

TAURUS_{TECH} | MCTAURUS_{TECH}

Air cooled water chillers and condensing units
with hermetic scroll compressors and R410A refrigerant gas.

Cooling capacity 72,5 – 154 kW

Cooling capacity condensing units 76,4 – 164,6 kW



*Conditioning your ambient,
maximising your comfort.*



Cooling, conditioning, purifying.



TAURUS_{TECH} | MCTAURUS_{TECH}

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1. General

The chillers and condensing units in the Taurus Tech range are air-cooled units designed for outdoor installation (IP54 protection class). These units are equipped with a finned core condenser, axial fans, hermetic scroll compressors in single circuit configuration and R410A refrigerant gas. The chillers are equipped with plates (or shell and tube) evaporator and can be supplied with an integral pumping module with or without water storage tank. The units are managed by a microprocessor controller, through a simple user interface allows a fully independent control of all the main functions, including adjustments and alarms. All units are designed, built and checked in compliance with ISO 9001 and incorporate components sourced from premium manufacturers.

The combinations of these solutions make it possible to enhance energy efficiency at partial loads, which account for the largest proportion of the working life of an air conditioning unit, thereby maximizing ESEER (*) seasonal performance values.

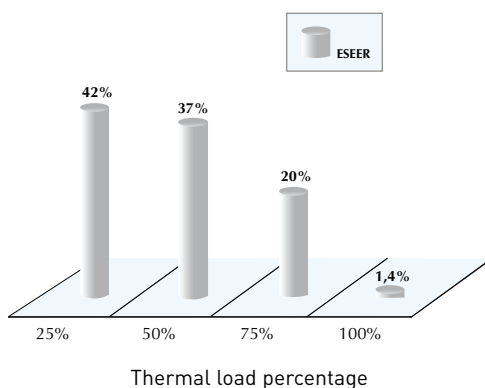
In order to satisfy specific system needs, the Taurus Tech chillers are available in 3 standard efficiency acoustic configurations (N, SN, SSN) and 2 high efficiency acoustic configurations with Eurovent A Class (HE, SHE). The standard product, destined for EU and EFTA countries, is subject to the following directives:

- Electromagnetic Compatibility Directive 2004/108/EC;
- Machinery Directive 2006/42/EC;
- Pressure Equipment Directive 97/23/EC.

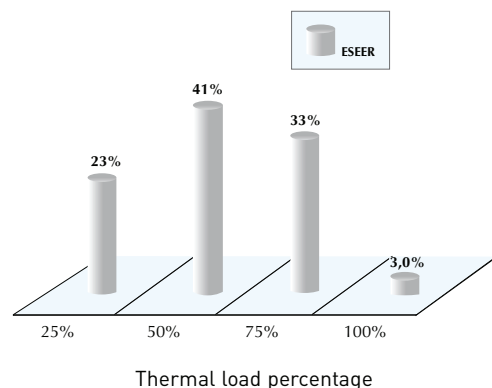
The electrical equipment is constructed in compliance with EN 60204-1. All data in this catalogue refer to standard units and nominal operating conditions (unless otherwise specified).

(*) The ESEER (European Seasonal Energy Efficiency Ratio) index proposed and used in the European design context, characterize the average weighted efficiency of a chiller for air conditioning applications. Both indices express, far more accurately than EER, the ratio between the useful effect (energy removed from interior spaces) and energy expenditure (electrical energy consumed) of a chiller during an entire season of operation. In relation to the various different operating conditions and the frequency with which they occur, these indicators are calculated by assigning a different energy weight to the corresponding output values of the unit. For example ESEER = 4 means that during an entire season of operation 1 kWh of electrical power is required on average to remove 4 kWh of heat energy from the air conditioned spaces.

ESEER operating time percentages



ESEER energy weights



2. Acoustic configurations and versions

The Taurus Tech series is available in 5 acoustic configurations with different energy efficiency levels:

Standard energy efficiency versions:

"N" - Standard energy efficiency and basic acoustic configuration: standard efficiency and noisiness, fans with high rotation speed; suitable for ambient temperatures up to 46 °C.

"SN" - Standard energy efficiency and low noise acoustic configuration: standard efficiency and reduced noise levels by approximately 6 db(A) compared to "N" version; suitable for ambient temperatures up to 43 °C.

"SSN" - Standard energy efficiency and very low noise acoustic configuration: standard efficiency and, compared to the "SN" version, further reduced noise thanks to oversized exchanger, fans with reduced rotation speed and a better acoustic insulation of the compressor housing; suitable for ambient temperatures up to 45 °C; not available on model 065.

High energy efficiency versions:

"HE" - High energy efficiency and basic acoustic configuration: high energy efficiency (Eurovent A Class) equipped with high efficiency EC fans with inverter technology and electronic expansion valve; suitable for ambient temperatures up to 47 °C; not available for the condensing unit version.

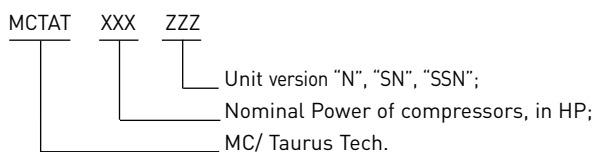
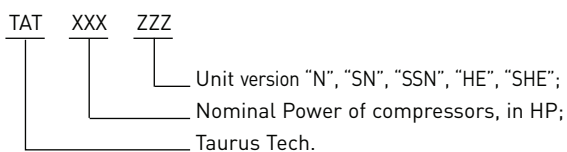
"SHE" - High energy efficiency and low noise acoustic configuration: high energy efficiency (Eurovent A Class) with reduced noise by approximately 5 dB [A] compared to "HE" version, equipped with high efficiency EC fans with inverter technology and electronic expansion valve as standard suitable for ambient temperatures up to 45 °C; not available for the condensing unit version.

-20 °C Option: the units can operate in cooling mode down to -20 °C ambient temperature; in addition to the features of the units described in this technical catalogue, this version is equipped with a heating element situated in the electrical board, controlled by a thermostat and high efficiency EC fans with inverter technology for a precise control of the condensing pressure. It is recommended to associate this option to the electronic expansion valve and antifreeze additives in adequate concentration, or alternatively provide for the antifreeze heater (see chapter 15.1). This option is not compatible with HE and SHE versions.

Version with total heat recovery: through the use of a 4-ways valve and of an additional plates heat exchanger it is possible to recover the condensation energy for the production of hot water (see chapter 8).

Version with partial heat recovery: by means of an additional plates heat exchanger in series with the condenser it is possible to recover about 20% of the rejection heat for the production of hot water (see chapter 8).

3. Nameplate



4. Testing

All units are tested in a test chamber in order to check correct operation. The main checks performed are as follows:

- the correct instalment of all components and the lack of refrigerant leaks;
- electrical safety tests as prescribed by EN60204-1;
- correct operation of the microprocessor and correct values of all the

operating parameters;

- the temperature probes and pressure transducers.

At the time of installation the units require exclusively electrical and hydraulic connections, thus maximising reliability levels. It is always advisable to install a filter on the unit inlet.

5. Compressors

The Taurus Tech units are equipped with 2 hermetic scroll compressors in single circuit configuration. The compressors of each refrigerant circuit are rigidly connected by a pair of steel rails and the resulting assembly is subsequently installed on rubber anti-vibration mountings inside an acoustically isolated enclosure with removable lateral panels to allow an easy access. Each compressor is equipped with a check valve on the discharge line that prevents possible liquid reverse flows. The oil level in the crankcases can be

checked by means of a sight glass. The motor windings are of the 2-pole type and are protected against overheating caused by possible malfunctions by means of an internal overload protection device. The protection from the phase loss and from the phase reversal is assured by the phase monitor. The compressors are equipped with crankcase heater.

6. Evaporator

The evaporator is of the stainless steel plates type brazed with copper, with external thermal insulation and anti-condensation cladding. The heat exchanger is protected from the risk of freezing by the antifreeze function incorporated in the electronic controller, which monitors the water outlet temperature and by a differential water pressure switch to protect it in zero or insufficient water flow conditions. The connections on the water side are of the threaded type and are routed to the exterior

of the unit on a connections plate. All evaporators feature a manual air bleed valve located on the top and a drain valve at the bottom; installers should fit a filter on the unit inlet to intercept any debris in the water supply that may otherwise deposit in the tank or in the evaporator. All evaporators comply with the "CE" pressure equipment directive and can handle antifreeze solutions and, in general, all other liquids that are compatible with the hydraulic circuit construction materials.

7. Condenser coils

The 2 condensing coils are of the finned core type with corrugated aluminum fins, copper tubes and headers, and galvanized sheet metal shoulders. The longitudinal "V" formation maximizes the ratio between exchange surface area and footprint. These exchangers are sized making use of the latest techniques and allow the use of

reduced speed fans ensuring a further improvement in the sound emission performance of the unit.

8. Partial and total heat recovery (optional)

"Version with total heat recovery (100% recovery of total rejection heat)": when the user transmits the relative command by means of a voltage-free contact in the electrical cabinet, a 4 ways valve and a pair of check valves divert the hot gas flow from the main condenser to the recovery condenser, thanks to which it is possible to totally recover all the rejection energy to produce hot water. The recovery exchanger is externally clad with thermal insulation in order to avoid heat dispersion; in addition to this it features a manual air bleed valve located on the top and a drain valve at the bottom. The connections on the water side are of the threaded type and are routed to the exterior of the unit on a connections plate. The minimum inlet water temperature at recovery is 20 °C. This option is compatible exclusively

for cooling units equipped with plates evaporator.

"Version with partial heat recovery (20% recovery of total rejection heat)": by means of an additional plates heat exchanger in series with the condenser it is possible to recover about 20% of rejection heat for the production of hot water. The recovery exchanger is externally clad with thermal insulation in order to avoid heat dispersion; in addition to this it features a manual air bleed valve located on the top and a drain valve at the bottom. The connections on the water side are of the threaded type and are routed to the exterior of the unit on a connections plate. This option is compatible exclusively for cooling units equipped with plates evaporator.

9. Fans

The fans, complete with protective grilles, are axial type and are made from sickled bladed with die-cast aluminum airfoil profiled. The aerodynamics of the blades, developed on the basis of bionic principles, achieves high fluid dynamic performance with reduced noise emissions. The electric motor with life lubrication is with external rotor, 6 poles for N and SN versions and 8 poles for SSN version. The rotor forms a single unit with the fan wheel and incorporates an overload protection device. The protection class is IP54 with insulation class F in order to ensure outdoor operation in all climatic conditions. The fans are arranged on a single row between the two condensing coils. The galvanized and painted sheet steel fan ports feature geometry designed to optimize the aerodynamic and noise

emissions characteristics of the fan unit and are protected by safety grilles. The condensing pressure control system is of the step type and is managed in such a way as to obtain progressive activation of steps in relation to the condensing pressure.

HE and SHE versions are equipped with high efficiency EC fans. The EC electronic switching technology, thanks to a continuous and efficient regulation of the fans speed at partial loads, allows the reduction of noise levels together with a decrease in consumption. EC fans are also available as an option for the N, SN and SSN versions.

10. Refrigeration circuit

10.1 TAT Chillers

The refrigeration circuit of TAT chillers is made up of:

- thermostatic expansion valve with external equalization (N, SN, SSN versions); electronic expansion valve (as an option in N, SN, SSN version and as standard in HE and SHE versions);
- filter-dryer;
- liquid flow sight glass;
- solenoid valve on the liquid line;
- fixed calibration low pressure switch;
- fixed calibration high pressure switch;
- high pressure transducer for: unloading function, step fans speed regulation, EC fans speed regulation (if present);
- R410A refrigerant charge;
- high and low pressure refrigerant gauges situated on the panel

below the electrical board;

- additional plates heat exchanger installed in parallel with the condenser, liquid receiver with pressure relief valve and level sight glass, diverter valve and check valves (exclusively in versions with total heat recovery);
- additional plates heat exchanger at compressor discharge (exclusively in versions with partial heat recovery).

All brazing for connections of components is performed with silver alloy as the filler metal, while cold pipes are clad with insulating material to prevent the formation of condensation.

10.2 MCTAT Condensing units

The MCTAT condensing unit version is created starting from the TAT chiller version, removing the evaporator and thermostatic valve and adding beside the solenoid valve on the liquid line, a shut-off valve on the liquid line at the unit outlet and a shut-off valve on the compressor suction line. Condensing unit versions are equipped with a refrigerant pre-charge which must be completed at the time of installation and

connection to the system. Sizing and installation of the refrigerant lines connecting the condensing unit and evaporator unit are of the utmost importance to guarantee correct and safe operation of the system; these operations must therefore be carried out by qualified personnel in strict observance of the indications and sizing recommended by MTA.

