14,8
Head loss	(1)	kPa	32,9	31,3	31,4	37,5	39,9	27,6	25	34,5
<b>Noise levels</b>										
Sound power lev.	(3)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(4)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(3)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(4)	dB(A)	50	52	53	55	55	56	56	58
<b>Dimensions and weights**</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	1.633	1.633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	967	967	967	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	28	35	35	42	42	42	42	42
Liquid line diameter		mm	16	18	18	22	22	28	28	28

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) 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.

(3) Sound power level obtained from measurements carried out in accordance with standard ISO 3744. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

(4) Sound pressure level measured at a distance of 1 metre from the unit in free field, with directivity factor Q=2. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

\*\* Basic unit without included accessories

## TETRIS W REV LC

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	97,6	109,6	124,5	138,5	157,4	171,4	189,3	213,2
Total absorbed power	(1)	kW	28,6	32,1	36,4	40,5	46,2	51,7	60,2	66,2
EER	(1)		3,41	3,41	3,43	3,42	3,41	3,31	3,14	3,22
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(2)	%	43%	50%	44%	50%	45%	50%	50%	50%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	16,9	18,9	21,5	23,9	27,2	29,6	32,7	36,8
Head loss	(1)	kPa	33,7	27	28	30	32	32	38	39
<b>Noise levels</b>										
Sound power lev.	(3)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(4)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(3)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(4)	dB(A)	59	60	62	62	63	64	64	64
<b>Dimensions and weights**</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	2.017	2.017
Depth		mm	792	792	792	792	792	792	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	42	54	54	54	67	67	67	67
Liquid line diameter		mm	28	35	35	35	35	35	35	35

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) 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.

(3) Sound power level obtained from measurements carried out in accordance with standard ISO 3744. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

(4) Sound pressure level measured at a distance of 1 metre from the unit in free field, with directivity factor Q=2. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

\*\* Basic unit without included accessories

## TETRIS W REV LC

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	275,8	311,8	345,7	141,6	171,5	194,4	219,4	249,3
Total absorbed power	(1)	kW	78	90,4	99,4	41,7	49,9	57	64	72,4
EER	(1)		3,54	3,45	3,48	3,39	3,43	3,41	3,43	3,44
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(2)	%	67%	67%	67%	25%	25%	21%	25%	22%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	47,6	53,8	59,7	24,4	29,6	33,5	37,8	43
Head loss	(1)	kPa	51	47	46	22	25	25	25	27
<b>Noise levels</b>										
Sound power lev.	(3)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(4)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(3)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(4)	dB(A)	64	64	66	58	59	62	62	64
<b>Dimensions and weights**</b>										
Length		mm	2.017	2.017	2.017	2.017	2.017	2.834	2.834	2.834
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	67	76	76	42	42	42	54	54
Liquid line diameter		mm	42	42	42	28	28	28	35	35

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) 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.

(3) Sound power level obtained from measurements carried out in accordance with standard ISO 3744. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

(4) Sound pressure level measured at a distance of 1 metre from the unit in free field, with directivity factor Q=2. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

\*\* Basic unit without included accessories

## TETRIS W REV LC

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Cooling</b>									
Refrigeration capacity	(1)	kW	278	320	356,9	391,2	439,1	473	532,8
Total absorbed power	(1)	kW	81	92,1	103,1	119,8	131,9	137	154,2
EER	(1)		3,43	3,47	3,46	3,26	3,33	3,45	3,46
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(2)	%	25%	23%	25%	25%	25%	30%	33%
<b>User-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m <sup>3</sup> /h	48	55,2	61,6	67,4	75,7	81,5	91,8
Head loss	(1)	kPa	37	35	36	21	22	25	26
<b>Noise levels</b>									
Sound power lev.	(3)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(4)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(3)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(4)	dB(A)	64	65	65	66	66	66	66
<b>Dimensions and weights**</b>									
Length		mm	2.834	2.834	2.834	2.834	2.834	3.334	3.334
Depth		mm	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>									
Suction line diameter		mm	54	67	67	67	67	67	67
Liquid line diameter		mm	35	35	35	35	42	35	35

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) 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.

