Multi-pipe units with screw compressors

Model RTMA 105 to 210

Cooling capacity: 344 - 661 kW
Heating capacity: 361 - 714 kW

RLC-PRC043C-GB

Table of Contents

Product presentation

4 PIPE SYSTEM

The RTMA units are high efficiency multi-functional units for 4-pipe systems with semi-hermetic screw compressors.

The possible installation are several, but generally they are the ideal solution for all those buildings undergoing strong opposite variable loads during the whole year.

The main applications are therefore:

- Buildings with double and opposite sun exposure;
- Airports;
- Hotels;
- Banks;
- Hospital, in particular the operating theatre where the cooling or heating demand is independent from the season;
- Discos, in which cooling for the dance floor zone and heating for those areas dedicated to conversation are simultaneously needed;
- Wellness centers where areas with opposite loads requirements are present;
- Datacenter, where the server zone needs to be cooled while the office area needs to both heating and cooling.

The four-pipe technology is considered the best energy efficient solution able to satisfy the complex needs of all those buildings with simultaneous opposite thermal loads.

RTMA, operating in total heat recovery mode, is able to satisfy the simultaneous demand of hot and chilled water over the year, simplifying the plant and reducing operating costs

MICROPROCESSOR DRIVEN ELECTRONIC EXPANSION VALVE

The use of the electronic expansion valve allows to:

- Maximize the heat exchange at the evaporator;
- Minimize the response time according to the load variation;
- Optimize the superheating regulation and ensure the maximum energy efficiency.

HIGH PERFORMANCE TEMPERATURE HPT (OPTIONAL)

It allows to reach hot water temperature up to 65°C in order to satisfy particular hot water needs.

REFRIGERANT CIRCUIT

The refrigerant circuit is optimized to allow avoiding fault of the unit caused by anti-freeze alarms.

These alarms happen frequently for all the standard multi-functional units not equipped with the appropriate circuit design. The reliability of the system considerably increases the operational reliability of the unit.

Shopping malls **Hospitals** **Airports** **Hotels** **Wellness center**

50% LESS DEFROST CYCLES

A innovative technology is implemented in the electronic control system in order to significantly decrease the number of defrosting cycles, drastically reducing the production of negative energy towards the plant, where a heat pump normally uses to switch the cycle in chiller mode producing chilled water.

It is a digital self-adaptive defrosting system able to intervene only in case of a consistent thickness formation of ice on the coils' fins. In particular, the system reduces the number of defrosting cycles by monitoring the outdoor conditions and the unit evaporation and activates the defrost function only if necessary and if the coils are really iced.

Thanks to this technology the number of defrosting cycles decreases by 50%.

The reduction of mechanical stress, due to the cycle inversions during heating mode, implies an increase in the life cycle of the unit, as well as improving the comfort felt by the user.

DYNAMIC LOGIC CONTROL

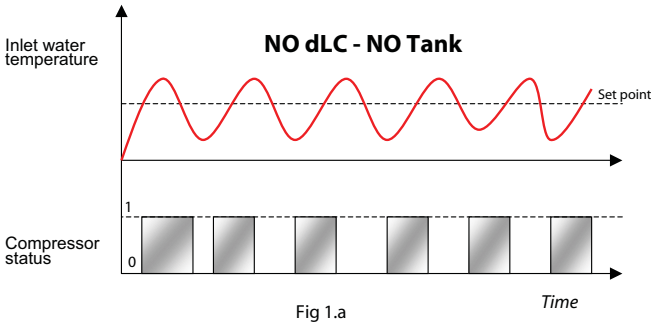


Fig 1.a

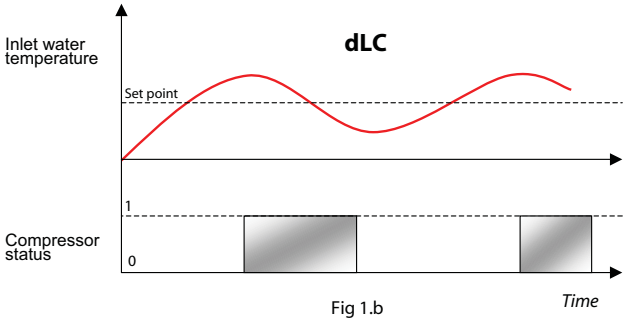


Fig 1.b

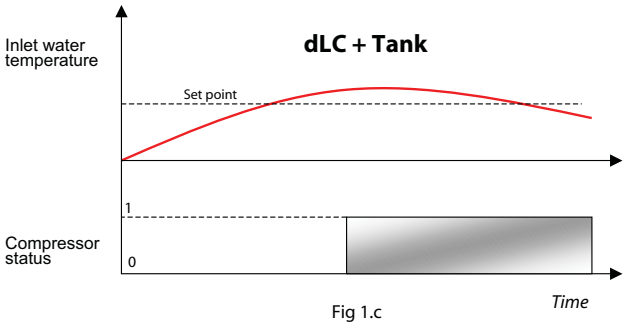


Fig 1.c

The electronic controller can manage the differential of the inlet water temperature on the basis of the speed of its variation.

The function dLC works partially as a simulator of a water tank: in fact it allows to reduce the number of the compressor's starts.

The main advantage of the function dLC is during the conditions of low load, that is:

- the compressor is switched off and the water temperature increases very slowly; in this situation the dLC is able to delay the start of the compressor by replacing itself to the thermal inertia that would be obtained from the water tank;
- the compressor is switched on and the water temperature decreases very quickly; in this situation the dLC is able to delay the compressor's switching off. In this way it is reached the same result that would be obtained from the water tank's thermal inertia.

As result the function dLC makes possible to reduce the dimensions of the water tank, with huge advantages for the footprint of the unit.

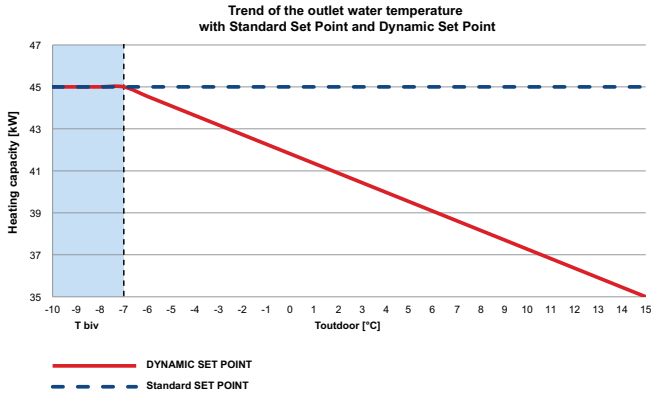
Figure 1 shows how the compressor's startups decrease by passing from a system with no tank and without dLC (1.a) to a system with dLC (1.b) and to a system with dLC and a small water tank (1.c). It can be seen that this last solution is still the best, though the tank dimensions can be reduced.

DYNAMIC SET POINT

During the heating season the outdoor temperature changes from the design temperature, and consequently the heating load of the plant changes too. It is therefore possible to adjust the outlet water temperature according to outdoor temperature by the use of a set point regulation following a climatic curve.

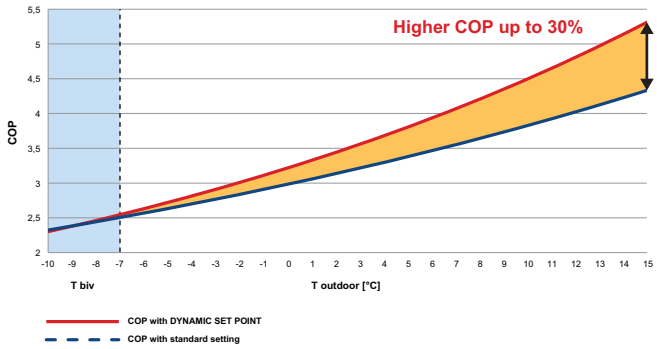
With a bivalent outdoor temperature of - 7°C with fan coils distribution (working with an inlet water temperature of 45°C) it is possible to adjust the outlet water temperature as per a linear trend between the bivalent temperature and 15°C (temperature value to which the heating load is assumed to be zero).

The curve shown is an example of possible regulation: the **DYNAMIC SET POINT** allows to set a regulation curve according to the design choices and to the requirements of each installation. This control allows to keep a high level of comfort and highlights the efficiency of the heat pump.



The efficiency increases with the decrease of the outlet water temperature thanks to a lowest condensing temperature of the refrigerant.

The diagram shows the COP trend for the standard set point and the Dynamic Set Point. The **DYNAMIC SETPOINT** allows to adjust the working set point of the unit maximizing the comfort and the efficiency of the unit.



ELECTRONICALLY COMMUTATED BRUSHLESS FANS (OPTIONAL)

The new generation EC-BRUSHLESS fans ensure a higher efficiency thanks to lower energy consumption compared to traditional AC motors.

The EC motors allow therefore lower sound emissions during the air flow modulation.

The blade profile has been studied to reduce noise and ensure high acoustic comfort levels.

NEW SUPERVISIONING CONTROL SYSTEM

The new generation and the most advanced control system entirely custom made able to manage and optimize the unit operation by coordinating the interaction between all the components:

compressors, fans, inverter pumps and electronic expansion valves, maximizing the efficiency of the multi-functional system. It allows the interface with the main BMS system, via RS485, the routing on the web of all the operating parameters of the unit, allowing a total remote control of the unit through the Ethernet port RJ45, and the interface with the expansion modules I/O, via CanBus.

ENERGY SAVING

The unit can be turned off according to time bands. An innovative **Energy Saving** function can be also activated to regulate the on-off of the unit. By activating this function, at certain time bands, the controller will adjust the set point value to those required by the user.

Thanks to the Energy saving the unit will be “forced to work more” at certain time when the cost of electricity is lower or even to work less when there is a lower heating load.

The electronic control gives priority to the automatic shutdown, if the two functions should be active for the same daily time band.

Operating modes

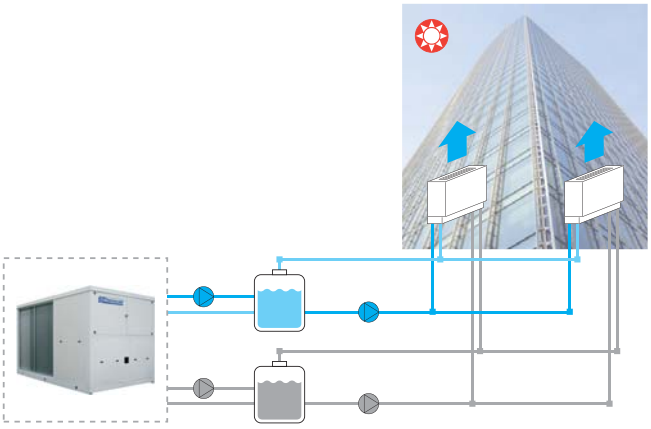
The multi-functional units are made by 2 distinct sections, the hot one at condenser side, and the cold one at evaporator side: the simultaneous production of hot and chilled water allows the unit to adapt its operation to any requirement of the plant, in a totally autonomous and self-managed way.

The multi-functional four pipes units automatically switch their operating cycle according to the load demands during the whole year, without doing the manual switch from summer to winter mode as needed for the traditional heat pumps. There are three basic operating modes which are automatically selected in order to minimize the power input and satisfy the thermal load of the plant.

ONLY CHILLER MODE

The unit working in chiller mode dissipates the condensation heat through a finned coil heat exchanger (condenser).

The water is chilled in a direct expansion shell and tube, high efficiency, evaporator.

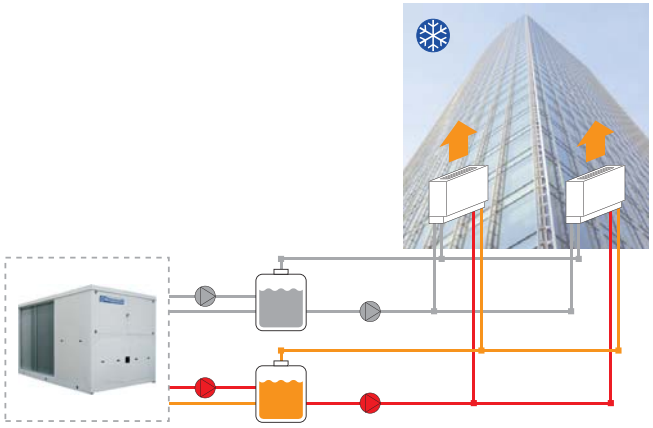


ONLY HEAT PUMP MODE

The unit works in heat pump mode only, exploiting the outdoor air energy to heat the water through a water refrigerant heat exchanger (condenser) Differently from traditional reversible heat pumps the hot water is produced in a different heat exchanger than the one used to produce chilled water.

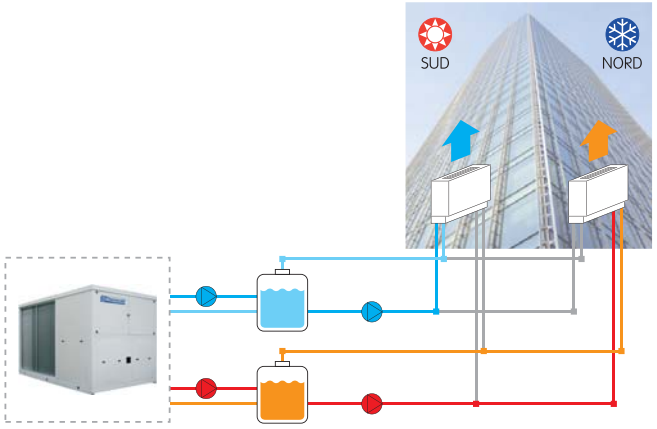
Therefore according to the operating mode, whether the unit works in heat pump mode or in chiller mode, there will be a dedicated heat exchanger for the chilled or hot water production (evaporator or condenser).

This is required in order to keep the cold and hot sections separated, as needed in a 4-pipe system.



CHILLER + TOTAL OR PARTIAL RECOVERY MODE

The unit works as a water-water heat pump if there's a simultaneous demand of hot and chilled water, by controlling the condensation and the evaporation through two different heat exchangers each for its own hydraulic circuit of the 4 pipe plant.



Operating modes

POSSIBLE OPERATING COMBINATIONS

COOLING LOAD (%)	HEATING LOAD (%)	CIRCUIT 1	CIRCUIT 2
0	25	OFF	H (50% PART LOAD)
0	37.5	OFF	H (75% PART LOAD)
0	50	OFF	H (100% FULL LOAD)
0	50	H (50% PART LOAD)	H (50% PART LOAD)
0	62.5	H (50% PART LOAD)	H (75% PART LOAD)
0	75	H (50% PART LOAD)	H (100% FULL LOAD)
0	75	H (75% PART LOAD)	H (75% PART LOAD)
0	87.5	H (100% PART LOAD)	H (75% PART LOAD)
0	100	H (100% PART LOAD)	H (100% FULL LOAD)
25	0	C (50% PART LOAD)	OFF
25	25	C+R (50% PART LOAD)	OFF
25	50	C+R (50% PART LOAD)	H (50% PART LOAD)
25	62.5	C+R (50% PART LOAD)	H (75% PART LOAD)
25	75	C+R (50% PART LOAD)	H (100% FULL LOAD)
37.5	0	C (75% PART LOAD)	OFF
37.5	37.5	C+R (75% PART LOAD)	OFF
37.5	62.5	C+R (75% PART LOAD)	H (50% PART LOAD)
37.5	75	C+R (75% PART LOAD)	H (75% PART LOAD)
37.5	87.5	C+R (75% PART LOAD)	H (100% FULL LOAD)
50	0	C (100% FULL LOAD)	OFF
50	0	C (50% PART LOAD)	C (50% PART LOAD)
50	25	C+R (50% PART LOAD)	C (50% PART LOAD)
50	50	C+R (100% FULL LOAD)	OFF
50	50	C+R (50% PART LOAD)	C+R (50% PART LOAD)
50	75	C+R (100% FULL LOAD)	H (50% PART LOAD)
50	87.5	C+R (100% FULL LOAD)	H (75% PART LOAD)
50	100	C+R (100% FULL LOAD)	H (100% FULL LOAD)
62.5	0	C (75% PART LOAD)	C (50% PART LOAD)
62.5	25	C+R (50% PART LOAD)	C (75% PART LOAD)
62.5	37.5	C+R (75% PART LOAD)	C (50% PART LOAD)
62.5	62.5	C+R (75% PART LOAD)	C+R (50% PART LOAD)
75	0	C (75% PART LOAD)	C (75% PART LOAD)
75	0	C (100% FULL LOAD)	C (50% PART LOAD)
75	25	C+R (50% PART LOAD)	C (100% FULL LOAD)
75	37.5	C+R (75% PART LOAD)	C (75% PART LOAD)
75	50	C+R (100% FULL LOAD)	C (50% PART LOAD)
75	75	C+R (75% PART LOAD)	C+R (75% PART LOAD)
75	75	C+R (100% FULL LOAD)	C+R (50% PART LOAD)
87.5	0	C (100% FULL LOAD)	C (75% PART LOAD)
87.5	37.5	C+R (75% PART LOAD)	C (100% FULL LOAD)
87.5	50	C+R (100% FULL LOAD)	C (75% PART LOAD)
87.5	87.5	C+R (100% FULL LOAD)	C+R (75% PART LOAD)
100	0	C (100% FULL LOAD)	C (100% FULL LOAD)
100	50	C+R (100% FULL LOAD)	C (100% FULL LOAD)
100	100	C+R (100% FULL LOAD)	C+R (100% FULL LOAD)

H HEAT PUMP MODE
C CHILLER MODE
C+R CHILLER + RECOVERY MODE

Operating range

Version	Operating mode	Ta (°C)		Tw out (°C)	
		Min	Max	Min	Max
Std - SL	Cooling	18/5 (3)	43	-6 (1)	18
Std - SL	Heating	-15	30	25/30 (3)	60/65 (2)

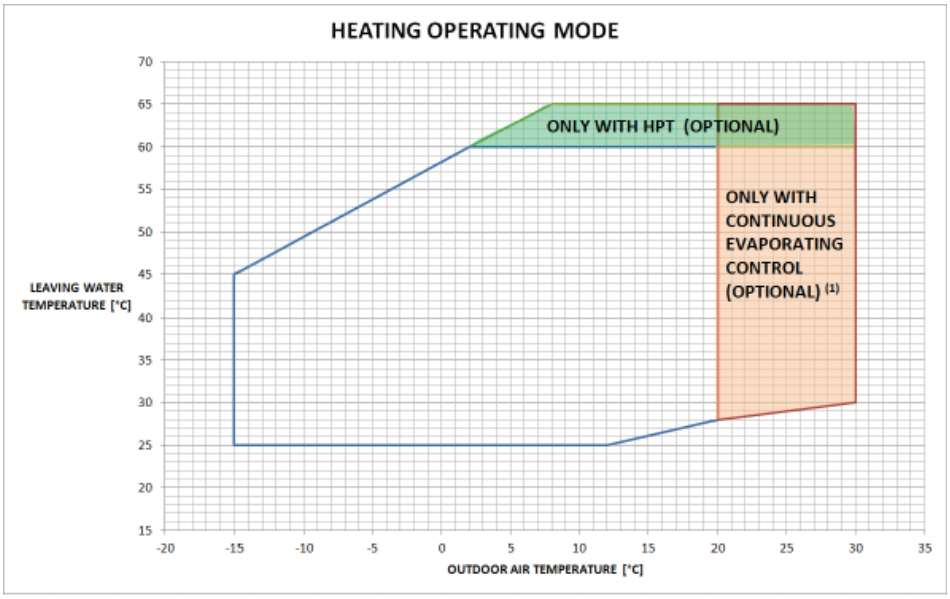
(1) Operation with glycol.

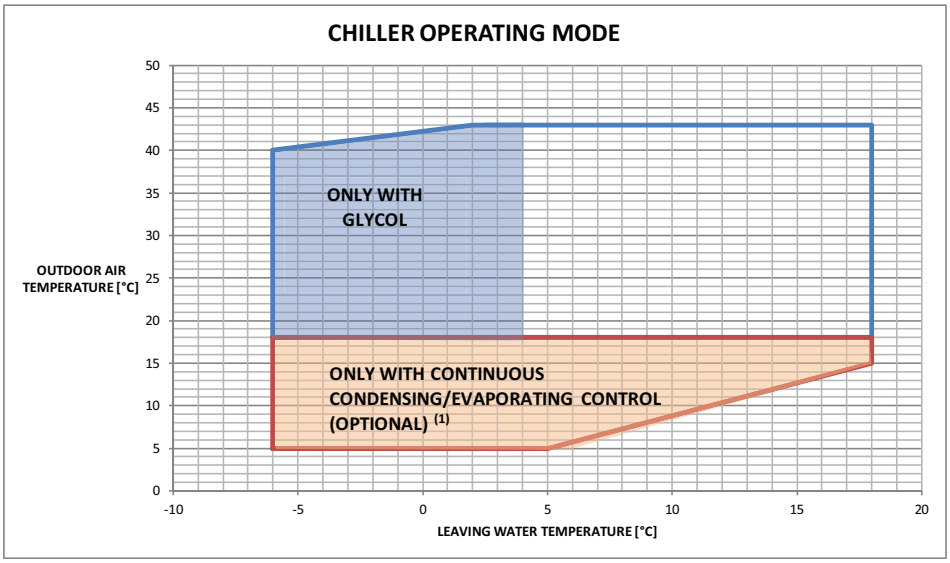
(2) Units equipped with accessory HPT (High Performance Temperature), to reach hot water temperature up to 65 °C.

(3) Units equipped with continuous condensing/evaporating control (optional).

Ta = Outdoor air temperature (°C)

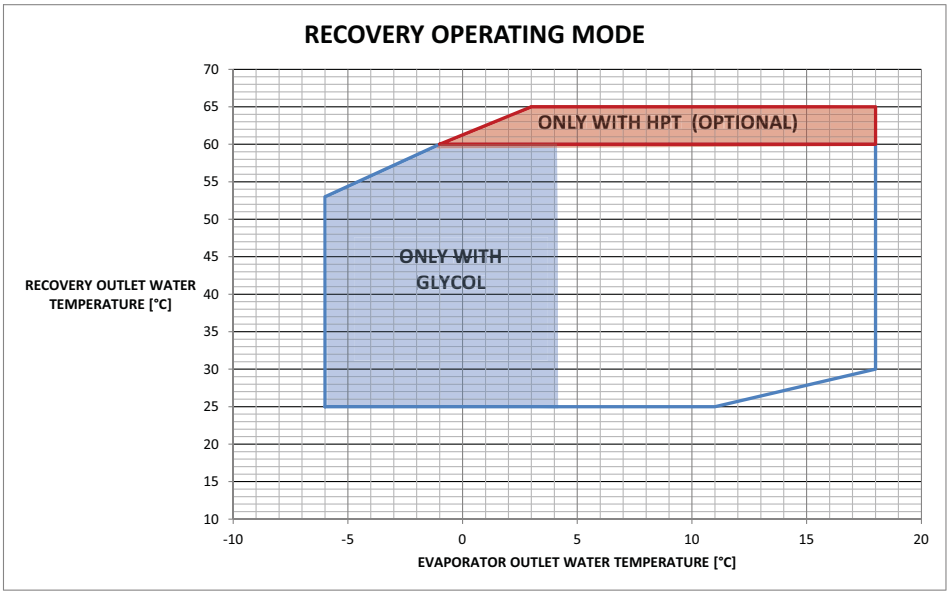
Tw out = Leaving water temperature (°C)





(1) In this area the fans modulate in order to control the condensing/evaporating temperature. The performances may be different from the declared ones.

Operating range



The minimum outdoor air temperature is based on low wind speeds (wind not exceeding 15 km/h). Greater wind speeds will result in a drop in head pressure, therefore increasing the minimum starting and/or operating outdoor air temperature.

In case of higher wind speeds it may be necessary to install appropriate wind barriers to avoid the operating limit reduction.

Model number

The encoding of RTMA is simple and follows the rules defined by Trane for all other units:

DIGIT																										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
R	T	M	A	1	3	0	S	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

Digits 1 to 4: RTMA = Screw compressor unit for Multi-pipe application

Digits 5 to 7 = Unit size (Nominal tonnage)
105 Size 105 (105 tons)
115 Size 115 (115 tons)
120 Size 120 (120 tons)
130 Size 130 (130 tons)
150 Size 150 (150 tons)
170 Size 170 (170 tons)
180 Size 180 (180 tons)
190 Size 190 (190 tons)
210 Size 210 (210 tons)

Digit 8 = Acoustics
X Standard Noise
L Low Noise
S Super Low Noise

Digit 9 = Pump package
X Without (Standard)
1 2 pumps, Low Head pressure
2 2 pumps, Medium Head pressure
3 2 pumps, High Head pressure
4 2+2 pumps, Low Head pressure
5 2+2 pumps, Medium Head pressure
6 2+2 pumps, High Head pressure

Digit 10 = Remote control display
X Without (Standard)
1 With Remote Control Display

Digit 11 = Power factor correction
X Without (Standard)
1 Cos Phi = 0.91

Digit 12 = Control panel electric heater with thermostat
X Without (Standard)
1 With

Digit 13 = Phase failure protection relay
1 With (Standard)

Digit 14 = Communication card
X RS485 (Standard)
1 Serial card with BacNet Protocol MS/TP
2 Serial card with BacNet Protocol TCP/IP
3 LonTalk™ gateway

Digit 15 = Soft starter
X Without (Standard)
1 With

Digit 16 = Automatic circuit breakers
X Without (Standard)
1 With

Digit 17 = Condensing control
X Standard
1 With variable fan speed modulation
2 EC Fans

Digit 18: Numbered wires
X Without (Standard)
1 With

Digit 19: Flow switch
X Without (Standard)
1 With one flow switch
2 With two flow switches

Digit 20 = Automatic water filling
1 With automatic water filling
2 With two automatic water filling
X Without (Standard)

Digit 21 = Water strainer
X Without (Standard)
1 With water strainer
2 With two water strainers

Digit 22 = Water gauges
X Without (Standard)
1 With water gauge
2 With two water gauges

Digit 23 = Gas gauges
X Without (Standard)
1 With

Digit 24 = Condensing coil protection grilles
X Without (Standard)
1 With

Digit 25 = Isolators
X Without (Standard)
1 Rubber anti vibration mounts
2 Spring anti vibration mounts

Digit 26 = Sea container kit
X Without (Standard)
1 With

Digit 27 = Condensing coil
1 Aluminum (Standard)
2 Aluminum + Blygold coated condensing coils
3 Aluminum epoxy coated condensing coils
4 Only epoxy pre-painted aluminum fins
5 Copper/Copper condensing coils
6 Tinned copper/copper condensing coils

Digit 28 = High temperature Hot leaving water (65°C max)
X Without (Standard)
1 With

Digit 29 = High static pressure fans 100Pa
X Without (Standard)
1 With

Digit 30 = Literature language
D Dutch
E English
F French
G German
I Italian
P Polish
R Greek
S Spanish
T Turkish

Digit 31 = Special
X Without (Standard)
S Special request

Digit 32 = Victaulic kit
X Without (Standard)
1 With one Victaulic kit
2 With two Victaulic kits

Technical specifications

RTMA multi-pipe units are equipped with semi-hermetic screw compressors and high efficiency axial fans, available in 9 sizes and in the following version:

ACOUSTIC VERSIONS

L version low noise unit, including condensing control with reduced fan speed (2 steps condensing control (Δ/Y) and soundproof insulation of the compressors box.

S version: super low noise unit. The noise reduction is achieved by soundproof insulation of the compressors box, muffler on the compressor intake and delivery lines, oversized coils and additional fans speed modulation according to the condensing/evaporating pressure. For the S unit, the hydraulic kit is equipped with soundproof box with acoustic insulation.

HYDRAULIC VERSIONS (built-in hydraulic kit)

1 pump for chilled water circuit (150 kPa) + 1 pump for hot water circuit (150 kPa)

1 pump for chilled water circuit (250 kPa) + 1 pump for hot water circuit (250 kPa)

1 pump for chilled water circuit (450 kPa) + 1 pump for hot water circuit (450 kPa)

CASING

Made of galvanized and painted steel with increased thickness and with thermoset polyurethane powder, dried in the oven. The main components (compressor and refrigerant circuit components) are contained in a closed box enclosure with different possibilities of acoustic insulation allowing a easier ordinary and extraordinary maintenance of the components. A closed compartment, easily inspectable, protecting exchangers and pumps is located in the condensing section of the unit. The whole structure is made of galvanized and painted steel. The assembled base frame is composed by longitudinal and transverse components with a thickness of 3mm, coupled by high resistance nailing, the profile has a base of 80mm suitable to the mounting of spring or rubber shock absorbers through holes of 18mm. The structure is fixed to the uprights (thickness 2mm) with bolts and threaded inserts to facilitate their removal, the particular profile of the uprights allow the installation of inspection panels and grids embedded type to protect all the components and at the same time to allow easy and immediate access during any maintenance and service operation.

The painting treatment of the casing is made with epoxy powder, which gives the whole structure a long lasting resistance for outdoor installation, even in aggressive environmental conditions.

COMPRESSORS

Semi-hermetic twin screw helical oil injection, complete with oil separator built in three stages, the latest generation, and oil filter, both for increased efficiency. The compressor is bi-rotor lob with male and female with very high precision workmanship.

The five-lobe rotor is directly mounted on the two pole motor without the interposition of gearboxes. The bearings disposed on the axis of the rotors, in a special chamber isolated from the compression chamber, are made of carbon steel.

The screws with the innovative profile with N-type operation "rolling" allow you to obtain the maximum discharge at the lowest power consumption with a very low noise generation.

The robust mechanics allows to operate with efficiency in the entire field of application and in all speeds of rotation permitted. The bearings mounted in tandem with a high degree of rigidity and precision of operation and resistant to the combination of axial and radial loads, protect the screw rotors against any rotations that might occur during system shutdown.

These bearings have a special cages help to reduce noise and to increase the operational life of the compressors.

In the starting phase, since the pressures are always equalized inside the compressor, there is no circulation of oil, however, the bearings and the screws are designed to tolerate short periods (a few seconds) of operation "dry", waiting they establish the necessary pressure difference.

The three-stage oil separator ensures less migration of oil into the refrigerant circuit and at the same time better lubrication of the mechanical components of the compressors with a significant reduction in noise.

The semi-hermetic screw compressors are available, depending on size, with star-delta starting or dual stator winding separate "part winding", with a considerable reduction of inrush currents, which in an engine with direct starting values could reach three to 8 times higher than the maximum rated currents of operation. The semi-hermetic screw compressors are available with adjustment in steps or continuously with slide valve.

The first type of adjustment is obtained by the combination of three solenoid valves positioned in fixed positions on the body of the compressor that guarantee 4 steps of adjustment; the second is obtained from the combination of two solenoid valves, first one fixed position and the other one button, positioned also on the body of the compressor.

The capacity regulation is realized through a sliding drawer, "shutter", activated by oil pressure of the hydraulic circuit and controlled by solenoid valves positioned on the body of the compressor. The sliding drawer by acting on the volume aspirated by the bolts regulates the flow outlet and the cooling capacity generated by the compressor, resulting in a step change 25%, 50%, 75% and 100% in the first case, continuous from the minimum step at 100% in second.

The cooling capacity control of the compressor allows increased performance at partial loads with a consequent increase in the value ESEER.

The perfect centering of the rotors, in the axial and radial, is ensured by bearings mounted to the ends of the shafts.

The oil circuit will perform the following functions:

- Dynamic seal between the chambers
- Maintenance of a sliding drawer
- Lubricate the bearings and rotors
- Cooling of the moving parts
- Synchronization gear

The oil circulation takes place by the pressure difference between the flow and the pressure of injection of oil, slightly higher than the suction pressure.

The oil and refrigerant mixture undergoes a first separation by virtue of the speed difference between the gas and the oil drops obtained for "Venture" effect, a second separation as a result of centrifugal forces produced by special propellers and a third separation due to effect "filtering "through the parcel of the separator" Demister ", easily accessible and replaceable, in which the oil droplets are subject to continuous changes of direction and speed. The oil, thus separated, is collected inside the oil pan, leaving free the surface of the "Demister", while the gas flows through the discharge valve.

This innovative system ensures a pressure drop below 0.6 bar and a separation efficiency of 99.98% even in the most critical conditions.

The compressor is equipped with non-return valve to prevent internal, at shutdown, the rotors rotate in opposite directions.

The compressor is equipped with a safety valve that connects the areas of high and low pressure. The valve is sized according to EN 60335-2-34 and opens at a differential pressure of 26 bar.

The motors are equipped with an electronic protection device model INT 69 FRY that controls over the temperature of the windings and the temperature of the gas flow in through PTC thermistors and probes mounted on the windings and on the high pressure side also the correct direction of rotation and the presence of the three phases. In more guarantees a start delay of at least 5 minutes in the case of overheating of the windings and a maximum number of 10 starts now. Screw compressors used have wide limits of operation and high values of COP.

The limited number of moving parts, dramatically reduces maintenance.

Special features of screw compressors used are extremely quiet, no vibration and therefore reduced pressure at the inlet pipes discharge pipes, low maintenance.

The compressors are also equipped as standard with:

- Taps delivery
- Upload oil
- Crankcase heater
- Oil Flow.

FANS

The technology of Electronically Commutated motor Fans (EC Fans) propeller fans, has blades statically and dynamically balanced, driven directly by the electric motors, closed type, external rotor and thermal protection for outdoor installation. Class F windings, internal protection according to VDE 0730. Ecoprofile are characterized by low speed and "owlet" profile to reduce the effect of vortices, thereby reducing the energy consumed for operation and noise, reducing it by an average of 6dB (A) compared with standard fans. All the sizes are equipped with the 2 steps condensing control (Δ/Y).

HIGH EFFICIENCY SHELL AND TUBE HEAT EXCHANGER – CHILLED WATER SIDE

Direct expansion shell and tube type, high efficiency with low temperature approach between fluid and refrigerant, to reduce the temperature difference and increasing the evaporation temperature, improving the efficiency and reducing the power consumption. The steel shell is provided with water connections victaulic and externally insulated with anti-condensate closed-cell (thickness of 10 mm and a thermal conductivity 0,033 W/mK a 0°C), in turn covered by a waterproof material resistant to UV rays.

The inner tubes are made of copper straight type with ruled surfaces, expanded on the tube plate of steel and complete with septa conveying water to optimize the thermal exchange. Designed for ecological fluids with speed inside the tubes is not less than 10m/sec, such as to ensure the proper oil carryover. The shell and tube heat exchanger is built and tested according to PED regulations. The heat exchanger is protected against the formation of ice through an immersion electrical heater, controlled directly by the microprocessor as a function of the temperature of the water leaving the evaporator, is also installed a differential water pressure switch appropriately selected depending on the exchanger pressure drops as security against the lack of flow.

Technical specifications

HIGH EFFICIENCY SHELL AND TUBE HEAT EXCHANGER – HOT WATER SIDE

Direct expansion shell and tube type, high efficiency with low temperature approach between fluid and refrigerant, to reduce the temperature difference and increasing the evaporation temperature, improving the efficiency and reducing the power consumption. The steel shell is provided with water connections victaulic and externally insulated with anticondensate closed-cell (thickness of 10 mm and a thermal conductivity 0,033 W/mK a 0°C), in turn covered by a waterproof material resistant to UV rays.

The inner tubes are made of copper straight type with ruled surfaces, expanded on the tube plate of steel and complete with septa conveying water to optimize the thermal exchange. Designed for ecological fluids with speed inside the tubes is not less than 10m/sec, such as to ensure the proper oil carryover. The shell and tube heat exchanger is built and tested according to PED regulations.

The heat exchanger is protected against the formation of ice through an immersion electrical heater, controlled directly by the microprocessor as a function of the temperature of the water leaving the evaporator, is also installed a differential water pressure switch appropriately selected depending on the exchanger pressure drops as security against the lack of flow.

SOURCE HEAT EXCHANGER

The condensing / evaporating exchangers are with finned coil and copper tubes, with corrugated fins of aluminum with spacing of the tubes 30/26 and spacing fins differentiated with fin pitch of 1.6mm at the top and 2.5mm at the bottom.

Thanks to the differentiated spacing is obtained a uniform speed profile across the coils so as to increase the heat exchange in the lower part especially critical in heat pumps.

Thermostatic electrical heaters are installed on the basis of the coils. These electrical heaters are useful to prevent formation of ice on the batteries and to reduce the defrosting time favoring the drainage of the condensate.

Copper tubes are mechanically expanded, and are high efficiency with CROSS-GROOVED tube.

The batteries are also designed for ecological fluids, the velocity inside the tubes, not less than 10m/sec, are such as to ensure the correct entrainment of the oil in each load condition.

REFRIGERANT CIRCUIT

The refrigerant circuit is specific and optimized for the use of a reduced number of solenoids valve and the cross exchange technology, which allows to avoid stops of the units during winter times in case of hot water demand only when cooling is satisfied. Consequently the water temperature of the cold tank doesn't reach the temperature of ice on the evaporator.

The units are equipped with two refrigerant circuits, entirely constructed with copper tubes, each supplied by its own compressor, including:

- Refrigerant charge R134a
- Electronic expansion valve with stepper motor, suitable for accurate control of the superheating within the full operating range of the unit
- Filter drier with interchangeable cartridge suitable for the use of ecological fluids and polyester oils
- Indicator lamp for liquid flow and humidity presence
- Shut off valve on the liquid line complete of balancing pressure system making easier the opening and closing operations
- High pressure switch
- Low pressure switch
- Pressure switch for the compressor oil to control the filter block
- Safety valve on the discharge line
- Safety valve on the suction line
- High pressure transducer
- Low pressure transducers
- Compressor discharge valve
- Liquid receiver
- Oil separator
- 4 way reverse valve
- Cycle configuration valve

ELECTRICAL PANEL

The electrical panel made in accordance with CEI-EN 60204-1 (CEI44-5; CEI EN 62061) standards, is housed in watertight box, the opening system of the box needs the use of a retractable handle or dedicated tools, in each case the opening is allowed only after disconnection of the power supply through the main switch with door lock handle lockable in OFF position.

The electrical panel includes:

- Protection fuses for the supply line of each compressor;
- Protection fuses for the supply line of fans for each refrigerant circuit;
- Protection fuses of auxiliary circuit;
- Start up contactors for compressors dimensioned according to the maximum stress;
- Start up contactors for fans;
- Adjustable thermal magnetic circuit breaker for the protection of the pump (only in case of units equipped with hydraulic kit);
- Start up contactors for pump (only in case of units equipped with hydraulic kit);
- single-phase transformer for the power supply of the auxiliary circuits;
- numbered wires;
- microprocessor control.

In case of phase failure an automatic system protects fans and compressors.

The wiring of the electric panel and the connection with the components of the units are made using cables appropriately calculated for operation at 55°C and according to the maximum electrical stress of the components.