The refrigerant circuit of MCTAT condensing units, in standard configuration, is made up of:

- filter-dryer;
- liquid flow sight glass;
- solenoid valve on the liquid line;
- fixed calibration low pressure switch;
- fixed calibration high pressure switch;
- high pressure transducer for: unloading function, step fan speed regulation, EC fans speed regulation (if present);

11. Structure and casing

The plinth, uprights and outer panels are made of galvanized carbon steel sheet subjected to a phosphor degreasing treatment and painted with a polyester powder coating baked on at 180 °C to provide a durable weatherproof finish.

The plinth is finished in orange-peel blue (RAL 5013P), while the remaining parts of the frame and panels are finished in orange-peel light grey (RAL 7035P). The unit frame is designed to ensure easy

12. Hydraulic group (optional)

TAT can be equipped with a pumping and storage module composed of:

- storage tank, installed on the return line from the system, made of carbon steel and externally insulated with thermal insulation and anti-condensation cladding (option not compatible with the shell & tube exchanger);
- single or double centrifugal pump (one of which is on stand-by with automatic changeover) with low or medium head pressure installed on the discharge line with motor according to International Regulation IEC 60034-30;
- automatic filling unit with pressure reducer and pressure gauge;

13. Electrical panel

The electrical equipment of all the unit are in compliance with CEI EN60204-1 (Safety of machinery – Electrical equipment of machines – Safety Part 1: General rules); specifically, weather protection is ensured such as to allow outdoor installation of the chillers (IP 54 protection rating). The electrical cabinet, with forced ventilation, is equipped with a main breaker with door lock device and contains

14. Control

Control and management of the units are provided by the electronic parametric control IC208CX that, by means of an icon interface and of a 6-buttons keypad, allows a remarkable easy use by anyone.

Thanks to the control menu it is possible to visualize the working conditions, the parameters and the possible alarms. The control is installed on the electrical panel and is protected by a flip-up polycarbonate cover.



The controller manages the following functions:

- system temperature control and display of the inlet/outlet temperature values;
- measure and display of the condensing pressure;

- R410A pre-refrigerant charge, to be complete during the installation;

All brazing for connections of components is performed with silver alloy as the filler metal, while cold sections of the pipes are clad with insulating material to prevent the formation of condensation

For any further information on the electrical management and on the control of the condensing unit, see "Control" Chapter.

access to all internal components of the unit, with the various components of the structure assembled by means of galvanized steel rivets and screws, while the removable panels are secured by metric screws. The hydraulic connections are of the threaded type and always flush with structure to facilitate the connection of hydraulic circuit pipes.

- water pressure gauge on the pump pressure line to show system circuit pressure (with chiller off) or pump delivery pressure (with chiller on).
- automatic air breather valve, expansion vessel, pressure relief valve and drain valve installed on the tank;
- protection of the hydraulic group by means of panels or metallic mesh available as option.

automatic thermal magnetic cut-outs to protect power users, namely compressors, fans and centrifugal pumps. The control section includes a transformer for the control circuits and the microprocessor board. Phase monitor provides protection against phase loss and phase reversal.

- compressor start cycles, timing, equalization of run times;
- automatic changeover of the 2 pumps and for equalization of run times (if present);
- unloading function, which allows system start-up and operation of the unit also in conditions that are significantly different from nominal values;
- management of fans activation steps in accordance with the condensing pressure;
- EC fans speed regulation (if present) in relation to condensing pressure to reduce noise emissions in less demanding operating conditions and maintain condensing pressure within the limits required by the compressor;
- antifreeze function with the unit in stand-by thanks to the activation of the pump (available if the pump is present);
- operating hours counters for the unit and individual compressors and pumps (if present);
- the electronic control can manage on request the dynamic set-point function that allows the automatic compensation of the chiller according to the ambient temperature;

- display and alarm management, including:
 - low evaporation pressure alarm;
 - high condensing pressure alarm;
 - fans thermal protections trip alarm;
 - differential pressure switch trip alarm due to insufficient or zero water flow to the evaporator;
 - alarm for tripping of thermal protections of pumps (if present);
 - compressor thermal protections trip alarm;
 - antifreeze alarm;
 - phase sequence alarm.

15. Options, kits and special executions

15.1 Options

The options must be specified at the time of the order because they are factory fitted:

Structure and casing:

- covering panels only;
- covering panels and metal mesh filters;
- covering panels and grilles to protect the condensing coils;
- grilles to protect the hydraulic side and the condensing coils (as an alternative to metal mesh filters);
- metal mesh protection filters for coils (as an alternative to grilles).

Compressors:

- soft starter: installed on each compressor, these devices allow an average reduction of 30% of the start-up current compared to the direct start. Units equipped with soft starter can operate up to a maximum ambient temperature of 40 °C, after which, the unit will enter in a safety mode, in order to preserving the operation of the machine; the capacitive elements, single-phase and 60 Hz power supplies are not applicable with this option.



Soft Starter

- shut-off valves on suction line and discharge line of each pair of compressors;

Heat recovery:

- total and partial heat recovery (see chapter 8);

Expansion valve:

electronic expansion valve: the use of this device allows the improvement of cooling performance in a much broader field than the thermostatic expansion valve, a reduction of fluctuations in water temperature and an accurate precision of the regulation in operation at partial loads. Available as an option for versions N, SN, and SSN and as standard for HE and SHE versions. Accessory strongly recommended in combination with -20 °C Option.

Condensing unit versions are equipped with the same electronic control of the TAT version; the units are designed to be controlled with digital input and they feature the following contacts inside the electrical board:

- digital input for remote ON/OFF;
- digital input for start-up and request for first capacity step;
- digital input for start-up and request for second capacity step;

The units, depending on the requirements, can also be controlled by water temperature probe (supplied with the units). This operation leads to the variation of some parameters and the adjustment of the electrical board.



Electronic expansion valve

Evaporator and hydraulic group:

- shell & tube evaporator (option available only for TAT units with N, SN and SSN versions);
- integrated hydraulic kit: see 12 chapter;
- double pump: with this option, the pumps are used with programmed rotation cycles. In case of failure, the switching on reserve pump is automatic and the shut-off valves and the check valves allow the replacement of the pump without any stoppage of the plant;
- version with pumping module only (1 or 2 pumps): unlike the version with the complete module, this version is not equipped with storage tank and relief valve.
- anti-freeze heater: resistance wires wrapped around the exchangers and pumps; immersions heaters in the storage tank (if present); the antifreeze heaters are controlled by the on-board electronic controller in accordance with ambient temperature. This option protects the evaporator when ambient temperature is below 0 °C and higher or equal to -10 °C. For ambient temperatures below -10 °C and above -20 °C, in addition to the anti-freeze heaters, must be provided with double insulation on the evaporator, tank and pumps if included (special machine). As an alternative, you must provide an adequate quantity of anti-freeze solutions.

Condensing sections and fans:

- high efficiency EC fans with inverter technology: the EC electronic switching technology, thanks to the continuous adjustment of fans speed and efficiently at partial loads, allows the reduction of noise levels together with a decrease in consumption. HE and SHE versions and -20 °C option are standardly equipped with high efficiency EC fans.
- pre-painted condenser coils: the treatment consists of an application of an expory primer and a polyurethane-based paint (RAL 7001 grey) to the coils, collectors and bends;
- -20 °C Option: it allows the units to operate in cooling mode down

to -20 °C ambient temperature; this version is equipped with an heating element situated in the electrical board, controlled by a thermostat and high efficiency EC fans with inverter technology for a precise control of the condensing pressure. It is recommended to

associate this option to the electronic expansion valve and antifreeze additives in adequate concentration, or alternatively provide for the antifreeze heater [see chapter 15.1]. This option is not compatible with HE and SHE versions.

15.2. Kits

The kits are supplied separately, generally at the same time of the unit, and installed by the user. They can be supplied later as spare parts, modification kits, completion kits, etc.:

- anti-vibration mounts;
- thermostatic expansion valves kit for condensing units: the kit consists of providing the same mechanical thermostatic valve installed in the TAT version. The correct dimensioning and installation of the refrigerant lines connecting the condensing and evaporating units is of paramount importance and must be performed by expert personnel. MTA SpA declines any responsibility with regard to damage caused by improper installation or improper matching between condensing unit - thermostatic valve - evaporating unit.

- **RS485 ModBus supervision kit:**

This accessory allows to connect the unit with BMS RS485 MODBUS-RTU supervision systems. It is composed of a serial cable and an opto-isolated serial interface is required to convert the output TTL signal from the electronic control in a RS485 signal.



RS485 optically coupled interface

- **Kit Remote Terminal VICX620 with LED display:** it makes it possible the remote control of all the functions of the unit's onboard electronic controller up to a maximum distance of 150 meters. This terminal also performs the remote ON/OFF function.



VICX620

- **Kit Remote Terminal VISOGRAPH VGI890 with LCD display:** backlit semi-graphic user terminal, makes it possible a remote control of all the functions of the unit's onboard electronic controller are up to a maximum distance of 150 meters. Thanks to the use of icons, multi-function keys with dynamic description and moving images, the visualization, and the information are easy to interpret.



VISOGRAPH VGI890

- **gateway Modbus/Trend kit:** it provides the connection of the machine and its supervision by a network of Trend checks; this kit must necessarily be combined with kit "RS485 ModBus Supervision kit";

- **xWEB300D supervision kit:**

xWEB300D, one of the most advanced monitoring, control and supervision systems on the market, is able to manage up to 6 units equipped with IC121, IC208CX, IC281 controllers with RS485 interface (the specific RS485 kit must be installed on each unit) and xDRIVE controllers. The kit is composed by:

- xWEB300D;
- quick connection guide;
- CD ROM with manuals.

xWEB300D is a small web server equipped with a Linux OS, capable of communicating with a local or remote PC via a standard LAN port. With just a normal browser (Explorer®, Firefox® or Chrome®) with no need for dedicated software, you can display all device data, managing parameters and alarms.

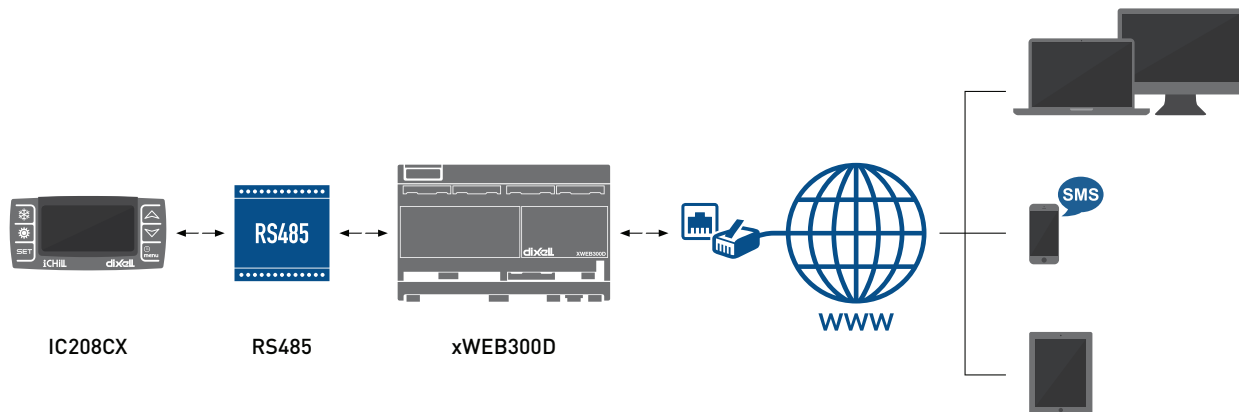
xWEB300D features:

- Power supply 110÷230Vac ±10%, 50/60Hz;
- 1 LAN port (RJ45 connector) for local or remote interface with a PC;
- 1 RS485 serial port for connection of devices (ModBUS - RTU);
- 1 RS232 port for an external modem;
- 1 configurable relay;
- 1 data unit connection USB port;
- 8MB internal memory for data storage (up to 1 year).

xWEB300D provides the following functions in Web page format both on a local connection (by means of a serial cable - not included) or on a remote connection (version must have internal GPRS modem or Internet link via LAN port):

- DATA EXPORT: data and graphs exported in Excel® format;
- RS485 LINE-CHECK: functional test of RS485 serial lines;
- RUN TIME: display of several units in the same window simultaneously;
- GRAPHICS: graphics representing multiple analogical values, output status and alarms.

Depending on the available connection, xWEB300D can call service by FAX, SMS text message or e-mail (e.g. when an alarm trips) and connect to PDAs and smartphones. xWEB300D is available also with built-in GPRS modem.