(3) Sound power level obtained from measurements carried out in accordance with standard ISO 3744. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

(4) Sound pressure level measured at a distance of 1 metre from the unit in free field, with directivity factor Q=2. Reference conditions: source side heat exchanger inlet/outlet water temperature 30/35°C; user side heat exchanger inlet/outlet water temperature 12/7°C

\*\* Basic unit without included accessories

**TETRIS W REV LC/HP**

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	30,4	35,1	37,1	44,5	51,5	59,4	67,0	78,4
Total absorbed power	(1)	kW	10,2	11,7	12,5	14,3	16,9	18,9	21,0	25,0
EER	(1)		2,97	2,99	2,97	3,11	3,05	3,15	3,20	3,14
<b>Heating</b>										
Heating capacity	(2)	kW	34,3	39,2	41,8	47,9	56,7	64,6	71,8	85,2
Total absorbed power	(2)	kW	9,7	11,1	11,8	13,6	16,0	18,2	20,0	23,6
COP	(2)		3,54	3,55	3,56	3,51	3,53	3,55	3,59	3,62
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(3)	%	50%	50%	50%	50%	50%	50%	50%	50%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	5,3	6,1	6,4	7,7	8,9	10,3	11,6	13,5
Head loss	(1)	kPa	33	28	30	26	34	25	29	29
Water flow rate	(2)	m³/h	5,9	6,7	7,2	8,2	9,7	11,1	12,3	14,6
Head loss	(2)	kPa	41	34	37	29	40	29	32	33
<b>Noise levels</b>										
Sound power lev.	(5)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure lev.	(4)	dB(A)	57	59	60	62	62	63	63	65
Sound power lev. LN vers.	(5)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure lev. LN vers.	(4)	dB(A)	50	52	53	55	55	56	56	58
<b>Unit dimensions and weights **</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	1.633	1.633
Depth		mm	792	792	792	792	792	792	792	792
Height		mm	967	967	967	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	28	35	35	42	42	42	42	42
Liquid line diameter		mm	16	18	18	22	22	28	28	28

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) Evaporating temperature -5°C; user-side heat exchanger inlet-outlet water temperature 40/45°C. Values compliant with standard EN 14511

(3) 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.

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

\*\* Basic unit without included accessories

## TETRIS W REV LC/HP

			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	89,1	100,2	113,5	126,4	145,1	163,3	180,4	214,5
Total absorbed power	(1)	kW	28,6	32,0	36,3	40,5	46,0	51,7	60,1	66,0
EER	(1)		3,12	3,13	3,13	3,12	3,15	3,16	3,00	3,25
<b>Heating</b>										
Heating capacity	(2)	kW	96,5	108,1	122,8	137,4	157,0	176,4	198,5	221,6
Total absorbed power	(2)	kW	27,1	30,4	34,7	38,8	44,2	49,9	56,3	62,5
COP	(2)		3,56	3,55	3,54	3,54	3,55	3,53	3,53	3,55
<b>Compressors</b>										
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Minimum capacity reduction step	(3)	%	43%	50%	44%	50%	45%	50%	50%	50%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	15,4	17,3	19,6	21,8	25,1	28,2	31,1	37,0
Head loss	(1)	kPa	37	31	33	34	33	42	24	23
Water flow rate	(2)	m³/h	16,5	18,5	21,0	23,5	26,9	30,2	34,0	38,0
Head loss	(2)	kPa	42	35	38	40	39	48	29	24
<b>Noise levels</b>										
Sound power lev.	(5)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure lev.	(4)	dB(A)	66	67	69	69	70	71	71	71
Sound power lev. LN vers.	(5)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure lev. LN vers.	(4)	dB(A)	59	60	62	62	63	64	64	64
<b>Unit dimensions and weights **</b>										
Length		mm	1.633	1.633	1.633	1.633	1.633	1.633	2.017	2.017
Depth		mm	792	792	792	792	792	792	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	42	54	54	54	67	67	67	67
Liquid line diameter		mm	28	35	35	35	35	35	35	35

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) Evaporating temperature -5°C; user-side heat exchanger inlet-outlet water temperature 40/45°C. Values compliant with standard EN 14511

(3) 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.