All the cables and the terminals are univocally numbered according to the electrical scheme in order to avoid possible misinterpretation. The identification system of the cables connected to the components allow also an easy and intuitive recognition of the component.

Each component of the electrical panel is provided with an identification plate according to what is shown on the electrical scheme. All the connection to the electrical panel are made from the bottom and are equipped with cover preventing from break.

The electrical panel supply is 400V/3ph+n/50Hz and no additional power supply is necessary. The input of the power cables is provided on the bottom of the box where it is provided a dismountable flange suitable for the purpose.

MICROPROCESSOR CONTROL SYSTEM

The multi-functional four pipes unit, are equipped with two completely independent circuits, controlled by 2 devices, each of which handles a single circuit. The two devices are in communication with each other via the Modbus protocol.

The keypad allows a complete and intuitive display of all the main control variables of both circuits.

The programmable controller is based on a powerful platform with 256bit microprocessor, 4MB mass storage with a hardware and software configuration made with the most innovative technology in terms of processing speed and connectivity.

The diagnostics includes a complete alarm management, alarm history and data logger which stores an archive of about 4 days (further expandable by USB memory) where the main variables and the operating status of the unit are recorded.

ModBus master and slave communication protocol. The temperature regulation us carried out by two hydraulic circuits (cooled water and hot water), with a continuous proportional logic according to the return water temperature.

Technical specifications

The operating parameters of the machine are protected by 3 levels of password (user-maintainer-manufacturer). The user panel provides information LCD display with exhaustive descriptions in Italian and English (selectable).

- Ability to interface with the main BMS systems via ModBus™ ,BACnet™ and LonTalk™ .
- Ability to interface with I/O expansion modules via CanBus.
- Ability to control the unit by voltage free contacts.
- Input Ethernet RJ45, for routing on the web of all the parameters of the unit, providing a total remote control of unit.
- USB input to upload parameter files, system files, firmware and to download files of historical alarms, residing parameters files and default parameters files.
- User interface on the door of the panel, low-reflection LCD, equipped with 8 function keys, easy iconic display, easy sliding between the dynamic screens.
- Control of condensation / evaporation air through two speed fans directly managed by the electronic controller based on proportional logic (L version).
- Control of condensation / evaporation air through inverter directly managed by the electronic controller based on proportional logic (S version).
- Management of electronic expansion valves through controller based on PID logic, with LOP control (low operating pressure), maintenance of the minimum working pressure and of the MOP (maximum operating pressure) for the management of the maximum working pressure.

The microprocessor manages:

- Star-Delta starting of the compressors with digital control of the interchange time and with the start-up and stop time control.
- Part-Winding starting of the compressors with digital control of the interchange time and with the start-up and stop time control.
- Solenoid valves for compressors partialization with digital control of delays.
- Fans start up and modulation according with condensation and evaporation pressure.
- Solenoid valves of liquid lines with pump-down management during stops through double control of suction pressure and maximum time of the procedure.
- Electric anti-freeze heater for user exchangers.
- Electric heater mounted on the base of coils to avoid ice formation.
- Hot and chilled water pumps management through voltage free contacts for standard versions; for hydraulic versions the pump management is automatically controlled.
- Alarm signal for each refrigerant circuit of the unit through voltage free contacts.

The microprocessor will control and display by suitable measuring transducers the following variables:

- Inlet and outlet water temperature to the cold user exchanger.
- Inlet and outlet water temperature to the hot user exchanger.
- Outdoor temperature.
- Condensing pressure of each refrigerant circuit.
- Evaporating pressure of each refrigerant circuit.
- Total operating time of each compressor.
- Total operating time of the unit.

The microprocessor will protect the unit in the following cases, the resetting of any alarm will always be manual:

- Low evaporating pressure by analogical and digital input with possibility to edit the marking details.
- High condensing pressure by analogical and digital input.
- High temperature of the compressors windings.
- Reverse rotation of each compressor.
- Low pressure difference between discharge and suction (to allow a correct lubrification of the compressor) with the possibility to edit the start-up delay and the minimum requested value.
- High pressure difference on the oil filter.
- High temperature of fans motor windings.
- High temperature of pumps motor windings
- Lack of water flow on evaporator and condenser.
- Low evaporator outlet water temperature.
- Low condenser outlet water temperature.

It is also possible to display and edit through the microprocessor the following value:

- Operating setpoint of the unit
- Operating differential of the unit.
- Set point and anti-freeze block differential.
- Set point and differential of activation of the evaporator heater.
- Minimum operating time of each compressor.
- Minimum stop time of each compressor.
- Maximum number of starts per hour of each compressor.
- Set point and optimal condensation pressure differential (condensation and evaporation control).

Other functionalities ensured from the microprocessor are:

- Activating of preventive functions at extreme conditions of high pressure.
- Activating of preventive functions at extreme conditions of low pressure.
- Activation of preventive functions at limit conditions of high discharge temperature.
- Activating preventive functions at extreme conditions of low evaporator leaving water temperature.
- Activating preventive functions at extreme conditions of high evaporator inlet water temperature.
- Protection from unwanted changes of the parameters thanks of the use of password and systems to confirm the changed data.
- Indication of the unit status and the components status.
- Possibility to exclude each compressor for the maintenance.
- Possibility to change the set point by external analog signal.
- Possibility of ON/OFF remote signal through digital external signal.
- Communication with supervision systems (data and parameters exchange).
- Continuous adjustment of the set point according to the outdoor air temperature both with direct and reverse direction logic (DSP).
- Intelligent management of defrosts depending on the approach of the coil (Digital Defrost).
- Auto power on-off of the unit using time slots.
- Adjustment of the set point by time bands both with direct and reverse direction logic (Energy Saving).

Options and accessories

FACTORY-MOUNTED OPTIONS

- Standby pump for air conditioning circuit + standby pump for heating circuit, 150/250/450 kPa
- High temperature module for hot water up to 65°C
- Automatic circuit breakers
- Softstarter
- Numbered wires
- Gas gauges
- Power factor correction to cos phi 0.91
- Control panel electric heater with thermostat
- Phase failure protection relay
- EC fan motors
- High static pressure (100 Pa) EC fans
- Condensing coil protection grille
- Blygold coated condensing coils
- Epoxy coated condensing coils
- Only epoxy pre-painted aluminum fins
- Copper/Copper condensing coils
- Tinned copper/copper condensing coils

ACCESSORIES

- Serial card with BACnet protocol TCP/IP or MS/TP
- Serial card with LonTalk™ gateway
- Remote control display
- Flow switch
- Automatic water filling
- Threaded water strainer
- Water gauges
- Rubber or spring anti vibration mounts

Energy efficiency ratios

METHODOLOGY FOR CALCULATING SEASONAL ENERGY EFFICIENCY

Energy efficiency of the multifunction unit heat pump **RTMA**, in chiller operating mode, is calculated according the ESEER coefficient. Considering that all have recognized the IPLV lack of adaptability in front of needs in Europe, it is developed a new coefficient, called ESEER (European Seasonal Energy Efficiency Ratio), that is much more equal to EMPE Italian coefficient than the IPLV coefficient.

The formula of the three coefficient is:

Index = PE100% EER100% + PE75% EER75% + PE50% EER50% + PE25% EER25%

FEATURES	INDEX	LOAD (100%)	LOAD (75%)	LOAD (50%)	LOAD (25%)
ENERGETIC WEIGHT	IPLV	1%	42%	45%	12%
	EMPE	10%	30%	40%	20%
	ESEER	3%	33%	41%	23%
$T._{IN\ AIR\ CONDENSER}$ air-water unit	IPLV	35°C	26,7°C	18,3°C	12,8°C
	EMPE	35°C	31,3°C	27,5°C	23,8°C
	ESEER	35°C	30°C	25°C	20°C
$T._{IN\ WATER\ CONDENSER}$ water-water unit	IPLV	29,5°C	23,9°C	18,3°C	18,3°C
	EMPE	29,5°C	26,9°C	24,4°C	21,9°C
	ESEER	30°C	25°C	20°C	20°C

TEC – TOTAL EFFICIENCY COEFFICIENT

The effective coefficient measuring the unit performance during the whole year is the TEC (Total Efficiency COEFFICIENT), an index properly properly developed to measure the multifunction real efficiency.

The TEC indicator is an average year efficiency index considering the efficiency of each operating mode of the unit properly weighted (cooling, cooling + heating, heating), more completely than the standard full-load efficiency ratios (EER, COP) and seasonal one (ESEER).

Usually the multifuncional units have TEC value around 5. This means that per each kW of power input there is a useful capacity of 5.

$$TEC = (EER_{COOLING} * \alpha + DMEC_{COOLING+HEATING} * \beta + COP_{HEATING} * \gamma)$$

Where:

α = weight for only chiller mode operation (%)

β = weight for chiller + heating mode operation (%)

γ = weight for only heating mode operation (%)

DMEC = Dual Mode Efficiency Coefficient = Efficiency in chiller + recovery mode

The DMEC index is the ratio between the sum of the heating and cooling capacity and the compressors electrical power input, in chiller + recovery mode, and reaches the maximum value when the heating and cooling loads are fully balanced. It allows to calculate.

This index was defined to objectively measure the efficiency of a multi-functional unit according to simultaneous load requirement.

Technical data

GENERAL TECHNICAL DATA

RTMA

RTMA		105	115	120	130	150	170	180	190	210
Cooling (1)										
Total cooling capacity	kW	344.3	380.7	397.7	431.4	491.1	558.3	598.5	621.6	661.2
Compressors power input	kW	126.6	142.8	135.0	148.5	165.8	199.5	218.0	208.0	227.2
Total EER		2.48	2.46	2.65	2.64	2.67	2.57	2.54	2.71	2.66
Water flow	m³/h	59.07	65.33	68.23	74.03	84.26	95.79	102.70	106.66	113.45
Water pressure drop	kPa	56.1	43.1	47.9	54.4	59.5	66.6	77.0	38.1	38.1
Heating (2)										
Total heating capacity	kW	361.2	381.0	435.9	470.5	513.8	562.4	582.4	659.6	713.9
Compressors power input	kW	116.8	119.4	128.0	138.5	154.3	178.8	189.4	193.0	205.3
Total COP		2.80	2.90	3.05	3.06	2.98	2.86	2.81	3.08	3.16
Water flow	m³/h	62.92	66.37	75.93	81.95	89.51	97.97	101.46	114.91	124.36
Water pressure drop	kPa	62.2	62.7	69.4	76.0	61.6	66.8	79.6	67.6	67.6
Heating + Cooling (3)										
Total cooling capacity	kW	344.1	388.3	388.3	435.3	490.4	565.9	596.0	599.2	684.6
Total heating capacity	kW	470.6	523.9	523.9	582.6	657.6	759.8	801.6	805.0	905.6
Compressors power input	kW	126.5	135.6	135.6	147.2	167.2	193.9	205.7	205.7	221.0
MOER		6.44	6.73	6.73	6.91	6.87	6.84	6.80	6.82	7.20
TEP		4.56	4.73	4.81	4.90	4.86	4.79	4.75	4.88	5.08
Evaporator water flow	m³/h	59.0	66.6	66.6	74.7	84.1	97.1	102.3	102.8	117.5
Evaporator pressure drop	kPa	56.1	44.8	45.7	55.4	59.3	68.4	76.3	35.4	40.8
Condenser water flow	m³/h	82.0	91.3	91.3	101.5	114.5	132.4	139.6	140.2	157.7
Condenser pressure drop	kPa	105.6	118.5	100.3	116.5	100.9	121.9	150.7	100.6	108.7
COMPRESSORS										
Compressors number	n	2	2	2	2	2	2	2	2	2
Refrigerant circuits	n	2	2	2	2	2	2	2	2	2
Part load	n	6	6	6	6	6	6	6	6	6
Refrigerant charge	kg	196	198	246	247	297	299	299	430	436
Oil charge	kg	20	20	34	34	34	34	34	34	40
FANS										
Fans number	n	8	8	10	10	12	12	12	14	14
Air flow	m³/h	164480	155200	206000	206000	235200	235200	235200	281400	281400
Power input for each fan	kW	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Absorbed current for each fan	A	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SOUND LEVEL										
Sound power level (ISO 3744)	db(A)	92	92	93	93	95	95	95	96	96
Sound pressure level at 10 m (ISO 3744)	db	60	60	60	60	62	62	62	63	63
Power supply										
DIMENSIONS AND WEIGHT										
Length	mm	5431	5431	6601	6601	7561	7561	7561	8892	8892
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400
Operating Weight	kg	5592	5799	6057	6121	6578	6925	6946	7199	7794
Shipping Weight	kg	5242	5449	5728	5792	6248	6607	6628	6891	7486

(1) Outdoor air temperature 35 °C – Outlet water temperature 12/7 °C

(2) Outdoor air temperature 7 °C - 90% UR - Outlet water temperature 45 °C

(3) Recovery water temperature 40/45 °C – Evaporator water temperature 12/7 °C

Technical data

GENERAL TECHNICAL DATA

RTMA L

RTMA L		105	115	120	130	150	170	180	190	210
Cooling (1)										
Total cooling capacity	kW	334.2	369.3	386.0	419.4	478.0	544.7	583.4	606.3	644.9
Compressors power input	kW	130.1	146.8	138.7	153.0	170.7	205.8	225.0	214.6	234.4
Total EER		2.40	2.37	2.57	2.55	2.59	2.48	2.45	2.63	2.58
Water flow	m³/h	57.34	63.36	66.23	71.96	82.01	93.45	100.10	104.02	110.65
Water pressure drop	kPa	52.9	40.5	45.1	51.4	56.3	63.4	73.1	36.2	36.2
Heating (2)										
Total heating capacity	kW	365.2	385.3	440.9	475.4	519.3	568.0	588.3	666.2	721.0
Compressors power input	kW	117.2	119.8	128.4	138.9	154.7	179.3	189.8	193.5	205.8
Total COP		2.90	2.99	3.16	3.17	3.09	2.95	2.89	3.18	3.25
Water flow	m³/h	63.63	67.12	76.80	82.81	90.46	98.94	102.47	116.05	125.59
Water pressure drop	kPa	63.6	64.1	71.0	77.6	62.9	68.1	81.2	68.9	68.9
Heating + Cooling (3)										
Total cooling capacity	kW	344.1	388.3	388.3	435.3	490.4	565.9	596.0	599.2	684.6
Total heating capacity	kW	470.6	523.9	523.9	582.6	657.6	759.8	801.6	805.0	905.6
Compressors power input	kW	126.5	135.6	135.6	147.2	167.2	193.9	205.7	205.7	221.0
MOER		6.44	6.73	6.73	6.91	6.87	6.84	6.80	6.82	7.20
TEP		4.57	4.74	4.83	4.92	4.88	4.80	4.75	4.89	5.09
Evaporator water flow	m³/h	59.05	66.62	66.62	74.70	84.14	97.10	102.26	102.81	117.46
Evaporator pressure drop	kPa	56.1	44.8	45.7	55.4	59.3	68.4	76.3	35.4	40.8
Condenser water flow	m³/h	81.98	91.25	91.25	101.48	114.55	132.36	139.64	140.22	157.75
Condenser pressure drop	kPa	105.6	118.5	100.3	116.5	100.9	121.9	150.7	100.6	108.7
COMPRESSORS										
Compressors number	n	2	2	2	2	2	2	2	2	2
Refrigerant circuits	n	2	2	2	2	2	2	2	2	2
Part load	n	6	6	6	6	6	6	6	6	6
Refrigerant charge	kg	196	198	246	247	297	299	299	430	436
Oil charge	kg	20	20	34	34	34	34	34	34	40
FANS										
Fans number	n	8	8	10	10	12	12	12	14	14
Air flow	m³/h	123360	116400	154500	154500	176400	176400	176400	211050	211050
Power input for each fan	kW	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Absorbed current for each fan	A	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
SOUND LEVEL										
Sound power level (ISO 3744)	db(A)	90	90	91	91	93	93	93	94	94
Sound pressure level at 10 m (ISO 3744)	db	58	58	58	58	60	60	60	61	61
Power supply										
DIMENSIONS AND WEIGHT										
Length	mm	5431	5431	6601	6601	7561	7561	7561	8892	8892
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400
Operating Weight	kg	5592	5799	6057	6121	6578	6925	6946	7199	7794
Shipping Weight	kg	5242	5449	5728	5792	6248	6607	6628	6891	7486

(1) Outdoor air temperature 35 °C – Outlet water temperature 12/7 °C

(2) Outdoor air temperature 7 °C - 90% UR - Outlet water temperature 45 °C

(3) Recovery water temperature 40/45 °C – Evaporator water temperature 12/7 °C

Technical data

GENERAL TECHNICAL DATA — RTMA S

RTMA S		105	115	120	130	150	170	180	190	210
Cooling (1)										
Total cooling capacity	kW	341.5	377.6	394.4	428.1	487.5	554.5	594.4	617.4	656.7
Compressors power input	kW	127.5	143.9	136.0	149.7	167.1	201.2	219.9	209.8	229.2
Total EER		2.51	2.48	2.69	2.67	2.71	2.59	2.56	2.75	2.69
Water flow	m³/h	58.59	64.78	67.68	73.46	83.64	95.15	101.98	105.93	112.68
Water pressure drop	kPa	55.2	42.4	47.1	53.5	58.6	65.7	75.9	37.6	37.6
Heating (2)										
Total heating capacity	kW	367.9	388.2	444.2	478.7	522.9	571.7	592.2	670.6	725.7
Compressors power input	kW	117.4	120.1	128.7	139.2	155.0	179.6	190.1	193.9	206.1
Total COP		2.93	3.02	3.19	3.20	3.12	2.97	2.92	3.22	3.29
Water flow	m³/h	64.10	67.62	77.38	83.39	91.09	99.59	103.15	116.81	126.42
Water pressure drop	kPa	64.6	65.1	72.1	78.6	63.8	69.0	82.2	69.8	69.8
Heating + Cooling (3)										
Total cooling capacity	kW	344.1	388.3	388.3	435.3	490.4	565.9	596.0	599.2	684.6
Total heating capacity	kW	470.6	523.9	523.9	582.6	657.6	759.8	801.6	805.0	905.6
Compressors power input	kW	126.5	135.6	135.6	147.2	167.2	193.9	205.7	205.7	221.0
MOER		6.44	6.73	6.73	6.91	6.87	6.84	6.80	6.82	7.20
TEP		4.60	4.77	4.86	4.95	4.91	4.83	4.79	4.93	5.12
Evaporator water flow	m³/h	59.0	66.6	66.6	74.7	84.1	97.1	102.3	102.8	117.5
Evaporator pressure drop	kPa	56.1	44.8	45.7	55.4	59.3	68.4	76.3	35.4	40.8
Condenser water flow	m³/h	81.98	91.25	91.25	101.48	114.55	132.36	139.64	140.22	157.75
Condenser pressure drop	kPa	105.6	118.5	100.3	116.5	100.9	121.9	150.7	100.6	108.7
COMPRESSORS										
Compressors number	n	2	2	2	2	2	2	2	2	2
Refrigerant circuits	n	2	2	2	2	2	2	2	2	2
Part load	n	6	6	6	6	6	6	6	6	6
Refrigerant charge	kg	196	198	246	247	297	299	299	430	436
Oil charge	kg	20	20	34	34	34	34	34	34	40
FANS										
Fans number	n	8	8	10	10	12	12	12	14	14
Air flow	m³/h	115136	108640	144200	144200	164640	164640	164640	196980	196980
Power input for each fan	kW	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Absorbed current for each fan	A	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
SOUND LEVEL										
Sound power level (ISO 3744)	db(A)	87	87	88	88	90	90	90	91	91
Sound pressure level at 10 m (ISO 3744)	db	55	55	55	55	57	57	57	58	58
Power supply										
DIMENSIONS AND WEIGHT										
Length	mm	5431	5431	6601	6601	7561	7561	7561	8892	8892
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400
Operating Weight	kg	5872	6079	6387	6451	6948	7295	7316	7619	8214
Shipping Weight	kg	5522	5729	6058	6122	6618	6977	6998	7311	7906

(1) Outdoor air temperature 35 °C – Outlet water temperature 12/7 °C

(2) Outdoor air temperature 7 °C - 90% UR - Outlet water temperature 45 °C

(3) Recovery water temperature 40/45 °C – Evaporator water temperature 12/7 °C

PERFORMANCE TABLE

COOLING CAPACITY PERFORMANCE

RTMA

Twout			105 Tae						115 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	381.5	358.1	348.3	333.2	307.5	291.9	423.9	397.0	385.8	368.6	339.4	321.8
	Pa	kW	108.5	116.0	119.4	124.7	134.6	140.9	122.2	130.8	134.7	140.8	151.9	159.0
	qw	m³/h	65.42	61.41	59.73	57.14	52.73	50.05	72.69	68.07	66.15	63.21	58.21	55.19
	dpw	kPa	68.8	60.7	57.4	52.5	44.7	40.3	53.4	46.8	44.2	40.3	34.2	30.8
7°C	Pf	kW	393.5	369.7	359.7	344.3	318.0	302.0	437.2	409.7	398.3	380.7	350.9	332.9
	Pa	kW	110.2	117.8	121.2	126.6	136.4	142.8	124.1	132.8	136.7	142.8	154.0	161.2
	qw	m³/h	67.52	63.43	61.71	59.07	54.55	51.81	75.02	70.30	68.33	65.33	60.21	57.12
	dpw	kPa	73.3	64.7	61.3	56.1	47.9	43.2	56.8	49.9	47.1	43.1	36.6	32.9
8°C	Pf	kW	405.8	381.4	371.2	355.5	328.6	312.3	450.8	422.7	411.0	393.1	362.6	344.2
	Pa	kW	112.0	119.6	123.0	128.4	138.3	144.8	126.1	134.8	138.7	144.9	156.1	163.3
	qw	m³/h	69.67	65.49	63.73	61.03	56.42	53.61	77.39	72.57	70.56	67.48	62.25	59.09
	dpw	kPa	78.1	69.0	65.3	59.9	51.2	46.2	60.5	53.2	50.3	46.0	39.1	35.3
9°C	Pf	kW	418.3	393.4	383.0	366.9	339.5	322.7	464.5	435.9	423.9	405.6	374.5	355.7
	Pa	kW	113.8	121.4	124.8	130.3	140.2	146.7	128.1	136.8	140.7	146.9	158.2	165.5
	qw	m³/h	71.85	67.58	65.79	63.03	58.31	55.44	79.79	74.87	72.82	69.68	64.33	61.09
	dpw	kPa	83.0	73.5	69.6	63.9	54.7	49.4	64.3	56.6	53.5	49.0	41.8	37.7
10°C	Pf	kW	431.0	405.6	394.9	378.6	350.5	333.4	478.5	449.3	437.1	418.4	386.6	367.3
	Pa	kW	115.6	123.2	126.7	132.1	142.2	148.7	130.1	138.9	142.8	149.0	160.4	167.7
	qw	m³/h	74.16	69.79	67.96	65.14	60.31	57.37	82.33	77.30	75.21	71.99	66.52	63.20
	dpw	kPa	88.4	78.3	74.3	68.2	58.5	52.9	68.4	60.3	57.1	52.3	44.7	40.3
11°C	Pf	kW	443.9	418.0	407.1	390.4	361.7	344.3	492.7	462.9	450.5	431.4	398.9	379.2
	Pa	kW	117.4	125.1	128.5	134.0	144.1	150.7	132.1	140.9	144.9	151.1	162.5	169.9
	qw	m³/h	76.50	72.04	70.16	67.28	62.34	59.33	84.92	79.78	77.63	74.35	68.75	65.36
	dpw	kPa	94.1	83.5	79.2	72.8	62.5	56.6	72.8	64.3	60.9	55.8	47.7	43.1

Twout			120 Tae						130 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	440.5	413.6	402.3	384.9	355.3	337.3	474.6	447.3	435.8	418.1	387.4	368.5
	Pa	kW	115.7	123.7	127.3	133.0	143.5	150.3	125.8	135.3	139.6	146.4	159.1	167.4
	qw	m³/h	75.53	70.92	68.98	66.01	60.92	57.84	81.39	76.71	74.74	71.69	66.43	63.18
	dpw	kPa	58.7	51.8	49.0	44.8	38.2	34.4	65.7	58.4	55.4	51.0	43.8	39.6
7°C	Pf	kW	454.4	426.9	415.4	397.7	367.3	348.9	489.4	461.4	449.7	431.4	399.9	380.5
	Pa	kW	117.6	125.7	129.2	135.0	145.5	152.3	127.7	137.3	141.6	148.5	161.2	169.6
	qw	m³/h	77.96	73.25	71.27	68.23	63.03	59.87	83.98	79.17	77.15	74.03	68.62	65.28
	dpw	kPa	62.6	55.2	52.3	47.9	40.9	36.9	70.0	62.2	59.1	54.4	46.7	42.3
8°C	Pf	kW	468.5	440.4	428.7	410.6	379.6	360.8	504.5	475.8	463.8	445.1	412.7	392.7
	Pa	kW	119.5	127.6	131.2	137.0	147.6	154.5	129.6	139.3	143.6	150.5	163.4	171.9
	qw	m³/h	80.43	75.62	73.60	70.49	65.17	61.94	86.62	81.69	79.62	76.41	70.86	67.43
	dpw	kPa	66.6	58.8	55.7	51.1	43.7	39.5	74.4	66.2	62.9	57.9	49.8	45.1
9°C	Pf	kW	482.9	454.2	442.2	423.8	392.1	372.9	520.0	490.5	478.1	459.0	425.8	405.3
	Pa	kW	121.5	129.6	133.2	139.0	149.7	156.6	131.6	141.3	145.6	152.7	165.6	174.2
	qw	m³/h	82.95	78.03	75.97	72.79	67.36	64.05	89.32	84.26	82.14	78.84	73.14	69.62
	dpw	kPa	70.8	62.7	59.4	54.5	46.7	42.2	79.2	70.5	66.9	61.7	53.1	48.1
10°C	Pf	kW	497.5	468.3	456.0	437.2	404.8	385.1	535.7	505.5	492.8	473.2	439.1	418.0
	Pa	kW	123.4	131.6	135.2	141.1	151.8	158.7	133.6	143.4	147.7	154.8	167.9	176.5
	qw	m³/h	85.60	80.57	78.46	75.22	69.66	66.27	92.17	86.98	84.79	81.41	75.55	71.93
	dpw	kPa	75.4	66.8	63.4	58.2	49.9	45.2	84.3	75.1	71.3	65.8	56.6	51.3
11°C	Pf	kW	512.3	482.5	470.0	450.8	417.8	397.6	551.7	520.8	507.8	487.6	452.7	431.1
	Pa	kW	125.4	133.6	137.3	143.1	153.9	160.9	135.7	145.5	149.9	157.0	170.2	178.9
	qw	m³/h	88.30	83.16	81.01	77.69	72.00	68.53	95.08	89.76	87.51	84.04	78.02	74.29
	dpw	kPa	80.2	71.2	67.5	62.1	53.4	48.3	89.7	79.9	76.0	70.1	60.4	54.8

Tae = Outdoor air temperature(°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

Technical data

COOLING CAPACITY PERFORMANCE

RTMA

Twout			150 Tae						170 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	537.1	507.8	495.4	476.1	442.6	421.9	603.1	574.0	561.4	541.8	506.9	484.7
	Pa	kW	141.2	151.4	156.0	163.5	177.3	186.5	168.9	181.6	187.4	196.8	214.6	226.5
	qw	m³/h	92.10	87.07	84.94	81.64	75.90	72.35	103.42	98.42	96.28	92.91	86.92	83.12
	dpw	kPa	71.1	63.5	60.4	55.8	48.3	43.8	77.6	70.3	67.3	62.6	54.8	50.1
7°C	Pf	kW	553.6	523.5	510.8	491.1	456.7	435.4	621.4	591.4	578.5	558.3	522.3	499.5
	Pa	kW	143.4	153.7	158.3	165.8	179.7	189.0	171.3	184.2	190.0	199.5	217.4	229.5
	qw	m³/h	94.99	89.83	87.65	84.26	78.37	74.71	106.62	101.48	99.27	95.79	89.62	85.70
	dpw	kPa	75.6	67.6	64.4	59.5	51.4	46.8	82.5	74.7	71.5	66.6	58.3	53.3
8°C	Pf	kW	570.5	539.6	526.6	506.4	471.1	449.2	640.1	609.3	596.0	575.2	538.1	514.6
	Pa	kW	145.6	155.9	160.6	168.1	182.2	191.5	173.9	186.8	192.6	202.2	220.3	232.5
	qw	m³/h	97.93	92.65	90.41	86.93	80.88	77.13	109.89	104.60	102.32	98.74	92.38	88.34
	dpw	kPa	80.3	71.9	68.5	63.3	54.8	49.8	87.6	79.4	76.0	70.8	61.9	56.6
9°C	Pf	kW	587.6	556.1	542.7	521.9	485.8	463.3	659.2	627.5	613.8	592.4	554.2	530.0
	Pa	kW	147.8	158.2	162.9	170.5	184.7	194.1	176.5	189.4	195.4	205.0	223.3	235.6
	qw	m³/h	100.94	95.52	93.22	89.66	83.45	79.59	113.24	107.79	105.44	101.76	95.20	91.04
	dpw	kPa	85.4	76.4	72.8	67.3	58.3	53.1	93.1	84.3	80.7	75.1	65.8	60.2
10°C	Pf	kW	605.1	572.8	559.1	537.8	500.7	477.7	678.8	646.1	632.1	610.0	570.7	545.7
	Pa	kW	150.2	160.6	165.3	173.0	187.2	196.7	179.2	192.2	198.1	207.9	226.4	238.8
	qw	m³/h	104.12	98.55	96.20	92.54	86.16	82.20	116.79	111.17	108.75	104.95	98.19	93.90
	dpw	kPa	90.8	81.4	77.5	71.7	62.2	56.6	99.0	89.7	85.8	79.9	70.0	64.0
11°C	Pf	kW	623.0	589.8	575.8	554.0	516.0	492.4	698.8	665.2	650.7	628.0	587.5	561.8
	Pa	kW	152.5	163.0	167.7	175.4	189.8	199.4	181.9	195.0	201.0	210.8	229.5	242.0
	qw	m³/h	107.37	101.66	99.24	95.48	88.93	84.86	120.43	114.64	112.14	108.23	101.26	96.83
	dpw	kPa	96.6	86.6	82.5	76.4	66.2	60.3	105.3	95.4	91.3	85.0	74.4	68.0

Twout			180 Tae						190 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	649.3	616.6	602.7	580.8	542.0	517.5	672.3	639.5	625.4	603.3	564.0	539.1
	Pa	kW	183.8	198.1	204.6	215.1	234.8	248.0	175.9	189.3	195.4	205.3	223.8	236.3
	qw	m³/h	111.34	105.74	103.35	99.59	92.94	88.73	115.29	109.66	107.24	103.45	96.71	92.44
	dpw	kPa	90.5	81.6	78.0	72.4	63.1	57.5	44.5	40.3	38.5	35.8	31.3	28.6
7°C	Pf	kW	669.1	635.5	621.1	598.5	558.6	533.3	692.7	658.9	644.4	621.6	581.1	555.5
	Pa	kW	186.4	200.9	207.4	218.0	237.9	251.3	178.5	192.0	198.1	208.0	226.8	239.4
	qw	m³/h	114.80	109.04	106.57	102.70	95.84	91.50	118.85	113.06	110.57	106.66	99.71	95.31
	dpw	kPa	96.2	86.8	82.9	77.0	67.1	61.1	47.3	42.8	40.9	38.1	33.3	30.4
8°C	Pf	kW	689.3	654.7	639.9	616.7	575.5	549.5	713.5	678.8	663.8	640.4	598.7	572.2
	Pa	kW	189.1	203.7	210.3	221.0	241.1	254.6	181.1	194.7	200.8	210.9	229.9	242.6
	qw	m³/h	118.34	112.41	109.86	105.88	98.81	94.33	122.50	116.53	113.96	109.94	102.78	98.24
	dpw	kPa	102.2	92.2	88.1	81.8	71.3	65.0	50.2	45.5	43.5	40.5	35.4	32.3
9°C	Pf	kW	710.0	674.4	659.2	635.3	592.9	566.0	734.9	699.1	683.7	659.5	616.6	589.4
	Pa	kW	191.9	206.5	213.2	224.0	244.3	258.0	183.9	197.5	203.7	213.8	233.0	245.8
	qw	m³/h	121.96	115.85	113.23	109.12	101.84	97.23	126.23	120.08	117.44	113.29	105.92	101.24
	dpw	kPa	108.6	98.0	93.6	86.9	75.7	69.0	53.3	48.3	46.2	43.0	37.6	34.3
10°C	Pf	kW	731.2	694.5	678.8	654.2	610.6	582.9	756.6	719.8	703.9	679.1	634.9	606.8
	Pa	kW	194.8	209.5	216.2	227.1	247.6	261.4	186.6	200.3	206.6	216.8	236.1	249.1
	qw	m³/h	125.81	119.50	116.80	112.57	105.05	100.29	130.19	123.85	121.12	116.85	109.24	104.41
	dpw	kPa	115.5	104.3	99.6	92.5	80.6	73.4	56.7	51.3	49.1	45.7	39.9	36.5
11°C	Pf	kW	752.8	715.1	698.9	673.6	628.6	600.1	778.9	741.0	724.7	699.1	653.6	624.7
	Pa	kW	197.7	212.5	219.3	230.3	251.0	264.9	189.5	203.3	209.6	219.9	239.4	252.5
	qw	m³/h	129.74	123.24	120.46	116.09	108.34	103.43	134.24	127.70	124.89	120.48	112.64	107.67
	dpw	kPa	122.9	110.9	105.9	98.4	85.7	78.1	60.3	54.6	52.2	48.6	42.5	38.8

Tae = Outdoor air temperature(°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

COOLING CAPACITY PERFORMANCE

RTMA

Twout			210 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	715.1	680.2	665.2	641.7	599.9	573.4
	Pa	kW	192.2	206.8	213.4	224.2	244.5	258.1
	qw	m³/h	122.63	116.65	114.08	110.04	102.87	98.33
	dpw	kPa	44.5	40.3	38.5	35.8	31.3	28.6
7°C	Pf	kW	736.8	700.9	685.5	661.2	618.2	590.9
	Pa	kW	195.0	209.7	216.3	227.2	247.7	261.5
	qw	m³/h	126.43	120.26	117.61	113.45	106.07	101.38
	dpw	kPa	47.3	42.8	40.9	38.1	33.3	30.4
8°C	Pf	kW	759.0	722.0	706.1	681.2	636.8	608.7
	Pa	kW	197.8	212.6	219.4	230.3	251.0	264.9
	qw	m³/h	130.30	123.95	121.22	116.94	109.33	104.50
	dpw	kPa	50.2	45.5	43.5	40.5	35.4	32.3
9°C	Pf	kW	781.7	743.6	727.2	701.5	655.9	626.9
	Pa	kW	200.8	215.7	222.5	233.5	254.4	268.5
	qw	m³/h	134.27	127.73	124.92	120.51	112.66	107.69
	dpw	kPa	53.3	48.3	46.2	43.0	37.6	34.3
10°C	Pf	kW	804.8	765.6	748.8	722.3	675.3	645.5
	Pa	kW	203.8	218.8	225.6	236.8	257.9	272.1
	qw	m³/h	138.48	131.74	128.84	124.29	116.20	111.07
	dpw	kPa	56.7	51.3	49.1	45.7	39.9	36.5
11°C	Pf	kW	828.5	788.2	770.8	743.6	695.2	664.5
	Pa	kW	207.0	222.0	228.9	240.1	261.4	275.8
	qw	m³/h	142.79	135.84	132.85	128.16	119.82	114.52
	dpw	kPa	60.3	54.6	52.2	48.6	42.5	38.8

Tae = Outdoor air temperature(°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m^3/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

Technical data

HEATING CAPACITY PERFORMANCE

RTMA

Ta.e. / R.U.			105 Tw out						115 Tw out					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	272.0	260.9	250.0	239.8	-	-	286.3	274.3	262.5	251.5	-	-
	Pat	kW	82.4	89.2	96.8	105.1	-	-	84.0	91.0	98.8	107.2	-	-
	qw	m³/h	47.10	45.26	43.46	41.76	-	-	49.57	47.59	45.64	43.82	-	-
	dpw	kPa	34.9	32.2	29.7	27.4	-	-	35.0	32.2	29.6	27.3	-	-
0°C / 90%	Pt	kW	325.1	312.1	299.1	286.5	264.3	-	342.8	328.8	314.8	301.2	277.4	-
	Pat	kW	86.9	93.8	101.5	109.9	128.8	-	88.7	95.7	103.6	112.3	131.6	-
	qw	m³/h	56.29	54.15	52.00	49.90	46.21	-	59.36	57.06	54.73	52.47	48.50	-
	dpw	kPa	49.8	46.1	42.5	39.1	33.6	-	50.1	46.3	42.6	39.2	33.5	-
7°C / 90%	Pt	kW	408.7	393.2	377.2	361.2	331.2	-	432.1	415.4	398.2	381.0	348.7	-
	Pat	kW	94.0	100.6	108.2	116.8	136.3	-	96.0	102.8	110.7	119.4	139.4	-
	qw	m³/h	70.77	68.22	65.58	62.92	57.90	-	74.82	72.07	69.23	66.37	60.96	-
	dpw	kPa	78.7	73.1	67.6	62.2	52.7	-	79.7	73.9	68.2	62.7	52.9	-
10°C / 90%	Pt	kW	449.0	432.3	415.0	397.5	364.0	335.3	475.1	457.1	438.5	419.8	383.7	352.9
	Pat	kW	97.4	103.9	111.4	119.9	139.5	161.8	99.5	106.2	113.9	122.7	142.8	165.8
	qw	m³/h	77.73	75.00	72.14	69.25	63.64	58.83	82.26	79.32	76.24	73.12	67.09	61.92
	dpw	kPa	95.0	88.4	81.8	75.4	63.7	54.4	96.3	89.5	82.7	76.1	64.1	54.6
15°C / 90%	Pt	kW	520.6	502.0	482.5	462.5	423.2	387.6	551.8	531.7	510.8	489.3	447.1	408.8
	Pat	kW	103.5	109.6	116.9	125.3	144.8	167.6	105.8	112.1	119.6	128.3	148.4	171.8
	qw	m³/h	90.13	87.09	83.88	80.57	74.00	68.02	95.53	92.26	88.80	85.24	78.17	71.73
	dpw	kPa	127.7	119.2	110.6	102.0	86.1	72.7	129.9	121.1	112.2	103.4	87.0	73.2