15.3 Special designs

This is a selection of the most popular special features, normally not described in detail in our catalogues; the feasibility of special designs must be assessed, confirmed, and priced on a case by case basis in communication with our sales offices before placing the order:

- coils with Blygold or Finguard protective treatment;
- copper-copper coils with copper tubes and fins and brass shoulders;
- pressure control valves for recovery exchangers suitable for working conditions with inlet water temperature below to 20 °C;
- 460 V / 3 ph / 60 Hz power supply.

SELECTION GUIDE

For a correct chiller selection it is necessary:

- 1) Observe the operational limits as indicated in the chart "Limits of operation";
- 2) Verify that the cool water flow is between the minimum and maximum values of water flow, which are described in the "General data" table. A very low flow can cause laminar flow and thus danger of ice formation and poor unit control; a very high flow can cause great pressure drops and the possibility of tube failure inside the evaporator;
- 3) For working temperatures under 6 °C outlet water and 0 °C external air temperature it is necessary to add ethylene glycol or any other antifreeze additives. Consult the chart "Solutions of water and glycol" to determine the necessary quantity of ethylene glycol, the reduction of cooling capacity, the increase of power absorbed by the compressors, the increase of evaporator pressure drop due to the presence of the ethylene glycol;
- 4) If the chiller is to be installed at an altitude higher than 500 m, you must calculate the cooling/heating capacity reduction and the increase of power absorbed by the compressor through the coefficients as pointed out in the chart "Condenser correction coefficients";
- 5) When the difference in temperature between water inlet and outlet is different from 5 °C, the cooling/heating capacity and the absorbed power must be corrected using the table "Corrective coefficients $\Delta T \neq 5 \text{ }^\circ\text{C}$ ".

PERFORMANCE AND TECHNICAL DATA - COOLING ONLY UNITS

GENERAL DATA

TAT

N VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	72,5	81,0	97,1	111	122	140	154
	Total absorbed power	kW	26,3	27,7	33,7	39,3	42,4	47,9	53,3
	EER	-	2,76	2,92	2,88	2,82	2,88	2,93	2,88
	ESEER	-	3,64	3,78	3,85	3,61	3,68	3,82	3,87
	Water flow rate	m ³ /h	12,4	13,9	16,6	19,0	20,9	24,0	26,3
Heat exchanger pressure drops	kPa	34	41	34	42	31	52	39	

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 -50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	2	2 + 3	2 + 3	2	3	3	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Axials						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	47200	46000	45300	70500	68000	68000	68000
	Absorbed power (each)	kW	2,10	2,10	2,10	2,10	2,10	2,10	2,10

Hydraulic group	Min/max flow rate evaporator	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8	8,5/34,8
	Evaporator water volume	l	4,32	4,32	5,58	6,30	6,84	7,56	8,46
	Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

Sound levels (3)	Sound power	dB [A]	87,5	87,1	86,7	90,3	90,1	88,8	89,9
	Sound pressure at 10 m	dB [A]	59,5	59,1	58,8	62,3	62,1	60,9	61,9

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	767	801	950	1162	1221	1261	1307

Data declared according to UNI EN 14511:2011.

(1) Cooling mode: external ambient temperature: 35 °C; evaporator IN/OUT: 12/7 °C;

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump;

(4) Dimensions and operating weights are referred to Taurus Tech cooling only version without options.

SN VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	70,1	79,2	93,2	107,2	118,1	135,0	151,1
	Total absorbed power	kW	25,5	27,0	33,5	38,0	41,3	47,2	53,7
	EER	-	2,75	2,93	2,78	2,82	2,86	2,86	2,81
	ESEER	-	3,97	4,10	4,00	3,93	3,93	4,06	4,09
	Water flow rate	m ³ /h	12,0	13,6	16,0	18,4	20,2	23,1	25,9
Heat exchanger pressure drops	kPa	32	39	32	40	29	49	38	

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 -50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	2	2 + 3	2 + 3	2	3	3	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Axials						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	36600	35700	34800	54000	51900	51900	51900
	Absorbed power (each)	kW	1,15	1,15	1,15	1,15	1,15	1,15	1,15

Hydraulic group	Min/max flow rate evaporator	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8	8,5/34,8
	Evaporator water volume	l	4,32	4,32	5,58	6,30	6,84	7,56	8,46
	Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

Sound levels (3)	Sound power	dB (A)	82,6	82,2	81,8	84,2	83,8	83,5	84,0
	Sound pressure at 10 m	dB (A)	54,6	54,2	53,8	56,3	55,9	55,5	56,0

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	767	801	950	1162	1221	1261	1307

Data declared according to UNI EN 14511:2011.

(1) Cooling mode: external ambient temperature: 35 °C; evaporator IN/OUT: 12/7 °C;

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump;

(4) Dimensions and operating weights are referred to Taurus Tech cooling only version without options.

SSN VERSION

			030	035	040	050	055	060
Cooling (1)	Cooling capacity	m ³ /s	70,0	77,1	90,1	105,0	115,6	134,0
	Total absorbed power	kW	23,7	25,3	31,9	35,3	39,0	44,7
	EER	-	2,96	3,05	2,83	2,98	2,97	2,99
	ESEER	-	4,16	4,14	4,02	4,00	3,97	4,15
	Water flow rate	m ³ /h	12,0	13,2	15,4	18,0	19,8	23,0
	Heat exchanger pressure drops	kPa	31	37	30	38	28	48
Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50					
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50					
Compressor	Refrigerant gas	-	Scroll					
	Type	-	R410A					
	Compressors / Cooling circuits	n°	2 / 1					
	Capacity control	-	0 -50 -100					
Condenser coils	Condensers number	n°	2	2	2	2	2	2
	Rows number	n°	3	3 + 4	4	3	4	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94
Fans	Type	-	Axials					
	Fans number	n°	2	2	2	3	3	3
	Total airflow	m ³ /h	27600	27000	26300	41400	39300	39300
	Absorbed power (each)	kW	0,5	0,50	0,50	0,50	0,50	0,50
Hydraulic group	Min/max flow rate evaporator	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8
	Evaporator water volume	l	4,32	4,32	5,58	6,30	6,84	7,56
	Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Sound levels (3)	Sound power	dB (A)	79,6	79,4	78,8	81,3	80,6	80,3
	Sound pressure at 10 m	dB (A)	51,6	51,4	50,9	53,3	52,6	52,3
Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140
	Weight	kg	792	825	974	1197	1256	1297

Data declared according to UNI EN 14511:2011.

(1) Cooling mode: external ambient temperature: 35 °C; evaporator IN/OUT: 12/7 °C;

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump;

(4) Dimensions and operating weights are referred to Taurus Tech cooling only version without options.

HE VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	67,1	73,2	86,1	101,7	109,9	124,7	138,1
	Total absorbed power	kW	21,1	23,1	27,3	32,2	34,6	39,5	44,5
	EER	-	3,18	3,17	3,15	3,16	3,18	3,16	3,10
	ESEER	-	4,16	4,10	4,13	4,11	3,99	4,10	4,14
	Water flow rate	m ³ /h	11,5	12,5	14,8	17,4	18,8	21,4	23,7
Heat exchanger pressure drops	kPa	35	33	33	36	33	35	35	

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 -50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	3	3 + 4	4	3	4	4	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Axials						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	43450	42800	42150	65170	63220	63220	63220
	Absorbed power (each)	kW	1,95	1,95	1,95	1,95	1,95	1,95	1,95

Hydraulic group	Min/max flow rate evaporator	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8	8,5/34,8
	Evaporator water volume	l	5,2	5,8	6,8	7,8	9,0	10,0	11,2
	Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

Sound levels (3)	Sound power	dB (A)	87,0	86,8	86,3	89,7	89,4	88,4	88,1
	Sound pressure at 10 m	dB (A)	59,0	58,8	58,4	61,7	61,4	60,5	60,1

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	792	825	904	1127	1236	1277	1287

Data declared according to UNI EN 14511:2011.

(1) Cooling mode: external ambient temperature: 35 °C; evaporator IN/OUT: 12/7 °C;

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump;

(4) Dimensions and operating weights are referred to Taurus Tech cooling only version without options.

SHE VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	63,9	70,2	82,6	96,9	105,3	121,1	134,9
	Total absorbed power	kW	20,0	22,1	26,5	30,5	33,0	38,2	43,5
	EER	-	3,19	3,18	3,12	3,18	3,19	3,17	3,10
	ESEER	-	4,28	4,26	4,23	4,22	4,11	4,25	4,21
	Water flow rate	m ³ /h	11,0	12,0	14,2	16,6	18,0	20,8	23,1
Heat exchanger pressure drops	kPa	32	30	31	33	30	33	34	

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 -50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	3	3 + 4	4	3	4	4	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Axials						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	35710	35160	34610	53566	51920	51920	51920
	Absorbed power (each)	kW	0,83	0,83	0,83	0,83	0,83	0,83	0,83

Hydraulic group	Min/max flow rate evaporator	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8	8,5/34,8
	Evaporator water volume	l	5,2	5,8	6,8	7,8	9,0	10,0	11,2
	Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

Sound levels (3)	Sound power	dB [A]	81,4	81,0	80,2	83,7	83,4	83,0	83,3
	Sound pressure at 10 m	dB [A]	53,4	53,0	52,2	55,7	55,5	55,0	55,3

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	792	825	904	1127	1236	1277	1287

Data declared according to UNI EN 14511:2011.

(1) Cooling mode: external ambient temperature: 35 °C; evaporator IN/OUT: 12/7 °C;

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump;

(4) Dimensions and operating weights are referred to Taurus Tech cooling only version without options.

Model	Version	Without pump				Pump P15				Pump P2			
		FLI (kW)	FLA (A)	ICF1 (A)	ICF2 (A)	FLI (kW)	FLA (A)	ICF1 (A)	ICF2 (A)	FLI (kW)	FLA (A)	ICF1 (A)	ICF2 (A)
030	N	33	57	179	168	35	59	182	170	36	61	184	172
	SN	32	53	170	166	33	55	172	168	34	57	174	170
	SSN	31	51	167	166	32	54	169	168	33	56	171	170
	HE	30	50	NA	163	32	53	NA	165	33	55	NA	167
	SHE	28	47	NA	161	29	49	NA	163	31	51	NA	166
035	N	36	63	213	202	37	65	216	204	38	67	218	206
	SN	34	59	204	200	35	61	206	202	36	63	208	204
	SSN	33	57	201	200	35	60	203	202	36	62	205	204
	HE	33	55	NA	168	34	57	NA	170	36	60	NA	172
	SHE	31	51	NA	166	32	54	NA	168	33	56	NA	170
040	N	44	75	270	258	45	77	273	261	46	80	275	263
	SN	42	71	261	256	43	73	263	259	44	76	265	261
	SSN	41	69	258	256	42	72	260	259	44	74	262	261
	HE	38	67	NA	207	39	69	NA	210	40	71	NA	212
	SHE	35	63	NA	205	37	65	NA	208	38	68	NA	210
050	N	51	86	281	268	53	89	284	272	55	92	287	274
	SN	48	80	269	264	50	83	273	268	52	86	275	271
	SSN	47	77	265	264	49	81	269	268	51	83	271	271
	HE	45	76	NA	262	47	80	NA	265	49	83	NA	268
	SHE	42	71	NA	258	44	74	NA	261	45	77	NA	264
055	N	56	94	328	315	58	97	331	319	60	100	334	321
	SN	53	88	316	311	55	91	320	315	57	94	322	318
	SSN	52	85	312	311	54	89	316	315	56	91	318	318
	HE	51	83	NA	268	53	86	NA	272	54	89	NA	274
	SHE	47	77	NA	264	49	81	NA	268	51	83	NA	271
060	N	61	102	336	323	64	106	340	328	65	108	342	329
	SN	58	96	324	319	61	100	329	324	62	102	330	326
	SSN	57	93	320	319	60	98	325	324	61	100	326	326
	HE	56	91	NA	315	58	95	NA	320	59	97	NA	321
	SHE	52	85	NA	311	55	90	NA	316	56	91	NA	318
065	N	70	116	374	361	72	120	378	366	73	122	380	367
	SN	67	110	362	357	69	114	367	362	70	116	368	364
	SSN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	HE	61	99	NA	323	63	103	NA	328	64	105	NA	329
	SHE	57	93	NA	319	60	98	NA	324	61	100	NA	326

FLI = max power absorbed in the working limits condition (kW);

FLA = max current absorbed in the working limits condition (A);

ICF1 = start-up current at the start of the last compressor in the working limits condition (A) - with fans with step regulation.

ICF2 = start-up current at the start of the last compressor in the working limits condition with electronic fans control regulator. (A) - EC fans.