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

\*\* Basic unit without included accessories

## TETRIS W REV LC/HP

			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
<b>Cooling</b>										
Refrigeration capacity	(1)	kW	248,4	270,9	302,8	134,3	158,2	178,8	201,0	232,9
Total absorbed power	(1)	kW	77,3	90,0	98,9	41,7	49,6	56,7	63,7	72,1
EER	(1)		3,21	3,01	3,06	3,22	3,19	3,16	3,15	3,23
<b>Heating</b>										
Heating capacity	(2)	kW	262,5	299,1	333,0	144,5	169,6	193,2	210,1	243,2
Total absorbed power	(2)	kW	73,1	85,5	93,2	40,2	47,4	54,1	66,1	67,7
COP	(2)		3,59	3,50	3,57	3,59	3,58	3,57	3,18	3,59
<b>Compressors</b>										
Compressors/Circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Minimum capacity reduction step	(3)	%	67%	67%	67%	25%	25%	21%	25%	22%
<b>User-side heat exchanger</b>										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	42,9	46,7	52,2	23,2	27,3	30,9	34,7	40,2
Head loss	(1)	kPa	30	26	30	24	23	24	25	24
Water flow rate	(2)	m³/h	45,0	51,3	57,1	24,8	29,1	33,1	36,0	41,7
Head loss	(2)	kPa	33	31	36	27	26	28	27	26
<b>Noise levels</b>										
Sound power lev.	(5)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure lev.	(4)	dB(A)	71	71	73	65	66	69	69	71
Sound power lev. LN vers.	(5)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure lev. LN vers.	(4)	dB(A)	64	64	66	58	59	62	62	64
<b>Unit dimensions and weights **</b>										
Length		mm	2.017	2.017	2.017	2.017	2.017	2.834	2.834	2.834
Depth		mm	872	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>										
Suction line diameter		mm	67	76	76	42	42	42	54	54
Liquid line diameter		mm	42	42	42	28	28	28	35	35

(1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511

(2) Evaporating temperature -5°C; user-side heat exchanger inlet-outlet water temperature 40/45°C. Values compliant with standard EN 14511

(3) 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.

(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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.

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

\*\* Basic unit without included accessories



## TETRIS W REV LC/HP

			34.4	38.4	40.4	48.4	54.4	56.6	60.6
<b>Cooling</b>									
Refrigeration capacity	(1)	kW	246,7	287,3	325,3	363,8	410,7	436,2	483,8
Total absorbed power	(1)	kW	80,6	91,7	102,7	119,8	131,5	137,4	154,0
EER	(1)		3,06	3,13	3,17	3,04	3,12	3,18	3,14
<b>Heating</b>									
Heating capacity	(2)	kW	275,6	310,4	349,6	403,1	442,9	466,5	524,7
Total absorbed power	(2)	kW	77,1	87,4	97,2	114,5	124,7	129,2	145,8
COP	(2)		3,58	3,55	3,60	3,52	3,55	3,61	3,60
<b>Compressors</b>									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Minimum capacity reduction step	(3)	%	25%	23%	25%	25%	25%	30%	33%
<b>User-side heat exchanger</b>									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate	(1)	m³/h	42,6	49,5	56,1	62,7	70,8	75,2	83,4
Head loss	(1)	kPa	34	27	18	19	20	23	24
Water flow rate	(2)	m³/h	47,2	53,2	60,0	69,2	76,0	80,1	90,0
Head loss	(2)	kPa	42	31	21	23	23	26	28
<b>Noise levels</b>									
Sound power lev.	(5)	dB(A)	88	89	90	90	91	91	91
Sound pressure lev.	(4)	dB(A)	71	72	72	73	73	73	73
Sound power lev. LN vers.	(5)	dB(A)	81	82	83	83	84	84	84
Sound pressure lev. LN vers.	(4)	dB(A)	64	65	65	66	66	66	66
<b>Unit dimensions and weights **</b>									
Length		mm	2.834	2.834	2.834	2.834	2.834	3.334	3.334
Depth		mm	872	872	872	872	872	872	872
Height		mm	1.880	1.880	1.880	1.880	1.880	1.880	1.880
<b>Diameters of refrigerant connections</b>									
Suction line diameter		mm	54	67	67	67	67	67	67
Liquid line diameter		mm	35	35	35	35	42	35	35