Ta.e. / R.U.			120 Tw out						130 Tw out					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	327.0	313.0	299.3	286.6	-	-	355.7	344.4	333.2	322.5	-	-
	Pat	kW	89.8	97.4	105.7	114.8	-	-	98.3	106.4	115.7	126.0	-	-
	qw	m³/h	56.62	54.30	52.03	49.92	-	-	61.58	59.75	57.93	56.17	-	-
	dpw	kPa	38.6	35.5	32.6	30.0	-	-	42.9	40.4	37.9	35.7	-	-
0°C / 90%	Pt	kW	392.3	375.9	359.6	343.8	316.3	-	419.8	406.4	392.8	379.4	354.6	-
	Pat	kW	94.9	102.4	110.9	120.2	141.0	-	102.8	111.1	120.5	131.2	156.0	-
	qw	m³/h	67.92	65.23	62.52	59.89	55.30	-	72.68	70.51	68.29	66.08	62.00	-
	dpw	kPa	55.6	51.2	47.1	43.2	36.8	-	59.7	56.2	52.7	49.4	43.5	-
7°C / 90%	Pt	kW	495.7	476.1	455.9	435.9	398.4	-	521.8	505.2	488.0	470.5	436.2	-
	Pat	kW	102.6	110.0	118.5	128.0	149.5	-	110.3	118.3	127.7	138.5	164.2	-
	qw	m³/h	85.82	82.60	79.27	75.93	69.66	-	90.34	87.66	84.84	81.95	76.27	-
	dpw	kPa	88.7	82.2	75.7	69.4	58.4	-	92.3	86.9	81.4	76.0	65.8	-
10°C / 90%	Pt	kW	545.5	524.5	502.7	480.8	438.9	403.3	571.6	553.5	534.5	515.1	476.5	440.7
	Pat	kW	106.4	113.6	122.1	131.5	153.2	177.8	114.0	121.9	131.2	142.0	167.9	199.4
	qw	m³/h	94.45	91.00	87.40	83.75	76.74	70.78	98.96	96.03	92.94	89.73	83.31	77.34
	dpw	kPa	107.4	99.7	92.0	84.5	70.9	60.3	110.7	104.3	97.7	91.1	78.5	67.6
15°C / 90%	Pt	kW	634.4	611.0	586.4	561.4	512.1	467.8	661.7	640.9	619.0	596.2	550.0	505.3
	Pat	kW	113.1	120.0	128.2	137.6	159.3	184.5	121.2	128.6	137.6	148.2	174.1	206.3
	qw	m³/h	109.84	106.00	101.95	97.79	89.55	82.10	114.56	111.20	107.62	103.87	96.16	88.68
	dpw	kPa	145.3	135.3	125.2	115.2	96.6	81.2	148.4	139.8	131.0	122.0	104.6	88.9

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Tw out = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

HEATING CAPACITY PERFORMANCE

RTMA

Ta.e. / R.U.			150 Tw out						170 Tw out					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	387.0	374.8	362.7	351.2	-	-	426.5	416.6	406.5	396.5	-	-
	Pat	kW	109.5	118.5	128.8	140.3	-	-	127.8	138.4	150.6	164.4	-	-
	qw	m³/h	67.01	65.03	63.06	61.17	-	-	73.83	72.28	70.68	69.08	-	-
	dpw	kPa	34.5	32.5	30.6	28.8	-	-	37.9	36.4	34.8	33.2	-	-
0°C / 90%	Pt	kW	457.2	442.8	428.1	413.7	387.0	-	497.4	485.5	473.0	460.3	435.2	-
	Pat	kW	114.6	123.7	134.2	146.0	173.6	-	132.9	143.5	155.9	170.3	204.8	-
	qw	m³/h	79.15	76.83	74.44	72.06	67.66	-	86.12	84.23	82.24	80.18	76.10	-
	dpw	kPa	48.2	45.4	42.6	39.9	35.2	-	51.6	49.4	47.1	44.8	40.3	-
7°C / 90%	Pt	kW	569.0	551.3	532.7	513.8	476.9	-	611.4	596.0	579.6	562.4	527.1	-
	Pat	kW	122.9	131.8	142.2	154.3	182.9	-	141.8	152.0	164.3	178.8	214.5	-
	qw	m³/h	98.52	95.65	92.62	89.51	83.38	-	105.85	103.41	100.76	97.97	92.16	-
	dpw	kPa	74.7	70.4	66.0	61.6	53.5	-	78.0	74.4	70.7	66.8	59.1	-
10°C / 90%	Pt	kW	623.7	604.3	583.9	563.0	521.2	482.6	667.7	650.6	632.2	612.9	572.7	532.2
	Pat	kW	127.1	135.8	146.1	158.1	187.0	222.1	146.6	156.5	168.6	183.0	219.0	264.7
	qw	m³/h	107.98	104.85	101.52	98.07	91.14	84.70	115.61	112.88	109.92	106.76	100.13	93.40
	dpw	kPa	89.7	84.6	79.3	74.0	63.9	55.2	93.0	88.7	84.1	79.3	69.8	60.7
15°C / 90%	Pt	kW	722.6	700.4	676.8	652.3	602.3	554.0	771.2	750.8	728.8	705.6	656.5	606.0
	Pat	kW	135.2	143.3	153.3	165.1	194.0	229.9	156.1	165.3	176.9	191.0	226.9	273.4
	qw	m³/h	125.11	121.52	117.67	113.63	105.31	97.23	133.51	130.26	126.71	122.91	114.80	106.34
	dpw	kPa	120.4	113.6	106.5	99.3	85.3	72.7	124.1	118.1	111.8	105.2	91.7	78.7

Ta.e. / R.U.			180 Tw out						190 Tw out					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	438.9	428.8	418.7	408.9	-	-	499.1	487.6	476.0	464.5	-	-
	Pat	kW	135.4	146.7	159.6	174.2	-	-	138.0	149.5	162.6	177.6	-	-
	qw	m³/h	76.00	74.40	72.80	71.23	-	-	86.41	84.60	82.75	80.91	-	-
	dpw	kPa	44.6	42.8	41.0	39.2	-	-	38.2	36.6	35.0	33.5	-	-
0°C / 90%	Pt	kW	513.1	500.9	488.3	475.7	451.5	-	582.5	568.6	554.2	539.5	510.7	-
	Pat	kW	140.4	151.9	165.3	180.5	217.0	-	143.5	155.0	168.4	183.9	221.1	-
	qw	m³/h	88.83	86.91	84.91	82.87	78.95	-	100.85	98.66	96.35	93.98	89.30	-
	dpw	kPa	61.0	58.4	55.7	53.1	48.2	-	52.1	49.8	47.5	45.2	40.8	-
7°C / 90%	Pt	kW	632.1	616.4	599.7	582.4	547.4	-	716.5	698.6	679.5	659.6	618.8	-
	Pat	kW	148.9	160.2	173.7	189.4	227.6	-	152.8	163.9	177.3	193.0	231.7	-
	qw	m³/h	109.45	106.95	104.27	101.46	95.71	-	124.04	121.20	118.14	114.91	108.20	-
	dpw	kPa	92.6	88.4	84.0	79.6	70.8	-	78.8	75.2	71.4	67.6	59.9	-
10°C / 90%	Pt	kW	691.0	673.5	654.7	635.2	594.9	555.2	782.7	762.8	741.4	719.0	672.4	625.8
	Pat	kW	153.4	164.5	177.8	193.5	232.2	281.0	157.8	168.6	181.8	197.5	236.4	285.9
	qw	m³/h	119.64	116.85	113.83	110.65	104.01	97.43	135.51	132.34	128.90	125.25	117.57	109.82
	dpw	kPa	110.6	105.5	100.2	94.6	83.6	73.4	94.0	89.6	85.0	80.3	70.7	61.7
15°C / 90%	Pt	kW	799.2	778.3	755.8	732.1	682.3	631.7	904.3	880.6	855.1	828.1	771.1	712.5
	Pat	kW	162.3	172.8	185.8	201.3	240.3	290.2	167.8	177.9	190.5	205.9	244.9	295.2
	qw	m³/h	138.37	135.03	131.40	127.52	119.30	110.85	156.57	152.79	148.66	144.25	134.82	125.03
	dpw	kPa	148.0	140.9	133.5	125.7	110.0	95.0	125.5	119.5	113.1	106.5	93.0	80.0

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Tw out = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

HEATING CAPACITY PERFORMANCE

RTMA

Ta.e. / R.U.			210 Tw out					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	540.1	527.7	515.1	502.6	-	-
	Pat	kW	146.8	158.9	172.9	188.8	-	-
	qw	m³/h	93.52	91.56	89.56	87.56	-	-
	dpw	kPa	38.2	36.6	35.0	33.5	-	-
0°C / 90%	Pt	kW	630.4	615.4	599.8	583.9	552.7	-
	Pat	kW	152.6	164.8	179.1	195.5	235.1	-
	qw	m³/h	109.14	106.77	104.28	101.71	96.65	-
	dpw	kPa	52.1	49.8	47.5	45.2	40.8	-
7°C / 90%	Pt	kW	775.4	756.0	735.4	713.9	669.7	-
	Pat	kW	162.5	174.3	188.6	205.3	246.3	-
	qw	m³/h	134.24	131.17	127.85	124.36	117.10	-
	dpw	kPa	78.8	75.2	71.4	67.6	59.9	-
10°C / 90%	Pt	kW	847.1	825.5	802.4	778.1	727.7	677.3
	Pat	kW	167.8	179.3	193.4	210.0	251.4	304.0
	qw	m³/h	146.66	143.22	139.50	135.55	127.24	118.85
	dpw	kPa	94.0	89.6	85.0	80.3	70.7	61.7
15°C / 90%	Pt	kW	978.7	953.0	925.4	896.2	834.5	771.1
	Pat	kW	178.4	189.1	202.6	218.9	260.4	314.0
	qw	m³/h	169.44	165.35	160.89	156.11	145.91	135.32
	dpw	kPa	125.5	119.5	113.1	106.5	93.0	80.0

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Tw out = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m^3/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA

Twout			105 Twoutr						115 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	414.2	387.8	359.8	330.6	271.6	216.2	466.0	436.8	405.6	373.2	307.5	245.5
	Pa	kW	101.2	108.2	116.3	125.4	146.2	169.9	108.7	116.1	124.7	134.4	156.6	181.9
	qw	m³/h	71.02	66.51	61.69	56.69	46.58	37.08	79.91	74.90	69.55	63.99	52.73	42.09
	dpw	kPa	81.1	71.1	61.2	51.7	34.9	22.1	64.5	56.6	48.8	41.4	28.1	17.9
	qwr	m³/h	89.23	86.06	82.76	79.43	73.07	67.76	99.49	95.92	92.19	88.42	81.15	75.01
	dpwr	kPa	125.1	116.4	107.7	99.2	83.9	72.2	140.9	130.9	121.0	111.3	93.7	80.1
7°C	Pf	kW	429.2	402.4	373.9	344.1	283.8	226.6	482.7	453.0	421.3	388.3	321.0	257.0
	Pa	kW	102.4	109.3	117.4	126.5	147.4	171.2	110.0	117.3	125.9	135.6	157.9	183.3
	qw	m³/h	73.64	69.05	64.15	59.05	48.69	38.87	82.82	77.73	72.29	66.62	55.08	44.10
	dpw	kPa	87.2	76.7	66.2	56.1	38.1	24.3	69.3	61.0	52.8	44.8	30.6	19.6
	qwr	m³/h	92.04	88.79	85.41	81.98	75.38	69.80	102.61	98.96	95.14	91.25	83.74	77.28
	dpwr	kPa	133.1	123.9	114.7	105.6	89.3	76.6	149.8	139.4	128.8	118.5	99.8	85.0
8°C	Pf	kW	444.5	417.4	388.3	358.0	296.2	237.2	499.7	469.6	437.4	403.7	334.9	269.0
	Pa	kW	103.6	110.5	118.5	127.6	148.5	172.4	111.3	118.6	127.1	136.8	159.1	184.7
	qw	m³/h	76.31	71.65	66.66	61.46	50.85	40.72	85.79	80.62	75.09	69.31	57.49	46.17
	dpw	kPa	93.7	82.6	71.5	60.7	41.6	26.7	74.3	65.6	56.9	48.5	33.4	21.5
	qwr	m³/h	94.90	91.58	88.12	84.59	77.76	71.89	105.78	102.05	98.14	94.15	86.38	79.61
	dpwr	kPa	141.5	131.8	122.0	112.5	95.0	81.2	159.3	148.2	137.1	126.2	106.2	90.2
9°C	Pf	kW	460.1	432.6	403.0	372.1	308.9	248.2	517.0	486.5	453.8	419.4	349.1	281.2
	Pa	kW	104.9	111.7	119.7	128.7	149.7	173.7	112.7	119.9	128.4	138.0	160.3	186.0
	qw	m³/h	79.03	74.30	69.23	63.92	53.06	42.63	88.81	83.57	77.94	72.05	59.97	48.31
	dpw	kPa	100.5	88.8	77.1	65.7	45.3	29.2	79.6	70.5	61.3	52.4	36.3	23.6
	qwr	m³/h	97.81	94.43	90.87	87.24	80.18	74.03	109.02	105.21	101.21	97.11	89.07	81.99
	dpwr	kPa	150.4	140.1	129.8	119.6	101.0	86.1	169.2	157.5	145.8	134.2	112.9	95.7
10°C	Pf	kW	476.0	448.0	418.0	386.6	321.9	259.4	534.7	503.7	470.5	435.5	363.6	293.8
	Pa	kW	106.1	112.9	120.8	129.8	150.8	174.9	114.1	121.2	129.6	139.2	161.6	187.4
	qw	m³/h	81.90	77.09	71.93	66.51	55.39	44.64	92.00	86.68	80.95	74.94	62.56	50.55
	dpw	kPa	107.9	95.6	83.2	71.2	49.4	32.1	85.5	75.9	66.2	56.7	39.5	25.8
	qwr	m³/h	100.78	97.32	93.68	89.96	82.66	76.22	112.32	108.43	104.33	100.12	91.83	84.44
	dpwr	kPa	159.6	148.9	137.9	127.2	107.4	91.3	179.5	167.3	154.9	142.7	120.0	101.5
11°C	Pf	kW	492.1	463.8	433.3	401.3	335.3	271.0	552.7	521.3	487.5	451.9	378.5	306.7
	Pa	kW	107.4	114.1	122.0	131.0	151.9	176.1	115.5	122.5	130.9	140.5	162.8	188.7
	qw	m³/h	84.82	79.94	74.68	69.16	57.79	46.71	95.25	89.84	84.02	77.89	65.23	52.86
	dpw	kPa	115.7	102.8	89.7	76.9	53.7	35.1	91.6	81.5	71.3	61.3	43.0	28.2
	qwr	m³/h	103.81	100.28	96.55	92.72	85.19	78.47	115.68	111.71	107.51	103.20	94.65	86.94
	dpwr	kPa	169.4	158.0	146.5	135.1	114.1	96.8	190.4	177.6	164.5	151.6	127.5	107.6

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA

Twout			120 Twoutr						130 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	467.5	437.7	405.9	373.0	306.6	244.4	509.7	481.8	451.5	419.3	351.2	281.7
	Pa	kW	108.4	115.9	124.6	134.4	156.7	182.0	116.5	124.9	134.7	146.0	173.1	205.7
	qw	m³/h	80.16	75.05	69.61	63.97	52.58	41.90	87.41	82.63	77.43	71.90	60.23	48.30
	dpw	kPa	66.1	58.0	49.9	42.1	28.5	18.1	75.8	67.7	59.5	51.3	36.0	23.1
	qwr	m³/h	99.70	96.04	92.24	88.39	81.02	74.83	108.43	105.26	101.92	98.48	91.67	85.54
	dpwr	kPa	119.7	111.1	102.5	94.1	79.1	67.4	133.0	125.3	117.5	109.7	95.0	82.7
7°C	Pf	kW	484.4	454.1	421.8	388.3	320.3	256.0	527.6	499.2	468.3	435.3	365.5	293.8
	Pa	kW	109.7	117.1	125.8	135.6	158.0	183.4	117.8	126.1	135.9	147.2	174.3	207.2
	qw	m³/h	83.11	77.92	72.38	66.62	54.95	43.92	90.53	85.65	80.35	74.70	62.72	50.41
	dpw	kPa	71.1	62.5	53.9	45.7	31.1	19.9	81.3	72.8	64.1	55.4	39.0	25.2
	qwr	m³/h	102.85	99.12	95.21	91.25	83.62	77.11	111.75	108.49	105.04	101.48	94.39	87.92
	dpwr	kPa	127.4	118.3	109.2	100.3	84.2	71.6	141.2	133.1	124.8	116.5	100.8	87.4
8°C	Pf	kW	501.6	470.9	438.1	403.9	334.3	267.9	545.9	517.0	485.4	451.8	380.2	306.3
	Pa	kW	111.0	118.4	127.0	136.8	159.2	184.8	119.2	127.3	137.1	148.4	175.6	208.6
	qw	m³/h	86.12	80.84	75.21	69.33	57.38	46.00	93.72	88.76	83.34	77.56	65.27	52.58
	dpw	kPa	76.3	67.3	58.2	49.5	33.9	21.8	87.2	78.2	68.9	59.7	42.3	27.4
	qwr	m³/h	106.07	102.25	98.25	94.18	86.28	79.46	115.15	111.79	108.24	104.56	97.18	90.36
	dpwr	kPa	135.5	125.9	116.3	106.8	89.7	76.0	149.9	141.3	132.5	123.6	106.8	92.3
9°C	Pf	kW	519.2	488.0	454.6	419.8	348.6	280.3	564.6	535.2	503.0	468.6	395.3	319.2
	Pa	kW	112.4	119.7	128.3	138.0	160.5	186.2	120.5	128.6	138.4	149.7	176.9	210.1
	qw	m³/h	89.19	83.83	78.10	72.11	59.88	48.14	96.99	91.93	86.40	80.50	67.90	54.82
	dpw	kPa	81.9	72.3	62.8	53.5	36.9	23.9	93.3	83.9	74.1	64.3	45.7	29.8
	qwr	m³/h	109.35	105.45	101.35	97.17	89.01	81.86	118.62	115.17	111.51	107.70	100.04	92.88
	dpwr	kPa	144.0	133.9	123.7	113.7	95.4	80.7	159.1	150.0	140.6	131.2	113.2	97.5
10°C	Pf	kW	537.1	505.5	471.6	436.0	363.2	292.9	583.7	553.7	521.0	485.9	410.7	332.4
	Pa	kW	113.8	121.0	129.6	139.3	161.8	187.6	122.0	130.0	139.6	150.9	178.2	211.5
	qw	m³/h	92.41	86.97	81.14	75.03	62.50	50.40	100.43	95.28	89.64	83.60	70.67	57.20
	dpw	kPa	87.9	77.9	67.8	57.9	40.2	26.1	100.1	90.1	79.7	69.3	49.6	32.5
	qwr	m³/h	112.69	108.70	104.51	100.22	91.79	84.33	122.18	118.63	114.86	110.93	102.97	95.46
	dpwr	kPa	152.9	142.3	131.6	121.0	101.5	85.6	168.8	159.1	149.2	139.1	119.9	103.0
11°C	Pf	kW	555.3	523.3	488.8	452.6	378.2	305.9	603.2	572.8	539.4	503.5	426.6	346.1
	Pa	kW	115.2	122.4	130.9	140.5	163.0	189.0	123.4	131.4	141.0	152.2	179.5	213.0
	qw	m³/h	95.71	90.18	84.24	78.01	65.19	52.73	103.96	98.71	92.95	86.78	73.52	59.65
	dpw	kPa	94.3	83.7	73.0	62.6	43.7	28.6	107.2	96.7	85.7	74.7	53.6	35.3
	qwr	m³/h	116.09	112.02	107.73	103.33	94.64	86.85	125.81	122.17	118.28	114.22	105.97	98.11
	dpwr	kPa	162.3	151.1	139.8	128.6	107.9	90.8	179.0	168.8	158.2	147.5	127.0	108.8

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA

Twout			150 Twoutr						170 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	573.4	542.4	508.6	472.4	395.3	315.5	648.6	618.0	583.8	546.1	462.2	368.7
	Pa	kW	133.1	142.2	153.2	165.8	196.3	233.2	153.1	163.9	177.0	192.4	230.6	279.0
	qw	m³/h	98.33	93.02	87.21	81.01	67.78	54.10	111.23	105.98	100.10	93.65	79.25	63.22
	dpw	kPa	81.0	72.5	63.7	55.0	38.5	24.5	89.8	81.5	72.7	63.7	45.6	29.0
	qwr	m³/h	122.31	118.79	115.05	111.18	103.43	96.29	138.81	135.67	132.26	128.66	121.13	113.65
	dpwr	kPa	115.1	108.6	101.8	95.1	82.3	71.3	134.1	128.1	121.8	115.2	102.1	89.9
7°C	Pf	kW	593.3	561.8	527.3	490.4	411.3	329.2	670.7	639.4	604.4	565.9	479.8	383.7
	Pa	kW	134.6	143.7	154.6	167.2	197.7	234.9	154.7	165.4	178.5	193.9	232.2	280.8
	qw	m³/h	101.80	96.40	90.48	84.14	70.58	56.48	115.07	109.71	103.71	97.10	82.33	65.83
	dpw	kPa	86.8	77.8	68.6	59.3	41.7	26.7	96.1	87.4	78.1	68.4	49.2	31.4
	qwr	m³/h	126.03	122.41	118.55	114.55	106.49	98.99	142.90	139.65	136.11	132.36	124.49	116.60
	dpwr	kPa	122.2	115.3	108.1	100.9	87.2	75.4	142.1	135.7	129.0	121.9	107.9	94.6
8°C	Pf	kW	613.7	581.6	546.5	508.8	427.9	343.3	693.2	661.4	625.6	586.2	498.0	399.1
	Pa	kW	136.2	145.2	156.0	168.6	199.1	236.5	156.4	167.0	180.0	195.4	233.7	282.6
	qw	m³/h	105.36	99.86	93.82	87.35	73.45	58.94	119.01	113.54	107.41	100.65	85.49	68.52
	dpw	kPa	93.0	83.5	73.7	63.9	45.2	29.1	102.8	93.6	83.7	73.5	53.0	34.1
	qwr	m³/h	129.83	126.11	122.13	118.00	109.63	101.75	147.11	143.73	140.06	136.16	127.94	119.64
	dpwr	kPa	129.7	122.3	114.8	107.1	92.5	79.7	150.6	143.8	136.6	129.0	113.9	99.6
9°C	Pf	kW	634.5	601.9	566.1	527.6	444.8	357.9	716.3	683.9	647.3	607.1	516.6	415.1
	Pa	kW	137.8	146.7	157.5	170.0	200.6	238.1	158.2	168.7	181.6	196.9	235.3	284.4
	qw	m³/h	108.99	103.40	97.25	90.63	76.41	61.48	123.05	117.47	111.20	104.28	88.75	71.30
	dpw	kPa	99.5	89.6	79.2	68.8	48.9	31.7	109.9	100.2	89.7	78.9	57.2	36.9
	qwr	m³/h	133.72	129.89	125.80	121.53	112.85	104.60	151.42	147.92	144.12	140.06	131.48	122.76
	dpwr	kPa	137.5	129.8	121.7	113.6	98.0	84.2	159.6	152.3	144.6	136.5	120.3	104.9
10°C	Pf	kW	655.8	622.6	586.2	546.9	462.2	372.9	740.0	706.9	669.6	628.5	535.8	431.5
	Pa	kW	139.5	148.3	159.0	171.5	202.1	239.7	160.1	170.4	183.2	198.5	237.0	286.2
	qw	m³/h	112.83	107.13	100.86	94.10	79.52	64.16	127.33	121.64	115.22	108.13	92.19	74.25
	dpw	kPa	106.7	96.2	85.2	74.2	53.0	34.5	117.7	107.4	96.3	84.9	61.7	40.0
	qwr	m³/h	137.69	133.76	129.55	125.15	116.14	107.51	155.85	152.23	148.28	144.06	135.12	125.97
	dpwr	kPa	145.9	137.6	129.1	120.5	103.8	88.9	169.1	161.3	153.0	144.5	127.1	110.4
11°C	Pf	kW	677.5	643.8	606.7	566.6	480.0	388.3	764.3	730.6	692.5	650.4	555.5	448.5
	Pa	kW	141.3	149.9	160.5	173.0	203.6	241.4	162.1	172.3	184.9	200.2	238.6	288.1
	qw	m³/h	116.76	110.96	104.56	97.66	82.72	66.93	131.73	125.91	119.35	112.09	95.74	77.30
	dpw	kPa	114.2	103.1	91.6	79.9	57.3	37.5	125.9	115.1	103.4	91.2	66.5	43.4
	qwr	m³/h	141.76	137.72	133.39	128.85	119.52	110.51	160.39	156.64	152.55	148.17	138.85	129.27
	dpwr	kPa	154.6	145.9	136.9	127.7	109.9	93.9	179.1	170.8	162.0	152.8	134.2	116.3

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA

Twout			180 Twoutr						190 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	684.8	651.8	615.1	575.0	485.8	387.0	687.1	654.6	618.2	578.3	489.0	389.6
	Pa	kW	161.7	173.4	187.6	204.2	245.0	296.4	162.5	173.9	187.8	204.2	244.7	296.0
	qw	m³/h	117.42	111.78	105.49	98.60	83.30	66.36	117.82	112.25	106.01	99.16	83.86	66.81
	dpw	kPa	100.7	91.2	81.2	71.0	50.7	32.1	46.5	42.2	37.6	32.9	23.5	14.9
	qwr	m³/h	146.55	143.19	139.56	135.73	127.77	119.93	147.09	143.76	140.14	136.30	128.29	120.32
	dpwr	kPa	166.0	158.5	150.5	142.4	126.2	111.2	110.7	105.8	100.5	95.1	84.2	74.1
7°C	Pf	kW	708.2	674.6	637.1	596.0	504.4	402.7	710.4	677.3	640.1	599.2	507.7	405.5
	Pa	kW	163.3	175.0	189.1	205.7	246.6	298.4	164.2	175.6	189.4	205.7	246.3	297.9
	qw	m³/h	121.51	115.74	109.31	102.26	86.55	69.10	121.89	116.20	109.83	102.81	87.12	69.58
	dpw	kPa	107.8	97.8	87.2	76.3	54.7	34.9	49.7	45.2	40.4	35.4	25.4	16.2
	qwr	m³/h	150.88	147.40	143.63	139.64	131.32	123.04	151.43	147.97	144.22	140.22	131.85	123.45
	dpwr	kPa	176.0	167.9	159.5	150.7	133.3	117.0	117.4	112.1	106.5	100.6	89.0	78.0
8°C	Pf	kW	732.1	697.9	659.5	617.5	523.6	419.0	734.3	700.5	662.5	620.7	527.0	421.9
	Pa	kW	165.1	176.6	190.6	207.2	248.3	300.3	166.1	177.3	191.0	207.3	248.0	299.8
	qw	m³/h	125.69	119.81	113.23	106.01	89.89	71.93	126.06	120.26	113.74	106.57	90.47	72.43
	dpw	kPa	115.3	104.8	93.6	82.0	59.0	37.8	53.2	48.4	43.3	38.0	27.4	17.6
	qwr	m³/h	155.34	151.73	147.81	143.66	134.95	126.23	155.88	152.30	148.40	144.25	135.50	126.66
	dpwr	kPa	186.5	177.9	168.9	159.5	140.8	123.2	124.4	118.7	112.7	106.5	94.0	82.1
9°C	Pf	kW	756.7	721.8	682.6	639.6	543.3	435.8	758.8	724.3	685.5	642.8	546.7	438.8
	Pa	kW	166.9	178.3	192.3	208.8	249.9	302.2	168.0	179.1	192.7	209.0	249.7	301.8
	qw	m³/h	129.99	123.98	117.25	109.86	93.33	74.85	130.34	124.42	117.76	110.42	93.91	75.38
	dpw	kPa	123.3	112.2	100.4	88.1	63.6	40.9	56.9	51.8	46.4	40.8	29.5	19.0
	qwr	m³/h	159.91	156.16	152.10	147.78	138.69	129.51	160.45	156.74	152.69	148.38	139.25	129.96
	dpwr	kPa	197.6	188.5	178.8	168.8	148.7	129.6	131.8	125.7	119.3	112.7	99.2	86.4
10°C	Pf	kW	781.9	746.2	706.2	662.2	563.5	453.1	783.9	748.7	709.1	665.4	567.0	456.2
	Pa	kW	168.8	180.1	193.9	210.4	251.6	304.2	170.0	180.9	194.5	210.7	251.4	303.7
	qw	m³/h	134.53	128.40	121.52	113.94	96.96	77.95	134.87	128.83	122.02	114.50	97.56	78.50
	dpw	kPa	132.1	120.4	107.8	94.8	68.6	44.4	60.9	55.6	49.8	43.9	31.9	20.6
	qwr	m³/h	164.60	160.72	156.50	152.01	142.53	132.89	165.15	161.30	157.10	152.62	143.11	133.36
	dpwr	kPa	209.4	199.7	189.3	178.6	157.0	136.5	139.6	133.2	126.3	119.2	104.8	91.0
11°C	Pf	kW	807.7	771.3	730.5	685.5	584.4	470.9	809.6	773.8	733.3	688.7	587.9	474.2
	Pa	kW	170.8	181.9	195.7	212.1	253.4	306.1	172.1	182.9	196.3	212.4	253.2	305.6
	qw	m³/h	139.20	132.94	125.89	118.14	100.71	81.16	139.53	133.35	126.39	118.69	101.32	81.73
	dpw	kPa	141.5	129.0	115.7	101.9	74.0	48.1	65.2	59.5	53.5	47.2	34.4	22.4
	qwr	m³/h	169.41	165.39	161.02	156.36	146.48	136.36	169.96	165.98	161.63	156.97	147.06	136.86
	dpwr	kPa	221.8	211.4	200.4	189.0	165.8	143.7	147.9	141.0	133.7	126.1	110.7	95.9

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA

Twout			210 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	781.2	745.2	705.0	660.9	562.6	453.4
	Pa	kW	174.5	186.8	201.7	219.3	262.8	317.9
	qw	m³/h	133.96	127.80	120.90	113.33	96.48	77.75
	dpw	kPa	53.1	48.3	43.2	38.0	27.5	17.9
	qwr	m³/h	165.48	161.72	157.65	153.34	144.33	135.36
	dpwr	kPa	119.7	114.3	108.6	102.7	91.0	80.1
7°C	Pf	kW	807.5	770.8	729.7	684.6	583.7	471.4
	Pa	kW	176.4	188.6	203.4	221.0	264.6	320.0
	qw	m³/h	138.56	132.26	125.21	117.46	100.15	80.87
	dpw	kPa	56.8	51.8	46.4	40.8	29.7	19.4
	qwr	m³/h	170.36	166.46	162.24	157.75	148.33	138.87
	dpwr	kPa	126.8	121.1	115.0	108.7	96.1	84.3
8°C	Pf	kW	834.5	797.1	755.0	708.8	605.4	489.9
	Pa	kW	178.4	190.4	205.2	222.7	266.4	322.0
	qw	m³/h	143.27	136.84	129.63	121.69	103.94	84.10
	dpw	kPa	60.7	55.4	49.7	43.8	32.0	20.9
	qwr	m³/h	175.37	171.33	166.94	162.27	152.43	142.49
	dpwr	kPa	134.4	128.3	121.8	115.1	101.5	88.7
9°C	Pf	kW	862.1	823.9	781.0	733.8	627.7	509.0
	Pa	kW	180.4	192.3	207.0	224.5	268.2	324.1
	qw	m³/h	148.10	141.53	134.16	126.04	107.83	87.44
	dpw	kPa	64.9	59.3	53.3	47.0	34.4	22.6
	qwr	m³/h	180.51	176.33	171.78	166.92	156.65	146.20
	dpwr	kPa	142.4	135.9	128.9	121.8	107.2	93.4
10°C	Pf	kW	890.5	851.5	807.7	759.3	650.7	528.7
	Pa	kW	182.6	194.3	208.9	226.3	270.1	326.2
	qw	m³/h	153.21	146.51	138.97	130.65	111.96	90.97
	dpw	kPa	69.5	63.5	57.1	50.5	37.1	24.5
	qwr	m³/h	185.78	181.45	176.73	171.69	160.99	150.03
	dpwr	kPa	150.8	143.9	136.5	128.8	113.3	98.4
11°C	Pf	kW	919.5	879.7	835.0	785.5	674.3	549.0
	Pa	kW	184.8	196.4	210.8	228.2	271.9	328.3
	qw	m³/h	158.47	151.62	143.90	135.38	116.21	94.62
	dpw	kPa	74.3	68.0	61.3	54.2	40.0	26.5
	qwr	m³/h	191.20	186.72	181.82	176.59	165.44	153.96
	dpwr	kPa	159.8	152.4	144.5	136.3	119.6	103.6

Twout = Outlet water temperature (°C);
Twoutr = Heating side heat exchanger leaving water temperature (°C);
Pf = Cooling capacity (kW);
Pr = Recovery mode heating capacity (kW);
Pa = Compressors heating capacity (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa);
qwr = Recovery heat exchanger water flow (m³/h);
dpw = Recovery heat exchanger pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C
(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

COOLING CAPACITY PERFORMANCE

RTMA L

Twout			105 Tae						115 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	372.6	348.6	338.6	323.3	307.5	291.9	413.6	386.1	374.7	357.4	339.4	321.8
	Pa	kW	111.1	119.1	122.6	128.2	134.6	140.9	125.2	134.3	138.3	144.7	151.9	159.0
	qw	m³/h	63.89	59.78	58.07	55.45	52.73	50.05	70.93	66.21	64.26	61.28	58.21	55.19
	dpw	kPa	65.7	57.5	54.2	49.5	44.7	40.3	50.8	44.3	41.7	37.9	34.2	30.8
7°C	Pf	kW	384.5	360.0	349.8	334.2	318.0	302.0	426.7	398.6	387.0	369.3	350.9	332.9
	Pa	kW	112.9	120.9	124.4	130.1	136.4	142.8	127.1	136.3	140.4	146.8	154.0	161.2
	qw	m³/h	65.97	61.76	60.01	57.34	54.55	51.81	73.22	68.40	66.40	63.36	60.21	57.12
	dpw	kPa	70.0	61.4	57.9	52.9	47.9	43.2	54.1	47.2	44.5	40.5	36.6	32.9
8°C	Pf	kW	396.5	371.5	361.1	345.2	328.6	312.3	440.1	411.4	399.5	381.4	362.6	344.2
	Pa	kW	114.6	122.7	126.2	131.9	138.3	144.8	129.1	138.3	142.4	148.8	156.1	163.3
	qw	m³/h	68.08	63.78	62.00	59.26	56.42	53.61	75.55	70.62	68.58	65.47	62.25	59.09
	dpw	kPa	74.5	65.4	61.8	56.5	51.2	46.2	57.6	50.4	47.5	43.3	39.1	35.3
9°C	Pf	kW	408.8	383.3	372.7	356.4	339.5	322.7	453.6	424.3	412.2	393.7	374.5	355.7
	Pa	kW	116.4	124.5	128.1	133.8	140.2	146.7	131.1	140.4	144.5	150.9	158.2	165.5
	qw	m³/h	70.23	65.84	64.02	61.22	58.31	55.44	77.92	72.89	70.80	67.63	64.33	61.09
	dpw	kPa	79.3	69.7	65.9	60.3	54.7	49.4	61.3	53.6	50.6	46.2	41.8	37.7
10°C	Pf	kW	421.3	395.3	384.4	367.8	350.5	333.4	467.4	437.5	425.1	406.2	386.6	367.3
	Pa	kW	118.2	126.4	130.0	135.7	142.2	148.7	133.1	142.4	146.5	153.1	160.4	167.7
	qw	m³/h	72.49	68.01	66.14	63.29	60.31	57.37	80.42	75.27	73.14	69.89	66.52	63.20
	dpw	kPa	84.5	74.4	70.4	64.4	58.5	52.9	65.3	57.2	54.0	49.3	44.7	40.3
11°C	Pf	kW	434.0	407.4	396.4	379.4	361.7	344.3	481.4	450.9	438.2	418.9	398.9	379.2
	Pa	kW	120.1	128.2	131.8	137.6	144.1	150.7	135.2	144.5	148.6	155.2	162.5	169.9
	qw	m³/h	74.80	70.22	68.31	65.39	62.34	59.33	82.96	77.70	75.53	72.20	68.75	65.36
	dpw	kPa	90.0	79.3	75.1	68.8	62.5	56.6	69.5	61.0	57.6	52.6	47.7	43.1

Twout			120 Tae						130 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	430.2	402.6	391.1	373.5	355.3	337.3	464.2	436.2	424.4	406.3	387.4	368.5
	Pa	kW	118.5	127.0	130.7	136.7	143.5	150.3	129.1	139.2	143.7	150.9	159.1	167.4
	qw	m³/h	73.78	69.04	67.07	64.06	60.92	57.84	79.61	74.79	72.78	69.68	66.43	63.18
	dpw	kPa	56.0	49.1	46.3	42.2	38.2	34.4	62.9	55.5	52.6	48.2	43.8	39.6
7°C	Pf	kW	443.9	415.7	404.0	386.0	367.3	348.9	478.8	450.0	437.9	419.4	399.9	380.5
	Pa	kW	120.4	128.9	132.7	138.7	145.5	152.3	131.0	141.2	145.7	153.0	161.2	169.6
	qw	m³/h	76.17	71.33	69.31	66.23	63.03	59.87	82.15	77.21	75.14	71.96	68.62	65.28
	dpw	kPa	59.7	52.4	49.4	45.1	40.9	36.9	67.0	59.2	56.0	51.4	46.7	42.3
8°C	Pf	kW	457.8	429.0	417.1	398.7	379.6	360.8	493.6	464.1	451.8	432.7	412.7	392.7
	Pa	kW	122.3	130.9	134.7	140.8	147.6	154.5	133.0	143.2	147.8	155.1	163.4	171.9
	qw	m³/h	78.60	73.66	71.60	68.45	65.17	61.94	84.74	79.68	77.56	74.29	70.86	67.43
	dpw	kPa	63.6	55.8	52.8	48.2	43.7	39.5	71.3	63.0	59.7	54.8	49.8	45.1
9°C	Pf	kW	472.0	442.6	430.4	411.6	392.1	372.9	508.8	478.5	465.8	446.3	425.8	405.3
	Pa	kW	124.3	132.9	136.7	142.8	149.7	156.6	135.0	145.3	149.9	157.2	165.6	174.2
	qw	m³/h	81.08	76.03	73.93	70.71	67.36	64.05	87.39	82.20	80.02	76.67	73.14	69.62
	dpw	kPa	67.7	59.5	56.2	51.5	46.7	42.2	75.8	67.0	63.5	58.3	53.1	48.1
10°C	Pf	kW	486.4	456.4	443.9	424.8	404.8	385.1	524.2	493.2	480.2	460.2	439.1	418.0
	Pa	kW	126.3	134.9	138.7	144.9	151.8	158.7	137.0	147.4	152.0	159.4	167.9	176.5
	qw	m³/h	83.69	78.53	76.38	73.09	69.66	66.27	90.19	84.86	82.62	79.18	75.55	71.93
	dpw	kPa	72.1	63.5	60.0	55.0	49.9	45.2	80.7	71.5	67.7	62.2	56.6	51.3
11°C	Pf	kW	501.0	470.4	457.7	438.1	417.8	397.6	539.9	508.2	494.8	474.3	452.7	431.1
	Pa	kW	128.3	136.9	140.8	146.9	153.9	160.9	139.0	149.5	154.1	161.6	170.2	178.9
	qw	m³/h	86.34	81.07	78.87	75.51	72.00	68.53	93.05	87.58	85.28	81.74	78.02	74.29
	dpw	kPa	76.7	67.6	64.0	58.7	53.4	48.3	85.9	76.1	72.2	66.3	60.4	54.8