NA = not available.

Soft starter: installed on each compressor, these devices allow an average reduction of 30% of the starting current than direct start. Units equipped with a soft starter can operate up to a maximum ambient temperature of 40 °C, after which, the unit will enter in a safety mode, in order to preserving the operation of the machine. Soft starters are not compatible with capacitive elements, 60 Hz frequency and single phase power supply.

Model	Version	Octave bands (Hz)								Sound power (1)	Sound pressure (2)
		63	125	250	500	1000	2000	4000	8000		
Sound power level dB (A)										dB (A)	dB (A)10m
030	N	62,6	73,4	80,6	81,7	82,7	78,5	70,3	64,5	87,5	59,5
	SN	58,9	69,0	75,8	76,8	77,7	73,8	66,1	60,6	82,6	54,6
	SSN	56,5	66,2	72,7	73,7	74,6	70,8	63,4	58,2	79,6	51,6
	HE	62,2	72,9	80,2	81,3	82,2	78,0	69,9	64,1	87,0	59,0
	SHE	57,9	67,9	74,6	75,6	76,5	72,6	65,1	59,7	81,4	53,4
035	N	62,3	73,0	80,2	81,3	82,3	78,1	70,0	64,2	87,1	59,1
	SN	58,5	68,6	75,4	76,4	77,3	73,4	65,8	60,3	82,2	54,2
	SSN	56,3	66,0	72,6	73,6	74,4	70,6	63,3	58,0	79,4	51,4
	HE	62,1	72,8	80,0	81,1	82,0	77,9	69,8	64,0	86,8	58,8
	SHE	57,6	67,5	74,2	75,2	76,1	72,2	64,7	59,3	81,0	53,0
040	N	62,0	72,7	79,9	81,0	81,9	77,8	69,7	63,9	86,7	58,8
	SN	58,2	68,2	75,0	76,0	76,9	73,0	65,4	60,0	81,8	53,8
	SSN	55,9	65,5	72,0	73,0	73,8	70,1	62,8	57,6	78,8	50,9
	HE	61,7	72,3	79,5	80,6	81,5	77,4	69,3	63,6	86,3	58,4
	SHE	57,0	66,8	73,4	74,4	75,2	71,4	64,0	58,7	80,2	52,2
050	N	64,8	75,9	83,5	84,6	85,6	81,2	72,8	66,8	90,3	62,3
	SN	60,1	70,4	77,4	78,5	79,4	75,3	67,5	61,9	84,2	56,3
	SSN	57,8	67,7	74,4	75,4	76,3	72,4	64,9	59,5	81,3	53,3
	HE	64,4	75,4	82,9	84,0	85,0	80,7	72,3	66,3	89,7	61,7
	SHE	59,7	69,9	76,9	77,9	78,8	74,8	67,0	61,5	83,7	55,7
055	N	64,6	75,7	83,2	84,4	85,3	81,0	72,6	66,6	90,1	62,1
	SN	59,8	70,1	77,0	78,1	78,9	75,0	67,2	61,6	83,8	55,9
	SSN	57,3	67,1	73,8	74,8	75,6	71,8	64,4	59,0	80,6	52,6
	HE	64,1	75,1	82,6	83,7	84,7	80,4	72,0	66,0	89,4	61,4
	SHE	59,5	69,7	76,6	77,7	78,5	74,6	66,8	61,3	83,4	55,5
060	N	63,7	74,6	82,0	83,1	84,1	79,8	71,5	65,6	88,8	60,9
	SN	59,5	69,8	76,7	77,7	78,6	74,6	66,9	61,3	83,5	55,5
	SSN	57,0	66,8	73,5	74,5	75,3	71,5	64,1	58,8	80,3	52,3
	HE	63,4	74,2	81,6	82,7	83,7	79,4	71,2	65,3	88,4	60,5
	SHE	59,2	69,3	76,2	77,2	78,1	74,2	66,5	61,0	83,0	55,0
065	N	64,5	75,6	83,1	84,2	85,1	80,8	72,4	66,4	89,9	61,9
	SN	59,9	70,2	77,2	78,2	79,1	75,1	67,3	61,7	84,0	56,0
	SSN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	HE	63,1	73,9	81,3	82,4	83,3	79,1	70,9	65,0	88,1	60,1
	SHE	59,4	69,5	76,5	77,5	78,4	74,4	66,7	61,1	83,3	55,3

(1) **Sound power:** determined on the basis of measurements taken in accordance with the standard ISO 3744.

(2) **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance +/- 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions and with circulation pump.

NA = not available.

Distance	KdB
(1) L (m)	
1	15
3	10
5	6
10	0

(1) To calculate a different distance of the sound pressure level, use the formula: $dB(A)_L = dB(A)_{10m} + K_{db}$.

SP						
MODEL		N	SN	SSN	HE	SHE
030	kg	767	767	792	792	792
035	kg	801	801	825	825	825
040	kg	950	950	974	904	904
050	kg	1162	1162	1197	1127	1127
055	kg	1221	1221	1256	1236	1236
060	kg	1261	1261	1297	1277	1277
065	kg	1307	1307	NA	1287	1287

P15						
MODEL		N	SN	SSN	HE	SHE
030	kg	787	787	812	812	812
035	kg	821	821	845	845	845
040	kg	970	970	994	924	924
050	kg	1194	1194	1229	1159	1159
055	kg	1253	1253	1288	1268	1268
060	kg	1293	1293	1329	1309	1309
065	kg	1339	1339	NA	1319	1319

P2						
MODEL		N	SN	SSN	HE	SHE
030	kg	811	811	836	836	836
035	kg	845	845	869	869	869
040	kg	994	994	1018	948	948
050	kg	1209	1209	1244	1174	1174
055	kg	1268	1268	1303	1283	1283
060	kg	1308	1308	1344	1324	1324
065	kg	1354	1354	NA	1334	1334

P15+P15						
MODEL		N	SN	SSN	HE	SHE
030	kg	806	806	831	831	831
035	kg	840	840	864	864	864
040	kg	989	989	1013	943	943
050	kg	1236	1236	1271	1201	1201
055	kg	1295	1295	1330	1310	1310
060	kg	1335	1335	1371	1351	1351
065	kg	1381	1381	NA	1361	1361

P2+P2						
MODEL		N	SN	SSN	HE	SHE
030	kg	854	854	879	879	879
035	kg	888	888	912	912	912
040	kg	1037	1037	1061	991	991
050	kg	1266	1266	1301	1231	1231
055	kg	1325	1325	1360	1340	1340
060	kg	1365	1365	1401	1381	1381
065	kg	1411	1411	NA	1391	1391

Tank+P15						
MODEL		N	SN	SSN	HE	SHE
030	kg	995	995	1020	1020	1020
035	kg	1028	1028	1052	1052	1052
040	kg	1177	1177	1201	1131	1131
050	kg	1549	1549	1584	1514	1514
055	kg	1608	1608	1643	1623	1623
060	kg	1648	1648	1684	1664	1664
065	kg	1694	1694	NA	1674	1674

Tank+P2						
MODEL		N	SN	SSN	HE	SHE
030	kg	1019	1019	1044	1044	1044
035	kg	1052	1052	1076	1076	1076
040	kg	1201	1201	1225	1155	1155
050	kg	1564	1564	1599	1529	1529
055	kg	1623	1623	1658	1638	1638
060	kg	1663	1663	1699	1679	1679
065	kg	1709	1709	NA	1689	1689

Tank+P15+P15						
MODEL		N	SN	SSN	HE	SHE
030	kg	1015	1015	1040	1040	1040
035	kg	1049	1049	1073	1073	1073
040	kg	1198	1198	1222	1152	1152
050	kg	1596	1596	1601	1531	1531
055	kg	1655	1655	1690	1670	1670
060	kg	1695	1695	1731	1711	1711
065	kg	1741	1741	NA	1721	1721

Tank+P2+P2						
MODEL		N	SN	SSN	HE	SHE
030	kg	1063	1063	1088	1088	1088
035	kg	1097	1097	1121	1121	1121
040	kg	1246	1246	1270	1200	1200
050	kg	1626	1626	1661	1591	1591
055	kg	1685	1685	1720	1700	1700
060	kg	1725	1725	1761	1741	1741
065	kg	1771	1771	NA	1751	1751

Covering panels on hydraulic side						
MODEL		N	SN	SSN	HE	SHE
030	kg			54		
035	kg			54		
040	kg			54		
050	kg			76		
055	kg			76		
060	kg			76		
065	kg			76		

SP: without pump and storage tank;

P15: pump P15

P2: pump P2

P2+P2: double pumps P2

P15+P15: double pumps P15

NA = not available.

Working weights includes water content.

N VERSION

Cooling	External air temperature (°C)																		t max(**) (°C)	
	30			35			38			40			42			46				
	tu (°C)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)		Fw (m ³ /h)
030	*5	71,8	23,8	13,1	67,3	25,9	12,2	64,5	27,2	11,7	62,5	28,1	11,4	60,4	29,1	11,0	56,2	31,2	10,2	46
	6	75,3	24,1	12,9	70,6	26,1	12,1	67,5	27,4	11,6	65,5	28,4	11,2	63,3	29,4	10,8	58,8	31,5	10,1	46
	7	77,4	24,3	13,3	72,5	26,3	12,4	69,5	27,6	11,9	67,3	28,6	11,5	65,1	29,6	11,2	60,5	31,7	10,4	46
	8	79,4	24,5	13,6	74,5	26,5	12,8	71,3	27,9	12,2	69,1	28,8	11,8	66,8	29,8	11,5	62,2	31,9	10,7	46
	9	81,4	24,7	14,0	76,3	26,7	13,1	73,0	28,1	12,5	70,8	29,0	12,1	68,5	30,0	11,7	63,7	32,2	10,9	46
	10	83,3	24,9	14,3	78,1	26,9	13,4	74,8	28,3	12,8	72,5	29,3	12,4	70,1	30,3	12,0	65,3	32,4	11,2	46
035	*5	79,7	25,3	14,5	75,1	27,3	13,6	72,1	28,6	13,1	70,1	29,5	12,7	68,0	30,5	12,4	63,6	32,7	11,6	46
	6	83,6	25,5	14,3	78,8	27,5	13,5	75,6	28,9	13,0	73,5	29,8	12,6	71,3	30,8	12,2	66,7	33,0	11,4	46
	7	86,0	25,7	14,7	81,0	27,7	13,9	77,8	29,1	13,3	75,6	30,0	13,0	73,3	31,0	12,6	68,6	33,2	11,8	46
	8	88,3	25,9	15,1	83,1	28,0	14,3	79,9	29,3	13,7	77,6	30,3	13,3	75,3	31,3	12,9	70,5	33,4	12,1	46
	9	90,4	26,2	15,5	85,1	28,2	14,6	81,8	29,6	14,0	79,5	30,5	13,6	77,1	31,5	13,2	72,3	33,7	12,4	46
	10	92,5	26,4	15,9	87,1	28,5	14,9	83,7	29,8	14,4	81,4	30,8	14,0	79,0	31,8	13,5	74,0	33,9	12,7	46
040	*5	95,4	30,6	17,3	89,9	33,1	16,3	86,5	34,7	15,7	84,2	35,9	15,3	81,9	37,2	14,9	77,1	40,1	14,0	46
	6	100	30,9	17,2	94,4	33,4	16,2	90,8	35,1	15,6	88,4	36,3	15,2	85,9	37,6	14,7	80,9	40,5	13,9	46
	7	103	31,2	17,7	97,1	33,7	16,6	93,5	35,4	16,0	91,0	36,7	15,6	88,5	38,0	15,2	83,3	40,8	14,3	46
	8	106	31,5	18,1	99,8	34,1	17,1	96,0	35,8	16,5	93,5	37,0	16,0	90,9	38,3	15,6	85,6	41,2	14,7	46
	9	108	31,8	18,6	102	34,4	17,5	98,5	36,1	16,9	95,9	37,3	16,4	93,2	38,6	16,0				45
	10	111	32,1	19,1	105	34,7	18,0	101	36,4	17,3	98,2	37,7	16,8	95,5	39,0	16,4	90,0	41,9	15,4	46
050	*5	108	35,8	19,7	102	38,6	18,6	98,5	40,5	17,9	96,0	41,9	17,5	93,5	43,4	17,0	88,3	46,7	16,0	46
	6	114	36,1	19,6	108	39,0	18,4	104	40,9	17,8	101	42,3	17,3	98,3	43,8	16,8	92,8	47,2	15,9	46
	7	118	36,4	20,1	111	39,3	19,0	107	41,3	18,3	104	42,7	17,8	101	44,2	17,4	95,7	47,6	16,4	46
	8	121	36,8	20,7	114	39,7	19,5	110	41,6	18,8	107	43,0	18,3	104	44,6	17,8	98,4	47,9	16,9	46
	9	124	37,1	21,2	117	40,0	20,0	113	42,0	19,3	110	43,4	18,8	107	44,9	18,3	101	48,3	17,3	46
	10	127	37,5	21,8	120	40,4	20,5	115	42,4	19,8	112	43,8	19,3	110	45,3	18,8	104	48,7	17,8	46
055	*5	119	38,6	21,7	113	41,7	20,5	109	43,7	19,7	106	45,2	19,2	103	46,8	18,7	97	50,2	17,7	46
	6	126	39,0	21,5	119	42,1	20,3	114	44,2	19,6	111	45,7	19,1	108	47,2	18,6	102	50,7	17,5	46
	7	129	39,3	22,2	122	42,4	20,9	118	44,5	20,2	115	46,0	19,7	112	47,6	19,1	105	51,0	18,1	46
	8	133	39,6	22,8	126	42,7	21,5	121	44,8	20,8	118	46,3	20,2	115	47,9	19,7	109	51,4	18,6	46
	9	137	39,9	23,4	129	43,1	22,1	124	45,2	21,3	121	46,7	20,8	118	48,3	20,3	112	51,8	19,1	46
	10	140	40,3	24,1	133	43,4	22,7	128	45,5	21,9	125	47,1	21,4	121	48,6	20,8	115	52,1	19,7	46
060	*5	137	43,5	24,9	129	47,1	23,5	125	49,4	22,7	121	51,0	22,1	118	52,8	21,5	111	56,5	20,2	46
	6	144	44,0	24,7	136	47,5	23,3	131	49,9	22,5	128	51,5	21,9	124	53,2	21,3	117	57,0	20,0	46
	7	149	44,4	25,4	140	47,9	24,0	135	50,2	23,1	131	51,9	22,5	128	53,7	21,9	120	57,4	20,6	46
	8	152	44,7	26,1	144	48,3	24,7	139	50,7	23,7	135	52,3	23,1	131	54,1	22,5	124	57,8	21,2	46
	9	156	45,1	26,8	147	48,7	25,3	142	51,1	24,3	138	52,7	23,7	134	54,5	23,1	127	58,2	21,7	46
	10	160	45,5	27,4	151	49,1	25,9	145	51,5	24,9	142	53,2	24,3	138	54,9	23,6	130	58,7	22,3	46
065	*5	150	48,2	27,3	142	52,3	25,8	137	55,0	24,8	133	56,9	24,2	129	58,9	23,5	122	63,3	22,2	46
	6	158	48,8	27,1	149	52,9	25,6	144	55,6	24,6	140	57,5	24,0	136	59,5	23,3	128	63,9	22,0	46
	7	163	49,2	27,9	154	53,3	26,3	148	56,0	25,3	144	58,0	24,7	140	60,0	24,0	132	64,4	22,6	46
	8	167	49,7	28,7	158	53,8	27,1	152	56,5	26,1	148	58,4	25,4	144	60,5	24,7	136	64,9	23,3	46
	9	172	50,1	29,5	162	54,2	27,8	156	57,0	26,8	152	58,9	26,1	148	61,0	25,3	139	65,4	23,9	46
	10	176	50,6	30,2	166	54,7	28,5	160	57,5	27,5	156	59,4	26,7	152	61,5	26,0	143	65,9	24,5	46