- (1) Condensing temperature 50°C; user-side heat exchanger inlet-outlet water temperature 12/7°C. Values compliant with standard EN 14511
- (2) Evaporating temperature -5°C; user-side heat exchanger inlet-outlet water temperature 40/45°C. Values compliant with standard EN 14511
- (3) 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.
- (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. Binding values. Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
- (5) Values obtained from the sound power level (condition in note 4), referred to a distance of 1 m from the unit in free field with directivity factor Q = 2. Non-binding values.

\*\* 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 ( $P_{\text{design}} \leq 400$  kW)
- Regulation 2016/2281, for chillers and heat pumps with  $P_{\text{design}} > 400$  kW
- Regulation 2013/811, for heat pumps with  $P_{\text{design}} \leq 70$  kW.

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

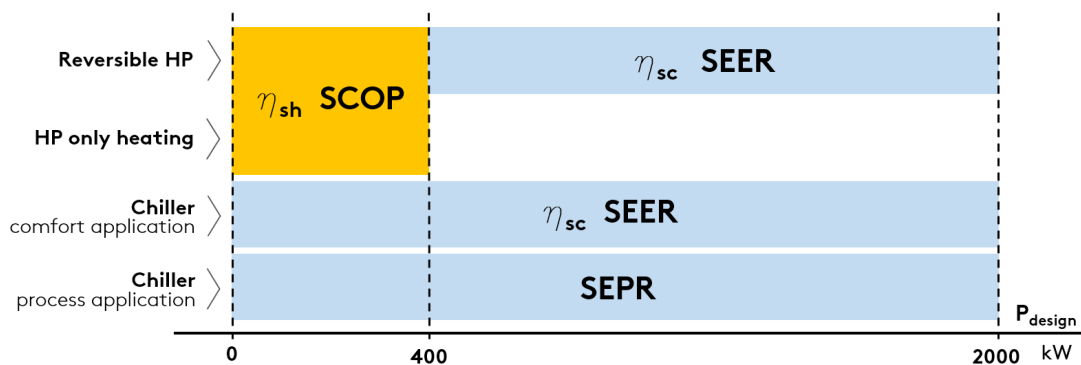
The other two regulations (2013/813 and 2016/2281) set seasonal efficiency targets that the products must comply with to be sold and installed in the European Union (essential requirement for CE marking).

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

- $\eta_{\text{sh}}$  (SCOP), with reference to regulation 2013/813
- $\eta_{\text{sc}}$  (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  $\eta_{\text{sc}}$  (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	P <sub>design</sub>	$\eta_{sc}$ [%]	SEER	$\eta_{sc}$ [%]	SEER
air	< 400kW	149	3,8	161	4,1
air	$\geq$ 400kW	161	4,1	179	4,55
water	< 400kW	196	5,1	200	5,2
water	$\geq$ 400kW and < 1500kW	227	5,875	252	6,5
water	$\geq$ 1500kW	245	6,325	272	7

REGULATION 2016/2281, process application

TYPE OF UNIT		MINIMUM REQUIREMENT	
		Tier 1	Tier 2 (2021)
SOURCE	P <sub>design</sub>	SEPR	SEPR
air	< 400kW	4,5	5
air	$\geq$ 400kW	5	5,5
water	< 400kW	6,5	7
water	$\geq$ 400kW and < 1500kW	7,5	8
water	$\geq$ 1500kW	8	8,5

REGULATION 2013/813

SOURCE	APPLICATION	MINIMUM REQUIREMENT	
		$\eta_{sh}$ [%]	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
<b>Chiller</b>	< 18°C	SEER/η <sub>sc</sub> low temperature application	2016/2281
	≥ 18°C	SEER/η <sub>sc</sub> medium temperature application	2016/2281
<b>Heat pumps (reversible and only heating) P<sub>design</sub> ≤ 400kW</b>		SCOP/η <sub>sh</sub>	2013/813
<b>Reversible heat pumps P<sub>design</sub> &gt; 400kW</b>	< 18°C	SEER/η <sub>sc</sub> low temperature application	2016/2281
	≥ 18°C	SEER/η <sub>sc</sub> medium temperature application	2016/2281
<b>Heat pumps only heating P<sub>design</sub> &gt; 400kW</b>		-	-