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

COOLING CAPACITY PERFORMANCE

RTMA L

Twout			150 Tae						170 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	525.9	495.7	483.0	463.3	442.6	421.9	592.0	561.7	548.8	528.5	506.9	484.7
	Pa	kW	144.7	155.6	160.5	168.4	177.3	186.5	173.3	186.9	193.1	203.0	214.6	226.5
	qw	m³/h	90.19	85.00	82.82	79.45	75.90	72.35	101.52	96.33	94.11	90.64	86.92	83.12
	dpw	kPa	68.1	60.5	57.5	52.9	48.3	43.8	74.8	67.3	64.3	59.6	54.8	50.1
7°C	Pf	kW	542.2	511.2	498.1	478.0	456.7	435.4	610.0	578.8	565.5	544.7	522.3	499.5
	Pa	kW	146.9	157.9	162.8	170.7	179.7	189.0	175.7	189.5	195.7	205.8	217.4	229.5
	qw	m³/h	93.02	87.71	85.47	82.01	78.37	74.71	104.66	99.32	97.03	93.45	89.62	85.70
	dpw	kPa	72.5	64.4	61.2	56.3	51.4	46.8	79.5	71.6	68.3	63.4	58.3	53.3
8°C	Pf	kW	558.7	527.0	513.6	492.9	471.1	449.2	628.4	596.3	582.6	561.1	538.1	514.6
	Pa	kW	149.1	160.2	165.1	173.1	182.2	191.5	178.3	192.1	198.4	208.6	220.3	232.5
	qw	m³/h	95.92	90.47	88.17	84.62	80.88	77.13	107.88	102.38	100.02	96.33	92.38	88.34
	dpw	kPa	77.1	68.6	65.1	60.0	54.8	49.8	84.5	76.1	72.6	67.3	61.9	56.6
9°C	Pf	kW	575.6	543.1	529.3	508.1	485.8	463.3	647.2	614.2	600.0	577.9	554.2	530.0
	Pa	kW	151.4	162.5	167.5	175.5	184.7	194.1	180.9	194.9	201.2	211.4	223.3	235.6
	qw	m³/h	98.88	93.29	90.93	87.29	83.45	79.59	111.17	105.50	103.07	99.27	95.20	91.04
	dpw	kPa	81.9	72.9	69.3	63.8	58.3	53.1	89.7	80.8	77.1	71.5	65.8	60.2
10°C	Pf	kW	592.8	559.5	545.4	523.7	500.7	477.7	666.4	632.4	617.9	595.1	570.7	545.7
	Pa	kW	153.7	164.9	169.9	178.0	187.2	196.7	183.6	197.6	204.0	214.4	226.4	238.8
	qw	m³/h	102.00	96.26	93.85	90.11	86.16	82.20	114.66	108.81	106.31	102.39	98.19	93.90
	dpw	kPa	87.2	77.6	73.8	68.0	62.2	56.6	95.4	85.9	82.0	76.1	70.0	64.0
11°C	Pf	kW	610.4	576.2	561.8	539.5	516.0	492.4	686.0	651.1	636.1	612.7	587.5	561.8
	Pa	kW	156.1	167.3	172.4	180.5	189.8	199.4	186.4	200.5	206.9	217.4	229.5	242.0
	qw	m³/h	105.20	99.31	96.82	92.98	88.93	84.86	118.23	112.21	109.63	105.59	101.26	96.83
	dpw	kPa	92.7	82.6	78.5	72.4	66.2	60.3	101.5	91.4	87.2	80.9	74.4	68.0

Twout			180 Tae						190 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	636.9	603.0	588.6	566.1	542.0	517.5	659.8	625.7	611.2	588.4	564.0	539.1
	Pa	kW	188.7	204.1	210.9	222.1	234.8	248.0	180.6	194.9	201.3	211.8	223.8	236.3
	qw	m³/h	109.21	103.41	100.93	97.07	92.94	88.73	113.15	107.30	104.80	100.89	96.71	92.44
	dpw	kPa	87.1	78.1	74.4	68.8	63.1	57.5	42.9	38.5	36.8	34.1	31.3	28.6
7°C	Pf	kW	656.3	621.5	606.6	583.4	558.6	533.3	679.9	644.8	629.8	606.3	581.1	555.5
	Pa	kW	191.4	206.9	213.8	225.0	237.9	251.3	183.1	197.6	204.1	214.6	226.8	239.4
	qw	m³/h	112.61	106.63	104.08	100.10	95.84	91.50	116.65	110.63	108.05	104.02	99.71	95.31
	dpw	kPa	92.6	83.0	79.1	73.1	67.1	61.1	45.6	41.0	39.1	36.2	33.3	30.4
8°C	Pf	kW	676.2	640.3	625.0	601.1	575.5	549.5	700.3	664.2	648.7	624.6	598.7	572.2
	Pa	kW	194.1	209.7	216.7	228.1	241.1	254.6	185.8	200.3	206.9	217.6	229.9	242.6
	qw	m³/h	116.09	109.93	107.30	103.20	98.81	94.33	120.23	114.03	111.38	107.23	102.78	98.24
	dpw	kPa	98.4	88.2	84.0	77.7	71.3	65.0	48.4	43.5	41.5	38.5	35.4	32.3
9°C	Pf	kW	696.5	659.6	643.8	619.2	592.9	566.0	721.3	684.1	668.2	643.3	616.6	589.4
	Pa	kW	197.0	212.6	219.7	231.2	244.3	258.0	188.5	203.2	209.8	220.5	233.0	245.8
	qw	m³/h	119.64	113.30	110.59	106.36	101.84	97.23	123.90	117.51	114.77	110.50	105.92	101.24
	dpw	kPa	104.5	93.7	89.3	82.6	75.7	69.0	51.4	46.2	44.1	40.9	37.6	34.3
10°C	Pf	kW	717.3	679.2	663.0	637.7	610.6	582.9	742.6	704.4	688.0	662.4	634.9	606.8
	Pa	kW	199.8	215.6	222.7	234.3	247.6	261.4	191.3	206.1	212.7	223.6	236.1	249.1
	qw	m³/h	123.41	116.87	114.08	109.72	105.05	100.29	127.78	121.19	118.37	113.97	109.24	104.41
	dpw	kPa	111.2	99.7	95.0	87.9	80.6	73.4	54.7	49.2	46.9	43.5	39.9	36.5
11°C	Pf	kW	738.5	699.4	682.7	656.6	628.6	600.1	764.5	725.1	708.2	681.9	653.6	624.7
	Pa	kW	202.8	218.7	225.9	237.5	251.0	264.9	194.2	209.0	215.8	226.7	239.4	252.5
	qw	m³/h	127.27	120.53	117.65	113.16	108.34	103.43	131.76	124.97	122.06	117.52	112.64	107.67
	dpw	kPa	118.2	106.1	101.0	93.5	85.7	78.1	58.1	52.3	49.9	46.2	42.5	38.8

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

Technical data

COOLING CAPACITY PERFORMANCE

RTMA L

Twout			210 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	701.9	665.6	650.1	625.8	599.9	573.4
	Pa	kW	197.2	212.8	219.9	231.3	244.5	258.1
	qw	m³/h	120.36	114.14	111.48	107.32	102.87	98.33
	dpw	kPa	42.9	38.5	36.8	34.1	31.3	28.6
7°C	Pf	kW	723.2	685.8	669.9	644.9	618.2	590.9
	Pa	kW	200.0	215.8	222.9	234.4	247.7	261.5
	qw	m³/h	124.08	117.68	114.94	110.65	106.07	101.38
	dpw	kPa	45.6	41.0	39.1	36.2	33.3	30.4
8°C	Pf	kW	744.9	706.5	690.1	664.4	636.8	608.7
	Pa	kW	202.9	218.8	226.0	237.6	251.0	264.9
	qw	m³/h	127.89	121.29	118.47	114.06	109.33	104.50
	dpw	kPa	48.4	43.5	41.5	38.5	35.4	32.3
9°C	Pf	kW	767.2	727.6	710.7	684.2	655.9	626.9
	Pa	kW	205.9	221.9	229.1	240.9	254.4	268.5
	qw	m³/h	131.79	124.99	122.09	117.54	112.66	107.69
	dpw	kPa	51.4	46.2	44.1	40.9	37.6	34.3
10°C	Pf	kW	789.9	749.2	731.8	704.5	675.3	645.5
	Pa	kW	209.0	225.1	232.3	244.2	257.9	272.1
	qw	m³/h	135.92	128.91	125.92	121.23	116.20	111.07
	dpw	kPa	54.7	49.2	46.9	43.5	39.9	36.5
11°C	Pf	kW	813.2	771.3	753.4	725.3	695.2	664.5
	Pa	kW	212.1	228.3	235.6	247.6	261.4	275.8
	qw	m³/h	140.15	132.93	129.84	125.00	119.82	114.52
	dpw	kPa	58.1	52.3	49.9	46.2	42.5	38.8

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

HEATING CAPACITY PERFORMANCE

RTMA L

Ta.e. / R.U.			105 Twout						115 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	275.4	264.1	253.1	242.7	-	-	289.9	277.7	265.8	254.7	-	-
	Pat	kW	82.7	89.5	97.1	105.4	-	-	84.3	91.3	99.1	107.6	-	-
	qw	m³/h	47.68	45.83	44.00	42.28	-	-	50.19	48.19	46.22	44.36	-	-
	dpw	kPa	35.7	33.0	30.4	28.1	-	-	35.9	33.0	30.4	28.0	-	-
0°C / 90%	Pt	kW	328.9	315.8	302.7	289.9	267.3	-	346.9	332.8	318.6	304.9	280.6	-
	Pat	kW	87.3	94.1	101.8	110.3	129.2	-	89.0	96.0	103.9	112.6	132.0	-
	qw	m³/h	56.95	54.80	52.62	50.50	46.74	-	60.07	57.74	55.40	53.11	49.06	-
	dpw	kPa	51.0	47.2	43.5	40.1	34.3	-	51.3	47.5	43.7	40.1	34.3	-
7°C / 90%	Pt	kW	413.2	397.5	381.4	365.2	334.8	-	436.9	420.0	402.7	385.3	352.5	-
	Pat	kW	94.4	101.0	108.6	117.2	136.6	-	96.4	103.2	111.0	119.8	139.8	-
	qw	m³/h	71.54	68.97	66.31	63.63	58.54	-	75.65	72.88	70.01	67.12	61.64	-
	dpw	kPa	80.4	74.8	69.1	63.6	53.9	-	81.4	75.6	69.7	64.1	54.1	-
10°C / 90%	Pt	kW	453.7	436.9	419.4	401.8	367.9	338.7	480.2	462.1	443.3	424.4	387.9	356.5
	Pat	kW	97.8	104.2	111.8	120.3	139.9	162.2	99.9	106.6	114.3	123.1	143.2	166.2
	qw	m³/h	78.55	75.80	72.92	69.99	64.32	59.43	83.14	80.17	77.07	73.92	67.82	62.56
	dpw	kPa	97.0	90.3	83.6	77.0	65.0	55.5	98.4	91.5	84.5	77.8	65.5	55.7
15°C / 90%	Pt	kW	525.8	507.0	487.4	467.3	427.6	391.4	557.3	537.1	516.0	494.4	451.7	412.9
	Pat	kW	103.9	110.0	117.3	125.6	145.2	168.0	106.2	112.5	120.1	128.7	148.8	172.2
	qw	m³/h	91.03	87.97	84.73	81.40	74.76	68.69	96.49	93.20	89.71	86.12	78.98	72.46
	dpw	kPa	130.2	121.6	112.8	104.1	87.8	74.2	132.5	123.6	114.5	105.6	88.8	74.7

Ta.e. / R.U.			120 Twout						130 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	331.1	316.9	303.1	290.2	-	-	359.8	348.3	337.0	326.1	-	-
	Pat	kW	90.2	97.7	106.0	115.1	-	-	98.5	106.7	116.0	126.4	-	-
	qw	m³/h	57.33	54.99	52.70	50.55	-	-	62.29	60.44	58.59	56.80	-	-
	dpw	kPa	39.6	36.4	33.4	30.8	-	-	43.9	41.3	38.8	36.5	-	-
0°C / 90%	Pt	kW	397.0	380.5	364.0	348.0	320.0	-	424.4	410.9	397.1	383.5	358.3	-
	Pat	kW	95.2	102.8	111.3	120.6	141.4	-	103.2	111.4	120.9	131.5	156.4	-
	qw	m³/h	68.74	66.02	63.28	60.62	55.95	-	73.48	71.29	69.05	66.81	62.65	-
	dpw	kPa	56.9	52.5	48.2	44.3	37.7	-	61.1	57.5	53.9	50.5	44.4	-
7°C / 90%	Pt	kW	501.2	481.4	461.1	440.9	402.9	-	527.3	510.6	493.1	475.4	440.6	-
	Pat	kW	103.1	110.4	118.9	128.4	149.9	-	110.7	118.7	128.1	138.9	164.7	-
	qw	m³/h	86.78	83.53	80.17	76.80	70.44	-	91.29	88.58	85.74	82.81	77.04	-
	dpw	kPa	90.7	84.0	77.4	71.0	59.8	-	94.2	88.7	83.1	77.6	67.1	-
10°C / 90%	Pt	kW	551.4	530.2	508.2	486.1	443.7	407.5	577.5	559.2	540.1	520.4	481.3	444.9
	Pat	kW	106.8	114.1	122.5	131.9	153.6	178.3	114.5	122.3	131.6	142.4	168.3	199.9
	qw	m³/h	95.47	91.99	88.36	84.68	77.58	71.52	99.98	97.03	93.90	90.66	84.15	78.08
	dpw	kPa	109.8	101.9	94.0	86.4	72.5	61.6	113.0	106.5	99.7	92.9	80.1	68.9
15°C / 90%	Pt	kW	640.9	617.2	592.5	567.2	517.5	472.6	668.3	647.3	625.2	602.2	555.4	510.1
	Pat	kW	113.6	120.5	128.6	138.0	159.8	184.9	121.7	129.1	138.0	148.6	174.6	206.7
	qw	m³/h	110.96	107.09	103.01	98.81	90.48	82.93	115.70	112.32	108.70	104.90	97.11	89.52
	dpw	kPa	148.3	138.1	127.8	117.6	98.6	82.8	151.4	142.7	133.6	124.4	106.6	90.6

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

HEATING CAPACITY PERFORMANCE

RTMA L

Ta.e. / R.U.			150 Twout						170 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	391.5	379.1	366.9	355.1	-	-	431.0	421.0	410.8	400.6	-	-
	Pat	kW	109.8	118.9	129.2	140.7	-	-	128.1	138.7	150.9	164.8	-	-
	qw	m³/h	67.78	65.78	63.79	61.86	-	-	74.62	73.04	71.41	69.78	-	-
	dpw	kPa	35.3	33.3	31.3	29.4	-	-	38.8	37.1	35.5	33.9	-	-
0°C / 90%	Pt	kW	462.3	447.7	432.9	418.2	391.0	-	502.6	490.5	477.9	464.9	439.4	-
	Pat	kW	115.0	124.1	134.6	146.4	174.1	-	133.3	143.9	156.3	170.7	205.3	-
	qw	m³/h	80.04	77.68	75.27	72.85	68.37	-	87.01	85.10	83.08	80.99	76.83	-
	dpw	kPa	49.3	46.4	43.6	40.8	36.0	-	52.7	50.4	48.0	45.7	41.1	-
7°C / 90%	Pt	kW	575.1	557.1	538.4	519.3	481.8	-	617.6	602.0	585.4	568.0	532.1	-
	Pat	kW	123.4	132.2	142.7	154.7	183.4	-	142.3	152.5	164.8	179.3	215.0	-
	qw	m³/h	99.56	96.66	93.60	90.46	84.23	-	106.93	104.45	101.77	98.94	93.04	-
	dpw	kPa	76.3	71.9	67.4	62.9	54.6	-	79.6	75.9	72.1	68.1	60.3	-
10°C / 90%	Pt	kW	630.1	610.6	590.0	568.8	526.5	487.3	674.5	657.1	638.5	618.9	578.1	537.0
	Pat	kW	127.7	136.3	146.6	158.6	187.5	222.7	147.2	157.0	169.1	183.5	219.5	265.3
	qw	m³/h	109.10	105.94	102.58	99.09	92.06	85.51	116.77	114.01	111.01	107.81	101.08	94.24
	dpw	kPa	91.6	86.3	80.9	75.5	65.2	56.3	94.9	90.5	85.8	80.9	71.1	61.8
15°C / 90%	Pt	kW	729.9	707.4	683.6	658.8	608.3	559.3	778.8	758.2	736.0	712.5	662.8	611.4
	Pat	kW	135.8	143.9	153.8	165.6	194.5	230.4	156.8	165.9	177.5	191.6	227.4	274.0
	qw	m³/h	126.37	122.74	118.86	114.77	106.36	98.15	134.84	131.54	127.95	124.11	115.88	107.30
	dpw	kPa	122.8	115.9	108.7	101.3	87.0	74.1	126.6	120.4	114.0	107.2	93.5	80.1

Ta.e. / R.U.			180 Twout						190 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	443.7	433.4	423.2	413.2	-	-	504.4	492.8	480.9	469.2	-	-
	Pat	kW	135.7	147.0	160.0	174.7	-	-	138.4	149.8	163.0	178.0	-	-
	qw	m³/h	76.81	75.20	73.57	71.97	-	-	87.33	85.50	83.62	81.74	-	-
	dpw	kPa	45.6	43.7	41.8	40.0	-	-	39.0	37.4	35.8	34.2	-	-
0°C / 90%	Pt	kW	518.5	506.2	493.4	480.6	455.9	-	588.6	574.5	559.9	545.0	515.6	-
	Pat	kW	140.8	152.3	165.7	181.0	217.6	-	143.9	155.4	168.8	184.3	221.6	-
	qw	m³/h	89.77	87.82	85.78	83.71	79.71	-	101.90	99.68	97.34	94.93	90.16	-
	dpw	kPa	62.3	59.6	56.9	54.2	49.1	-	53.1	50.9	48.5	46.1	41.6	-
7°C / 90%	Pt	kW	638.6	622.7	605.8	588.3	552.6	-	723.8	705.6	686.3	666.2	624.7	-
	Pat	kW	149.4	160.7	174.1	189.8	228.1	-	153.3	164.4	177.8	193.5	232.2	-
	qw	m³/h	110.57	108.04	105.32	102.47	96.62	-	125.31	122.43	119.33	116.05	109.24	-
	dpw	kPa	94.5	90.2	85.7	81.2	72.2	-	80.4	76.7	72.9	68.9	61.1	-
10°C / 90%	Pt	kW	698.1	680.3	661.3	641.5	600.5	560.1	790.6	770.4	748.8	726.1	678.8	631.4
	Pat	kW	154.0	165.0	178.3	194.0	232.8	281.6	158.4	169.2	182.4	198.0	237.0	286.5
	qw	m³/h	120.86	118.03	114.98	111.74	105.00	98.29	136.88	133.67	130.19	126.48	118.69	110.81
	dpw	kPa	112.9	107.7	102.2	96.5	85.2	74.7	95.9	91.5	86.7	81.9	72.1	62.8
15°C / 90%	Pt	kW	807.2	786.0	763.2	739.2	688.8	637.4	913.3	889.3	863.5	836.1	778.4	718.9
	Pat	kW	163.0	173.4	186.4	201.9	240.8	290.9	168.6	178.6	191.2	206.5	245.5	295.9
	qw	m³/h	139.76	136.38	132.70	128.77	120.43	111.85	158.13	154.30	150.12	145.65	136.10	126.17
	dpw	kPa	151.0	143.8	136.1	128.2	112.1	96.7	128.0	121.9	115.4	108.6	94.8	81.5

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

HEATING CAPACITY PERFORMANCE

RTMA L

Ta.e. / R.U.			210 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	545.9	533.3	520.5	507.8	-	-
	Pat	kW	147.2	159.3	173.3	189.3	-	-
	qw	m³/h	94.51	92.53	90.49	88.46	-	-
	dpw	kPa	39.0	37.4	35.8	34.2	-	-
0°C / 90%	Pt	kW	637.0	621.8	605.9	589.8	558.1	-
	Pat	kW	153.0	165.2	179.5	196.0	235.7	-
	qw	m³/h	110.28	107.88	105.35	102.74	97.57	-
	dpw	kPa	53.1	50.9	48.5	46.1	41.6	-
7°C / 90%	Pt	kW	783.3	763.7	742.8	721.0	676.1	-
	Pat	kW	163.1	174.9	189.1	205.8	246.9	-
	qw	m³/h	135.61	132.50	129.14	125.59	118.22	-
	dpw	kPa	80.4	76.7	72.9	68.9	61.1	-
10°C / 90%	Pt	kW	855.6	833.8	810.4	785.8	734.6	683.3
	Pat	kW	168.5	179.9	193.9	210.6	252.0	304.7
	qw	m³/h	148.14	144.66	140.89	136.88	128.45	119.92
	dpw	kPa	95.9	91.5	86.7	81.9	72.1	62.8
15°C / 90%	Pt	kW	988.4	962.4	934.5	904.9	842.4	778.1
	Pat	kW	179.2	189.9	203.3	219.6	261.0	314.7
	qw	m³/h	171.13	166.99	162.47	157.63	147.29	136.54
	dpw	kPa	128.0	121.9	115.4	108.6	94.8	81.5

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m^3/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA L

Twout			105 Twoutr						115 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	414.2	387.8	359.8	330.6	271.6	216.2	466.0	436.8	405.6	373.2	307.5	245.5
	Pa	kW	101.2	108.2	116.3	125.4	146.2	169.9	108.7	116.1	124.7	134.4	156.6	181.9
	qw	m³/h	71.02	66.51	61.69	56.69	46.58	37.08	79.91	74.90	69.55	63.99	52.73	42.09
	dpw	kPa	81.1	71.1	61.2	51.7	34.9	22.1	64.5	56.6	48.8	41.4	28.1	17.9
	qwr	m³/h	89.23	86.06	82.76	79.43	73.07	67.76	99.49	95.92	92.19	88.42	81.15	75.01
	dpwr	kPa	125.1	116.4	107.7	99.2	83.9	72.2	140.9	130.9	121.0	111.3	93.7	80.1
7°C	Pf	kW	429.2	402.4	373.9	344.1	283.8	226.6	482.7	453.0	421.3	388.3	321.0	257.0
	Pa	kW	102.4	109.3	117.4	126.5	147.4	171.2	110.0	117.3	125.9	135.6	157.9	183.3
	qw	m³/h	73.64	69.05	64.15	59.05	48.69	38.87	82.82	77.73	72.29	66.62	55.08	44.10
	dpw	kPa	87.2	76.7	66.2	56.1	38.1	24.3	69.3	61.0	52.8	44.8	30.6	19.6
	qwr	m³/h	92.04	88.79	85.41	81.98	75.38	69.80	102.61	98.96	95.14	91.25	83.74	77.28
	dpwr	kPa	133.1	123.9	114.7	105.6	89.3	76.6	149.8	139.4	128.8	118.5	99.8	85.0
8°C	Pf	kW	444.5	417.4	388.3	358.0	296.2	237.2	499.7	469.6	437.4	403.7	334.9	269.0
	Pa	kW	103.6	110.5	118.5	127.6	148.5	172.4	111.3	118.6	127.1	136.8	159.1	184.7
	qw	m³/h	76.31	71.65	66.66	61.46	50.85	40.72	85.79	80.62	75.09	69.31	57.49	46.17
	dpw	kPa	93.7	82.6	71.5	60.7	41.6	26.7	74.3	65.6	56.9	48.5	33.4	21.5
	qwr	m³/h	94.90	91.58	88.12	84.59	77.76	71.89	105.78	102.05	98.14	94.15	86.38	79.61
	dpwr	kPa	141.5	131.8	122.0	112.5	95.0	81.2	159.3	148.2	137.1	126.2	106.2	90.2
9°C	Pf	kW	460.1	432.6	403.0	372.1	308.9	248.2	517.0	486.5	453.8	419.4	349.1	281.2
	Pa	kW	104.9	111.7	119.7	128.7	149.7	173.7	112.7	119.9	128.4	138.0	160.3	186.0
	qw	m³/h	79.03	74.30	69.23	63.92	53.06	42.63	88.81	83.57	77.94	72.05	59.97	48.31
	dpw	kPa	100.5	88.8	77.1	65.7	45.3	29.2	79.6	70.5	61.3	52.4	36.3	23.6
	qwr	m³/h	97.81	94.43	90.87	87.24	80.18	74.03	109.02	105.21	101.21	97.11	89.07	81.99
	dpwr	kPa	150.4	140.1	129.8	119.6	101.0	86.1	169.2	157.5	145.8	134.2	112.9	95.7
10°C	Pf	kW	476.0	448.0	418.0	386.6	321.9	259.4	534.7	503.7	470.5	435.5	363.6	293.8
	Pa	kW	106.1	112.9	120.8	129.8	150.8	174.9	114.1	121.2	129.6	139.2	161.6	187.4
	qw	m³/h	81.90	77.09	71.93	66.51	55.39	44.64	92.00	86.68	80.95	74.94	62.56	50.55
	dpw	kPa	107.9	95.6	83.2	71.2	49.4	32.1	85.5	75.9	66.2	56.7	39.5	25.8
	qwr	m³/h	100.78	97.32	93.68	89.96	82.66	76.22	112.32	108.43	104.33	100.12	91.83	84.44
	dpwr	kPa	159.6	148.9	137.9	127.2	107.4	91.3	179.5	167.3	154.9	142.7	120.0	101.5
11°C	Pf	kW	492.1	463.8	433.3	401.3	335.3	271.0	552.7	521.3	487.5	451.9	378.5	306.7
	Pa	kW	107.4	114.1	122.0	131.0	151.9	176.1	115.5	122.5	130.9	140.5	162.8	188.7
	qw	m³/h	84.82	79.94	74.68	69.16	57.79	46.71	95.25	89.84	84.02	77.89	65.23	52.86
	dpw	kPa	115.7	102.8	89.7	76.9	53.7	35.1	91.6	81.5	71.3	61.3	43.0	28.2
	qwr	m³/h	103.81	100.28	96.55	92.72	85.19	78.47	115.68	111.71	107.51	103.20	94.65	86.94
	dpwr	kPa	169.4	158.0	146.5	135.1	114.1	96.8	190.4	177.6	164.5	151.6	127.5	107.6

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA L

Twout			120 Twoutr						130 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	467.5	437.7	405.9	373.0	306.6	244.4	509.7	481.8	451.5	419.3	351.2	281.7
	Pa	kW	108.4	115.9	124.6	134.4	156.7	182.0	116.5	124.9	134.7	146.0	173.1	205.7
	qw	m³/h	80.16	75.05	69.61	63.97	52.58	41.90	87.41	82.63	77.43	71.90	60.23	48.30
	dpw	kPa	66.1	58.0	49.9	42.1	28.5	18.1	75.8	67.7	59.5	51.3	36.0	23.1
	qwr	m³/h	99.70	96.04	92.24	88.39	81.02	74.83	108.43	105.26	101.92	98.48	91.67	85.54
	dpwr	kPa	119.7	111.1	102.5	94.1	79.1	67.4	133.0	125.3	117.5	109.7	95.0	82.7
7°C	Pf	kW	484.4	454.1	421.8	388.3	320.3	256.0	527.6	499.2	468.3	435.3	365.5	293.8
	Pa	kW	109.7	117.1	125.8	135.6	158.0	183.4	117.8	126.1	135.9	147.2	174.3	207.2
	qw	m³/h	83.11	77.92	72.38	66.62	54.95	43.92	90.53	85.65	80.35	74.70	62.72	50.41
	dpw	kPa	71.1	62.5	53.9	45.7	31.1	19.9	81.3	72.8	64.1	55.4	39.0	25.2
	qwr	m³/h	102.85	99.12	95.21	91.25	83.62	77.11	111.75	108.49	105.04	101.48	94.39	87.92
	dpwr	kPa	127.4	118.3	109.2	100.3	84.2	71.6	141.2	133.1	124.8	116.5	100.8	87.4
8°C	Pf	kW	501.6	470.9	438.1	403.9	334.3	267.9	545.9	517.0	485.4	451.8	380.2	306.3
	Pa	kW	111.0	118.4	127.0	136.8	159.2	184.8	119.2	127.3	137.1	148.4	175.6	208.6
	qw	m³/h	86.12	80.84	75.21	69.33	57.38	46.00	93.72	88.76	83.34	77.56	65.27	52.58
	dpw	kPa	76.3	67.3	58.2	49.5	33.9	21.8	87.2	78.2	68.9	59.7	42.3	27.4
	qwr	m³/h	106.07	102.25	98.25	94.18	86.28	79.46	115.15	111.79	108.24	104.56	97.18	90.36
	dpwr	kPa	135.5	125.9	116.3	106.8	89.7	76.0	149.9	141.3	132.5	123.6	106.8	92.3
9°C	Pf	kW	519.2	488.0	454.6	419.8	348.6	280.3	564.6	535.2	503.0	468.6	395.3	319.2
	Pa	kW	112.4	119.7	128.3	138.0	160.5	186.2	120.5	128.6	138.4	149.7	176.9	210.1
	qw	m³/h	89.19	83.83	78.10	72.11	59.88	48.14	96.99	91.93	86.40	80.50	67.90	54.82
	dpw	kPa	81.9	72.3	62.8	53.5	36.9	23.9	93.3	83.9	74.1	64.3	45.7	29.8
	qwr	m³/h	109.35	105.45	101.35	97.17	89.01	81.86	118.62	115.17	111.51	107.70	100.04	92.88
	dpwr	kPa	144.0	133.9	123.7	113.7	95.4	80.7	159.1	150.0	140.6	131.2	113.2	97.5
10°C	Pf	kW	537.1	505.5	471.6	436.0	363.2	292.9	583.7	553.7	521.0	485.9	410.7	332.4
	Pa	kW	113.8	121.0	129.6	139.3	161.8	187.6	122.0	130.0	139.6	150.9	178.2	211.5
	qw	m³/h	92.41	86.97	81.14	75.03	62.50	50.40	100.43	95.28	89.64	83.60	70.67	57.20
	dpw	kPa	87.9	77.9	67.8	57.9	40.2	26.1	100.1	90.1	79.7	69.3	49.6	32.5
	qwr	m³/h	112.69	108.70	104.51	100.22	91.79	84.33	122.18	118.63	114.86	110.93	102.97	95.46
	dpwr	kPa	152.9	142.3	131.6	121.0	101.5	85.6	168.8	159.1	149.2	139.1	119.9	103.0
11°C	Pf	kW	555.3	523.3	488.8	452.6	378.2	305.9	603.2	572.8	539.4	503.5	426.6	346.1
	Pa	kW	115.2	122.4	130.9	140.5	163.0	189.0	123.4	131.4	141.0	152.2	179.5	213.0
	qw	m³/h	95.71	90.18	84.24	78.01	65.19	52.73	103.96	98.71	92.95	86.78	73.52	59.65
	dpw	kPa	94.3	83.7	73.0	62.6	43.7	28.6	107.2	96.7	85.7	74.7	53.6	35.3
	qwr	m³/h	116.09	112.02	107.73	103.33	94.64	86.85	125.81	122.17	118.28	114.22	105.97	98.11
	dpwr	kPa	162.3	151.1	139.8	128.6	107.9	90.8	179.0	168.8	158.2	147.5	127.0	108.8

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA L

Twout			150 Twoutr						170 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	573.4	542.4	508.6	472.4	395.3	315.5	648.6	618.0	583.8	546.1	462.2	368.7
	Pa	kW	133.1	142.2	153.2	165.8	196.3	233.2	153.1	163.9	177.0	192.4	230.6	279.0
	qw	m³/h	98.33	93.02	87.21	81.01	67.78	54.10	111.23	105.98	100.10	93.65	79.25	63.22
	dpw	kPa	81.0	72.5	63.7	55.0	38.5	24.5	89.8	81.5	72.7	63.7	45.6	29.0
	qwr	m³/h	122.31	118.79	115.05	111.18	103.43	96.29	138.81	135.67	132.26	128.66	121.13	113.65
	dpwr	kPa	115.1	108.6	101.8	95.1	82.3	71.3	134.1	128.1	121.8	115.2	102.1	89.9
7°C	Pf	kW	593.3	561.8	527.3	490.4	411.3	329.2	670.7	639.4	604.4	565.9	479.8	383.7
	Pa	kW	134.6	143.7	154.6	167.2	197.7	234.9	154.7	165.4	178.5	193.9	232.2	280.8
	qw	m³/h	101.80	96.40	90.48	84.14	70.58	56.48	115.07	109.71	103.71	97.10	82.33	65.83
	dpw	kPa	86.8	77.8	68.6	59.3	41.7	26.7	96.1	87.4	78.1	68.4	49.2	31.4
	qwr	m³/h	126.03	122.41	118.55	114.55	106.49	98.99	142.90	139.65	136.11	132.36	124.49	116.60
	dpwr	kPa	122.2	115.3	108.1	100.9	87.2	75.4	142.1	135.7	129.0	121.9	107.9	94.6
8°C	Pf	kW	613.7	581.6	546.5	508.8	427.9	343.3	693.2	661.4	625.6	586.2	498.0	399.1
	Pa	kW	136.2	145.2	156.0	168.6	199.1	236.5	156.4	167.0	180.0	195.4	233.7	282.6
	qw	m³/h	105.36	99.86	93.82	87.35	73.45	58.94	119.01	113.54	107.41	100.65	85.49	68.52
	dpw	kPa	93.0	83.5	73.7	63.9	45.2	29.1	102.8	93.6	83.7	73.5	53.0	34.1
	qwr	m³/h	129.83	126.11	122.13	118.00	109.63	101.75	147.11	143.73	140.06	136.16	127.94	119.64
	dpwr	kPa	129.7	122.3	114.8	107.1	92.5	79.7	150.6	143.8	136.6	129.0	113.9	99.6
9°C	Pf	kW	634.5	601.9	566.1	527.6	444.8	357.9	716.3	683.9	647.3	607.1	516.6	415.1
	Pa	kW	137.8	146.7	157.5	170.0	200.6	238.1	158.2	168.7	181.6	196.9	235.3	284.4
	qw	m³/h	108.99	103.40	97.25	90.63	76.41	61.48	123.05	117.47	111.20	104.28	88.75	71.30
	dpw	kPa	99.5	89.6	79.2	68.8	48.9	31.7	109.9	100.2	89.7	78.9	57.2	36.9
	qwr	m³/h	133.72	129.89	125.80	121.53	112.85	104.60	151.42	147.92	144.12	140.06	131.48	122.76
	dpwr	kPa	137.5	129.8	121.7	113.6	98.0	84.2	159.6	152.3	144.6	136.5	120.3	104.9
10°C	Pf	kW	655.8	622.6	586.2	546.9	462.2	372.9	740.0	706.9	669.6	628.5	535.8	431.5
	Pa	kW	139.5	148.3	159.0	171.5	202.1	239.7	160.1	170.4	183.2	198.5	237.0	286.2
	qw	m³/h	112.83	107.13	100.86	94.10	79.52	64.16	127.33	121.64	115.22	108.13	92.19	74.25
	dpw	kPa	106.7	96.2	85.2	74.2	53.0	34.5	117.7	107.4	96.3	84.9	61.7	40.0
	qwr	m³/h	137.69	133.76	129.55	125.15	116.14	107.51	155.85	152.23	148.28	144.06	135.12	125.97
	dpwr	kPa	145.9	137.6	129.1	120.5	103.8	88.9	169.1	161.3	153.0	144.5	127.1	110.4
11°C	Pf	kW	677.5	643.8	606.7	566.6	480.0	388.3	764.3	730.6	692.5	650.4	555.5	448.5
	Pa	kW	141.3	149.9	160.5	173.0	203.6	241.4	162.1	172.3	184.9	200.2	238.6	288.1
	qw	m³/h	116.76	110.96	104.56	97.66	82.72	66.93	131.73	125.91	119.35	112.09	95.74	77.30
	dpw	kPa	114.2	103.1	91.6	79.9	57.3	37.5	125.9	115.1	103.4	91.2	66.5	43.4
	qwr	m³/h	141.76	137.72	133.39	128.85	119.52	110.51	160.39	156.64	152.55	148.17	138.85	129.27
	dpwr	kPa	154.6	145.9	136.9	127.7	109.9	93.9	179.1	170.8	162.0	152.8	134.2	116.3