Data declared according to UNI EN 14511:2011

tu: outlet water temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW);

Fw: water flow rate with ΔT = 5 °C (m³/h).

(*): The performances have been calculated with 20% ethylene glycol in the water.

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5 °C".

SN VERSION

Cooling tu (°C)	External air temperature (°C)																		t max(**) (°C)		
	30			35			38			40			42			44					
	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)			
030	*5	69,8	22,9	12,7	65,2	25,0	11,8	62,2	26,4	11,3	60,2	27,4	10,9	58,1	28,4	10,6	56,0	29,5	10,2	45	
	6	73,0	23,1	12,5	68,2	25,3	11,7	65,1	26,7	11,2	63,0	27,7	10,8	60,8	28,7	10,4	58,6	29,8	10,0	44	
	7	75,0	23,4	12,9	70,1	25,5	12,0	66,9	26,9	11,5	64,7	27,9	11,1	62,5	28,9	10,7	60,2	30,0	10,3	44	
	8	76,9	23,6	13,2	71,8	25,8	12,3	68,6	27,2	11,8	66,4	28,2	11,4	64,1	29,2	11,0					43
	9	78,8	23,9	13,5	73,5	26,0	12,6	70,3	27,4	12,0	68,0	28,4	11,7	65,6	29,5	11,3					43
	10	80,5	24,1	13,8	75,2	26,3	12,9	71,8	27,7	12,3	69,5	28,7	11,9	67,1	29,7	11,5					43
035	*5	78,3	24,3	14,2	73,5	26,4	13,4	70,5	27,8	12,8	68,4	28,8	12,4	66,2	29,9	12,0	64,0	31,0	11,6	46	
	6	82,1	24,6	14,1	77,1	26,7	13,2	73,8	28,1	12,6	71,6	29,1	12,3	69,4	30,2	11,9	67,1	31,3	11,5	45	
	7	84,4	24,9	14,5	79,2	27,0	13,6	75,9	28,4	13,0	73,6	29,4	12,6	71,3	30,4	12,2	68,9	31,5	11,8	45	
	8	86,5	25,1	14,8	81,2	27,3	13,9	77,8	28,7	13,3	75,5	29,7	12,9	73,1	30,7	12,5	70,7	31,8	12,1	45	
	9	88,6	25,4	15,2	83,1	27,5	14,2	79,7	28,9	13,7	77,3	29,9	13,3	74,9	31,0	12,8	72,4	32,1	12,4	44	
	10	90,5	25,6	15,5	84,9	27,8	14,6	81,4	29,2	14,0	79,0	30,2	13,6	76,6	31,2	13,1	74,1	32,3	12,7	44	
040	*5	91,9	30,0	16,7	86,4	32,7	15,7	83,0	34,5	15,1	80,7	35,8	14,7	78,3	37,2	14,2	76,0	38,7	13,8	45	
	6	96,4	30,4	16,5	90,6	33,1	15,5	87,0	34,9	14,9	84,6	36,2	14,5	82,1	37,6	14,1	79,6	39,1	13,6	44	
	7	99,1	30,8	17,0	93,2	33,5	16,0	89,5	35,3	15,3	87,0	36,6	14,9	84,5	38,0	14,5				43	
	8	102	31,1	17,4	95,7	33,8	16,4	91,9	35,7	15,8	89,3	37,0	15,3	86,7	38,4	14,9				43	
	9	104	31,5	17,9	98,0	34,2	16,8	94,2	36,1	16,1	91,5	37,4	15,7	88,9	38,8	15,2				43	
	10	107	31,8	18,3	100	34,6	17,2	96,4	36,4	16,5	93,8	37,8	16,1	91,0	39,2	15,6				42	
050	*5	105	34,2	19,1	99,2	37,2	18,0	95,4	39,2	17,3	92,9	40,7	16,9	90,3	42,3	16,4	87,8	44,1	16,0	46	
	6	111	34,6	19,0	104	37,7	17,9	100	39,7	17,2	97,6	41,2	16,7	94,9	42,9	16,3	92,2	44,6	15,8	46	
	7	114	35,0	19,5	107	38,0	18,4	103	40,1	17,7	100	41,6	17,2	97,7	43,3	16,7	94,9	45,0	16,3	45	
	8	117	35,3	20,0	110	38,4	18,9	106	40,5	18,2	103	42,1	17,7	100	43,7	17,2	97,5	45,5	16,7	44	
	9	120	35,7	20,6	113	38,8	19,4	109	41,0	18,6	106	42,5	18,1	103	44,1	17,7	100	45,9	17,2	44	
	10	123	36,1	21,1	116	39,2	19,8	111	41,4	19,1	108	42,9	18,6	106	44,6	18,1				43	
055	*5	116	37,2	21,0	109	40,5	19,8	105	42,7	19,1	102	44,2	18,6	99,4	45,9	18,1	96,6	47,6	17,6	46	
	6	122	37,7	20,8	115	41,0	19,6	110	43,2	18,9	107	44,7	18,4	104	46,4	17,9	101	48,2	17,4	45	
	7	125	38,0	21,5	118	41,3	20,2	114	43,5	19,5	111	45,1	19,0	108	46,8	18,4	105	48,6	17,9	45	
	8	129	38,4	22,1	121	41,7	20,8	117	43,9	20,0	114	45,5	19,5	111	47,2	19,0	107	49,0	18,4	45	
	9	132	38,8	22,7	125	42,1	21,4	120	44,3	20,6	117	45,9	20,0	114	47,6	19,5	110	49,4	18,9	44	
	10	136	39,1	23,3	128	42,5	21,9	123	44,7	21,1	120	46,3	20,6	117	48,0	20,0	113	49,8	19,4	44	
060	*5	133	42,5	24,1	125	46,2	22,7	120	48,7	21,8	117	50,4	21,2	113	52,2	20,6	110	54,1	20,0	44	
	6	139	43,0	23,9	131	46,8	22,5	126	49,2	21,6	123	51,0	21,0	119	52,8	20,4	116	54,7	19,8	44	
	7	143	43,5	24,6	135	47,2	23,1	130	49,7	22,2	126	51,4	21,6	122	53,3	21,0				43	
	8	147	43,9	25,2	138	47,7	23,7	133	50,2	22,8	129	51,9	22,2	126	53,8	21,5				43	
	9	151	44,4	25,8	142	48,1	24,3	136	50,6	23,4	133	52,4	22,7	129	54,2	22,1				42	
	10	154	44,8	26,4	145	48,6	24,9	139	51,1	23,9	136	52,9	23,3	132	54,7	22,6				42	
065	*5	149	48,2	27,0	140	52,5	25,4	134	55,4	24,4	131	57,5	23,8	127	59,6	23,1	123	61,9	22,4	45	
	6	156	48,8	26,8	147	53,2	25,2	141	56,1	24,2	137	58,2	23,5	133	60,4	22,8	129	62,7	22,1	44	
	7	161	49,3	27,5	151	53,7	25,9	145	56,7	24,9	141	58,7	24,2	137	60,9	23,5	133	63,2	22,8	44	
	8	165	49,9	28,3	155	54,3	26,6	149	57,2	25,5	145	59,3	24,8	141	61,5	24,1				43	
	9	169	50,4	29,0	159	54,8	27,2	153	57,8	26,2	148	59,9	25,4	144	62,1	24,7				43	
	10	173	51,0	29,7	163	55,4	27,9	156	58,4	26,8	152	60,5	26,0	147	62,7	25,3				42	

Data declared according to UNI EN 14511:2011

tu: outlet water temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW);

Fw: water flow rate with ΔT = 5 °C (m³/h).

(*): The performances have been calculated with 20% ethylene glycol in the water.

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5 °C".