#### PROCESS APPLICATION

PRODUCT	OUTLET WATER TEMPERATURE	COMPLIANCE INDEX	REGULATION
<b>Chiller</b>	≥ +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 (η<sub>sc</sub>) than the configuration with standard fans.

#### TETRIS W REV RANGE

As regards, specifically, the Tetris W Rev range, below, the regulations of interest for the various units in the various configurations.

#### Tetris W Rev:

- regulation 2016/2281

#### Tetris W Rev HPW and Tetris W Rev /HP:

- Regulation 2013/813 and 2013/811 from size 3.2 to 8.2
- Regulation 2013/813 from size 9.2 to 34.3 and from size 18.4 to 34.4
- **Regulation 2016/2281 for the remaining units**

#### Tetris W Rev OH:

- Regulation 2013/813 and 2013/811 from size 3.2 to 8.2
- Regulation 2013/813 from size 9.2 to 34.3 and from size 18.4 to 34.4
- **the remaining units are exempt from any regulation as heat pumps for heating only with P<sub>design</sub> > 400 kW**

## TETRIS W REV

			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
<b>REGULATION 2016/2281</b>										
Pdesign	(1)	kW	38	44	50	55	64	72	82	100
<b>COMFORT</b>										
$\eta_{sc}$	(1)	%	201,2	201,3	200,8	202,6	201,7	205,6	200,9	200
SEER	(1)		5,23	5,23	5,22	5,27	5,24	5,34	5,22	5,2
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y	Y	Y
<b>PROCESS</b>										
SEPR	(3)		7,22	7,2	7,27	7,21	7,28	7,25	7,23	7,22
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y	Y	Y
			<b>12.2</b>	<b>13.2</b>	<b>15.2</b>	<b>17.2</b>	<b>19.2</b>	<b>20.2</b>	<b>24.2</b>	<b>27.2</b>
<b>REGULATION 2016/2281</b>										
Pdesign	(1)	kW	113	131	145	161	183	200	222	252
<b>COMFORT</b>										
$\eta_{sc}$	(1)	%	206,3	201,5	201,2	200,5	205,8	200,7	215,7	213
SEER	(1)		5,36	5,24	5,23	5,21	5,35	5,22	5,59	5,52
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y	Y	Y
<b>PROCESS</b>										
SEPR	(3)		7,2	7,18	7,16	7,14	7,12	7,1	7,15	7,21
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y	Y	Y
			<b>30.3</b>	<b>34.3</b>	<b>40.3</b>	<b>18.4</b>	<b>20.4</b>	<b>24.4</b>	<b>26.4</b>	<b>30.4</b>
<b>REGULATION 2016/2281</b>										
Pdesign	(1)	kW	311	347	385	163	198	225	254	288
<b>COMFORT</b>										
$\eta_{sc}$	(1)	%	215,2	221,3	216,8	215,4	222,5	218,5	220,1	216,2
SEER	(1)		5,58	5,73	5,62	5,59	5,76	5,66	5,7	5,6
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y	Y	Y
<b>PROCESS</b>										
SEPR	(3)		7,25	7,29	7,5	7,23	7,17	7,15	7,25	7,37
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y	Y	Y
			<b>34.4</b>	<b>38.4</b>	<b>40.4</b>	<b>48.4</b>	<b>54.4</b>	<b>56.6</b>	<b>60.6</b>	
<b>REGULATION 2016/2281</b>										
Pdesign	(1)	kW	320	365	410	455	514	546	617	
<b>COMFORT</b>										
$\eta_{sc}$	(1)	%	209,8	212,1	228,4	231,2	229,9	227,4	227,2	
SEER	(1)		5,45	5,5	5,91	5,98	5,95	5,89	5,88	
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y	
Compliance Tier 2 (2021)	(1)		Y	Y	N	N	N	N	N	
<b>PROCESS</b>										
SEPR	(3)		7,42	7,43	7,5	7,51	7,53	7,52	7,51	
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y	Y	
Compliance Tier 2 (2021)	(3)		Y	Y	N	N	N	N	N	

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.