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA L

Twout			180 Twoutr						190 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	684.8	651.8	615.1	575.0	485.8	387.0	687.1	654.6	618.2	578.3	489.0	389.6
	Pa	kW	161.7	173.4	187.6	204.2	245.0	296.4	162.5	173.9	187.8	204.2	244.7	296.0
	qw	m³/h	117.42	111.78	105.49	98.60	83.30	66.36	117.82	112.25	106.01	99.16	83.86	66.81
	dpw	kPa	100.7	91.2	81.2	71.0	50.7	32.1	46.5	42.2	37.6	32.9	23.5	14.9
	qwr	m³/h	146.55	143.19	139.56	135.73	127.77	119.93	147.09	143.76	140.14	136.30	128.29	120.32
	dpwr	kPa	166.0	158.5	150.5	142.4	126.2	111.2	110.7	105.8	100.5	95.1	84.2	74.1
7°C	Pf	kW	708.2	674.6	637.1	596.0	504.4	402.7	710.4	677.3	640.1	599.2	507.7	405.5
	Pa	kW	163.3	175.0	189.1	205.7	246.6	298.4	164.2	175.6	189.4	205.7	246.3	297.9
	qw	m³/h	121.51	115.74	109.31	102.26	86.55	69.10	121.89	116.20	109.83	102.81	87.12	69.58
	dpw	kPa	107.8	97.8	87.2	76.3	54.7	34.9	49.7	45.2	40.4	35.4	25.4	16.2
	qwr	m³/h	150.88	147.40	143.63	139.64	131.32	123.04	151.43	147.97	144.22	140.22	131.85	123.45
	dpwr	kPa	176.0	167.9	159.5	150.7	133.3	117.0	117.4	112.1	106.5	100.6	89.0	78.0
8°C	Pf	kW	732.1	697.9	659.5	617.5	523.6	419.0	734.3	700.5	662.5	620.7	527.0	421.9
	Pa	kW	165.1	176.6	190.6	207.2	248.3	300.3	166.1	177.3	191.0	207.3	248.0	299.8
	qw	m³/h	125.69	119.81	113.23	106.01	89.89	71.93	126.06	120.26	113.74	106.57	90.47	72.43
	dpw	kPa	115.3	104.8	93.6	82.0	59.0	37.8	53.2	48.4	43.3	38.0	27.4	17.6
	qwr	m³/h	155.34	151.73	147.81	143.66	134.95	126.23	155.88	152.30	148.40	144.25	135.50	126.66
	dpwr	kPa	186.5	177.9	168.9	159.5	140.8	123.2	124.4	118.7	112.7	106.5	94.0	82.1
9°C	Pf	kW	756.7	721.8	682.6	639.6	543.3	435.8	758.8	724.3	685.5	642.8	546.7	438.8
	Pa	kW	166.9	178.3	192.3	208.8	249.9	302.2	168.0	179.1	192.7	209.0	249.7	301.8
	qw	m³/h	129.99	123.98	117.25	109.86	93.33	74.85	130.34	124.42	117.76	110.42	93.91	75.38
	dpw	kPa	123.3	112.2	100.4	88.1	63.6	40.9	56.9	51.8	46.4	40.8	29.5	19.0
	qwr	m³/h	159.91	156.16	152.10	147.78	138.69	129.51	160.45	156.74	152.69	148.38	139.25	129.96
	dpwr	kPa	197.6	188.5	178.8	168.8	148.7	129.6	131.8	125.7	119.3	112.7	99.2	86.4
10°C	Pf	kW	781.9	746.2	706.2	662.2	563.5	453.1	783.9	748.7	709.1	665.4	567.0	456.2
	Pa	kW	168.8	180.1	193.9	210.4	251.6	304.2	170.0	180.9	194.5	210.7	251.4	303.7
	qw	m³/h	134.53	128.40	121.52	113.94	96.96	77.95	134.87	128.83	122.02	114.50	97.56	78.50
	dpw	kPa	132.1	120.4	107.8	94.8	68.6	44.4	60.9	55.6	49.8	43.9	31.9	20.6
	qwr	m³/h	164.60	160.72	156.50	152.01	142.53	132.89	165.15	161.30	157.10	152.62	143.11	133.36
	dpwr	kPa	209.4	199.7	189.3	178.6	157.0	136.5	139.6	133.2	126.3	119.2	104.8	91.0
11°C	Pf	kW	807.7	771.3	730.5	685.5	584.4	470.9	809.6	773.8	733.3	688.7	587.9	474.2
	Pa	kW	170.8	181.9	195.7	212.1	253.4	306.1	172.1	182.9	196.3	212.4	253.2	305.6
	qw	m³/h	139.20	132.94	125.89	118.14	100.71	81.16	139.53	133.35	126.39	118.69	101.32	81.73
	dpw	kPa	141.5	129.0	115.7	101.9	74.0	48.1	65.2	59.5	53.5	47.2	34.4	22.4
	qwr	m³/h	169.41	165.39	161.02	156.36	146.48	136.36	169.96	165.98	161.63	156.97	147.06	136.86
	dpwr	kPa	221.8	211.4	200.4	189.0	165.8	143.7	147.9	141.0	133.7	126.1	110.7	95.9

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA L

Twout			210 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	781.2	745.2	705.0	660.9	562.6	453.4
	Pa	kW	174.5	186.8	201.7	219.3	262.8	317.9
	qw	m³/h	133.96	127.80	120.90	113.33	96.48	77.75
	dpw	kPa	53.1	48.3	43.2	38.0	27.5	17.9
	qwr	m³/h	165.48	161.72	157.65	153.34	144.33	135.36
	dpwr	kPa	119.7	114.3	108.6	102.7	91.0	80.1
7°C	Pf	kW	807.5	770.8	729.7	684.6	583.7	471.4
	Pa	kW	176.4	188.6	203.4	221.0	264.6	320.0
	qw	m³/h	138.56	132.26	125.21	117.46	100.15	80.87
	dpw	kPa	56.8	51.8	46.4	40.8	29.7	19.4
	qwr	m³/h	170.36	166.46	162.24	157.75	148.33	138.87
	dpwr	kPa	126.8	121.1	115.0	108.7	96.1	84.3
8°C	Pf	kW	834.5	797.1	755.0	708.8	605.4	489.9
	Pa	kW	178.4	190.4	205.2	222.7	266.4	322.0
	qw	m³/h	143.27	136.84	129.63	121.69	103.94	84.10
	dpw	kPa	60.7	55.4	49.7	43.8	32.0	20.9
	qwr	m³/h	175.37	171.33	166.94	162.27	152.43	142.49
	dpwr	kPa	134.4	128.3	121.8	115.1	101.5	88.7
9°C	Pf	kW	862.1	823.9	781.0	733.8	627.7	509.0
	Pa	kW	180.4	192.3	207.0	224.5	268.2	324.1
	qw	m³/h	148.10	141.53	134.16	126.04	107.83	87.44
	dpw	kPa	64.9	59.3	53.3	47.0	34.4	22.6
	qwr	m³/h	180.51	176.33	171.78	166.92	156.65	146.20
	dpwr	kPa	142.4	135.9	128.9	121.8	107.2	93.4
10°C	Pf	kW	890.5	851.5	807.7	759.3	650.7	528.7
	Pa	kW	182.6	194.3	208.9	226.3	270.1	326.2
	qw	m³/h	153.21	146.51	138.97	130.65	111.96	90.97
	dpw	kPa	69.5	63.5	57.1	50.5	37.1	24.5
	qwr	m³/h	185.78	181.45	176.73	171.69	160.99	150.03
	dpwr	kPa	150.8	143.9	136.5	128.8	113.3	98.4
11°C	Pf	kW	919.5	879.7	835.0	785.5	674.3	549.0
	Pa	kW	184.8	196.4	210.8	228.2	271.9	328.3
	qw	m³/h	158.47	151.62	143.90	135.38	116.21	94.62
	dpw	kPa	74.3	68.0	61.3	54.2	40.0	26.5
	qwr	m³/h	191.20	186.72	181.82	176.59	165.44	153.96
	dpwr	kPa	159.8	152.4	144.5	136.3	119.6	103.6

Twout = Outlet water temperature (°C);
Twoutr = Heating side heat exchanger leaving water temperature (°C);
Pf = Cooling capacity (kW);
Pr = Recovery mode heating capacity (kW);
Pa = Compressors heating capacity (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa);
qwr = Recovery heat exchanger water flow (m³/h);
dpw = Recovery heat exchanger pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C
(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

COOLING CAPACITY PERFORMANCE

RTMA S

Twout			105 Tae						115 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	379.0	355.5	345.6	330.5	311.3	300.1	421.1	394.0	382.7	365.5	343.7	331.1
	Pa	kW	109.2	116.9	120.3	125.7	133.1	137.7	123.0	131.8	135.7	141.8	150.2	155.4
	qw	m³/h	65.00	60.96	59.27	56.67	53.38	51.46	72.21	67.56	65.63	62.67	58.94	56.78
	dpw	kPa	67.9	59.8	56.5	51.7	45.8	42.6	52.6	46.1	43.5	39.7	35.1	32.5
7°C	Pf	kW	391.0	367.0	356.9	341.5	321.9	310.4	434.3	406.7	395.1	377.6	355.3	342.4
	Pa	kW	110.9	118.6	122.1	127.5	135.0	139.6	124.9	133.8	137.7	143.9	152.3	157.5
	qw	m³/h	67.10	62.97	61.24	58.59	55.22	53.26	74.52	69.77	67.80	64.78	60.97	58.75
	dpw	kPa	72.4	63.8	60.3	55.2	49.1	45.6	56.1	49.2	46.4	42.4	37.5	34.8
8°C	Pf	kW	403.3	378.7	368.4	352.7	332.6	320.9	447.8	419.6	407.8	389.8	367.1	353.9
	Pa	kW	112.7	120.4	123.9	129.4	136.9	141.5	126.9	135.8	139.7	145.9	154.4	159.7
	qw	m³/h	69.23	65.02	63.25	60.54	57.10	55.09	76.88	72.03	70.01	66.93	63.02	60.75
	dpw	kPa	77.1	68.0	64.4	59.0	52.4	48.8	59.7	52.4	49.5	45.2	40.1	37.3
9°C	Pf	kW	415.7	390.6	380.1	364.0	343.5	331.6	461.5	432.7	420.7	402.3	379.1	365.6
	Pa	kW	114.5	122.3	125.7	131.2	138.8	143.4	128.9	137.8	141.7	148.0	156.6	161.8
	qw	m³/h	71.41	67.10	65.30	62.53	59.01	56.95	79.28	74.32	72.26	69.11	65.12	62.80
	dpw	kPa	82.0	72.4	68.6	62.9	56.0	52.2	63.5	55.8	52.7	48.2	42.8	39.8
10°C	Pf	kW	428.3	402.7	392.0	375.6	354.7	342.4	475.4	446.0	433.8	415.0	391.3	377.5
	Pa	kW	116.3	124.1	127.6	133.1	140.7	145.4	130.9	139.8	143.8	150.1	158.7	164.0
	qw	m³/h	73.70	69.30	67.46	64.62	61.02	58.92	81.81	76.74	74.63	71.41	67.33	64.95
	dpw	kPa	87.4	77.2	73.2	67.2	59.9	55.8	67.6	59.5	56.2	51.5	45.8	42.6
11°C	Pf	kW	441.2	415.1	404.1	387.4	366.0	353.5	489.6	459.6	447.1	428.0	403.7	389.6
	Pa	kW	118.2	126.0	129.4	135.0	142.6	147.3	132.9	141.9	145.9	152.2	160.9	166.2
	qw	m³/h	76.03	71.54	69.65	66.76	63.07	60.92	84.38	79.20	77.05	73.76	69.58	67.14
	dpw	kPa	93.0	82.3	78.0	71.7	64.0	59.7	71.9	63.3	59.9	54.9	48.9	45.5

Twout			120 Tae						130 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	437.6	410.5	399.2	381.8	359.7	346.8	471.8	444.2	432.7	414.8	392.0	378.5
	Pa	kW	116.5	124.6	128.2	134.0	141.9	146.8	126.7	136.4	140.7	147.7	157.2	163.1
	qw	m³/h	75.05	70.40	68.45	65.47	61.68	59.46	80.90	76.18	74.20	71.14	67.21	64.90
	dpw	kPa	58.0	51.0	48.2	44.1	39.2	36.4	64.9	57.6	54.6	50.2	44.8	41.8
7°C	Pf	kW	451.5	423.8	412.2	394.4	371.8	358.6	486.5	458.3	446.4	428.1	404.6	390.8
	Pa	kW	118.4	126.5	130.2	136.0	144.0	148.9	128.6	138.4	142.7	149.7	159.4	165.3
	qw	m³/h	77.47	72.72	70.73	67.68	63.80	61.53	83.48	78.63	76.60	73.46	69.43	67.05
	dpw	kPa	61.8	54.4	51.5	47.1	41.9	39.0	69.1	61.4	58.2	53.5	47.8	44.6
8°C	Pf	kW	465.6	437.3	425.5	407.3	384.2	370.7	501.5	472.6	460.5	441.7	417.6	403.3
	Pa	kW	120.3	128.5	132.2	138.0	146.0	151.0	130.5	140.4	144.7	151.8	161.5	167.6
	qw	m³/h	79.93	75.08	73.04	69.93	65.96	63.64	86.10	81.14	79.05	75.82	71.69	69.24
	dpw	kPa	65.8	58.0	54.9	50.3	44.8	41.7	73.6	65.3	62.0	57.0	51.0	47.6
9°C	Pf	kW	479.9	451.0	439.0	420.4	396.8	383.0	516.9	487.2	474.8	455.5	430.7	416.1
	Pa	kW	122.2	130.5	134.2	140.1	148.1	153.1	132.5	142.4	146.8	153.9	163.7	169.8
	qw	m³/h	82.43	77.48	75.40	72.22	68.16	65.79	88.79	83.69	81.55	78.24	73.99	71.48
	dpw	kPa	69.9	61.8	58.5	53.7	47.8	44.6	78.2	69.5	66.0	60.7	54.3	50.7
10°C	Pf	kW	494.4	465.0	452.7	433.7	409.6	395.5	532.5	502.1	489.3	469.6	444.2	429.2
	Pa	kW	124.2	132.5	136.2	142.1	150.2	155.2	134.5	144.5	148.9	156.1	166.0	172.1
	qw	m³/h	85.07	80.01	77.89	74.63	70.48	68.05	91.63	86.40	84.20	80.80	76.43	73.84
	dpw	kPa	74.5	65.9	62.4	57.3	51.1	47.7	83.3	74.1	70.3	64.8	58.0	54.1
11°C	Pf	kW	509.2	479.2	466.6	447.3	422.7	408.3	548.5	517.3	504.2	483.9	457.9	442.5
	Pa	kW	126.2	134.5	138.2	144.2	152.3	157.3	136.6	146.6	151.0	158.2	168.2	174.4
	qw	m³/h	87.76	82.58	80.42	77.09	72.84	70.36	94.52	89.16	86.90	83.41	78.92	76.26
	dpw	kPa	79.3	70.2	66.6	61.2	54.6	51.0	88.7	78.9	74.9	69.0	61.8	57.7

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

Technical data

COOLING CAPACITY PERFORMANCE

RTMA S

Twout			150 Tae						170 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	534.0	504.4	491.9	472.6	447.6	432.9	600.0	570.6	558.0	538.2	512.2	496.5
	Pa	kW	142.2	152.6	157.3	164.8	175.3	181.8	170.1	183.0	188.9	198.5	211.9	220.4
	qw	m³/h	91.58	86.50	84.36	81.04	76.76	74.23	102.90	97.85	95.68	92.28	87.83	85.14
	dpw	kPa	70.3	62.7	59.6	55.0	49.4	46.2	76.8	69.5	66.4	61.8	56.0	52.6
7°C	Pf	kW	550.5	520.1	507.3	487.5	461.9	446.7	618.3	588.0	575.0	554.5	527.8	511.6
	Pa	kW	144.3	154.8	159.5	167.1	177.7	184.3	172.5	185.6	191.5	201.2	214.8	223.3
	qw	m³/h	94.45	89.25	87.05	83.64	79.25	76.65	106.08	100.88	98.65	95.15	90.56	87.79
	dpw	kPa	74.7	66.7	63.5	58.6	52.6	49.2	81.7	73.9	70.6	65.7	59.5	55.9
8°C	Pf	kW	567.2	536.1	523.0	502.6	476.4	460.8	636.9	605.7	592.3	571.3	543.7	527.1
	Pa	kW	146.5	157.1	161.8	169.5	180.1	186.8	175.1	188.2	194.2	204.0	217.6	226.3
	qw	m³/h	97.38	92.05	89.79	86.29	81.79	79.11	109.34	103.99	101.69	98.08	93.35	90.49
	dpw	kPa	79.4	71.0	67.5	62.4	56.0	52.4	86.8	78.5	75.0	69.8	63.2	59.4
9°C	Pf	kW	584.3	552.5	539.0	518.1	491.2	475.2	655.9	623.8	610.0	588.4	560.0	542.9
	Pa	kW	148.8	159.4	164.2	171.9	182.6	189.3	177.7	190.9	196.9	206.8	220.6	229.3
	qw	m³/h	100.38	94.90	92.59	89.00	84.38	81.63	112.68	107.16	104.79	101.08	96.20	93.25
	dpw	kPa	84.4	75.5	71.8	66.4	59.6	55.8	92.1	83.3	79.7	74.1	67.2	63.1
10°C	Pf	kW	601.8	569.1	555.3	533.9	506.3	489.9	675.4	642.4	628.2	605.9	576.7	559.0
	Pa	kW	151.1	161.8	166.6	174.3	185.1	191.9	180.4	193.7	199.7	209.7	223.6	232.4
	qw	m³/h	103.54	97.92	95.55	91.87	87.11	84.29	116.21	110.53	108.08	104.25	99.22	96.18
	dpw	kPa	89.8	80.3	76.5	70.7	63.6	59.5	98.0	88.7	84.8	78.9	71.4	67.1
11°C	Pf	kW	619.5	586.1	571.9	550.0	521.7	504.9	695.3	661.3	646.7	623.8	593.7	575.5
	Pa	kW	153.5	164.2	169.0	176.8	187.7	194.5	183.1	196.5	202.6	212.6	226.7	235.6
	qw	m³/h	106.77	101.01	98.57	94.79	89.91	87.01	119.83	113.97	111.45	107.50	102.31	99.18
	dpw	kPa	95.5	85.5	81.4	75.3	67.7	63.4	104.2	94.3	90.1	83.9	76.0	71.4

Twout			180 Tae						190 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C	25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	645.9	612.9	598.8	576.7	547.9	530.5	668.9	635.7	621.5	599.2	569.9	552.3
	Pa	kW	185.1	199.7	206.3	217.0	231.9	241.2	177.2	190.8	197.0	207.0	221.1	229.9
	qw	m³/h	110.75	105.10	102.68	98.90	93.95	90.97	114.70	109.01	106.57	102.75	97.73	94.71
	dpw	kPa	89.5	80.6	77.0	71.4	64.4	60.4	44.0	39.8	38.0	35.3	32.0	30.0
7°C	Pf	kW	665.6	631.6	617.1	594.4	564.6	546.7	689.2	655.0	640.4	617.4	587.3	569.1
	Pa	kW	187.8	202.5	209.1	219.9	235.0	244.4	179.8	193.5	199.7	209.8	224.0	233.0
	qw	m³/h	114.20	108.38	105.88	101.98	96.88	93.81	118.25	112.39	109.88	105.93	100.77	97.65
	dpw	kPa	95.2	85.7	81.8	75.9	68.5	64.2	46.8	42.3	40.4	37.6	34.0	31.9
8°C	Pf	kW	685.7	650.8	635.8	612.4	581.8	563.3	709.9	674.8	659.7	636.0	605.0	586.3
	Pa	kW	190.5	205.3	212.0	222.9	238.1	247.7	182.4	196.2	202.5	212.7	227.0	236.1
	qw	m³/h	117.72	111.73	109.16	105.14	99.88	96.71	121.88	115.84	113.25	109.19	103.87	100.65
	dpw	kPa	101.2	91.1	87.0	80.7	72.8	68.3	49.7	44.9	42.9	39.9	36.1	33.9
9°C	Pf	kW	706.3	670.3	654.9	630.8	599.3	580.3	731.1	694.9	679.4	655.0	623.1	603.8
	Pa	kW	193.3	208.2	215.0	225.9	241.3	251.0	185.1	199.0	205.3	215.6	230.1	239.2
	qw	m³/h	121.33	115.15	112.51	108.36	102.94	99.68	125.59	119.38	116.71	112.52	107.04	103.73
	dpw	kPa	107.5	96.8	92.4	85.7	77.4	72.5	52.8	47.7	45.6	42.4	38.4	36.0
10°C	Pf	kW	727.4	690.3	674.5	649.7	617.2	597.6	752.8	715.5	699.6	674.5	641.6	621.7
	Pa	kW	196.1	211.2	218.0	229.1	244.6	254.3	187.9	201.9	208.3	218.7	233.3	242.5
	qw	m³/h	125.15	118.78	116.05	111.78	106.19	102.82	129.53	123.12	120.37	116.05	110.39	106.98
	dpw	kPa	114.3	103.0	98.3	91.2	82.3	77.2	56.2	50.7	48.5	45.1	40.8	38.3
11°C	Pf	kW	748.9	710.8	694.5	668.9	635.4	615.3	775.0	736.6	720.2	694.3	660.5	640.1
	Pa	kW	199.1	214.2	221.1	232.2	247.9	257.8	190.8	204.8	211.2	221.7	236.5	245.8
	qw	m³/h	129.06	122.50	119.69	115.28	109.51	106.04	133.56	126.95	124.12	119.67	113.83	110.31
	dpw	kPa	121.6	109.5	104.6	97.0	87.6	82.1	59.7	54.0	51.6	47.9	43.4	40.7

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

COOLING CAPACITY PERFORMANCE

RTMA S

Twout			210 Tae					
			25°C	30°C	32°C	35°C	40°C	43°C
6°C	Pf	kW	711.5	676.2	661.1	637.3	606.2	587.5
	Pa	kW	193.5	208.4	215.1	226.1	241.4	251.1
	qw	m³/h	122.01	115.96	113.36	109.29	103.96	100.75
	dpw	kPa	44.0	39.8	38.0	35.3	32.0	30.0
7°C	Pf	kW	733.1	696.8	681.2	656.7	624.7	605.4
	Pa	kW	196.3	211.3	218.1	229.2	244.7	254.4
	qw	m³/h	125.78	119.55	116.88	112.68	107.19	103.87
	dpw	kPa	46.8	42.3	40.4	37.6	34.0	31.9
8°C	Pf	kW	755.2	717.8	701.7	676.5	643.5	623.6
	Pa	kW	199.2	214.3	221.2	232.3	248.0	257.8
	qw	m³/h	129.64	123.22	120.47	116.15	110.48	107.07
	dpw	kPa	49.7	44.9	42.9	39.9	36.1	33.9
9°C	Pf	kW	777.7	739.2	722.7	696.8	662.8	642.3
	Pa	kW	202.2	217.4	224.3	235.5	251.3	261.3
	qw	m³/h	133.59	126.98	124.14	119.69	113.85	110.33
	dpw	kPa	52.8	47.7	45.6	42.4	38.4	36.0
10°C	Pf	kW	800.8	761.1	744.1	717.5	682.5	661.4
	Pa	kW	205.2	220.5	227.4	238.8	254.7	264.8
	qw	m³/h	137.78	130.96	128.04	123.45	117.43	113.79
	dpw	kPa	56.2	50.7	48.5	45.1	40.8	38.3
11°C	Pf	kW	824.3	783.5	766.0	738.6	702.6	680.8
	Pa	kW	208.4	223.7	230.7	242.2	258.2	268.4
	qw	m³/h	142.07	135.04	132.02	127.29	121.08	117.34
	dpw	kPa	59.7	54.0	51.6	47.9	43.4	40.7

Tae = Outdoor air temperature (°C);
Twout = Outlet water temperature (°C);
Pf = Cooling capacity (kW);
Pa = Compressors power input (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

Technical data

HEATING CAPACITY PERFORMANCE

RTMA S

Ta.e. / R.U.			105 Twout						115 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	277.7	266.3	255.2	244.7	-	-	292.3	280.1	268.1	256.8	-	-
	Pat	kW	82.9	89.7	97.3	105.6	-	-	84.5	91.5	99.3	107.8	-	-
	qw	m³/h	48.07	46.21	44.36	42.62	-	-	50.61	48.59	46.60	44.73	-	-
	dpw	kPa	36.3	33.6	30.9	28.6	-	-	36.5	33.6	30.9	28.5	-	-
0°C / 90%	Pt	kW	331.5	318.3	305.1	292.2	269.3	-	349.7	335.5	321.2	307.3	282.8	-
	Pat	kW	87.5	94.3	102.0	110.5	129.4	-	89.3	96.3	104.2	112.9	132.3	-
	qw	m³/h	57.40	55.23	53.04	50.90	47.09	-	60.54	58.20	55.84	53.53	49.44	-
	dpw	kPa	51.8	47.9	44.2	40.7	34.9	-	52.2	48.2	44.4	40.8	34.8	-
7°C / 90%	Pt	kW	416.2	400.4	384.2	367.9	337.2	-	440.1	423.1	405.7	388.2	355.1	-
	Pat	kW	94.6	101.2	108.8	117.4	136.9	-	96.6	103.4	111.3	120.1	140.1	-
	qw	m³/h	72.06	69.48	66.80	64.10	58.97	-	76.20	73.42	70.53	67.62	62.10	-
	dpw	kPa	81.6	75.9	70.1	64.6	54.6	-	82.6	76.7	70.8	65.1	54.9	-
10°C / 90%	Pt	kW	456.9	440.0	422.4	404.7	370.5	341.0	483.6	465.4	446.5	427.4	390.7	359.0
	Pat	kW	98.1	104.5	112.0	120.5	140.1	162.5	100.2	106.8	114.6	123.3	143.5	166.5
	qw	m³/h	79.10	76.33	73.44	70.49	64.78	59.84	83.73	80.75	77.63	74.46	68.31	62.99
	dpw	kPa	98.3	91.6	84.8	78.1	66.0	56.3	99.8	92.8	85.8	78.9	66.4	56.5
15°C / 90%	Pt	kW	529.3	510.4	490.6	470.4	430.5	394.0	561.0	540.8	519.5	497.8	454.8	415.6
	Pat	kW	104.2	110.3	117.5	125.9	145.5	168.2	106.5	112.8	120.3	128.9	149.1	172.5
	qw	m³/h	91.63	88.56	85.30	81.95	75.26	69.15	97.13	93.82	90.32	86.71	79.52	72.94
	dpw	kPa	132.0	123.3	114.4	105.5	89.0	75.1	134.3	125.3	116.1	107.0	90.0	75.7

Ta.e. / R.U.			120 Twout						130 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	333.9	319.6	305.7	292.6	-	-	362.5	351.0	339.5	328.5	-	-
	Pat	kW	90.4	97.9	106.3	115.4	-	-	98.7	106.9	116.2	126.6	-	-
	qw	m³/h	57.82	55.46	53.14	50.97	-	-	62.76	60.90	59.03	57.23	-	-
	dpw	kPa	40.3	37.0	34.0	31.3	-	-	44.5	41.9	39.4	37.0	-	-
0°C / 90%	Pt	kW	400.2	383.6	366.9	350.8	322.5	-	427.5	413.9	400.0	386.3	360.8	-
	Pat	kW	95.5	103.0	111.5	120.9	141.7	-	103.4	111.6	121.1	131.8	156.7	-
	qw	m³/h	69.29	66.55	63.79	61.11	56.38	-	74.02	71.82	69.55	67.29	63.08	-
	dpw	kPa	57.8	53.4	49.0	45.0	38.3	-	62.0	58.3	54.7	51.2	45.0	-
7°C / 90%	Pt	kW	504.9	485.0	464.6	444.2	405.9	-	531.0	514.1	496.6	478.7	443.6	-
	Pat	kW	103.3	110.7	119.2	128.7	150.2	-	111.0	118.9	128.3	139.2	164.9	-
	qw	m³/h	87.42	84.16	80.78	77.38	70.97	-	91.93	89.21	86.34	83.39	77.57	-
	dpw	kPa	92.1	85.3	78.6	72.1	60.7	-	95.6	90.0	84.3	78.6	68.0	-
10°C / 90%	Pt	kW	555.3	534.0	511.9	489.7	446.9	410.4	581.4	563.1	543.8	524.0	484.5	447.7
	Pat	kW	107.1	114.3	122.7	132.2	153.9	178.6	114.8	122.6	131.9	142.7	168.6	200.2
	qw	m³/h	96.15	92.65	89.00	85.30	78.14	72.01	100.67	97.69	94.54	91.28	84.71	78.57
	dpw	kPa	111.3	103.4	95.4	87.6	73.5	62.5	114.6	107.9	101.1	94.2	81.1	69.8
15°C / 90%	Pt	kW	645.2	621.4	596.6	571.2	521.1	475.8	672.7	651.6	629.3	606.2	559.0	513.3
	Pat	kW	113.9	120.8	128.9	138.3	160.0	185.2	122.1	129.4	138.4	148.9	174.9	207.1
	qw	m³/h	111.71	107.82	103.72	99.50	91.11	83.49	116.47	113.06	109.42	105.60	97.74	90.08
	dpw	kPa	150.3	140.0	129.6	119.2	100.0	84.0	153.4	144.6	135.4	126.1	108.0	91.8

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

HEATING CAPACITY PERFORMANCE

RTMA S

Ta.e. / R.U.			150 Twout						170 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	394.5	382.1	369.7	357.8	-	-	434.0	423.9	413.6	403.3	-	-
	Pat	kW	110.0	119.1	129.4	140.9	-	-	128.3	138.9	151.2	165.1	-	-
	qw	m³/h	68.30	66.29	64.27	62.33	-	-	75.14	73.55	71.91	70.26	-	-
	dpw	kPa	35.9	33.8	31.8	29.9	-	-	39.3	37.7	36.0	34.4	-	-
0°C / 90%	Pt	kW	465.7	451.1	436.1	421.3	393.8	-	506.0	493.9	481.1	468.0	442.2	-
	Pat	kW	115.2	124.3	134.8	146.7	174.4	-	133.6	144.2	156.6	170.9	205.6	-
	qw	m³/h	80.63	78.26	75.82	73.38	68.85	-	87.61	85.69	83.64	81.53	77.32	-
	dpw	kPa	50.0	47.1	44.2	41.4	36.5	-	53.4	51.1	48.7	46.3	41.6	-
7°C / 90%	Pt	kW	579.1	561.1	542.2	522.9	485.0	-	621.8	606.0	589.3	571.7	535.5	-
	Pat	kW	123.7	132.5	143.0	155.0	183.7	-	142.7	152.8	165.1	179.6	215.4	-
	qw	m³/h	100.27	97.35	94.26	91.09	84.81	-	107.65	105.15	102.45	99.59	93.63	-
	dpw	kPa	77.3	72.9	68.4	63.8	55.3	-	80.7	77.0	73.1	69.0	61.0	-
10°C / 90%	Pt	kW	634.5	614.8	594.1	572.7	530.1	490.4	679.0	661.5	642.7	623.0	581.8	540.2
	Pat	kW	128.0	136.6	146.9	158.9	187.8	223.0	147.6	157.4	169.5	183.9	219.8	265.7
	qw	m³/h	109.85	106.67	103.29	99.77	92.68	86.06	117.56	114.77	111.74	108.52	101.72	94.80
	dpw	kPa	92.8	87.5	82.1	76.6	66.1	57.0	96.2	91.7	86.9	82.0	72.0	62.6
15°C / 90%	Pt	kW	734.7	712.2	688.2	663.2	612.3	562.9	783.9	763.1	740.8	717.1	666.9	615.1
	Pat	kW	136.2	144.2	154.2	165.9	194.9	230.8	157.3	166.4	177.9	192.0	227.8	274.4
	qw	m³/h	127.21	123.56	119.65	115.54	107.06	98.77	135.73	132.41	128.79	124.91	116.61	107.95
	dpw	kPa	124.5	117.5	110.1	102.7	88.2	75.1	128.2	122.0	115.5	108.6	94.7	81.1

Ta.e. / R.U.			180 Twout						190 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	446.8	436.5	426.1	416.0	-	-	508.0	496.2	484.3	472.5	-	-
	Pat	kW	135.9	147.2	160.2	174.9	-	-	138.6	150.1	163.3	178.3	-	-
	qw	m³/h	77.36	75.74	74.09	72.47	-	-	87.95	86.10	84.20	82.30	-	-
	dpw	kPa	46.3	44.3	42.4	40.6	-	-	39.6	37.9	36.3	34.7	-	-
0°C / 90%	Pt	kW	522.1	509.7	496.8	483.8	458.8	-	592.6	578.5	563.7	548.6	518.9	-
	Pat	kW	141.1	152.6	165.9	181.3	217.9	-	144.2	155.6	169.1	184.6	222.0	-
	qw	m³/h	90.39	88.43	86.37	84.28	80.22	-	102.61	100.37	98.01	95.57	90.74	-
	dpw	kPa	63.2	60.4	57.7	54.9	49.7	-	53.9	51.6	49.2	46.7	42.1	-
7°C / 90%	Pt	kW	643.0	626.9	609.9	592.2	556.1	-	728.7	710.4	690.9	670.6	628.7	-
	Pat	kW	149.7	161.0	174.5	190.1	228.5	-	153.7	164.8	178.1	193.9	232.5	-
	qw	m³/h	111.33	108.77	106.03	103.15	97.24	-	126.16	123.25	120.12	116.81	109.93	-
	dpw	kPa	95.8	91.4	86.9	82.2	73.1	-	81.5	77.8	73.9	69.8	61.9	-
10°C / 90%	Pt	kW	702.8	684.9	665.7	645.7	604.3	563.4	795.9	775.6	753.8	730.8	683.1	635.2
	Pat	kW	154.3	165.4	178.7	194.4	233.1	282.1	158.9	169.6	182.8	198.4	237.3	286.9
	qw	m³/h	121.68	118.83	115.74	112.48	105.67	98.88	137.80	134.56	131.05	127.31	119.44	111.47
	dpw	kPa	114.4	109.1	103.5	97.8	86.3	75.6	97.2	92.7	87.9	83.0	73.0	63.6
15°C / 90%	Pt	kW	812.6	791.2	768.3	744.1	693.2	641.2	919.3	895.2	869.1	841.6	783.3	723.3
	Pat	kW	163.5	173.9	186.8	202.3	241.2	291.3	169.1	179.1	191.7	207.0	245.9	296.4
	qw	m³/h	140.69	137.28	133.57	129.61	121.20	112.52	159.17	155.31	151.11	146.60	136.96	126.93
	dpw	kPa	153.0	145.7	137.9	129.8	113.5	97.9	129.7	123.5	116.9	110.0	96.0	82.5

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

HEATING CAPACITY PERFORMANCE

RTMA S

Ta.e. / R.U.			210 Twout					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
-5°C / 90%	Pt	kW	549.7	537.0	524.1	511.3	-	-
	Pat	kW	147.4	159.6	173.6	189.6	-	-
	qw	m³/h	95.18	93.18	91.12	89.07	-	-
	dpw	kPa	39.6	37.9	36.3	34.7	-	-
0°C / 90%	Pt	kW	641.4	626.1	610.1	593.7	561.6	-
	Pat	kW	153.3	165.5	179.8	196.3	236.0	-
	qw	m³/h	111.04	108.62	106.06	103.43	98.20	-
	dpw	kPa	53.9	51.6	49.2	46.7	42.1	-
7°C / 90%	Pt	kW	788.6	768.8	747.7	725.7	680.4	-
	Pat	kW	163.5	175.2	189.4	206.1	247.3	-
	qw	m³/h	136.53	133.39	130.00	126.42	118.97	-
	dpw	kPa	81.5	77.8	73.9	69.8	61.9	-
10°C / 90%	Pt	kW	861.4	839.3	815.7	790.9	739.3	687.4
	Pat	kW	168.9	180.4	194.3	211.0	252.4	305.1
	qw	m³/h	149.13	145.63	141.83	137.78	129.26	120.63
	dpw	kPa	97.2	92.7	87.9	83.0	73.0	63.6
15°C / 90%	Pt	kW	994.9	968.8	940.6	910.8	847.7	782.7
	Pat	kW	179.8	190.4	203.8	220.1	261.5	315.1
	qw	m³/h	172.26	168.09	163.53	158.65	148.22	137.36
	dpw	kPa	129.7	123.5	116.9	110.0	96.0	82.5

Ta.e. / R.U. = Outdoor air temperature (°C)/Relative humidity (%)

Twout = Outlet water temperature (°C);

Pt = Heating capacity (kW);

Pa = Compressors power input (kW) ;

qw = Water flow (m^3/h);

dpw = Pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C.