SSN VERSION

Cooling	External air temperature (°C)																		t max(**) (°C)	
	30			35			38			40			42			46				
	tu (°C)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)		Fw (m ³ /h)
030	*5	69,4	21,2	12,6	65,0	23,2	11,8	62,2	24,6	11,3	60,2	25,5	10,9	58,2	26,5	10,6	54,0	28,7	9,8	46
	6	72,7	21,4	12,5	68,0	23,5	11,7	65,1	24,8	11,1	63,0	25,8	10,8	60,9	26,8	10,4	56,6	28,9	9,7	46
	7	74,7	21,6	12,8	70,0	23,7	12,0	66,9	25,0	11,5	64,8	26,0	11,1	62,7	27,0	10,7	58,2	29,2	10,0	46
	8	76,7	21,8	13,2	71,8	23,9	12,3	68,7	25,3	11,8	66,6	26,2	11,4	64,4	27,2	11,0	59,8	29,4	10,2	46
	9	78,6	22,0	13,5	73,6	24,1	12,6	70,4	25,5	12,1	68,2	26,5	11,7	66,0	27,5	11,3	61,3	29,7	10,5	46
	10	80,5	22,3	13,8	75,4	24,3	12,9	72,1	25,7	12,4	69,9	26,7	12,0	67,6	27,7	11,6	62,8	29,9	10,8	46
035	*5	76,1	22,7	13,8	71,5	24,7	13,0	68,7	26,1	12,5	66,7	27,1	12,1	64,6	28,1	11,7	60,4	30,3	11,0	46
	6	79,8	22,9	13,7	75,0	25,0	12,9	72,0	26,4	12,3	69,9	27,4	12,0	67,7	28,4	11,6	63,3	30,6	10,8	46
	7	82,0	23,2	14,1	77,1	25,3	13,2	74,0	26,6	12,7	71,9	27,6	12,3	69,7	28,6	11,9	65,1	30,8	11,2	46
	8	84,2	23,4	14,4	79,2	25,5	13,6	76,0	26,9	13,0	73,8	27,9	12,6	71,6	28,9	12,3	66,9	31,1	11,5	46
	9	86,3	23,7	14,8	81,2	25,8	13,9	77,9	27,1	13,4	75,7	28,1	13,0	73,4	29,1	12,6	68,6	31,3	11,8	46
	10	88,4	23,9	15,2	83,2	26,0	14,3	79,9	27,4	13,7	77,5	28,4	13,3	75,2	29,4	12,9	70,3	31,6	12,1	46
040	*5	88,7	28,5	16,1	83,5	31,1	15,2	80,3	32,9	14,6	78,0	34,2	14,2	75,8	35,5	13,8	71,2	38,5	12,9	46
	6	93,1	28,9	15,9	87,5	31,5	15,0	84,1	33,3	14,4	81,8	34,6	14,0	79,4	36,0	13,6	74,6	39,0	12,8	46
	7	95,8	29,2	16,4	90,1	31,9	15,4	86,6	33,7	14,8	84,2	35,0	14,4	81,8	36,3	14,0				45
	8	98,4	29,6	16,9	92,6	32,2	15,9	89,0	34,0	15,3	86,6	35,3	14,8	84,0	36,7	14,4				45
	9	101	29,9	17,3	95,1	32,6	16,3	91,3	34,4	15,7	88,9	35,7	15,2	86,4	37,1	14,8				44
	10	104	30,3	17,8	97,5	33,0	16,7	93,8	34,8	16,1	91,2	36,1	15,6	88,6	37,5	15,2				44
050	*5	103	31,6	18,7	96,9	34,5	17,6	93,3	36,5	17,0	90,9	37,9	16,5	88,5	39,4	16,1	83,5	42,8	15,2	46
	6	108	32,0	18,5	101,9	34,9	17,5	98,1	36,9	16,8	95,6	38,3	16,4	93,0	39,9	15,9	87,7	43,3	15,0	46
	7	111	32,3	19,1	105	35,3	18,0	101	37,3	17,3	98,5	38,7	16,9	95,8	40,3	16,4	90,4	43,7	15,5	46
	8	115	32,7	19,6	108	35,6	18,5	104	37,6	17,8	101	39,1	17,4	98,6	40,6	16,9	93,1	44,1	16,0	46
	9	118	33,0	20,2	111	36,0	19,0	107	38,0	18,3	104	39,5	17,8	101	41,0	17,4				45
	10	121	33,4	20,7	114	36,4	19,5	110	38,4	18,8	107	39,9	18,3	104	41,4	17,8				45
055	*5	113	35,0	20,6	107	38,2	19,4	103	40,3	18,7	100	41,8	18,2	97,4	43,5	17,7	91,9	47,0	16,7	46
	6	119	35,4	20,4	112	38,6	19,2	108	40,8	18,5	105	42,3	18,0	102	44,0	17,5	96,6	47,5	16,5	46
	7	123	35,7	21,0	116	39,0	19,8	111	41,1	19,1	108	42,7	18,6	105	44,3	18,1	99,5	47,9	17,1	46
	8	126	36,1	21,6	119	39,3	20,4	115	41,5	19,6	112	43,1	19,1	109	44,7	18,6	102	48,3	17,6	46
	9	130	36,4	22,2	122	39,7	21,0	118	41,9	20,2	115	43,4	19,7	112	45,1	19,2	105	48,7	18,1	46
	10	133	36,8	22,9	126	40,1	21,6	121	42,3	20,8	118	43,8	20,2	115	45,5	19,7	108	49,1	18,6	46
060	*5	131	40,2	23,9	124	43,8	22,5	119	46,2	21,7	116	47,9	21,1	113	49,7	20,5	106	53,5	19,3	46
	6	138	40,7	23,7	130	44,3	22,3	125	46,7	21,5	122	48,4	20,9	118	50,2	20,3	111	54,1	19,1	46
	7	142	41,1	24,4	134	44,7	23,0	129	47,2	22,1	125	48,9	21,5	122	50,7	20,9				45
	8	146	41,5	25,0	138	45,2	23,6	132	47,6	22,7	129	49,3	22,1	125	51,1	21,4				45
	9	150	41,9	25,7	141	45,6	24,2	136	48,0	23,3	132	49,8	22,6	128	51,6	22,0				45
	10	153	42,3	26,3	144	46,1	24,8	139	48,5	23,8	135	50,2	23,2	131	52,0	22,5				44

Data declared according to UNI EN 14511:2011

tu: outlet water temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW);

Fw: water flow rate with ΔT = 5 °C (m³/h).

(*): The performances have been calculated with 20% ethylene glycol in the water.

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5 °C".

HE VERSION

Cooling tu (°C)	External air temperature (°C)																		t max(**) (°C)	
	30			35			38			40			42			47				
	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)		
030	*5	66,1	19,1	12,0	62,3	20,8	11,3	59,8	22,0	10,9	58,1	22,8	10,6	56,4	23,7	10,2	51,8	26,0	9,4	47
	6	69,2	19,2	11,9	65,2	21,0	11,2	62,6	22,1	10,7	60,8	22,9	10,4	59,0	23,8	10,1	54,2	26,2	9,3	47
	7	71,2	19,4	12,2	67,1	21,1	11,5	64,5	22,3	11,1	62,7	23,1	10,7	60,8	23,9	10,4	55,9	26,3	9,6	47
	8	73,2	19,5	12,6	69,0	21,2	11,8	66,3	22,4	11,4	64,5	23,2	11,1	62,6	24,1	10,7	57,6	26,5	9,9	47
	9	75,2	19,7	12,9	70,9	21,4	12,2	68,1	22,5	11,7	66,2	23,4	11,4	64,3	24,2	11,0	59,2	26,6	10,1	47
	10	77,1	19,8	13,2	72,7	21,6	12,5	69,9	22,7	12,0	68,0	23,5	11,7	66,0	24,4	11,3	60,8	26,8	10,4	47
035	*5	72,0	20,9	13,1	67,9	22,7	12,3	65,2	24,0	11,9	63,4	24,9	11,5	61,5	25,8	11,2	56,5	28,3	10,3	47
	6	75,4	21,0	12,9	71,1	22,9	12,2	68,3	24,1	11,7	66,3	25,0	11,4	64,3	26,0	11,0	59,1	28,5	10,1	47
	7	77,6	21,2	13,3	73,2	23,1	12,5	70,4	24,3	12,1	68,4	25,2	11,7	66,3	26,1	11,4	60,9	28,7	10,4	47
	8	79,9	21,4	13,7	75,3	23,2	12,9	72,4	24,5	12,4	70,3	25,4	12,1	68,2	26,3	11,7	62,7	28,8	10,8	47
	9	82,1	21,6	14,1	77,4	23,4	13,3	74,4	24,7	12,8	72,3	25,5	12,4	70,1	26,5	12,0	64,5	29,0	11,1	47
	10	84,3	21,7	14,5	79,5	23,6	13,6	76,4	24,8	13,1	74,3	25,7	12,7	72,1	26,7	12,4	66,3	29,2	11,4	47
040	*5	84,5	24,8	15,4	79,9	26,8	14,5	77,0	28,1	14,0	75,0	29,1	13,6	72,9	30,1	13,3	67,6	32,8	12,3	47
	6	88,5	25,0	15,2	83,6	27,1	14,3	80,6	28,4	13,8	78,5	29,3	13,4	76,3	30,3	13,1	70,7	33,0	12,1	47
	7	91,1	25,2	15,6	86,1	27,3	14,8	83,0	28,6	14,2	80,8	29,6	13,9	78,6	30,6	13,5	72,8	33,3	12,5	47
	8	93,6	25,5	16,0	88,5	27,5	15,2	85,3	28,9	14,6	83,1	29,8	14,2	80,8	30,8	13,9	74,9	33,5	12,8	47
	9	96,1	25,7	16,5	90,9	27,8	15,6	87,6	29,1	15,0	85,4	30,1	14,6	83,0	31,1	14,2	77,0	33,7	13,2	47
	10	98,6	25,9	16,9	93,3	28,0	16,0	89,9	29,4	15,4	87,6	30,3	15,0	85,2	31,3	14,6	79,1	34,0	13,6	47
050	*5	99,7	29,3	18,1	94,2	31,6	17,1	90,8	33,2	16,5	88,5	34,3	16,1	86,2	35,5	15,7	80,1	38,8	14,6	47
	6	105	29,5	17,9	98,8	31,9	16,9	95,2	33,5	16,3	92,8	34,6	15,9	90,3	35,8	15,5	84,0	39,1	14,4	47
	7	108	29,8	18,4	102	32,2	17,4	98,1	33,7	16,8	95,6	34,9	16,4	93,1	36,1	15,9	86,6	39,4	14,8	47
	8	111	30,0	19,0	105	32,4	17,9	101	34,0	17,3	98,3	35,1	16,8	95,7	36,3	16,4	89,1	39,7	15,3	47
	9	114	30,3	19,5	107	32,7	18,4	104	34,3	17,8	101	35,4	17,3	98,3	36,6	16,8	91,5	40,0	15,7	47
	10	116	30,6	20,0	110	33,0	18,9	106	34,6	18,2	104	35,7	17,8	101	36,9	17,3	93,9	40,3	16,1	47
055	*5	107	31,5	19,5	101	34,0	18,4	97,9	35,8	17,8	95,4	37,0	17,3	93,0	38,4	16,9	86,8	42,2	15,8	47
	6	113	31,8	19,3	107	34,3	18,2	103	36,1	17,6	100	37,3	17,2	97,7	38,7	16,7	91,2	42,5	15,6	47
	7	116	32,0	19,9	110	34,6	18,8	106	36,3	18,2	103	37,6	17,7	101	39,0	17,3	94,1	42,8	16,1	47
	8	120	32,3	20,5	113	34,9	19,4	109	36,6	18,7	107	37,9	18,3	104	39,3	17,8	97,0	43,1	16,6	47
	9	123	32,5	21,1	117	35,1	20,0	112	36,9	19,3	110	38,2	18,8	107	39,6	18,3	100	43,4	17,1	47
	10	127	32,8	21,7	120	35,4	20,6	116	37,2	19,9	113	38,5	19,4	110	39,9	18,9	103	43,7	17,7	47
060	*5	122	35,8	22,2	115	38,8	21,0	111	40,8	20,2	108	42,3	19,7	106	43,8	19,2	98,3	48,0	17,9	47
	6	128	36,1	21,9	121	39,1	20,7	117	41,2	20,0	114	42,6	19,5	111	44,2	19,0	103	48,4	17,7	47
	7	132	36,4	22,6	125	39,5	21,4	120	41,5	20,6	117	42,9	20,1	114	44,5	19,6	106	48,7	18,2	47
	8	136	36,7	23,3	128	39,8	22,0	124	41,8	21,2	121	43,3	20,7	117	44,8	20,1	109	49,1	18,8	47
	9	139	37,1	23,9	132	40,1	22,6	127	42,1	21,8	124	43,6	21,3	121	45,2	20,7	113	49,4	19,3	47
	10	143	37,4	24,6	135	40,4	23,2	131	42,5	22,4	127	44,0	21,9	124	45,5	21,3	116	49,8	19,8	47
065	*5	135	40,3	24,6	128	43,7	23,2	123	46,0	22,4	120	47,6	21,8	117	49,3	21,2	109	53,9	19,7	47
	6	142	40,7	24,3	134	44,1	23,0	129	46,4	22,1	126	48,1	21,6	122	49,8	21,0	114	54,4	19,5	47
	7	146	41,0	25,1	138	44,5	23,7	133	46,8	22,8	130	48,4	22,2	126	50,1	21,6	117	54,8	20,1	47
	8	150	41,4	25,8	142	44,9	24,3	137	47,2	23,4	133	48,8	22,8	130	50,5	22,2	120	55,2	20,6	47
	9	154	41,7	26,5	146	45,2	25,0	140	47,6	24,1	137	49,2	23,5	133	50,9	22,8	124	55,6	21,2	47
	10	158	42,1	27,2	150	45,6	25,7	144	47,9	24,7	140	49,6	24,1	137	51,3	23,4	127	56,0	21,8	47

Data declared according to UNI EN 14511:2011

tu: outlet water temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW);

Fw: water flow rate with ΔT = 5 °C (m³/h).

(*): The performances have been calculated with 20% ethylene glycol in the water.