## TETRIS W REV /HP

			3.2	4.2	5.2	6.2
<b>REGULATION 2013/813</b>						
<b>Low Temperature Application</b>						
Pdesign	(1)	kW	47	53	57	64
$\eta_{sh}$	(1)	%	204	202,4	204,8	211,2
SCOP	(1)		5,3	5,26	5,32	5,48
Compliance	(1)		Y	Y	Y	Y
<b>Medium Temperature Application</b>						
Pdesign	(2)	kW	44	51	47	53
$\eta_{sh}$	(2)	%	169,9	169,9	175,8	180,6
SCOP	(2)		4,45	4,45	4,59	4,72
Compliance	(2)		Y	Y	Y	Y
<b>REGULATION 2013/811</b>						
Ecolabel LT	(3)		A++	A++	A++	A++
Ecolabel MT	(4)		A++	A++	A++	A++

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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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.

(3) Efficiency class referred to Regulation 2013/811, operating conditions specified in note 1 (low temperature applications).

## TETRIS W REV /HP

			7.2	8.2	9.2	10.2	12.2	13.2	15.2
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	77	87	90	115	131	148	167
$\eta_{sh}$	(1)	%	208,4	223,6	213,6	214	210,4	214	212
SCOP	(1)		5,41	5,79	5,54	5,55	5,46	5,55	5,5
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	65	70	80	94	109	122	139
$\eta_{sh}$	(2)	%	182,3	178,6	177,9	177,3	181,5	178,9	182,7
SCOP	(2)		4,76	4,67	4,65	4,63	4,73	4,67	4,77
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y
			17.2	19.2	20.2	24.2	27.2	30.3	34.3
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	185	213	239	268	302	338	399
$\eta_{sh}$	(1)	%	212,8	216,4	211,2	217,2	227,2	213,6	211,2
SCOP	(1)		5,52	5,61	5,48	5,63	5,88	5,54	5,48
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	172	175	197	265	282	305	400
$\eta_{sh}$	(2)	%	176,5	183,3	178,9	178,2	182,7	190,7	180,1
SCOP	(2)		4,61	4,78	4,67	4,65	4,77	4,97	4,7
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y
			18.4	20.4	24.4	26.4	30.4	34.4	
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	195	231	264	293	331	367	
$\eta_{sh}$	(1)	%	220,8	214	206,8	221,6	216	215,6	
SCOP	(1)		5,72	5,55	5,37	5,74	5,6	5,59	
Compliance	(1)		Y	Y	Y	Y	Y	Y	
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	161	214	225	239	278	336	
$\eta_{sh}$	(2)	%	189,5	181	187,7	188,3	191,1	182,6	
SCOP	(2)		4,94	4,73	4,89	4,91	4,98	4,77	
Compliance	(2)		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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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.

## TETRIS W REV /HP

			40.3	38.4	40.4	48.4	54.4	56.6	60.6
<b>REGULATION 2016/2281</b>									
P <sub>design</sub>	(1)	kW	350	329	366	411	467	493	549
<b>COMFORT</b>									
η <sub>sc</sub>	(1)	%	198,6	196,2	202,3	227,3	227,2	227,2	227,2
SEER	(1)		5,17	5,1	5,26	5,88	5,88	5,88	5,88
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	Y	N	N	N	N

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.

## TETRIS W REV HPW

			3.2	4.2	5.2	6.2
<b>REGULATION 2013/813</b>						
<b>Low Temperature Application</b>						
Pdesign	(1)	kW	47	53	57	64
ηsh	(1)	%	204	202,4	204,8	211,2
SCOP	(1)		5,3	5,26	5,32	5,48
Compliance	(1)		Y	Y	Y	Y
<b>Medium Temperature Application</b>						
Pdesign	(2)	kW	44	51	47	53
ηsh	(2)	%	169,9	169,9	175,8	180,6
SCOP	(2)		4,45	4,45	4,59	4,72
Compliance	(2)		Y	Y	Y	Y
<b>REGULATION 2013/811</b>						
Ecolabel LT	(3)		A++	A++	A++	A++
Ecolabel MT	(4)		A++	A++	A++	A++

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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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.