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA S

Twout			105 Twoutr						115 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	414.2	387.8	359.8	330.6	271.6	216.2	466.0	436.8	405.6	373.2	307.5	245.5
	Pa	kW	101.2	108.2	116.3	125.4	146.2	169.9	108.7	116.1	124.7	134.4	156.6	181.9
	qw	m³/h	71.02	66.51	61.69	56.69	46.58	37.08	79.91	74.90	69.55	63.99	52.73	42.09
	dpw	kPa	81.1	71.1	61.2	51.7	34.9	22.1	64.5	56.6	48.8	41.4	28.1	17.9
	qwr	m³/h	89.23	86.06	82.76	79.43	73.07	67.76	99.49	95.92	92.19	88.42	81.15	75.01
	dpwr	kPa	125.1	116.4	107.7	99.2	83.9	72.2	140.9	130.9	121.0	111.3	93.7	80.1
7°C	Pf	kW	429.2	402.4	373.9	344.1	283.8	226.6	482.7	453.0	421.3	388.3	321.0	257.0
	Pa	kW	102.4	109.3	117.4	126.5	147.4	171.2	110.0	117.3	125.9	135.6	157.9	183.3
	qw	m³/h	73.64	69.05	64.15	59.05	48.69	38.87	82.82	77.73	72.29	66.62	55.08	44.10
	dpw	kPa	87.2	76.7	66.2	56.1	38.1	24.3	69.3	61.0	52.8	44.8	30.6	19.6
	qwr	m³/h	92.04	88.79	85.41	81.98	75.38	69.80	102.61	98.96	95.14	91.25	83.74	77.28
	dpwr	kPa	133.1	123.9	114.7	105.6	89.3	76.6	149.8	139.4	128.8	118.5	99.8	85.0
8°C	Pf	kW	444.5	417.4	388.3	358.0	296.2	237.2	499.7	469.6	437.4	403.7	334.9	269.0
	Pa	kW	103.6	110.5	118.5	127.6	148.5	172.4	111.3	118.6	127.1	136.8	159.1	184.7
	qw	m³/h	76.31	71.65	66.66	61.46	50.85	40.72	85.79	80.62	75.09	69.31	57.49	46.17
	dpw	kPa	93.7	82.6	71.5	60.7	41.6	26.7	74.3	65.6	56.9	48.5	33.4	21.5
	qwr	m³/h	94.90	91.58	88.12	84.59	77.76	71.89	105.78	102.05	98.14	94.15	86.38	79.61
	dpwr	kPa	141.5	131.8	122.0	112.5	95.0	81.2	159.3	148.2	137.1	126.2	106.2	90.2
9°C	Pf	kW	460.1	432.6	403.0	372.1	308.9	248.2	517.0	486.5	453.8	419.4	349.1	281.2
	Pa	kW	104.9	111.7	119.7	128.7	149.7	173.7	112.7	119.9	128.4	138.0	160.3	186.0
	qw	m³/h	79.03	74.30	69.23	63.92	53.06	42.63	88.81	83.57	77.94	72.05	59.97	48.31
	dpw	kPa	100.5	88.8	77.1	65.7	45.3	29.2	79.6	70.5	61.3	52.4	36.3	23.6
	qwr	m³/h	97.81	94.43	90.87	87.24	80.18	74.03	109.02	105.21	101.21	97.11	89.07	81.99
	dpwr	kPa	150.4	140.1	129.8	119.6	101.0	86.1	169.2	157.5	145.8	134.2	112.9	95.7
10°C	Pf	kW	476.0	448.0	418.0	386.6	321.9	259.4	534.7	503.7	470.5	435.5	363.6	293.8
	Pa	kW	106.1	112.9	120.8	129.8	150.8	174.9	114.1	121.2	129.6	139.2	161.6	187.4
	qw	m³/h	81.90	77.09	71.93	66.51	55.39	44.64	92.00	86.68	80.95	74.94	62.56	50.55
	dpw	kPa	107.9	95.6	83.2	71.2	49.4	32.1	85.5	75.9	66.2	56.7	39.5	25.8
	qwr	m³/h	100.78	97.32	93.68	89.96	82.66	76.22	112.32	108.43	104.33	100.12	91.83	84.44
	dpwr	kPa	159.6	148.9	137.9	127.2	107.4	91.3	179.5	167.3	154.9	142.7	120.0	101.5
11°C	Pf	kW	492.1	463.8	433.3	401.3	335.3	271.0	552.7	521.3	487.5	451.9	378.5	306.7
	Pa	kW	107.4	114.1	122.0	131.0	151.9	176.1	115.5	122.5	130.9	140.5	162.8	188.7
	qw	m³/h	84.82	79.94	74.68	69.16	57.79	46.71	95.25	89.84	84.02	77.89	65.23	52.86
	dpw	kPa	115.7	102.8	89.7	76.9	53.7	35.1	91.6	81.5	71.3	61.3	43.0	28.2
	qwr	m³/h	103.81	100.28	96.55	92.72	85.19	78.47	115.68	111.71	107.51	103.20	94.65	86.94
	dpwr	kPa	169.4	158.0	146.5	135.1	114.1	96.8	190.4	177.6	164.5	151.6	127.5	107.6

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA S

Twout			120 Twoutr						130 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	467.5	437.7	405.9	373.0	306.6	244.4	509.7	481.8	451.5	419.3	351.2	281.7
	Pa	kW	108.4	115.9	124.6	134.4	156.7	182.0	116.5	124.9	134.7	146.0	173.1	205.7
	qw	m³/h	80.16	75.05	69.61	63.97	52.58	41.90	87.41	82.63	77.43	71.90	60.23	48.30
	dpw	kPa	66.1	58.0	49.9	42.1	28.5	18.1	75.8	67.7	59.5	51.3	36.0	23.1
	qwr	m³/h	99.70	96.04	92.24	88.39	81.02	74.83	108.43	105.26	101.92	98.48	91.67	85.54
	dpwr	kPa	119.7	111.1	102.5	94.1	79.1	67.4	133.0	125.3	117.5	109.7	95.0	82.7
7°C	Pf	kW	484.4	454.1	421.8	388.3	320.3	256.0	527.6	499.2	468.3	435.3	365.5	293.8
	Pa	kW	109.7	117.1	125.8	135.6	158.0	183.4	117.8	126.1	135.9	147.2	174.3	207.2
	qw	m³/h	83.11	77.92	72.38	66.62	54.95	43.92	90.53	85.65	80.35	74.70	62.72	50.41
	dpw	kPa	71.1	62.5	53.9	45.7	31.1	19.9	81.3	72.8	64.1	55.4	39.0	25.2
	qwr	m³/h	102.85	99.12	95.21	91.25	83.62	77.11	111.75	108.49	105.04	101.48	94.39	87.92
	dpwr	kPa	127.4	118.3	109.2	100.3	84.2	71.6	141.2	133.1	124.8	116.5	100.8	87.4
8°C	Pf	kW	501.6	470.9	438.1	403.9	334.3	267.9	545.9	517.0	485.4	451.8	380.2	306.3
	Pa	kW	111.0	118.4	127.0	136.8	159.2	184.8	119.2	127.3	137.1	148.4	175.6	208.6
	qw	m³/h	86.12	80.84	75.21	69.33	57.38	46.00	93.72	88.76	83.34	77.56	65.27	52.58
	dpw	kPa	76.3	67.3	58.2	49.5	33.9	21.8	87.2	78.2	68.9	59.7	42.3	27.4
	qwr	m³/h	106.07	102.25	98.25	94.18	86.28	79.46	115.15	111.79	108.24	104.56	97.18	90.36
	dpwr	kPa	135.5	125.9	116.3	106.8	89.7	76.0	149.9	141.3	132.5	123.6	106.8	92.3
9°C	Pf	kW	519.2	488.0	454.6	419.8	348.6	280.3	564.6	535.2	503.0	468.6	395.3	319.2
	Pa	kW	112.4	119.7	128.3	138.0	160.5	186.2	120.5	128.6	138.4	149.7	176.9	210.1
	qw	m³/h	89.19	83.83	78.10	72.11	59.88	48.14	96.99	91.93	86.40	80.50	67.90	54.82
	dpw	kPa	81.9	72.3	62.8	53.5	36.9	23.9	93.3	83.9	74.1	64.3	45.7	29.8
	qwr	m³/h	109.35	105.45	101.35	97.17	89.01	81.86	118.62	115.17	111.51	107.70	100.04	92.88
	dpwr	kPa	144.0	133.9	123.7	113.7	95.4	80.7	159.1	150.0	140.6	131.2	113.2	97.5
10°C	Pf	kW	537.1	505.5	471.6	436.0	363.2	292.9	583.7	553.7	521.0	485.9	410.7	332.4
	Pa	kW	113.8	121.0	129.6	139.3	161.8	187.6	122.0	130.0	139.6	150.9	178.2	211.5
	qw	m³/h	92.41	86.97	81.14	75.03	62.50	50.40	100.43	95.28	89.64	83.60	70.67	57.20
	dpw	kPa	87.9	77.9	67.8	57.9	40.2	26.1	100.1	90.1	79.7	69.3	49.6	32.5
	qwr	m³/h	112.69	108.70	104.51	100.22	91.79	84.33	122.18	118.63	114.86	110.93	102.97	95.46
	dpwr	kPa	152.9	142.3	131.6	121.0	101.5	85.6	168.8	159.1	149.2	139.1	119.9	103.0
11°C	Pf	kW	555.3	523.3	488.8	452.6	378.2	305.9	603.2	572.8	539.4	503.5	426.6	346.1
	Pa	kW	115.2	122.4	130.9	140.5	163.0	189.0	123.4	131.4	141.0	152.2	179.5	213.0
	qw	m³/h	95.71	90.18	84.24	78.01	65.19	52.73	103.96	98.71	92.95	86.78	73.52	59.65
	dpw	kPa	94.3	83.7	73.0	62.6	43.7	28.6	107.2	96.7	85.7	74.7	53.6	35.3
	qwr	m³/h	116.09	112.02	107.73	103.33	94.64	86.85	125.81	122.17	118.28	114.22	105.97	98.11
	dpwr	kPa	162.3	151.1	139.8	128.6	107.9	90.8	179.0	168.8	158.2	147.5	127.0	108.8

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA S

Twout			150 Twoutr						170 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	573.4	542.4	508.6	472.4	395.3	315.5	648.6	618.0	583.8	546.1	462.2	368.7
	Pa	kW	133.1	142.2	153.2	165.8	196.3	233.2	153.1	163.9	177.0	192.4	230.6	279.0
	qw	m³/h	98.33	93.02	87.21	81.01	67.78	54.10	111.23	105.98	100.10	93.65	79.25	63.22
	dpw	kPa	81.0	72.5	63.7	55.0	38.5	24.5	89.8	81.5	72.7	63.7	45.6	29.0
	qwr	m³/h	122.31	118.79	115.05	111.18	103.43	96.29	138.81	135.67	132.26	128.66	121.13	113.65
	dpwr	kPa	115.1	108.6	101.8	95.1	82.3	71.3	134.1	128.1	121.8	115.2	102.1	89.9
7°C	Pf	kW	593.3	561.8	527.3	490.4	411.3	329.2	670.7	639.4	604.4	565.9	479.8	383.7
	Pa	kW	134.6	143.7	154.6	167.2	197.7	234.9	154.7	165.4	178.5	193.9	232.2	280.8
	qw	m³/h	101.80	96.40	90.48	84.14	70.58	56.48	115.07	109.71	103.71	97.10	82.33	65.83
	dpw	kPa	86.8	77.8	68.6	59.3	41.7	26.7	96.1	87.4	78.1	68.4	49.2	31.4
	qwr	m³/h	126.03	122.41	118.55	114.55	106.49	98.99	142.90	139.65	136.11	132.36	124.49	116.60
	dpwr	kPa	122.2	115.3	108.1	100.9	87.2	75.4	142.1	135.7	129.0	121.9	107.9	94.6
8°C	Pf	kW	613.7	581.6	546.5	508.8	427.9	343.3	693.2	661.4	625.6	586.2	498.0	399.1
	Pa	kW	136.2	145.2	156.0	168.6	199.1	236.5	156.4	167.0	180.0	195.4	233.7	282.6
	qw	m³/h	105.36	99.86	93.82	87.35	73.45	58.94	119.01	113.54	107.41	100.65	85.49	68.52
	dpw	kPa	93.0	83.5	73.7	63.9	45.2	29.1	102.8	93.6	83.7	73.5	53.0	34.1
	qwr	m³/h	129.83	126.11	122.13	118.00	109.63	101.75	147.11	143.73	140.06	136.16	127.94	119.64
	dpwr	kPa	129.7	122.3	114.8	107.1	92.5	79.7	150.6	143.8	136.6	129.0	113.9	99.6
9°C	Pf	kW	634.5	601.9	566.1	527.6	444.8	357.9	716.3	683.9	647.3	607.1	516.6	415.1
	Pa	kW	137.8	146.7	157.5	170.0	200.6	238.1	158.2	168.7	181.6	196.9	235.3	284.4
	qw	m³/h	108.99	103.40	97.25	90.63	76.41	61.48	123.05	117.47	111.20	104.28	88.75	71.30
	dpw	kPa	99.5	89.6	79.2	68.8	48.9	31.7	109.9	100.2	89.7	78.9	57.2	36.9
	qwr	m³/h	133.72	129.89	125.80	121.53	112.85	104.60	151.42	147.92	144.12	140.06	131.48	122.76
	dpwr	kPa	137.5	129.8	121.7	113.6	98.0	84.2	159.6	152.3	144.6	136.5	120.3	104.9
10°C	Pf	kW	655.8	622.6	586.2	546.9	462.2	372.9	740.0	706.9	669.6	628.5	535.8	431.5
	Pa	kW	139.5	148.3	159.0	171.5	202.1	239.7	160.1	170.4	183.2	198.5	237.0	286.2
	qw	m³/h	112.83	107.13	100.86	94.10	79.52	64.16	127.33	121.64	115.22	108.13	92.19	74.25
	dpw	kPa	106.7	96.2	85.2	74.2	53.0	34.5	117.7	107.4	96.3	84.9	61.7	40.0
	qwr	m³/h	137.69	133.76	129.55	125.15	116.14	107.51	155.85	152.23	148.28	144.06	135.12	125.97
	dpwr	kPa	145.9	137.6	129.1	120.5	103.8	88.9	169.1	161.3	153.0	144.5	127.1	110.4
11°C	Pf	kW	677.5	643.8	606.7	566.6	480.0	388.3	764.3	730.6	692.5	650.4	555.5	448.5
	Pa	kW	141.3	149.9	160.5	173.0	203.6	241.4	162.1	172.3	184.9	200.2	238.6	288.1
	qw	m³/h	116.76	110.96	104.56	97.66	82.72	66.93	131.73	125.91	119.35	112.09	95.74	77.30
	dpw	kPa	114.2	103.1	91.6	79.9	57.3	37.5	125.9	115.1	103.4	91.2	66.5	43.4
	qwr	m³/h	141.76	137.72	133.39	128.85	119.52	110.51	160.39	156.64	152.55	148.17	138.85	129.27
	dpwr	kPa	154.6	145.9	136.9	127.7	109.9	93.9	179.1	170.8	162.0	152.8	134.2	116.3

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Technical data

RECOVERY CAPACITY PERFORMANCE

RTMA S

Twout			180 Twoutr						190 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)	30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	684.8	651.8	615.1	575.0	485.8	387.0	687.1	654.6	618.2	578.3	489.0	389.6
	Pa	kW	161.7	173.4	187.6	204.2	245.0	296.4	162.5	173.9	187.8	204.2	244.7	296.0
	qw	m³/h	117.42	111.78	105.49	98.60	83.30	66.36	117.82	112.25	106.01	99.16	83.86	66.81
	dpw	kPa	100.7	91.2	81.2	71.0	50.7	32.1	46.5	42.2	37.6	32.9	23.5	14.9
	qwr	m³/h	146.55	143.19	139.56	135.73	127.77	119.93	147.09	143.76	140.14	136.30	128.29	120.32
	dpwr	kPa	166.0	158.5	150.5	142.4	126.2	111.2	110.7	105.8	100.5	95.1	84.2	74.1
7°C	Pf	kW	708.2	674.6	637.1	596.0	504.4	402.7	710.4	677.3	640.1	599.2	507.7	405.5
	Pa	kW	163.3	175.0	189.1	205.7	246.6	298.4	164.2	175.6	189.4	205.7	246.3	297.9
	qw	m³/h	121.51	115.74	109.31	102.26	86.55	69.10	121.89	116.20	109.83	102.81	87.12	69.58
	dpw	kPa	107.8	97.8	87.2	76.3	54.7	34.9	49.7	45.2	40.4	35.4	25.4	16.2
	qwr	m³/h	150.88	147.40	143.63	139.64	131.32	123.04	151.43	147.97	144.22	140.22	131.85	123.45
	dpwr	kPa	176.0	167.9	159.5	150.7	133.3	117.0	117.4	112.1	106.5	100.6	89.0	78.0
8°C	Pf	kW	732.1	697.9	659.5	617.5	523.6	419.0	734.3	700.5	662.5	620.7	527.0	421.9
	Pa	kW	165.1	176.6	190.6	207.2	248.3	300.3	166.1	177.3	191.0	207.3	248.0	299.8
	qw	m³/h	125.69	119.81	113.23	106.01	89.89	71.93	126.06	120.26	113.74	106.57	90.47	72.43
	dpw	kPa	115.3	104.8	93.6	82.0	59.0	37.8	53.2	48.4	43.3	38.0	27.4	17.6
	qwr	m³/h	155.34	151.73	147.81	143.66	134.95	126.23	155.88	152.30	148.40	144.25	135.50	126.66
	dpwr	kPa	186.5	177.9	168.9	159.5	140.8	123.2	124.4	118.7	112.7	106.5	94.0	82.1
9°C	Pf	kW	756.7	721.8	682.6	639.6	543.3	435.8	758.8	724.3	685.5	642.8	546.7	438.8
	Pa	kW	166.9	178.3	192.3	208.8	249.9	302.2	168.0	179.1	192.7	209.0	249.7	301.8
	qw	m³/h	129.99	123.98	117.25	109.86	93.33	74.85	130.34	124.42	117.76	110.42	93.91	75.38
	dpw	kPa	123.3	112.2	100.4	88.1	63.6	40.9	56.9	51.8	46.4	40.8	29.5	19.0
	qwr	m³/h	159.91	156.16	152.10	147.78	138.69	129.51	160.45	156.74	152.69	148.38	139.25	129.96
	dpwr	kPa	197.6	188.5	178.8	168.8	148.7	129.6	131.8	125.7	119.3	112.7	99.2	86.4
10°C	Pf	kW	781.9	746.2	706.2	662.2	563.5	453.1	783.9	748.7	709.1	665.4	567.0	456.2
	Pa	kW	168.8	180.1	193.9	210.4	251.6	304.2	170.0	180.9	194.5	210.7	251.4	303.7
	qw	m³/h	134.53	128.40	121.52	113.94	96.96	77.95	134.87	128.83	122.02	114.50	97.56	78.50
	dpw	kPa	132.1	120.4	107.8	94.8	68.6	44.4	60.9	55.6	49.8	43.9	31.9	20.6
	qwr	m³/h	164.60	160.72	156.50	152.01	142.53	132.89	165.15	161.30	157.10	152.62	143.11	133.36
	dpwr	kPa	209.4	199.7	189.3	178.6	157.0	136.5	139.6	133.2	126.3	119.2	104.8	91.0
11°C	Pf	kW	807.7	771.3	730.5	685.5	584.4	470.9	809.6	773.8	733.3	688.7	587.9	474.2
	Pa	kW	170.8	181.9	195.7	212.1	253.4	306.1	172.1	182.9	196.3	212.4	253.2	305.6
	qw	m³/h	139.20	132.94	125.89	118.14	100.71	81.16	139.53	133.35	126.39	118.69	101.32	81.73
	dpw	kPa	141.5	129.0	115.7	101.9	74.0	48.1	65.2	59.5	53.5	47.2	34.4	22.4
	qwr	m³/h	169.41	165.39	161.02	156.36	146.48	136.36	169.96	165.98	161.63	156.97	147.06	136.86
	dpwr	kPa	221.8	211.4	200.4	189.0	165.8	143.7	147.9	141.0	133.7	126.1	110.7	95.9

Twout = Outlet water temperature (°C);

Twoutr = Heating side heat exchanger leaving water temperature (°C);

Pf = Cooling capacity (kW);

Pr = Recovery mode heating capacity (kW);

Pa = Compressors heating capacity (kW) ;

qw = Water flow (m³/h);

dpw = Pressure drop (kPa);

qwr = Recovery heat exchanger water flow (m³/h);

dpw = Recovery heat exchanger pressure drop (kPa).

Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C

(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

RECOVERY CAPACITY PERFORMANCE

RTMA S

Twout			210 Twoutr					
			30°C	35°C	40°C	45°C	55°C	65°C (1)
6°C	Pf	kW	781.2	745.2	705.0	660.9	562.6	453.4
	Pa	kW	174.5	186.8	201.7	219.3	262.8	317.9
	qw	m³/h	133.96	127.80	120.90	113.33	96.48	77.75
	dpw	kPa	53.1	48.3	43.2	38.0	27.5	17.9
	qwr	m³/h	165.48	161.72	157.65	153.34	144.33	135.36
	dpwr	kPa	119.7	114.3	108.6	102.7	91.0	80.1
7°C	Pf	kW	807.5	770.8	729.7	684.6	583.7	471.4
	Pa	kW	176.4	188.6	203.4	221.0	264.6	320.0
	qw	m³/h	138.56	132.26	125.21	117.46	100.15	80.87
	dpw	kPa	56.8	51.8	46.4	40.8	29.7	19.4
	qwr	m³/h	170.36	166.46	162.24	157.75	148.33	138.87
	dpwr	kPa	126.8	121.1	115.0	108.7	96.1	84.3
8°C	Pf	kW	834.5	797.1	755.0	708.8	605.4	489.9
	Pa	kW	178.4	190.4	205.2	222.7	266.4	322.0
	qw	m³/h	143.27	136.84	129.63	121.69	103.94	84.10
	dpw	kPa	60.7	55.4	49.7	43.8	32.0	20.9
	qwr	m³/h	175.37	171.33	166.94	162.27	152.43	142.49
	dpwr	kPa	134.4	128.3	121.8	115.1	101.5	88.7
9°C	Pf	kW	862.1	823.9	781.0	733.8	627.7	509.0
	Pa	kW	180.4	192.3	207.0	224.5	268.2	324.1
	qw	m³/h	148.10	141.53	134.16	126.04	107.83	87.44
	dpw	kPa	64.9	59.3	53.3	47.0	34.4	22.6
	qwr	m³/h	180.51	176.33	171.78	166.92	156.65	146.20
	dpwr	kPa	142.4	135.9	128.9	121.8	107.2	93.4
10°C	Pf	kW	890.5	851.5	807.7	759.3	650.7	528.7
	Pa	kW	182.6	194.3	208.9	226.3	270.1	326.2
	qw	m³/h	153.21	146.51	138.97	130.65	111.96	90.97
	dpw	kPa	69.5	63.5	57.1	50.5	37.1	24.5
	qwr	m³/h	185.78	181.45	176.73	171.69	160.99	150.03
	dpwr	kPa	150.8	143.9	136.5	128.8	113.3	98.4
11°C	Pf	kW	919.5	879.7	835.0	785.5	674.3	549.0
	Pa	kW	184.8	196.4	210.8	228.2	271.9	328.3
	qw	m³/h	158.47	151.62	143.90	135.38	116.21	94.62
	dpw	kPa	74.3	68.0	61.3	54.2	40.0	26.5
	qwr	m³/h	191.20	186.72	181.82	176.59	165.44	153.96
	dpwr	kPa	159.8	152.4	144.5	136.3	119.6	103.6

Twout = Outlet water temperature (°C);
Twoutr = Heating side heat exchanger leaving water temperature (°C);
Pf = Cooling capacity (kW);
Pr = Recovery mode heating capacity (kW);
Pa = Compressors heating capacity (kW) ;
qw = Water flow (m³/h);
dpw = Pressure drop (kPa);
qwr = Recovery heat exchanger water flow (m³/h);
dpw = Recovery heat exchanger pressure drop (kPa).
Water flow and pressure drop on heat exchanger calculated with ΔT= 5 °C
(1) Units equipped with the accessory High Performance temperature (HPT), with outlet water temperature up to 65°C.

Scaling correction tables

ETHYLENE GLYCOL CORRECTION TABLE

% Ethylene glycol weight		5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19	-23,4
Suggested security limit	°C	3	1	-1	-4	-6	-10	-14	-19
Cooling capacity coefficient	-	0,995	0,99	0,985	0,981	0,977	0,974	0,971	0,968
Power input coefficient	-	0,997	0,993	0,99	0,988	0,986	0,984	0,982	0,981
Flow rate coefficient	-	1,003	1,01	1,02	1,033	1,05	1,072	1,095	1,124
Pressure drop coefficient	-	1,029	1,06	1,09	1,118	1,149	1,182	1,211	1,243

In order to calculate performance with glycoled solutions multiply main sizes by respective coefficients.

GLYCOL PERCENTAGE DEPENDING ON FREEZING TEMPERATURE

% glycol according to the freezing temperature						
Freezing temperature	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
% Ethylene glycol	5%	12%	20%	28%	35%	40%
Flow rate coefficient	1,02	1,033	1,05	1,072	1,095	1,124

In order to calculate performance with glycoled solutions multiply main sizes by respective coefficients.

FOULING FACTOR CORRECTION TABLE

Fouling Factor	Plant side cold heat exchanger			Plant side hot heat exchanger		
F.F. [m^2°C*W]	A1	B1	Tmin	A2	B2	Tmax
0	1,00	1,00	0,00	1,00	1,00	0,00
1,80E-05	1,00	1,00	0,00	1,00	1,00	0,00
4,40E-05	1,00	1,00	0,00	0,99	1,03	1,00
8,80E-05	0,96	0,99	0,70	0,98	1,04	1,50
1,32E-04	0,94	0,99	1,00	0,96	1,05	2,30
1,72E-04	0,93	0,98	1,50	0,95	1,06	3,00

A factor Capacity correction factor
B factor Compressor power input correction factor
Tmin Minimum evaporator outlet water temperature increase
T max Maximum condenser outlet water temperature decrease

Effect of altitude on capacity
RTMA capacities given in the performance data tables are for use at sea level. At elevations substantially above sea level, the decreased air density will reduce condenser capacity and, therefore, unit capacity and efficiency. Please contact your Trane Sales Office for advice and an appropriate technical selection.

Hydraulic data

MAXIMUM AND MINIMUM WATER FLOW AND RECOMMENDED WATER CONTENT

RTMA	Plant side chilled water heat exchanger				Plant side hot water heat exchanger			
	V [m³]	K	Q min [m³/h]	Q max [m³/h]	V [m³]	K	Q min [m³/h]	Q max [m³/h]
105	3.47	16.1	36.9	98.5	10.5	15.7	39.3	104.9
115	3.84	10.1	40.8	108.9	11.1	14.2	41.5	110.6
120	4.01	10.3	42.6	113.7	12.7	12.0	47.5	126.6
130	4.35	9.92	46.3	123.4	13.7	11.3	51.2	136.6
150	4.96	8.38	52.7	140.4	14.9	7.69	55.9	149.2
170	5.63	7.26	59.9	159.7	16.3	6.96	61.2	163.3
180	6.04	7.30	64.2	171.2	16.9	7.73	63.4	169.1
190	6.27	3.35	66.7	177.8	19.2	5.12	71.8	191.5
210	6.67	2.96	70.9	189.1	20.7	4.37	77.7	207.3
105 L	3.37	16.1	35.8	95.6	10.6	15.7	39.8	106.0
115 L	3.73	10.1	39.6	105.6	11.2	14.2	41.9	111.9
120 L	3.90	10.3	41.4	110.4	12.8	12.0	48.0	128.0
130 L	4.23	9.92	45.0	119.9	13.8	11.3	51.8	138.0
150 L	4.82	8.38	51.3	136.7	15.1	7.69	56.5	150.8
170 L	5.50	7.26	58.4	155.8	16.5	6.96	61.8	164.9
180 L	5.89	7.30	62.6	166.8	17.1	7.73	64.0	170.8
190 L	6.12	3.35	65.0	173.4	19.3	5.12	72.5	193.4
210 L	6.51	2.96	69.2	184.4	20.9	4.37	78.5	209.3
105 S	3.45	16.1	36.6	97.7	10.7	15.7	40.1	106.8
115 S	3.81	10.1	40.5	108.0	11.3	14.2	42.3	112.7
120 S	3.98	10.3	42.3	112.8	12.9	12.0	48.4	129.0
130 S	4.32	9.92	45.9	122.4	13.9	11.3	52.1	139.0
150 S	4.92	8.38	52.3	139.4	15.2	7.69	56.9	151.8
170 S	5.60	7.26	59.5	158.6	16.6	6.96	62.2	166.0
180 S	6.00	7.30	63.7	170.0	17.2	7.73	64.5	171.9
190 S	6.23	3.35	66.2	176.6	19.5	5.12	73.0	194.7
210 S	6.63	2.96	70.4	187.8	21.1	4.37	79.0	210.7

V: **recommended water content of the plant (cold side and hot side) with dT 5°C on the heat exchanger**

Q min: **minimum water flow to the heat exchanger**

Q max: **maximum water flow to the heat exchanger**

$dpw = K \cdot Q^2 / 1000$

$Q = 0{,}86\ P/\Delta T$

P: Heating or cooling capacity [kW]

Δt: ΔT at the heat exchanger (min = 3, max = 8) [°C]

dpw: Pressure drop [kPa]

Hydraulic data

HYDRONIC GROUP

The units of the **RTMA** family are also available in multiple hydraulic versions, characterized by complete kits of all major hydraulic components for an easier installation, with reduced time, cost and space.

The wide range of hydraulic versions available make the unit suitable for any type of installation.

HYDRAULIC VERSIONS

- 2 pumps low head pressure 150 kPa
- 2 pumps medium head pressure 250 kPa
- 2 pumps high head pressure 450 kPa

HYDRONIC KIT

Centrifugal pumps with 2 or 4 poles, axial suction bowls and radial delivery, available in low, medium or high head pressure.

Pumps with cast iron body and impeller entirely welded using laser technology. Mechanical seal with ceramic components, coal and EPDM elastomers. Three phase electric motor with IP55 protection and insulation class F, suitable for continuous service.

Series motors with higher efficiency IE2 technology.

- Differential pressure switch on exchanger
- Water discharge and shut-off valve
- Taps on pumps suction / delivery which allow the replacement of a damaged pump eliminating the plant shutdown differently from other types of common use
- Check valve (only for double pump versions)
- Safety valve
- Relief valve
- Safety valve
- Water gauges
- Expansion vessel
- High pressure switch

The stand by pump accessory is also available, including 2 additional pumps (one for the cold circuit and the other for the hot circuit) in stand-by mode to the first, equipped with the automatic changeover including also the pressure switch for the intervention of the second pump.The pumps operate with the balance of the related working hours. In case of failure of one pump the controller in automatic switches on the additional pump. The control panel is equipped with fuses and contactor with thermal protection.

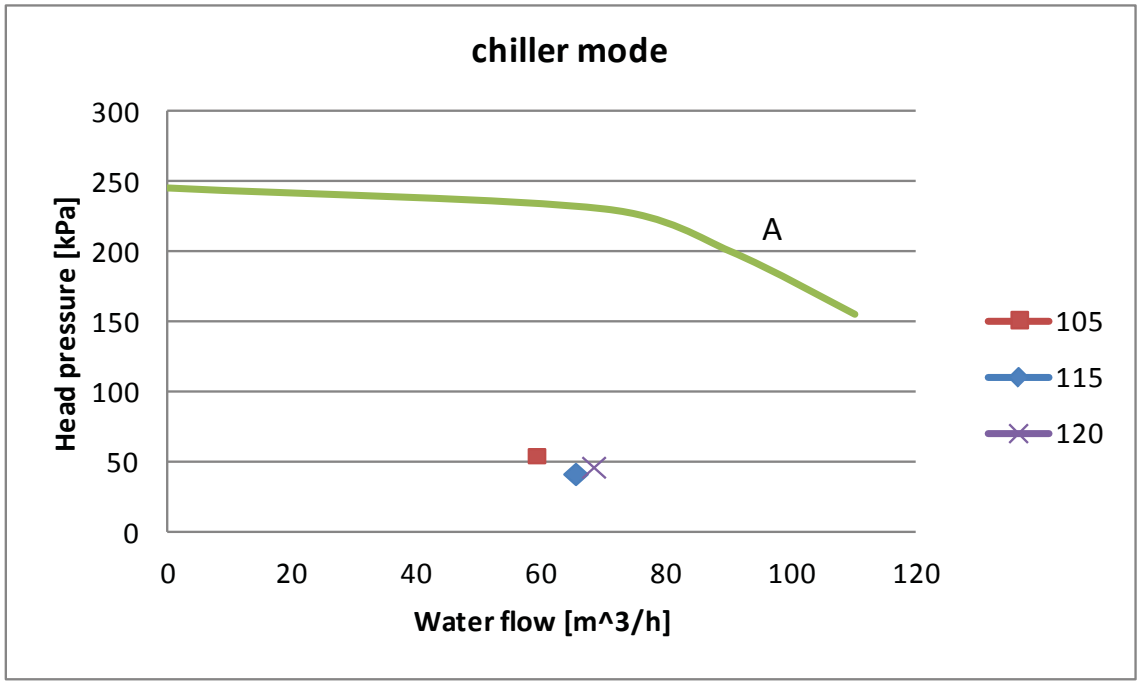
ACCESSORIES

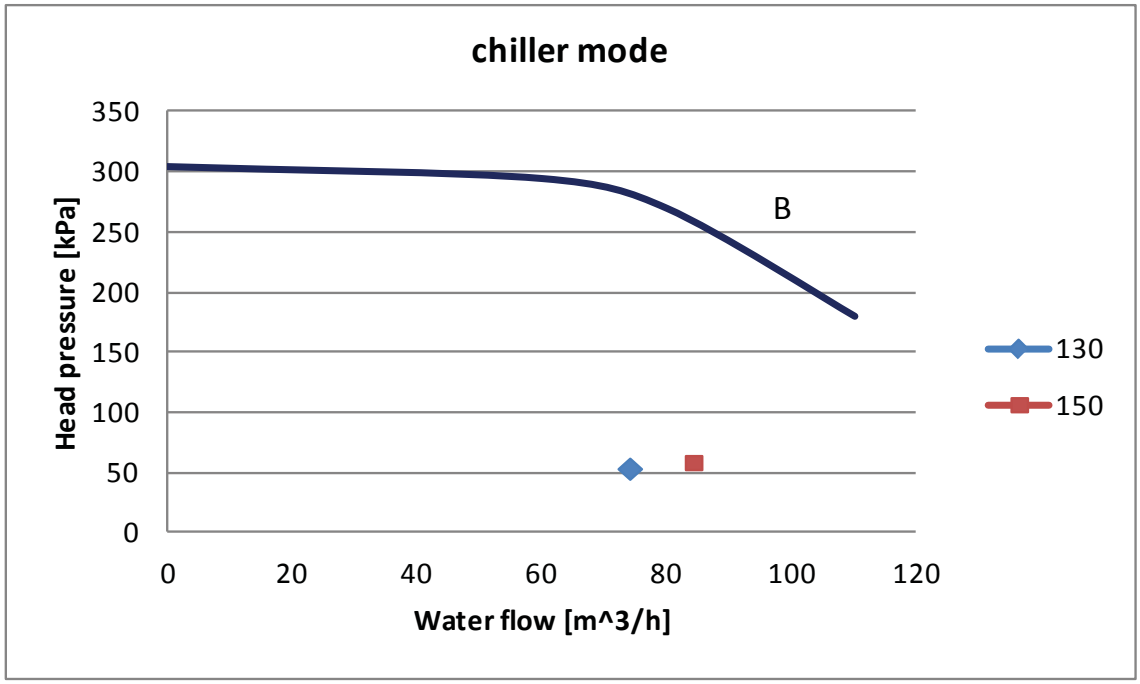
- "Y" water strainer (sold separately), consists of body and stainless steel mesh, with replaceable filter through the inspection cap.
- Automatic water filling (sold separately).
- Stand by pump for air conditioning circuit + stand by pump for heating circuit, 150 kPa
- Stand by pump for air conditioning circuit + stand by pump for heating circuit, 250 kPa
- Stand by pump for air conditioning circuit + stand by pump for heating circuit, 450 kPa

LOW HEAD PRESSURE PUMP (150 kPa)

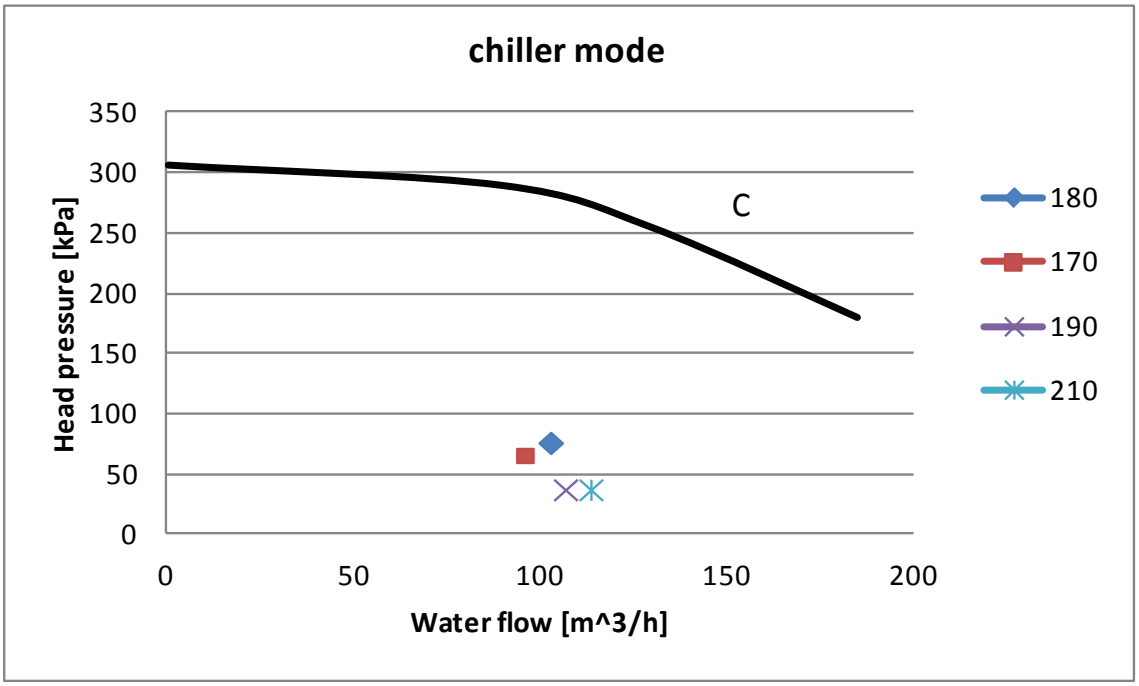
COOLING MODE

RTMA 105 - 210





Hydraulic data

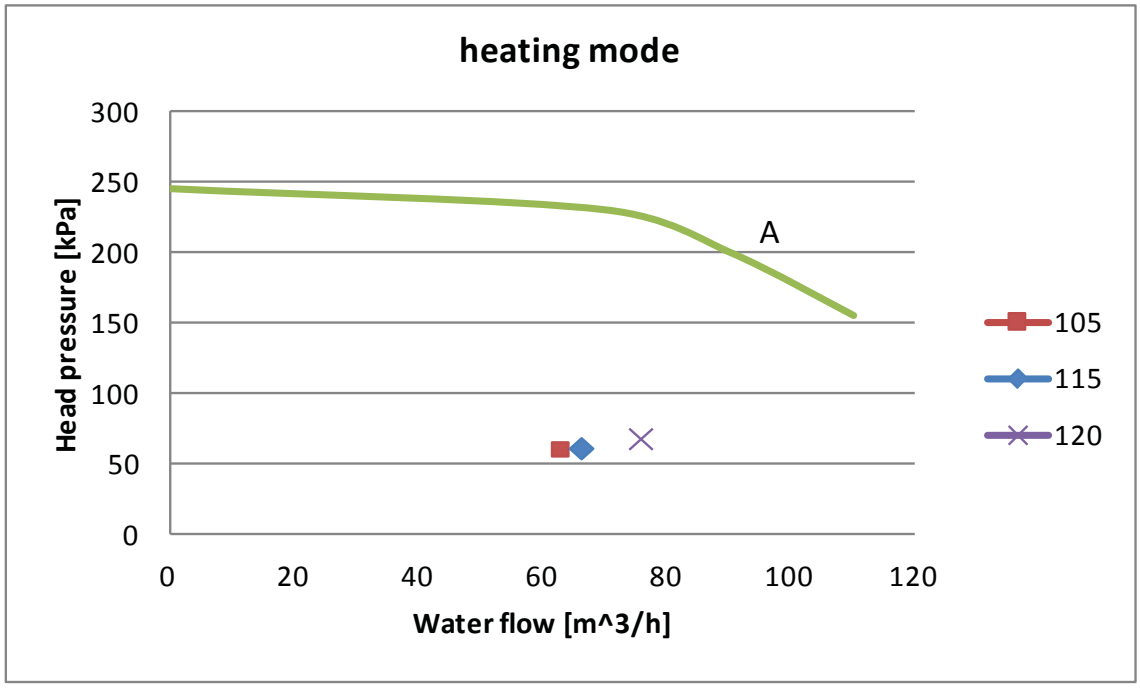


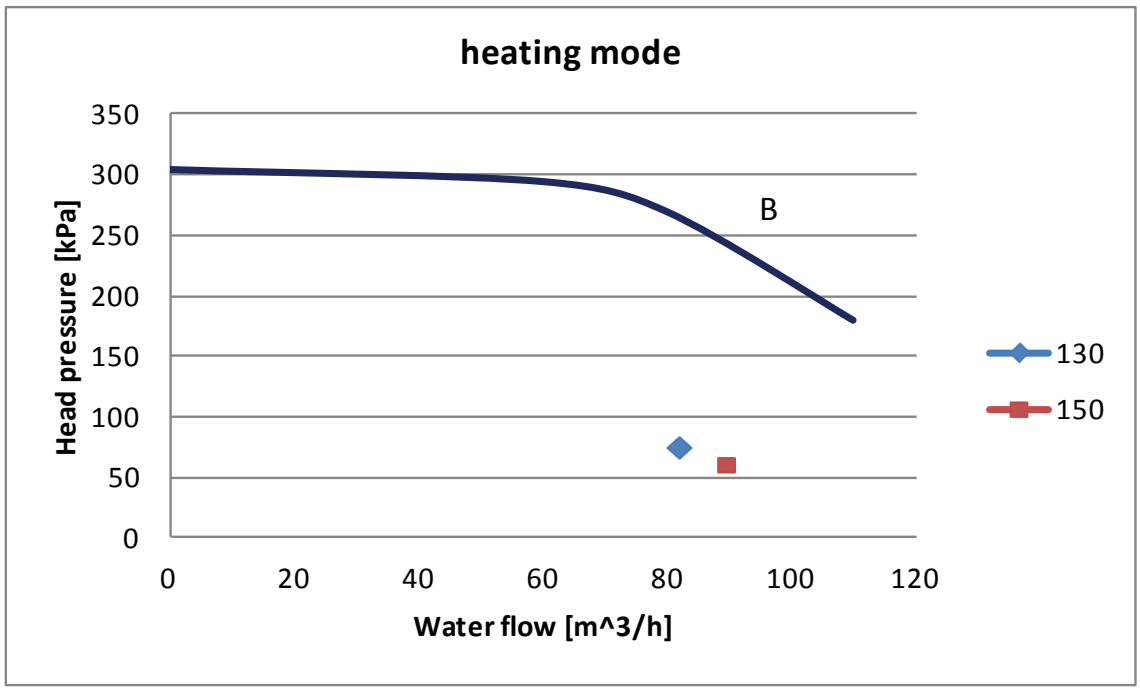
Mod.	Pf [kW]	qw [m³/h]	dpw [kPa]	Ref. Curve	Expansion vessel [l]	F.L.I. [kW]	F.L.A. [A]	Hp [kPa]	Hu [kPa]
105	344	59	56	A	2x24	7.5	14.2	250	194
115	381	65	43	A	2x24	7.5	14.2	239	196
120	398	68	48	A	2x24	7.5	14.2	233	185
130	431	74	54	B	2x24	9	16.5	280	226
150	491	84	59	B	2x24	9	16.5	262	202
170	558	96	67	C	2x24	15	25.8	286	219
180	599	103	77	C	2x24	15	25.8	281	204
190	622	107	38	C	2x24	15	25.8	277	239
210	661	113	38	C	2x24	15	25.8	271	233