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5 °C".

SHE VERSION

Cooling	External air temperature (°C)																		t max(**) (°C)	
	30			35			38			40			42			45				
	tu (°C)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)	Fw (m ³ /h)	Pf (kW)	Pa (kW)		Fw (m ³ /h)
030	*5	63,1	17,9	11,5	59,3	19,7	10,8	56,9	20,9	10,3	55,2	21,7	10,0	53,5	22,6	9,7	50,9	24,0	9,2	45
	6	66,0	18,1	11,3	62,1	19,9	10,6	59,5	21,0	10,2	57,8	21,9	9,9	56,0	22,8	9,6	53,2	24,2	9,1	45
	7	67,9	18,2	11,6	63,9	20,0	11,0	61,3	21,2	10,5	59,6	22,0	10,2	57,7	22,9	9,9	54,9	24,4	9,4	45
	8	69,9	18,4	12,0	65,7	20,2	11,3	63,1	21,4	10,8	61,3	22,2	10,5	59,4	23,1	10,2	56,5	24,5	9,7	45
	9	71,8	18,6	12,3	67,6	20,3	11,6	64,9	21,5	11,1	63,0	22,4	10,8	61,1	23,3	10,5	58,1	24,7	10,0	45
	10	73,7	18,7	12,6	69,4	20,5	11,9	66,6	21,7	11,4	64,7	22,5	11,1	62,7	23,4	10,8	59,7	24,9	10,2	45
035	*5	69,3	19,8	12,6	65,2	21,7	11,8	62,6	23,0	11,4	60,7	23,9	11,0	58,9	24,8	10,7	55,9	26,3	10,2	45
	6	72,5	19,9	12,4	68,2	21,9	11,7	65,4	23,2	11,2	63,5	24,1	10,9	61,6	25,0	10,5	58,5	26,5	10,0	45
	7	74,6	20,1	12,8	70,2	22,1	12,0	67,4	23,3	11,5	65,4	24,2	11,2	63,4	25,2	10,9	60,3	26,7	10,3	45
	8	76,8	20,3	13,2	72,3	22,2	12,4	69,4	23,5	11,9	67,3	24,4	11,5	65,3	25,4	11,2	62,0	26,9	10,6	45
	9	78,9	20,5	13,5	74,3	22,4	12,7	71,3	23,7	12,2	69,2	24,6	11,9	67,1	25,6	11,5	63,8	27,1	10,9	45
	10	81,1	20,7	13,9	76,3	22,6	13,1	73,3	23,9	12,6	71,1	24,8	12,2	69,0	25,8	11,8	65,6	27,3	11,3	45
040	*5	81,3	23,8	14,8	76,8	25,9	13,9	73,9	27,3	13,4	71,9	28,2	13,1	69,8	29,3	12,7	66,7	30,9	12,1	45
	6	85,0	24,1	14,6	80,3	26,2	13,7	77,2	27,6	13,2	75,1	28,5	12,9	73,0	29,6	12,5	69,7	31,2	11,9	45
	7	87,5	24,4	15,0	82,6	26,5	14,2	79,5	27,8	13,6	77,3	28,8	13,3	75,2	29,8	12,9	71,8	31,4	12,3	45
	8	90,0	24,6	15,4	84,9	26,7	14,6	81,7	28,1	14,0	79,5	29,1	13,6	77,3	30,1	13,2	73,8	31,7	12,7	45
	9	92,4	24,8	15,8	87,2	27,0	15,0	83,9	28,4	14,4	81,7	29,3	14,0	79,4	30,4	13,6	75,9	32,0	13,0	45
	10	94,8	25,1	16,3	89,5	27,3	15,4	86,2	28,6	14,8	83,9	29,6	14,4	81,5	30,6	14,0	77,9	32,2	13,4	45
050	*5	95,2	27,5	17,3	89,9	29,9	16,3	86,5	31,5	15,7	84,3	32,6	15,3	82,0	33,9	14,9	78,5	35,9	14,3	45
	6	99,7	27,8	17,1	94,1	30,2	16,1	90,6	31,8	15,5	88,3	33,0	15,1	85,9	34,2	14,7	82,2	36,2	14,1	45
	7	103	28,0	17,6	96,9	30,5	16,6	93,4	32,1	16,0	90,9	33,3	15,6	88,5	34,5	15,2	84,7	36,5	14,5	45
	8	106	28,3	18,1	99,6	30,7	17,1	96,0	32,4	16,5	93,5	33,6	16,0	91,0	34,8	15,6	87,2	36,8	14,9	45
	9	108	28,6	18,6	102	31,0	17,6	98,7	32,7	16,9	96,1	33,9	16,5	93,6	35,1	16,0	89,6	37,1	15,4	45
	10	111	28,9	19,1	105	31,3	18,0	101	33,0	17,4	98,7	34,2	16,9	96,1	35,4	16,5	92,0	37,4	15,8	45
055	*5	103	29,8	18,7	97,3	32,4	17,7	93,8	34,2	17,0	91,4	35,5	16,6	89,0	36,9	16,2	85,5	39,2	15,5	45
	6	108	30,1	18,5	102	32,7	17,5	98,4	34,6	16,9	95,9	35,9	16,4	93,4	37,3	16,0	89,6	39,6	15,4	45
	7	111	30,4	19,1	105	33,0	18,0	102	34,9	17,4	99,0	36,2	17,0	96,4	37,6	16,5	92,5	39,9	15,9	45
	8	115	30,6	19,7	109	33,3	18,6	105	35,2	17,9	102	36,5	17,5	99,4	37,9	17,0	95,4	40,2	16,4	45
	9	118	30,9	20,3	112	33,6	19,2	108	35,5	18,5	105	36,8	18,0	102	38,2	17,6	98,3	40,6	16,9	45
	10	122	31,2	20,9	115	34,0	19,7	111	35,8	19,0	108	37,2	18,6	105	38,6	18,1	101	40,9	17,4	45
060	*5	119	34,3	21,6	112	37,5	20,4	108	39,6	19,6	105	41,0	19,1	102	42,6	18,6	98,1	45,2	17,8	45
	6	125	34,7	21,3	118	37,8	20,1	113	39,9	19,4	110	41,5	18,9	107	43,0	18,4	103	45,6	17,6	45
	7	128	35,0	22,0	121	38,2	20,8	117	40,3	20,0	114	41,8	19,5	111	43,4	19,0	106	46,0	18,2	45
	8	132	35,4	22,6	125	38,5	21,4	120	40,7	20,6	117	42,2	20,1	114	43,8	19,5	109	46,4	18,7	45
	9	136	35,7	23,3	128	38,9	22,0	123	41,0	21,2	120	42,5	20,6	117	44,2	20,1	112	46,7	19,2	45
	10	139	36,1	23,9	132	39,3	22,6	127	41,4	21,7	124	42,9	21,2	120	44,5	20,6	115	47,1	19,8	45
065	*5	133	39,1	24,1	125	42,7	22,7	120	45,0	21,9	117	46,7	21,3	114	48,5	20,7	109	51,2	19,8	45
	6	139	39,5	23,8	131	43,1	22,5	126	45,5	21,6	123	47,2	21,0	119	49,0	20,5	114	51,8	19,6	45
	7	143	39,9	24,5	135	43,5	23,1	130	45,9	22,3	126	47,6	21,7	123	49,4	21,1	118	52,2	20,1	45
	8	147	40,3	25,2	139	43,9	23,8	133	46,3	22,9	130	48,0	22,3	126	49,8	21,6	121	52,6	20,7	45
	9	151	40,7	25,9	142	44,3	24,4	137	46,7	23,5	133	48,4	22,9	130	50,2	22,2	124	53,0	21,3	45
	10	155	41,1	26,5	146	44,8	25,0	140	47,2	24,1	137	48,9	23,5	133	50,6	22,8	127	53,5	21,8	45

Data declared according to UNI EN 14511:2011

tu: outlet water temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW);

Fw: water flow rate with ΔT = 5 °C (m³/h).

(*): The performances have been calculated with 20% ethylene glycol in the water.

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5 °C".

Model	Partial heat recovery					Total heat recovery									
	External air temperature				Weight	Recovery outlet water temperature									
	30 °C	35 °C	40 °C	45 °C		40 °C			45 °C			50 °C			Weight
Pd (kW)	Pd (kW)	Pd (kW)	Pd (kW)	Kg	Pf (kW)	Pa (kW)	Pr (kW)	Pf (kW)	Pa (kW)	Pr (kW)	Pf (kW)	Pa (kW)	Pr (kW)	Kg	
TAT 030	23,2	24,3	24,6	25,6	37,2	75,8	25,4	101	70,6	27,9	98,5	65,4	30,5	95,9	77,4
TAT 035	25,8	27,0	27,3	28,3	40,3	84,6	27,0	112	78,9	29,5	108	72,9	32,4	105	80,1
TAT 040	31,3	32,8	33,2	34,5	43,8	103	32,8	136	96,4	36,1	133	89,5	39,8	129	91,5
TAT 050	36,1	37,8	38,3	39,8	58,4	117	39,5	157	110	43,0	153	101	47,1	148	116
TAT 055	40,6	42,6	43,1	44,9	62,9	131	44,2	175	123	48,2	171	113	52,9	166	126
TAT 060	44,9	47,0	47,5	49,4	68,6	148	47,1	195	138	51,6	189	128	56,6	184	137
TAT 065	49,1	51,4	52,0	54,1	68,6	161	51,7	213	150	56,8	207	138	62,8	201	137

Pd: thermal power supplied by the desuperheater (kW);

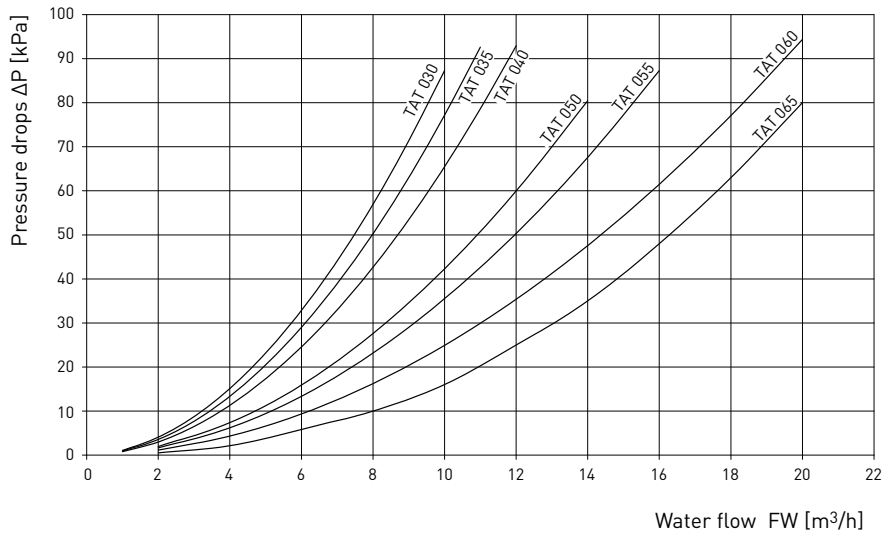
Pf: cooling capacity (kW);

Pa: absorbed power (kW);

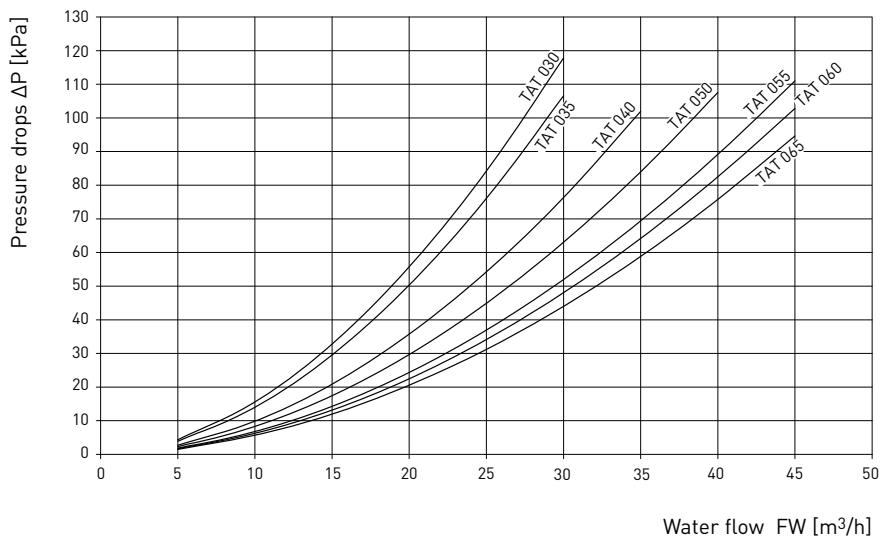
Pr: thermal power supplied by heat recovery (kW).