(3) Efficiency class referred to Regulation 2013/811, operating conditions specified in note 1 (low temperature applications).

## TETRIS W REV HPW

			7.2	8.2	9.2	10.2	12.2	13.2	15.2
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	77	87	90	115	131	148	167
ηsh	(1)	%	208,4	223,6	213,6	214	210,4	214	212
SCOP	(1)		5,41	5,79	5,54	5,55	5,46	5,55	5,5
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	65	70	80	94	109	122	139
ηsh	(2)	%	182,3	178,6	177,9	177,3	181,5	178,9	182,7
SCOP	(2)		4,76	4,67	4,65	4,63	4,73	4,67	4,77
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y
			17.2	19.2	20.2	24.2	27.2	30.3	34.3
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	185	213	239	268	302	338	399
ηsh	(1)	%	212,8	216,4	211,2	217,2	227,2	213,6	211,2
SCOP	(1)		5,52	5,61	5,48	5,63	5,88	5,54	5,48
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	172	175	197	265	282	305	400
ηsh	(2)	%	176,5	183,3	178,9	178,2	182,7	190,7	180,1
SCOP	(2)		4,61	4,78	4,67	4,65	4,77	4,97	4,7
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y
			18.4	20.4	24.4	26.4	30.4	34.4	
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	195	231	264	293	331	367	
ηsh	(1)	%	220,8	214	206,8	221,6	216	215,6	
SCOP	(1)		5,72	5,55	5,37	5,74	5,6	5,59	
Compliance	(1)		Y	Y	Y	Y	Y	Y	
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	161	214	225	239	278	336	
ηsh	(2)	%	189,5	181	187,7	188,3	191,1	182,6	
SCOP	(2)		4,94	4,73	4,89	4,91	4,98	4,77	
Compliance	(2)		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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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.



## TETRIS W REV HPW

			40.3	38.4	40.4	48.4	54.4	56.6	60.6
<b>REGULATION 2016/2281</b>									
P <sub>design</sub>	(1)	kW	385	365	366	411	467	493	549
<b>COMFORT</b>									
η <sub>sc</sub>	(1)	%	198,6	196,2	202,3	227,3	227,2	227,2	227,2
SEER	(1)		5,17	5,1	5,26	5,88	5,88	5,88	5,88
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	Y	N	N	N	N

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.

## TETRIS W REV OH

			3.2	4.2	5.2	6.2
<b>REGULATION 2013/813</b>						
<b>Low Temperature Application</b>						
Pdesign	(1)	kW	47	53	57	64
$\eta_{sh}$	(1)	%	204	202,4	204,8	211,2
SCOP	(1)		5,3	5,26	5,32	5,48
Compliance	(1)		Y	Y	Y	Y
<b>Medium Temperature Application</b>						
Pdesign	(2)	kW	44	51	47	53
$\eta_{sh}$	(2)	%	169,9	169,9	175,8	180,6
SCOP	(2)		4,45	4,45	4,59	4,72
Compliance	(2)		Y	Y	Y	Y
<b>REGULATION 2013/811</b>						
Ecolabel LT	(3)		A++	A++	A++	A++
Ecolabel MT	(4)		A++	A++	A++	A++

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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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.

(3) Efficiency class referred to Regulation 2013/811, operating conditions specified in note 1 (low temperature applications).