Pf Cooling capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

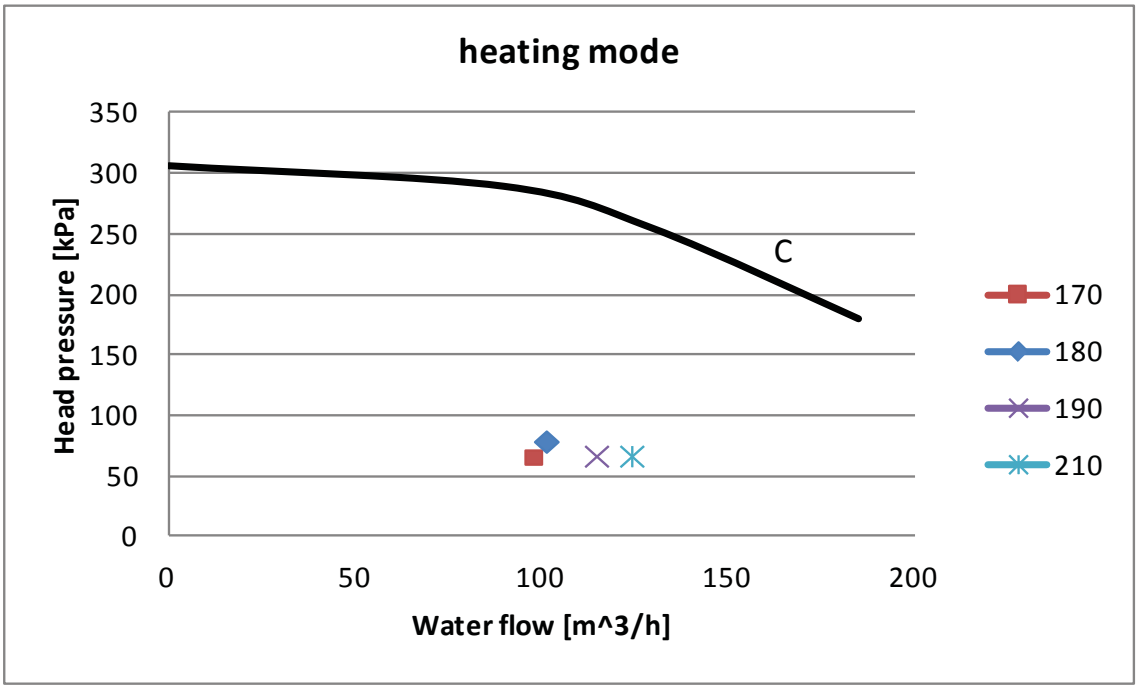
HEATING MODE

RTMA 105- 210





Hydraulic data



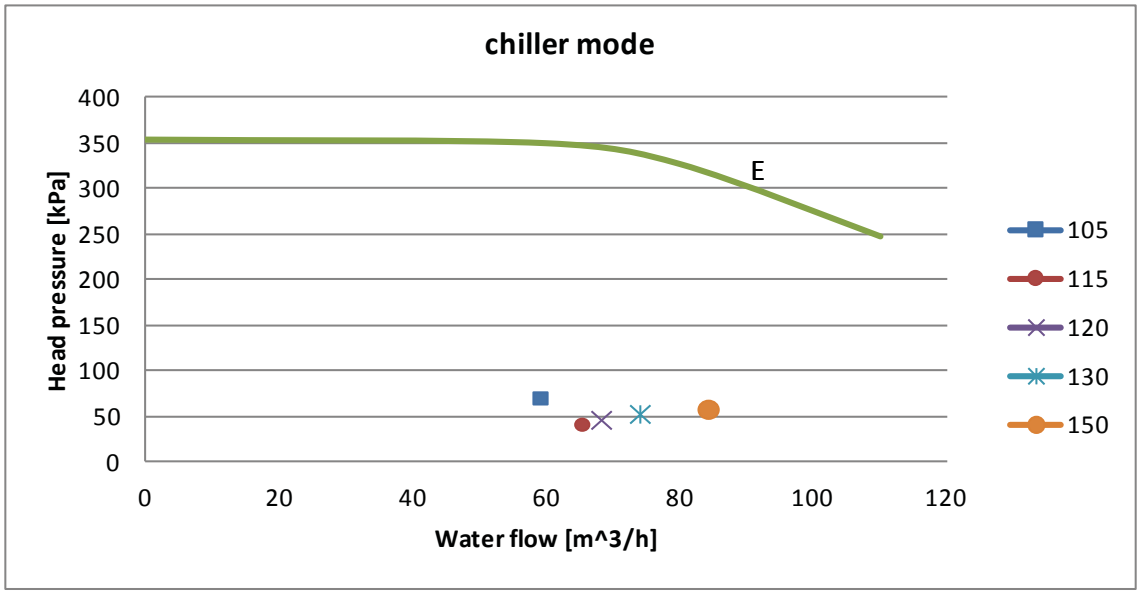
Mod.	Pf [kW]	qw [m³/h]	dpw [kPa]	Ref. Curve	Expansion vessel [l]	F.L.I. [kW]	F.L.A. [A]	Hp [kPa]	Hu [kPa]
105	361	63	62	A	2x24	7.5	14.2	237.3	175.1
115	381	66	63	A	2x24	7.5	14.2	233.9	171.2
120	436	76	69	A	2x24	7.5	14.2	222.4	152.9
130	470	82	76	B	2x24	9	16.5	266.3	190.4
150	514	90	62	B	2x24	9	16.5	249.5	187.8
170	562	98	67	C	2x24	15	25.8	284.6	217.7
180	582	101	80	C	2x24	15	25.8	281.9	202.3
190	660	115	68	C	2x24	15	25.8	270.5	202.9
210	714	124	68	C	2x24	15	25.8	261.3	193.8

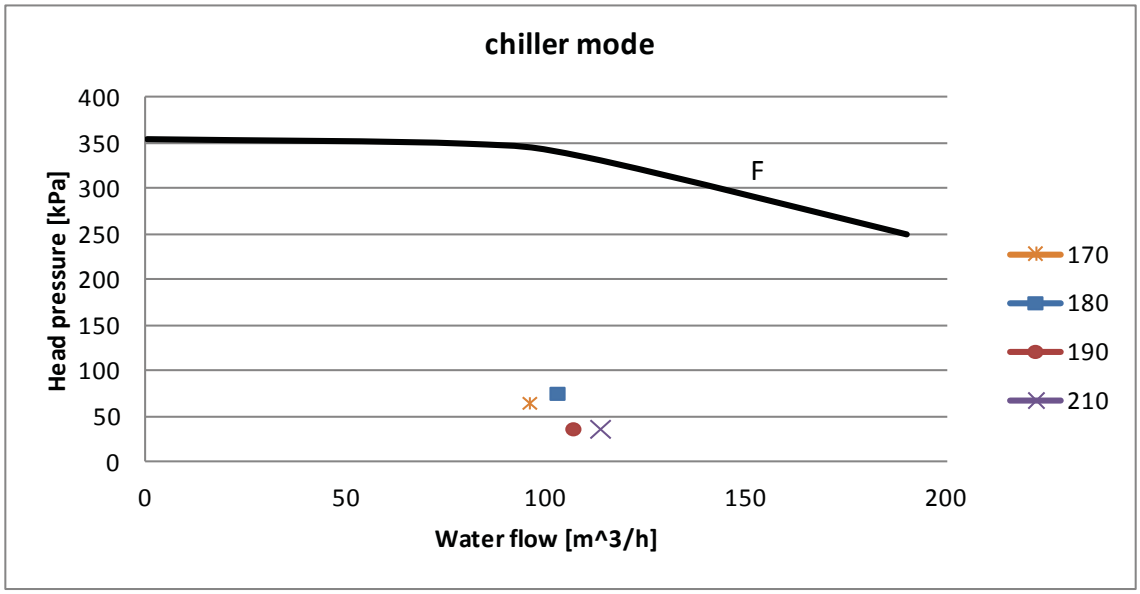
Pt Heating capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

MEDIUM HEAD PRESSURE PUMP (250 kPa)

COOLING MODE

RTMA 105 - 150





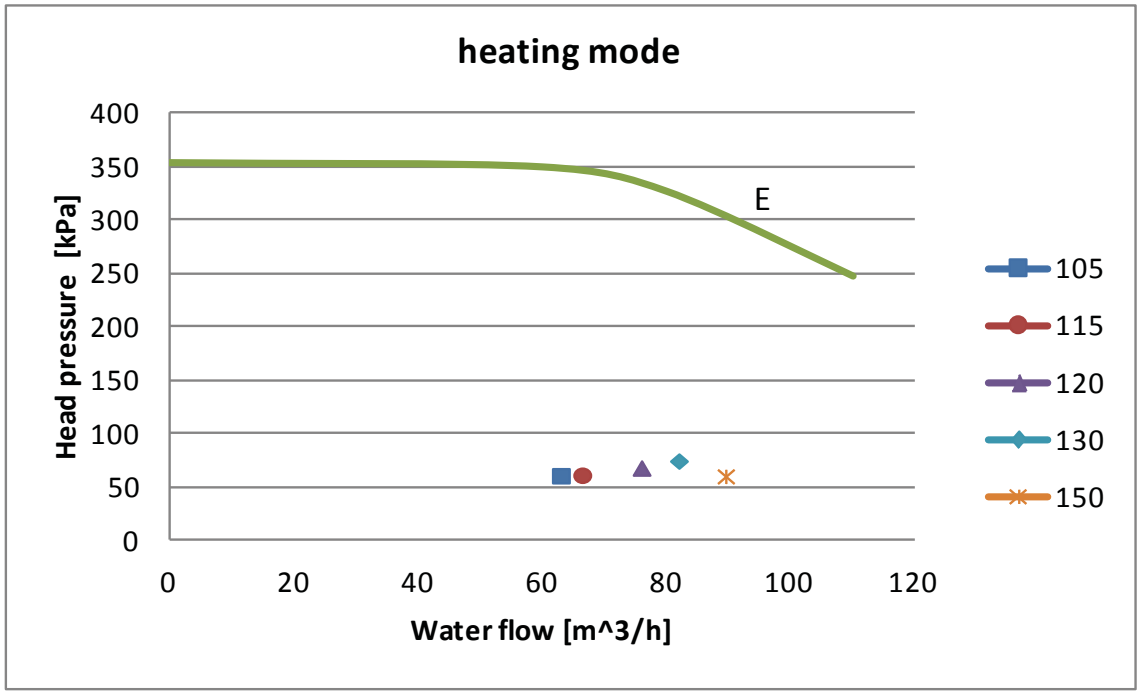
Hydraulic data

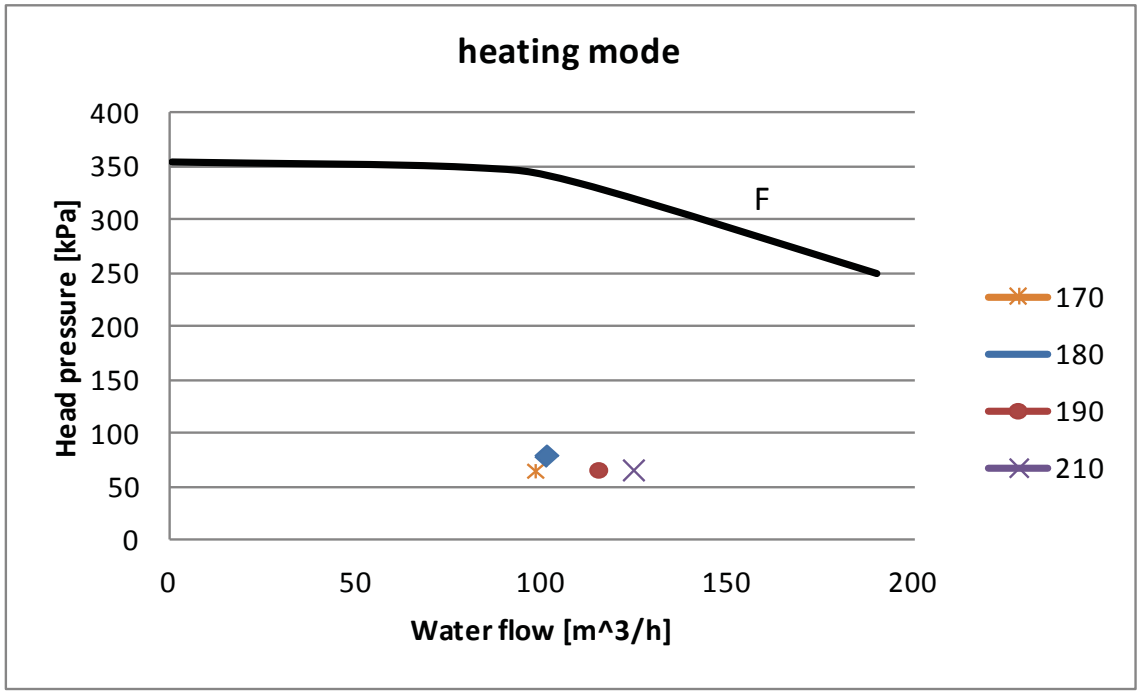
Mod.	Pf	qw	dpw	Ref. Curve	Expansion vessel	F.L.I.	F.L.A.	Hp	Hu
	[kW]	[m³/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
105	344	59	56	E	2x24	11	19.3	352	296
115	381	65	43	E	2x24	11	19.3	347	304
120	398	68	48	E	2x24	11	19.3	344	296
130	431	74	54	E	2x24	11	19.3	337	283
150	491	84	59	E	2x24	11	19.3	320	261
170	558	96	67	F	2x24	18.5	32.9	343	276
180	599	103	77	F	2x24	18.5	32.9	339	262
190	622	107	38	F	2x24	18.5	32.9	337	299
210	661	113	38	F	2x24	18.5	32.9	333	295

Pf Cooling capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

HEATING MODE

RTMA 105 -210





Hydraulic data

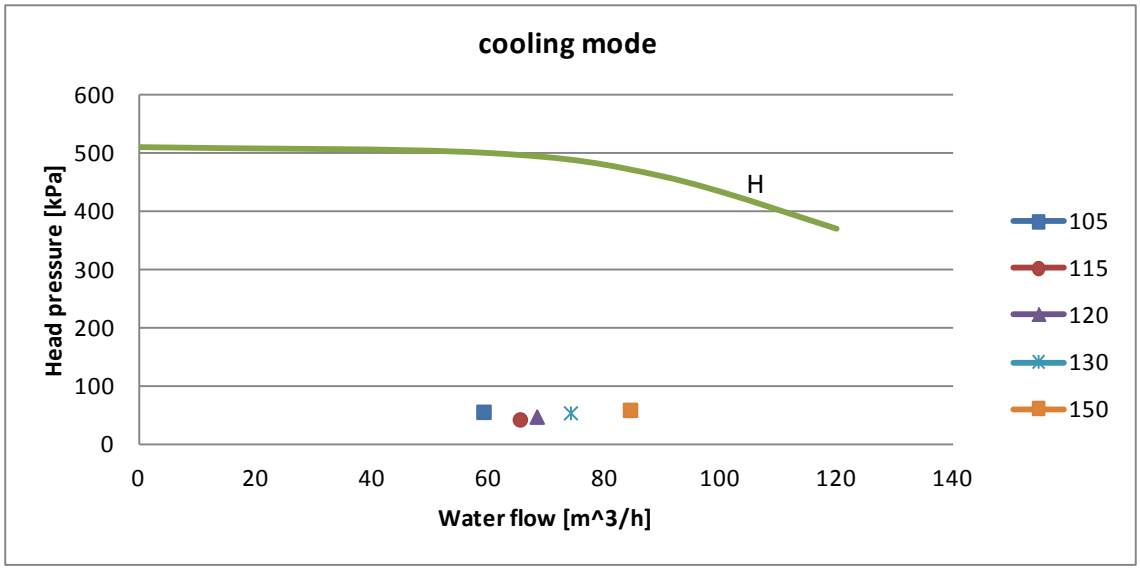
Mod.	Pf	qw	dpw	Ref. Curve	Expansion vessel	F.L.I.	F.L.A.	Hp	Hu
	[kW]	[m³/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
105	361	63	62	E	2x24	11	19.3	349	286
115	381	66	63	E	2x24	11	19.3	346	283
120	436	76	69	E	2x24	11	19.3	334	265
130	470	82	76	E	2x24	11	19.3	324	248
150	514	90	62	E	2x24	11	19.3	309	248
170	562	98	67	F	2x24	18.5	32.9	342	275
180	582	101	80	F	2x24	18.5	32.9	340	260
190	660	115	68	F	2x24	18.5	32.9	332	264
210	714	124	68	F	2x24	18.5	32.9	325	257

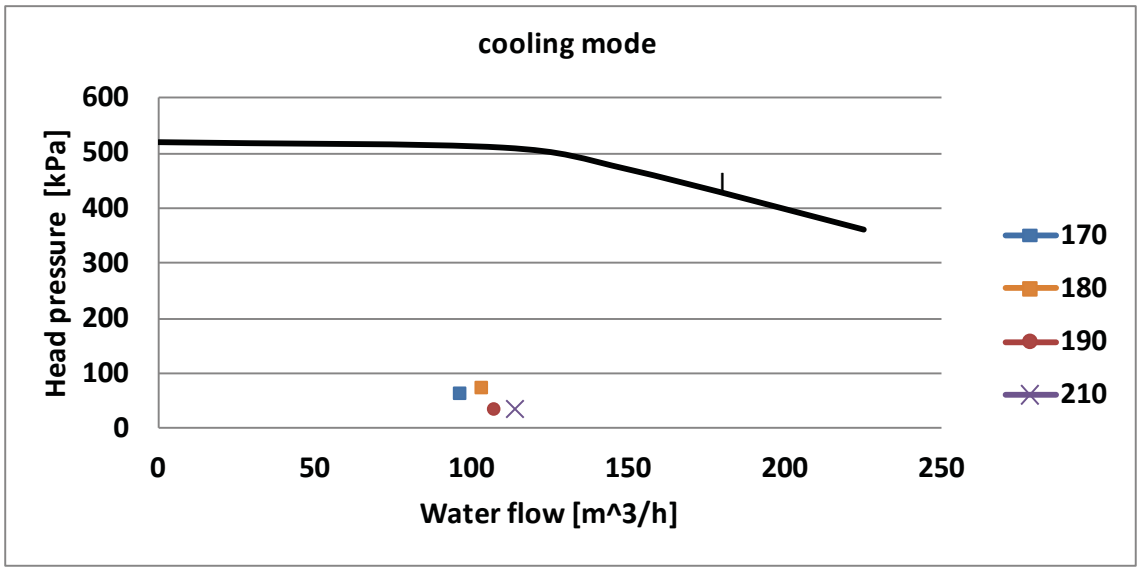
Pt Heating capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

HIGH HEAD PRESSURE PUMP (450 kPa)

COOLING MODE

RTMA 150 - 210





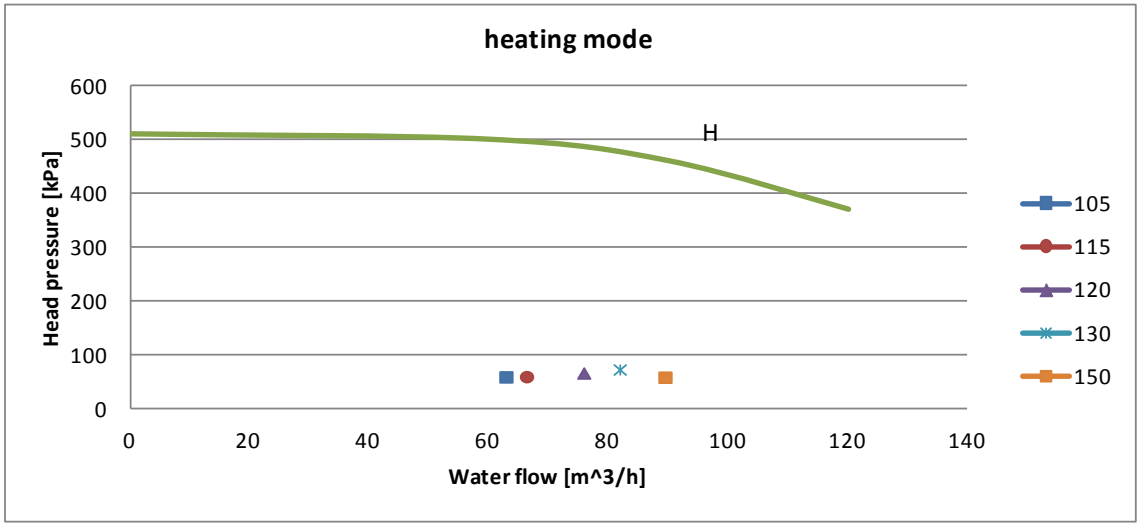
Hydraulic data

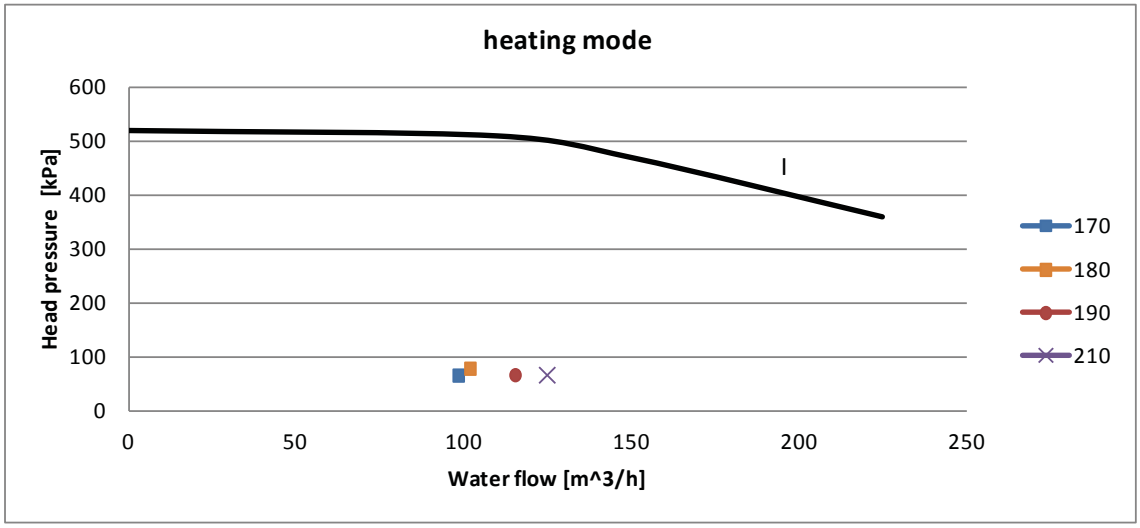
Mod.	Pf	qw	dpw	Ref. curve	Expansion vessel	F.L.I.	F.L.A.	Hp	Hu
	[kW]	[m³/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
105	344	59	56	H	2x24	18.5	32.9	501	445
115	381	65	43	H	2x24	18.5	32.9	496	453
120	398	68	48	H	2x24	18.5	32.9	493	445
130	431	74	54	H	2x24	18.5	32.9	486	432
150	491	84	59	H	2x24	18.5	32.9	471	412
170	558	96	67	I	2x24	30	54	520	453
180	599	103	77	I	2x24	30	54	516	439
190	622	107	38	I	2x24	30	54	513	475
210	661	113	38	I	2x24	30	54	507	469

Pf Cooling capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

HEATING MODE

RTMA 105 – 210



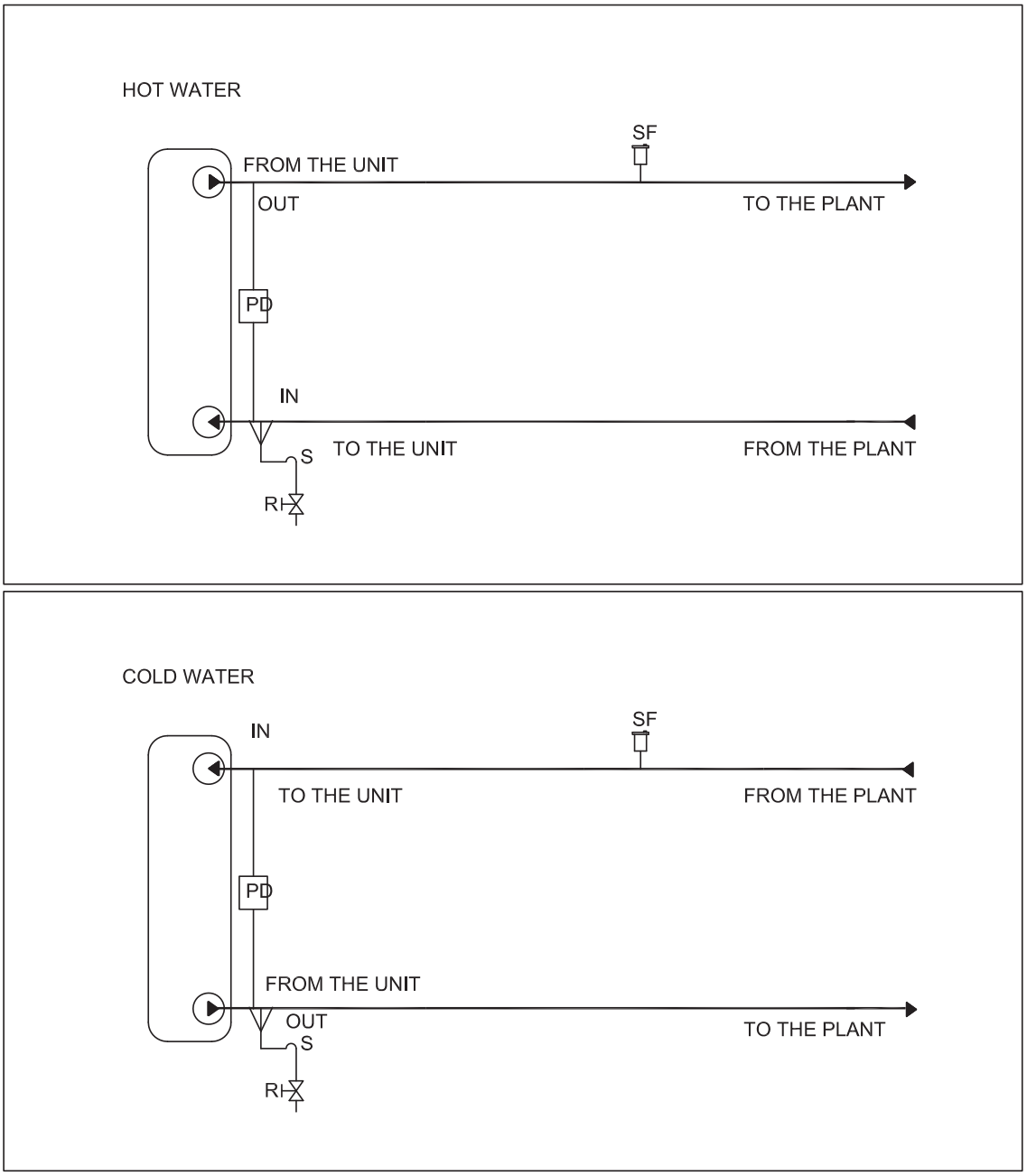


Hydraulic data

Mod.	Pt	qw	dpw	Ref. curve	Expansion vessel	F.L.I.	F.L.A.	Hp	Hu
	[kW]	[m³/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
105	361	63	62	H	2x24	18.5	32.9	505	443
115	381	66	63	H	2x24	18.5	32.9	502	440
120	436	76	69	H	2x24	18.5	32.9	492	423
130	470	82	76	H	2x24	18.5	32.9	484	408
150	514	90	62	H	2x24	18.5	32.9	471	410
170	562	98	67	I	2x24	30	54	519	452
180	582	101	80	I	2x24	30	54	517	437
190	660	115	68	I	2x24	30	54	506	439
210	714	124	68	I	2x24	37	63	498	430

Pt Heating capacity (kW)
qw Water flow (m³/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power
F.L.A. Full load operating current
Hp Pump head pressure
Hu Available pressure

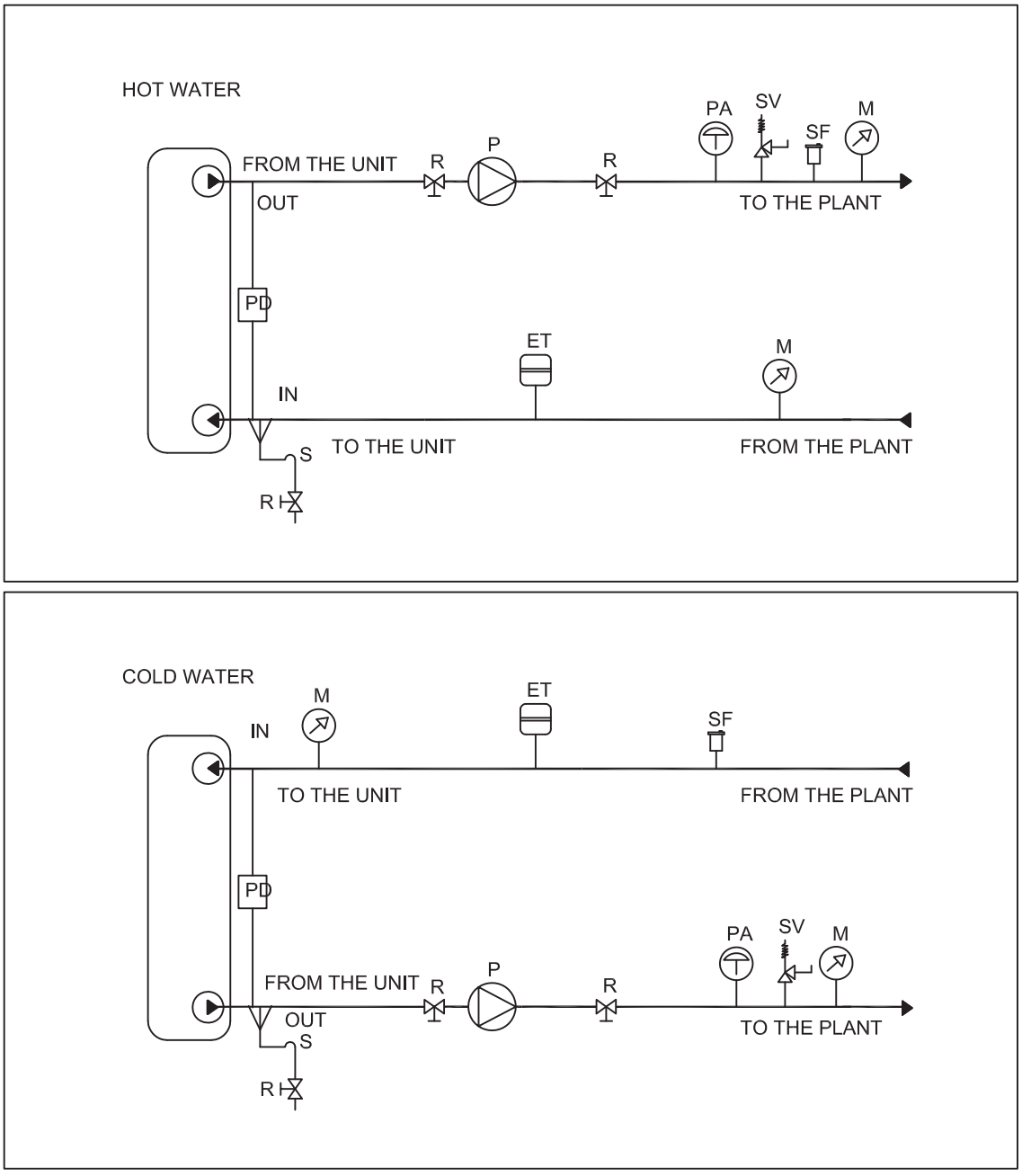
CONNECTION SCHEME - STANDARD VERSION



S Water discharge
SF Relief valve
R Shut off valve
PD Water differential pressure switch
Note: a water strainer shall always be installed on the inlet water pipe.

Hydraulic data

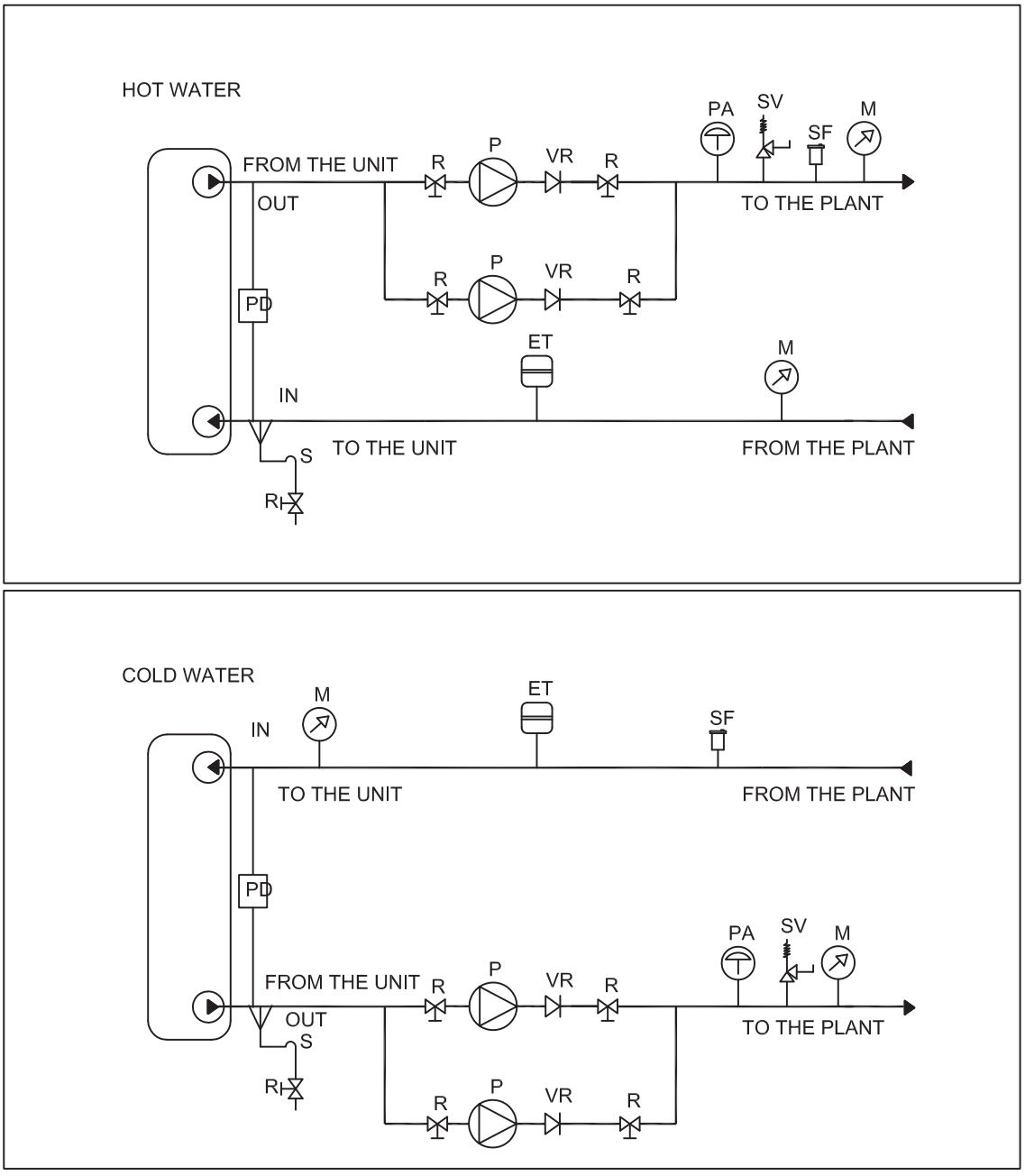
HYDRONIC KIT WITH 1 PUMP HOT WATER SIDE + 1 PUMP COLD WATER SIDE



M	Gauges
S	Water discharge
P	Pump
SV	Safety valve
SF	Relief valve
ET	Expansion vessel
PRS	Empty plant security pressure switch
R	Shut off valve
PD	Water differential pressure switch
PA	High pressure switch* * 4,6 bar - Low head pressure * 5,4 bar - Medium head pressure * 5,4 bar - High head pressure

Note: a water strainer shall always be installed on the inlet water pipe.

HYDRONIC KIT WITH 2 HOT WATER PUMPS + 2 COLD WATER PUMPS



M	Gauges
S	Water discharge
P	Pump
SV	Safety valve
SF	Relief valve
ET	Expansion vessel
PD	Water differential pressure switch
R	Shut off valve
VR	Check valve
PA	High pressure switch* * 4,6 bar - Low head pressure * 5,4 bar - Medium head pressure * 5,4 bar - High head pressure

Note: a water strainer shall always be installed on the inlet water pipe.

Electrical data

RTMA

Model	NOMINAL VALUES Outdoor air temperature 35°C, evaporator water temperature in / out 12 / 7°C								MAXIMUM VALUES (1)		
	Compressors (2)			Fans		TOTAL			TOTAL		
	F.L.I.	F.L.A.	L.R.A.	E.P.	O.C.	F.L.I.	F.L.A.	S.A.	F.L.I.	F.L.A.	S.A.
	kW	A	A	kW	A	kW	A	A	kW	A	A
105	127	221	405	12	24	139	245	514	202	344	589
115	143	250	434	12	24	155	274	555	214	364	618
120	135	236	434	15	30	150	266	543	218	370	624
130	148	260	434	15	30	163	290	559	229	390	644
150	166	290	530	18	36	184	326	69	254	432	764
170	199	349	587	18	36	217	385	770	281	478	844
180	218	382	587	18	36	236	418	786	318	540	906
190	208	364	587	21	42	229	406	761	321	546	912
210	227	398	436	21	42	248	440	619	358	608	761

RTMA L

Model	NOMINAL VALUES Outdoor air temperature 35°C, evaporator water temperature in / out 12 / 7°C								MAXIMUM VALUES (1)		
	Compressors (2)			Fans		TOTAL			TOTAL		
	F.L.I.	F.L.A.	L.R.A.	E.P.	O.C.	F.L.I.	F.L.A.	S.A.	F.L.I.	F.L.A.	S.A.
	kW	A	A	kW	A	kW	A	A	kW	A	A
105	130	228	405	9.0	18.0	139	246	560	202	344	589
115	147	257	434	9.0	18.0	156	275	607	214	364	618
120	139	243	434	11.3	22.5	150	265	597	218	370	624
130	153	268	434	11.3	22.5	164	290	615	229	390	644
150	171	299	530	13.5	27.0	184	326	732	254	432	764
170	206	360	587	13.5	27.0	219	387	840	281	478	844
180	225	394	587	13.5	27.0	239	421	862	318	540	906
190	215	376	587	15.8	31.5	230	407	840	321	546	912
210	234	410	436	15.8	31.5	250	442	706	358	608	761

RTMA S

Model	NOMINAL VALUES Outdoor air temperature 35°C, evaporator water temperature in/out 12/7°C								MAXIMUM VALUES (1)		
	Compressors (2)			Fans		TOTAL			TOTAL		
	F.L.I.	F.L.A.	L.R.A.	E.P.	O.C.	F.L.I.	F.L.A.	S.A.	F.L.I.	F.L.A.	S.A.
	kW	A	A	kW	A	kW	A	A	kW	A	A
105	128	223	405	8.4	16.8	136	240	554	198	337	582
115	144	252	434	8.4	16.8	152	269	600	210	357	611
120	136	238	434	10.5	21.0	147	259	591	212	361	615
130	150	262	434	10.5	21.0	160	283	607	224	381	635
150	167	292	530	12.6	25.2	180	318	723	248	421	753
170	201	352	587	12.6	25.2	214	377	829	275	467	833
180	220	385	587	12.6	25.2	233	410	850	311	529	895
190	210	367	587	14.7	29.4	225	397	829	314	533	899
210	229	401	436	14.7	29.4	244	430	694	350	595	748

Electrical data referred to 400V - 3PH+N-50Hz

Maximum operating admitted conditions: 10%

Maximum phase unbalance: 3%

F.L.I. full load electrical power

F.L.A. full load operating current

L.R.A. compressor motor locked rotor current (direct starting)

S.A. sum of LRA of the most powerful compressor, FLA of other compressor and fans current

E.P. electrical power

O.C. operating current

(1) maximum operating admitted conditions by the compressors manufacturer

(2) data referred to the biggest compressor for units with different compressors

Acoustic data

RTMA

Model	Octave bands (Hz) 63	125	250	500	1000	2000	4000	8000	Lw eq dB
	Lw dB								
105	68,9	64,9	60,3	56,1	54	51	45	40,4	92
115	68,9	64,9	60,3	56,1	54	51	45	40,4	92
120	69,8	65,8	61,2	57,0	55	52	46	41,3	93
130	69,8	65,8	61,2	57,0	55	52	46	41,3	93
150	72	67,7	63,1	59	56	54	48	43,2	95
170	72	67,7	63,1	59	57	54	48	43,2	95
180	72	67,7	63,1	59	57	54	48	43,2	95
190	73	69	63,9	60	57	55	49	44,0	96
210	73	69	63,9	60	57	55	49	44,0	96

RTMA L

Model	Octave bands (Hz) 63	125	250	500	1000	2000	4000	8000	Lw eq dB
	Lw dB								
105	66,9	62,9	58,3	54,1	52	49	43	38,4	90
115	66,9	62,9	58,3	54,1	52	49	43	38,4	90
120	68	63,8	59,2	55,0	53	50	44	39,3	91
130	68	63,8	59,2	55,0	53	50	44	39,3	91
150	70	66	61,1	56,9	54	52	46	41,2	93
170	70	70	61,1	56,9	54	52	46	41,2	93
180	70	70	61,1	56,9	54	52	46	41,2	93
190	71	67	62	58	55	53	47	42,0	94
210	71	67	62	58	55	53	47	42,0	94

RTMA S

Model	Octave bands (Hz) 63	125	250	500	1000	2000	4000	8000	Lw eq dB
	Lw dB								
105	64	60	55,3	51,1	49	46	40	35,4	87
115	64	60	55,3	51,1	49	46	40	35,4	87
120	65	61	56,2	52,0	50	47	41	36,3	88
130	65	61	56,2	52,0	50	47	41	36,3	88
150	67	63	58,1	54	51	49	43	38,2	90
170	67	63	58,1	54	51	49	43	38,2	90
180	67	63	58,1	54	51	49	43	38,2	90
190	68	64	59,0	55	52	50	44	39,1	91
210	68	64	59,0	55	52	50	44	39,1	91

NOISE CORRECTION FACTORS FOR HYDRAULIC VERSION

For the Hydraulic version please consider the noise output increase due to the addition of the hydraulic group.

RTMA

Model	LOW head pressure		MEDIUM head pressure		HIGH head pressure	
	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]
105	-	1	-	1	-	1
115	-	1	-	1	-	1
120	-	1	-	1	-	1
130	-	1	-	1	-	1
150	-	1	-	1	-	1
170	-	1	-	1	1	1
180	-	1	-	1	1	1
190	-	1	-	1	-	1
210	-	1	-	1	1	1

RTMA L

Model	LOW head pressure		MEDIUM head pressure		HIGH head pressure	
	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]
105	-	1	-	1	-	1
115	-	1	-	1	-	1
120	-	1	-	1	-	1
130	-	1	-	1	-	1
150	-	1	-	1	-	1
170	-	1	-	1	1	1
180	-	1	-	1	1	1
190	-	1	-	1	1	1
210	-	1	-	1	1	1

RTMA S

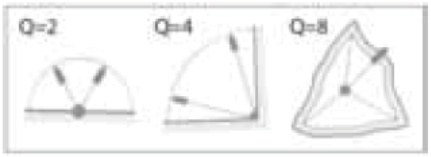
Model	LOW head pressure		MEDIUM head pressure		HIGH head pressure	
	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]	1 pump [dB(A)]	2 pump [dB(A)]
105	1	1	-	1	1	1
115	1	1	-	1	1	1
120	-	1	-	1	1	1
130	1	1	-	1	1	1
150	-	1	-	1	1	1
170	-	2	-	2	1	2
180	-	2	-	2	1	2
190	1	2	-	2	1	2
210	-	2	-	2	1	2

Acoustic data

Operating conditions:
Outlet water temperature in/out 12°C/7°C – outdoor air temperature 35°C.

Testing point:
Average sound pressure levels calculated according to ISO 3744 at 10 m distance from unit.

Measurement conditions:
Free field on reflecting surface (Q factor Q=2).

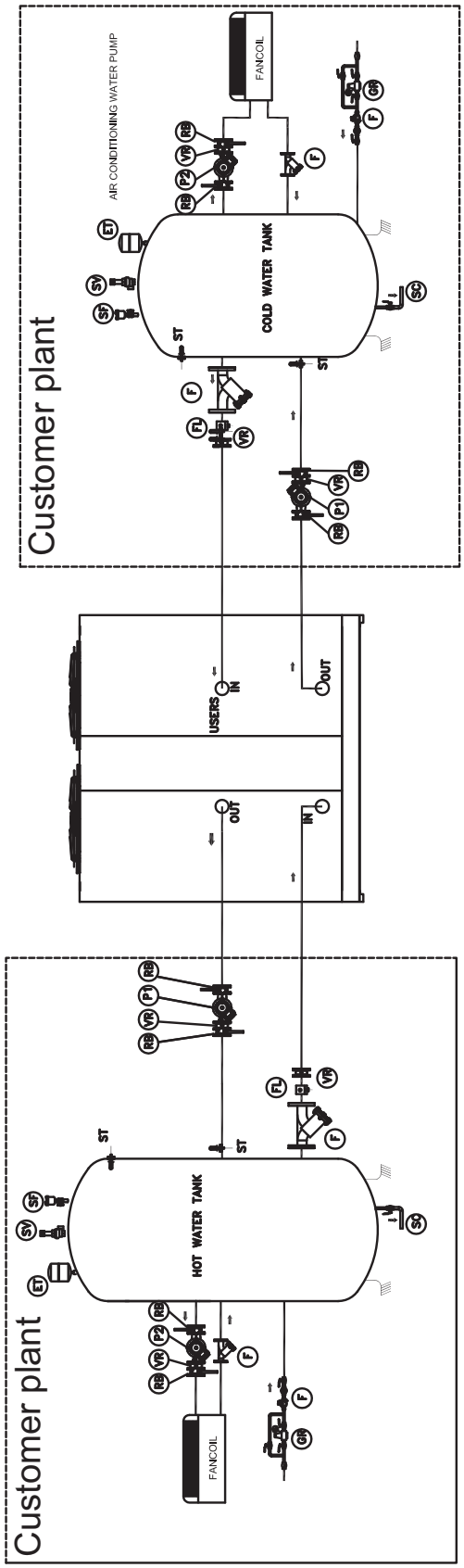


- For units installed in the presence of 2 reflecting surfaces (Q factor Q=4) 3 dB have to be added at values above mentioned.
- For units installed in the presence of 3 reflecting surfaces (Q factor Q=8) 6 dB have to be added at values above mentioned.
- For units installed at a certain height from the ground, the sound energy coming out from the bottom of the unit leads an increase of the noise pressure level of around 3 dB.

Sound emission values in octave bands are shown just as an indication and they are not to be considered as a commitment. Sound pressure values, according to ISO 3744 standards and in observance of EUROVENT certification program, are the only ones to be used for every calculation to make a prevision of the sound pressure level at the operating conditions. The sound pressure level data are not binding. For a more precise value please refer to the sound power level.

Installation sketch

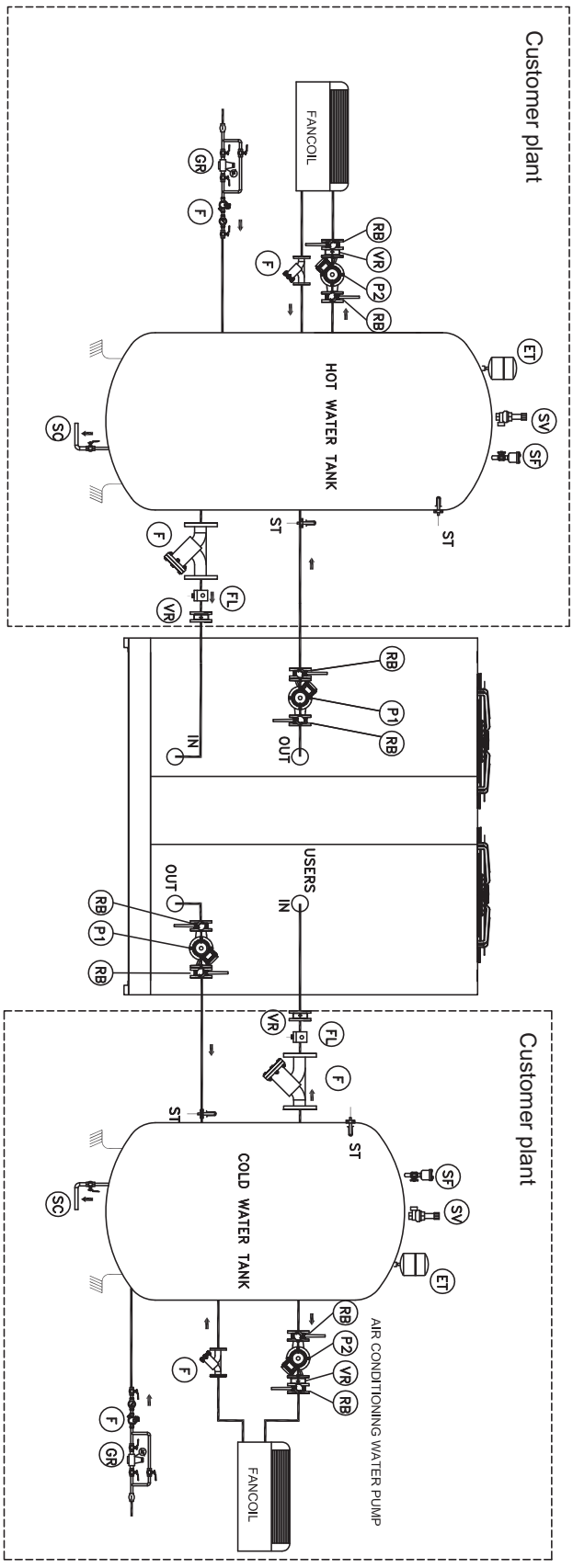
CONNECTION SCHEME – STANDARD VERSION



P1	Primary pump
P2	Secondary pump
ST	Temperature probe
FL	Flow switch
SC	Drainage
SF	Vent valve
ET	Expansion vessel
GR	Filling group
F	Steel mesh strainer
VR	Check valve
SV	Safety valve
RB	Interception valve

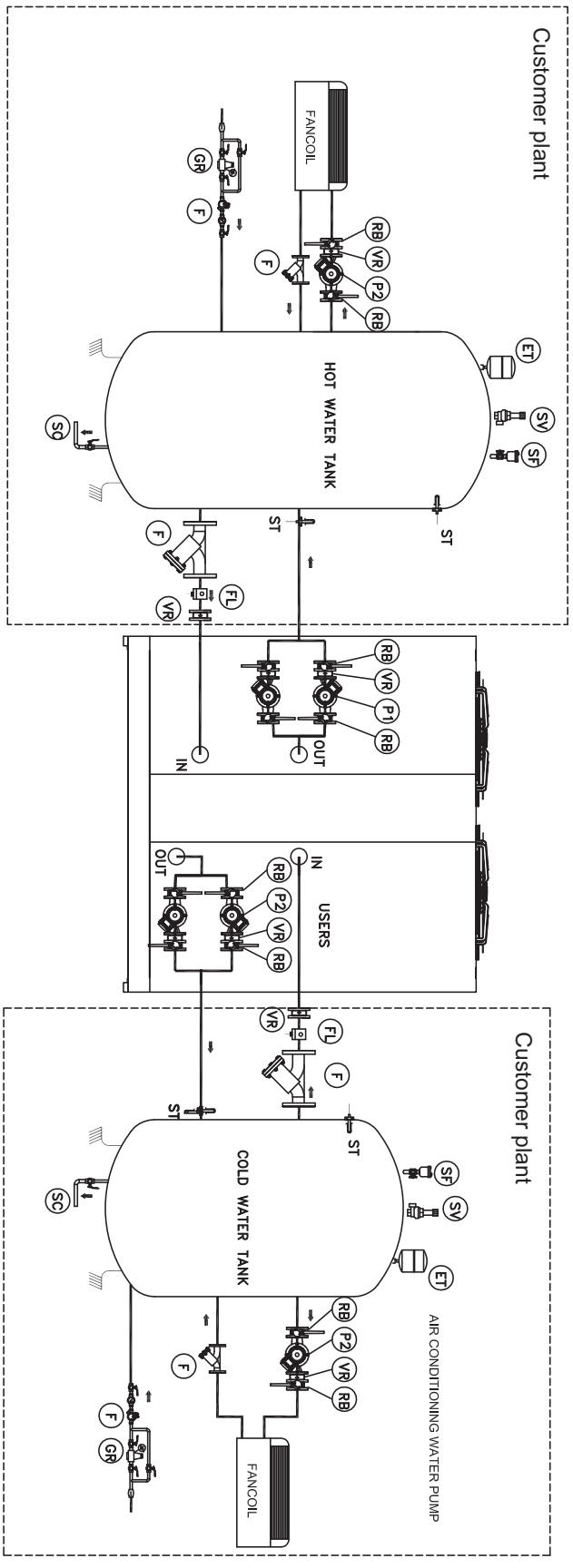
Installation sketch

CONNECTION SCHEME – SINGLE PUMP VERSION



P1	Primary pump
P2	Secondary pump
ST	Temperature probe
FL	Flow switch
SC	Drainage
SF	Vent valve
ET	Expansion vessel
GR	Filling group
F	Steel mesh strainer
VR	Check valve
SV	Safety valve
RB	Interception valve

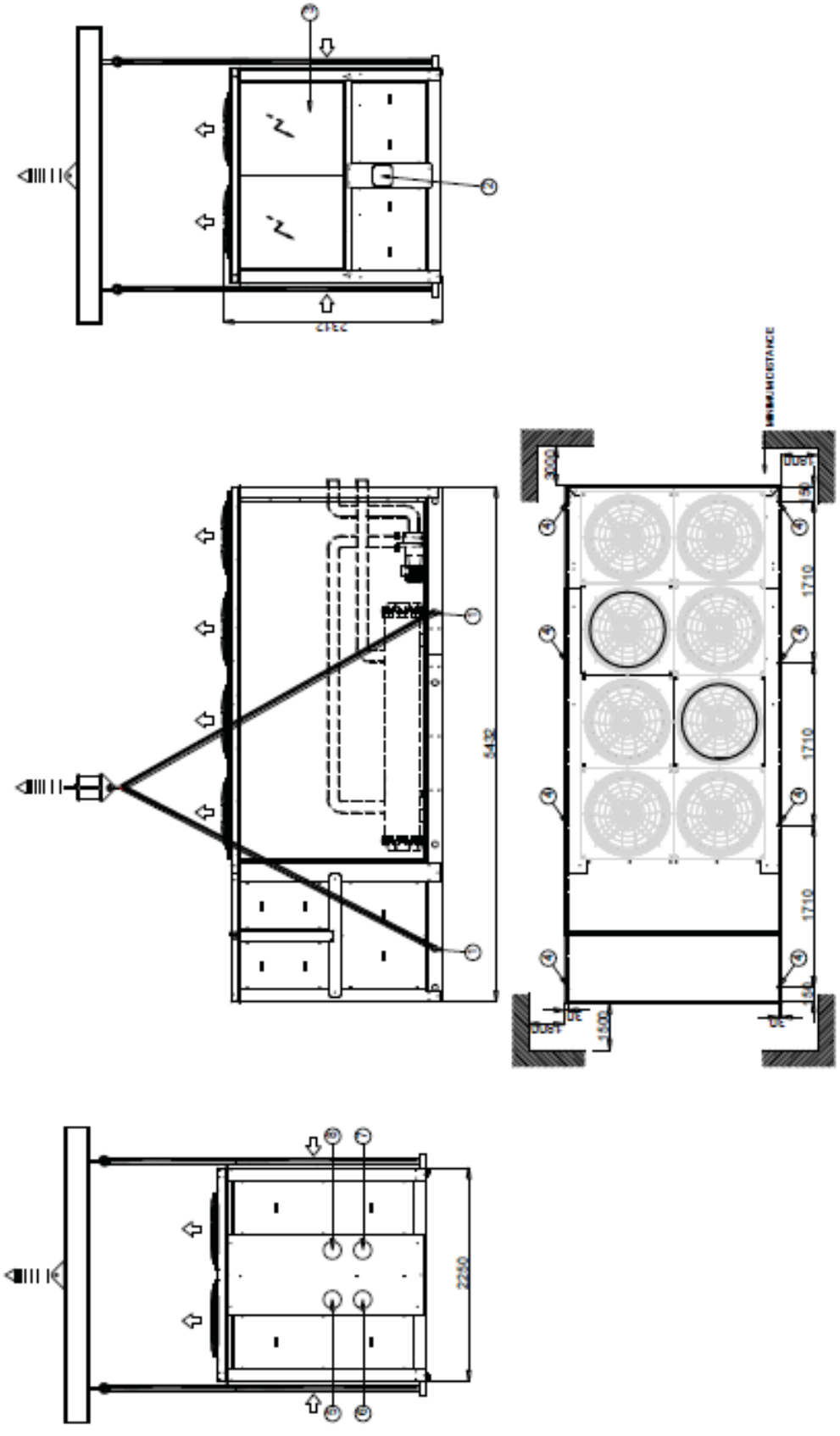
CONNECTION SCHEME – DOUBLE PUMP VERSION



P1	Primary pump
P2	Secondary pump
ST	Temperature probe
FL	Flow switch
SC	Drainage
SF	Vent valve
ET	Expansion vessel
GR	Filling group
F	Steel mesh strainer
VR	Check valve
SV	Safety valve
RB	Interception valve

Dimensional drawings and weights

RTMA 105 - 115

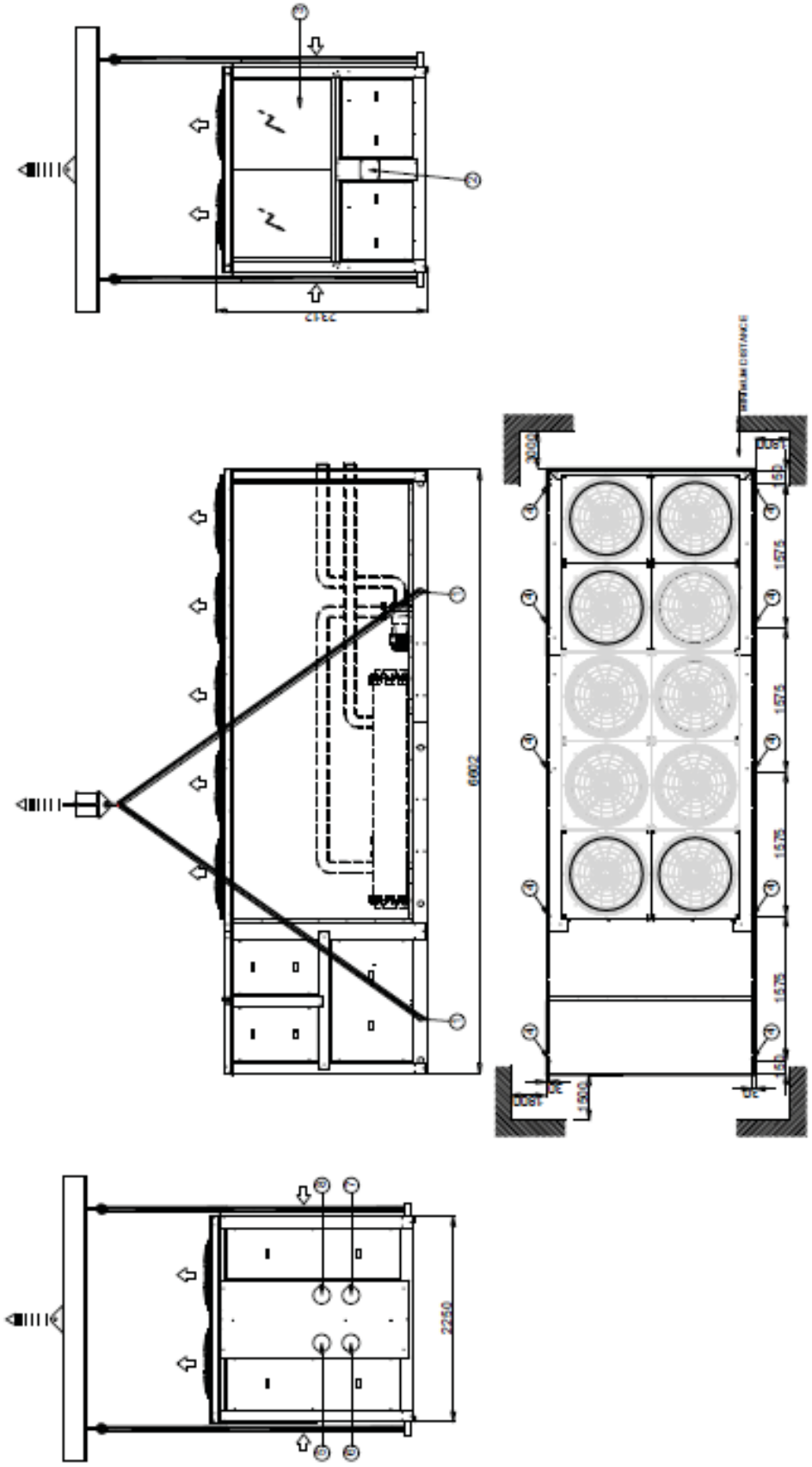


Dimensional drawings and weights

Operating weights		105	115
Basic Version	kg	5592	5799
Tubes diameter			
⑤ - ⑥	Ø	5" VICTAULIC	5" VICTAULIC
⑦ - ⑧	Ø	5" VICTAULIC	5" VICTAULIC
Operating weights for hydraulic version			
Single pump 150 kPa head pressure	kg	5903	6110
Double pump 150 kPa head pressure	kg	6149	6356
Single pump 250 kPa head pressure	kg	5949	6156
Double pump 250 kPa head pressure	kg	6241	6448
Single pump 450 kPa head pressure	kg	5991	6198
Double pump 450 kPa head pressure	kg	6325	6532
Operating weights for acoustic version			
L	kg	5592	5799
S	kg	5872	6079
Single pump 150 kPa head pressure + S	kg	6183	6390
Double pump 150 kPa head pressure + S	kg	6429	6636
Single pump 250 kPa head pressure + S	kg	6229	6436
Double pump 250 kPa head pressure + S	kg	6521	6728
Single pump 450 kPa head pressure + S	kg	6271	6478
Double pump 450 kPa head pressure + S	kg	6605	6812

Dimensional drawings and weights

RTMA 120 – 130



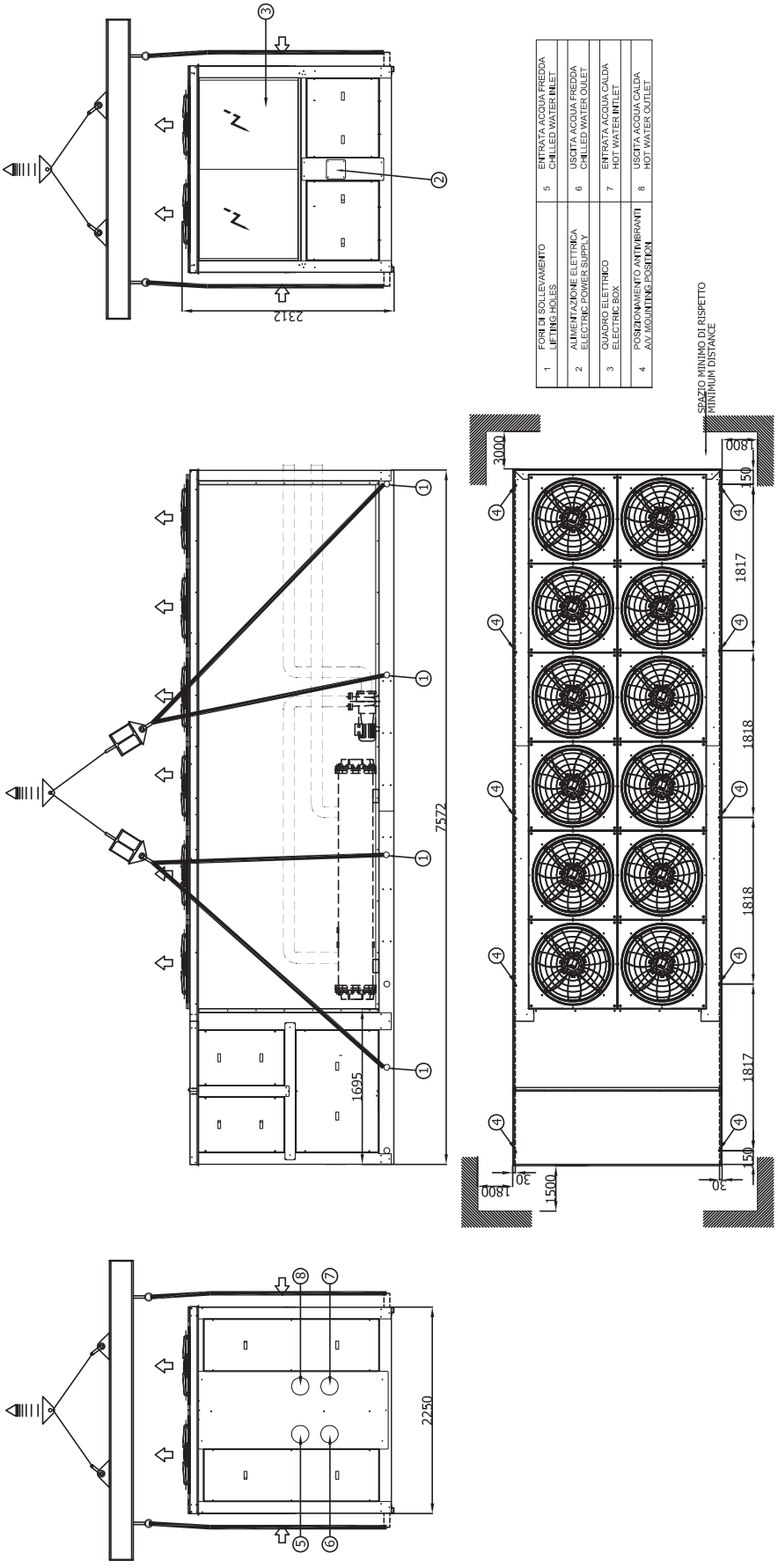
9 Lifting holes
10 Electronic power supply
11 Electric box
12 A/V mounting position
13 Chilled water inlet
14 Chilled water outlet
15 Hot water inlet
16 Hot water oultet

Dimensional drawings and weights

Operating weights		120	130
Basic Version	kg	6057	6121
Tubes diameter			
⑤ - ⑥	Ø	5" VICTAULIC	5" VICTAULIC
⑦ - ⑧	Ø	5" VICTAULIC	5" VICTAULIC
Operating weights for hydraulic version			
Single pump 150 kPa head pressure	kg	6368	6517
Double pump 150 kPa head pressure	kg	6614	6831
Single pump 250 kPa head pressure	kg	6414	6529
Double pump 250 kPa head pressure	kg	6706	6855
Single pump 450 kPa head pressure	kg	6456	6571
Double pump 450 kPa head pressure	kg	6790	6939
Operating weights for acoustic version			
L	kg	6057	6121
S	kg	6387	6451
Single pump 150 kPa head pressure + S	kg	6698	6847
Double pump 150 kPa head pressure + S	kg	6944	7161
Single pump 250 kPa head pressure + S	kg	6744	6859
Double pump 250 kPa head pressure + S	kg	7036	7185
Single pump 450 kPa head pressure + S	kg	6786	6901
Double pump 450 kPa head pressure + S	kg	7120	7269

Dimensional drawings and weights

RTMA 150 - 180

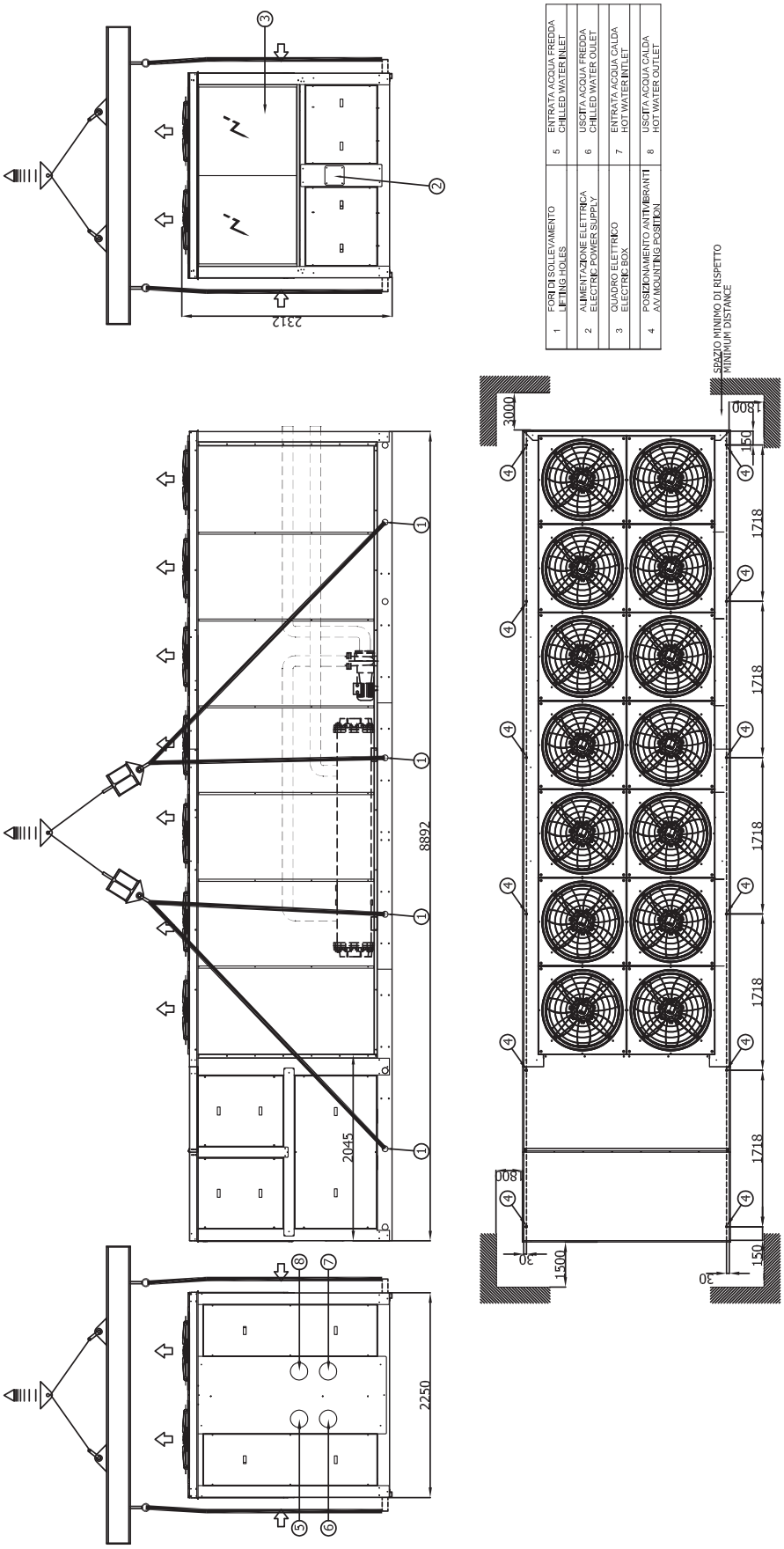


Dimensional drawings and weights

Operating weights		150	170	180
Basic Version	kg	6578	6925	6946
Tubes diameter				
⑤ - ⑥	Ø	5" VICTAULIC	5" VICTAULIC	6" VICTAULIC
⑦ - ⑧	Ø	5" VICTAULIC	6" VICTAULIC	6" VICTAULIC
Operating weights for hydraulic version				
Single pump 150 kPa head pressure	kg	7010	7411	7432
Double pump 150 kPa head pressure	kg	7360	7797	7818
Single pump 250 kPa head pressure	kg	6986	7499	7520
Double pump 250 kPa head pressure	kg	7312	7973	7994
Single pump 450 kPa head pressure	kg	7028	7769	7790
Double pump 450 kPa head pressure	kg	7396	8513	8534
Operating weights for acoustic version				
L	kg	6578	6925	6946
S	kg	6948	7295	7316
Single pump 150 kPa head pressure + S	kg	7380	7781	7802
Double pump 150 kPa head pressure + S	kg	7730	8167	8188
Single pump 250 kPa head pressure + S	kg	7356	7869	7890
Double pump 250 kPa head pressure + S	kg	7682	8343	8364
Single pump 450 kPa head pressure + S	kg	7398	8139	8160
Double pump 450 kPa head pressure + S	kg	7766	8883	8904

Dimensional drawings and weights

RTMA 190 – 210



Dimensional drawings and weights

Operating weights		190	210
Basic Version	kg	7199	7794
Tubes diameter			
⑤ - ⑥	Ø	6'' VICTAULIC	6'' VICTAULIC
⑦ - ⑧	Ø	6'' VICTAULIC	6'' VICTAULIC
Operating weights for hydraulic version			
Single pump 150 kPa head pressure	kg	7733	8328
Double pump 150 kPa head pressure	kg	8151	8746
Single pump 250 kPa head pressure	kg	7821	8416
Double pump 250 kPa head pressure	kg	8327	8922
Single pump 450 kPa head pressure	kg	8091	8686
Double pump 450 kPa head pressure	kg	8867	9462
Operating weights for acoustic version			
L	kg	7199	7794
S	kg	7619	8214
Single pump 150 kPa head pressure + S	kg	8153	8748
Double pump 150 kPa head pressure + S	kg	8571	9166
Single pump 250 kPa head pressure + S	kg	8241	8836
Double pump 250 kPa head pressure + S	kg	8747	9342
Single pump 450 kPa head pressure + S	kg	8511	9106
Double pump 450 kPa head pressure + S	kg	9287	9882

Notes

Notes

Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services and parts. For more information visit www.Trane.com

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

RLC-PRC043C-GB December 2015

We are committed to using environmentally conscious print practices that reduce waste.