## TETRIS W REV OH

			7.2	8.2	9.2	10.2	12.2	13.2	
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	77	87	90	115	131	148	
$\eta_{sh}$	(1)	%	208,4	223,6	213,6	214	210,4	214	
SCOP	(1)		5,41	5,79	5,54	5,55	5,46	5,55	
Compliance	(1)		Y	Y	Y	Y	Y	Y	
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	65	70	80	94	109	122	
$\eta_{sh}$	(2)	%	182,3	178,6	177,9	177,3	181,5	178,9	
SCOP	(2)		4,76	4,67	4,65	4,63	4,73	4,67	
Compliance	(2)		Y	Y	Y	Y	Y	Y	
			15.2	17.2	19.2	20.2	24.2	27.2	30.3
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	167	185	213	239	268	302	338
$\eta_{sh}$	(1)	%	212	212,8	216,4	211,2	217,2	227,2	213,6
SCOP	(1)		5,5	5,52	5,61	5,48	5,63	5,88	5,54
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	139	172	175	197	265	282	305
$\eta_{sh}$	(2)	%	182,7	176,5	183,3	178,9	178,2	182,7	190,7
SCOP	(2)		4,77	4,61	4,78	4,67	4,65	4,77	4,97
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y
			34.3	18.4	20.4	24.4	26.4	30.4	34.4
<b>REGULATION 2013/813</b>									
<b>Low Temperature Application</b>									
Pdesign	(1)	kW	399	195	231	264	293	331	367
$\eta_{sh}$	(1)	%	211,2	220,8	214	206,8	221,6	216	215,6
SCOP	(1)		5,48	5,72	5,55	5,37	5,74	5,6	5,59
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y
<b>Medium Temperature Application</b>									
Pdesign	(2)	kW	400	161	214	225	239	278	336
$\eta_{sh}$	(2)	%	180,1	189,5	181	187,7	188,3	191,1	182,6
SCOP	(2)		4,7	4,94	4,73	4,89	4,91	4,98	4,77
Compliance	(2)		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 30/35°C, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

(2) 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:

<b>Total hardness</b>	2,0 ÷ 6,0 °f
<b>Langelier index</b>	- 0,4 ÷ 0,4
<b>pH</b>	7,5 ÷ 8,5
<b>Electrical conductivity</b>	10 ÷ 500 µS/cm
<b>Organic elements</b>	-
<b>Hydrogen carbonate (HCO<sub>3</sub><sup>-</sup>)</b>	70 ÷ 300 ppm
<b>Sulphates (SO<sub>4</sub><sup>2-</sup>)</b>	< 50 ppm
<b>Hydrogen carbonate / Sulphates (HCO<sub>3</sub><sup>-</sup>/SO<sub>4</sub><sup>2-</sup>)</b>	> 1
<b>Chlorides (Cl<sup>-</sup>)</b>	< 50 ppm
<b>Nitrates (NO<sub>3</sub><sup>-</sup>)</b>	< 50 ppm
<b>Hydrogen sulphide (H<sub>2</sub>S)</b>	< 0,05 ppm
<b>Ammonia (NH<sub>3</sub>)</b>	< 0,05 ppm
<b>Sulphites (SO<sub>3</sub>), free chlorine (Cl<sub>2</sub>)</b>	< 1 ppm
<b>Carbon dioxide (CO<sub>2</sub>)</b>	< 5 ppm
<b>Metal cations</b>	< 0,2 ppm
<b>Manganese ions (Mn<sup>++</sup>)</b>	< 0,2 ppm
<b>Iron ions ( Fe<sup>2+</sup> , Fe<sup>3+</sup>)</b>	< 0,2 ppm
<b>Iron + Manganese</b>	< 0,4 ppm
<b>Phosphates (PO<sub>4</sub><sup>3-</sup>)</b>	< 2 ppm
<b>Oxygen</b>	< 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.

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

The quantity of antifreeze should be considered as % on weight

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## 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.

The following experimental formula allows the minimum water volume of the system to be calculated:

$$V_{min} = \frac{P_{tot} \cdot 1.000}{N} \cdot \frac{300}{\Delta T \cdot \rho \cdot c_p} + P_{tot} \cdot 0,25$$

where

$V_{min}$  is the minimum water content of the system [l]

$P_{tot}$  is the total cooling capacity of the machine [kW]

N: number of capacity reduction steps

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

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

$c_p$ : 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:

$$V_{min} = \frac{P_{tot}}{N} \cdot 17,2 + P_{tot} \cdot 0,25$$

N is equal to the number of compressors installed in the unit.

## 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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