The values are referred ΔT 5 °C. The values given in the desuperheater table refer to an evaporator water outlet temperature of 7 °C and a desuperheater water outlet temperature of 45 °C; the values in the 100% recovery table refer to an evaporator water outlet temperature of 7 °C.

PARTIAL HEAT RECOVERY PRESSURE DROPS



TOTAL HEAT RECOVERY PRESSURE DROPS



	030	035	040	050	055	060	065
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Water flow rate plates heat exchanger ⁽¹⁾	m ³ /h	4,6/17,5	5,2/19,3	6,2/23,6	7,0/27,8	7,7/31,3	8,5/34,8	8,5/34,8
Water flow rate shell and tubes exchanger ⁽¹⁾	m ³ /h	4,6/14,0	5,2/17,0	6,2/17,0	7,0/24,6	7,7/29,3	8,5/29,3	8,5/32,8
Pressure drops ⁽²⁾	kPa	7/75	7/79	7/63	4/86	7/69	7/64	10/55
Water connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Desuperheater connections	in	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"
Heat recovery connections	in	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

Tank volume (if present)	l	100	100	100	200	200	200	200
Expansion tank volume ⁽³⁾	l	10	10	10	12	12	12	12

Nominal power pump P15	kW	1,1	1,1	1,1	1,5	1,5	1,85	1,85
Nominal power pump P2	kW	2	2,2	2	3	3	3	3,0

Available head pressure P15 ⁽⁴⁾	kPa	194/80	192/60	189/54	188/43	188/53	228/83	217/90
Available head pressure P15+P15 ⁽⁴⁾	kPa	193/69	191/48	188/39	187/32	187/43	227/75	216/81
Available head pressure Tank+P15 ⁽⁴⁾	kPa	194/71	191/49	188/41	188/37	187/48	227/74	216/81
Available head pressure Tank+P15+P15 ⁽⁴⁾	kPa	193/60	190/37	187/26	187/25	186/36	227/66	214/72
Available head pressure P2 ⁽⁴⁾	kPa	326/192	323/170	320/163	293/184	294/195	294/187	290/193
Available head pressure P2+P2 ⁽⁴⁾	kPa	326/185	323/160	319/152	293/176	293/187	293/177	288/184
Available head pressure Tank+P2 ⁽⁴⁾	kPa	325/183	323/158	318/149	293/177	293/187	293/178	288/184
Available head pressure Tank+P2+P2 ⁽⁴⁾	kPa	325/175	322/148	317/137	292/169	293/179	292/168	287/175

(1) Minimum and maximum water flow rate (m³/h).

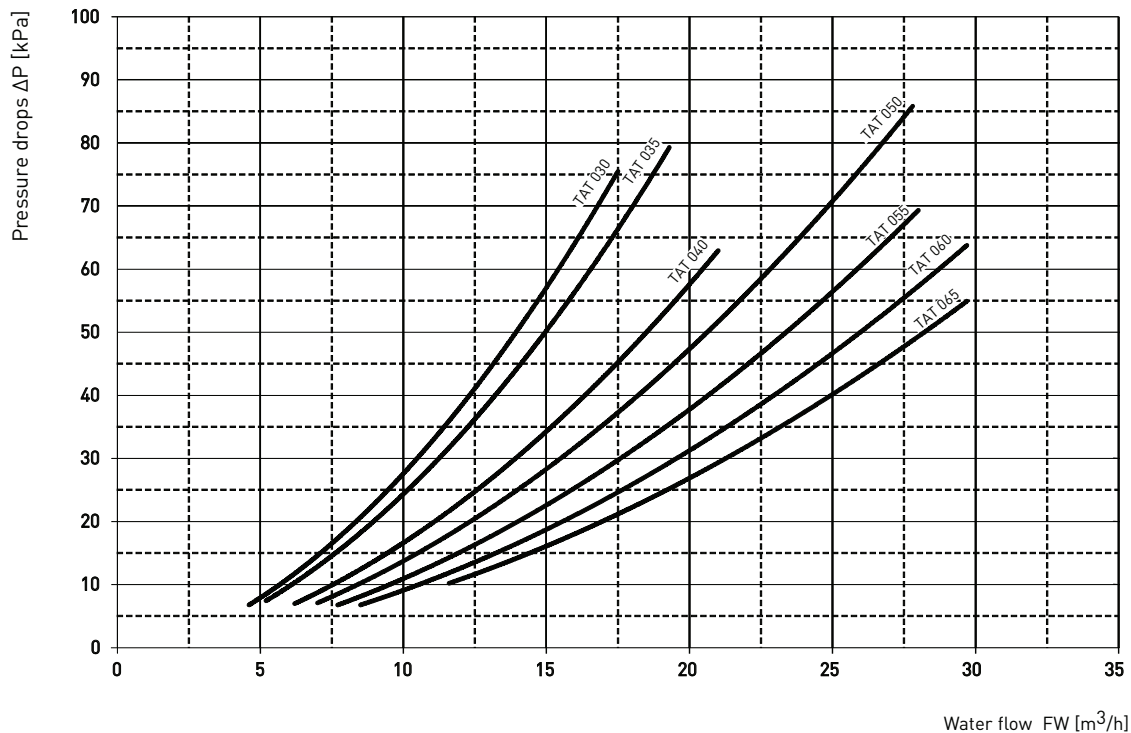
(2) Pressure drops referred to min/max allowed flow rate with the plates heat exchanger (kPa).

(3) The expansion tank is always present with pumping module.

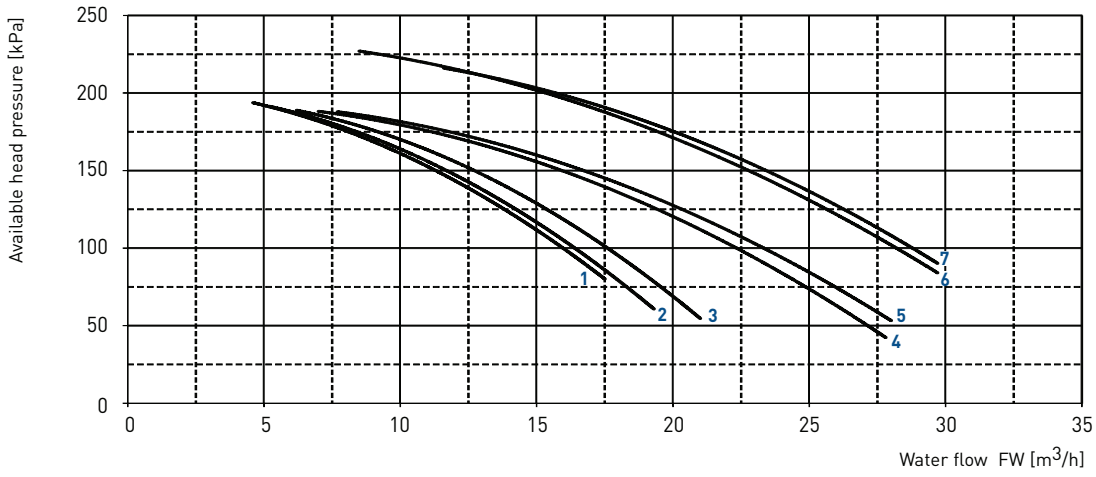
(4) Available head pressure referred to min/max allowed flow rate with the plates heat exchanger (kPa).

PRESSURE DROPS

TAT

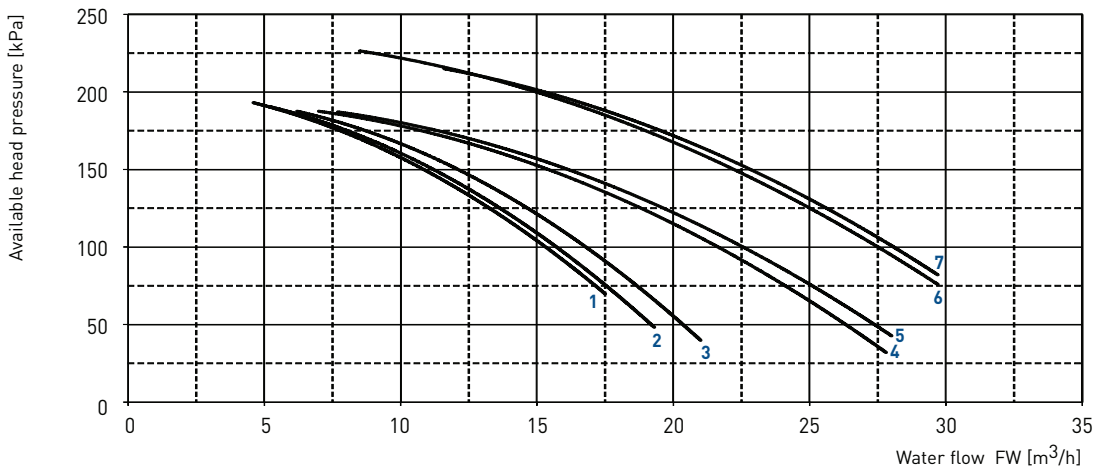


AVAILABLE HEAD PRESSURE WITH PUMP P15



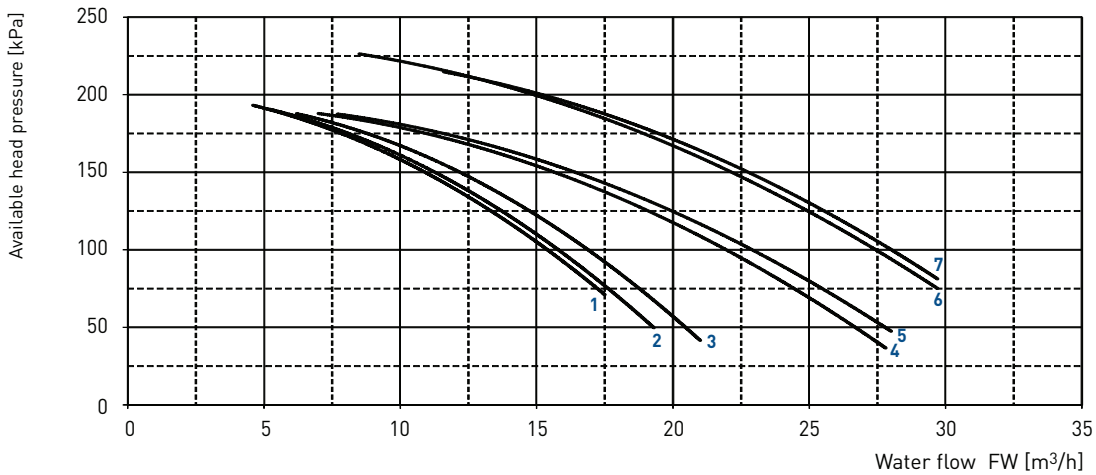
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE WITH DOUBLE PUMP P15



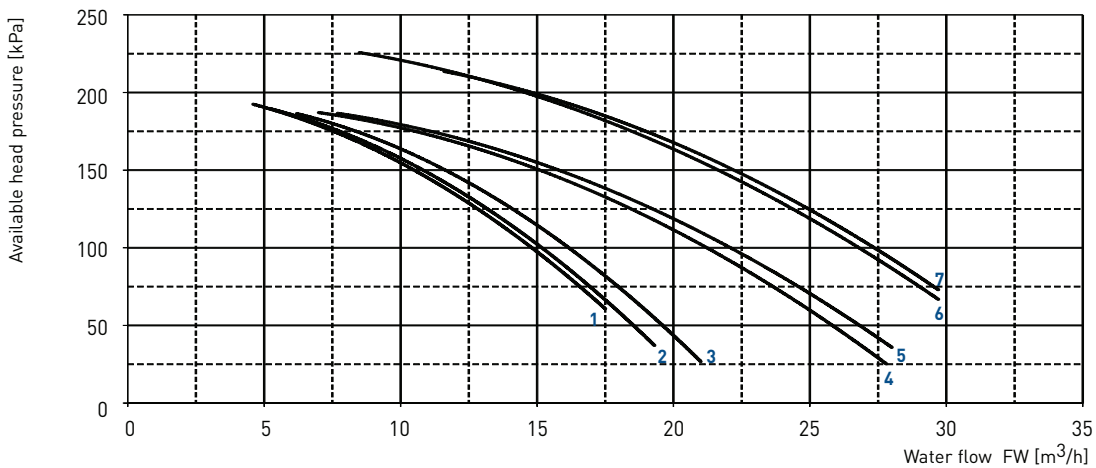
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE WITH PUMP P15 AND TANK



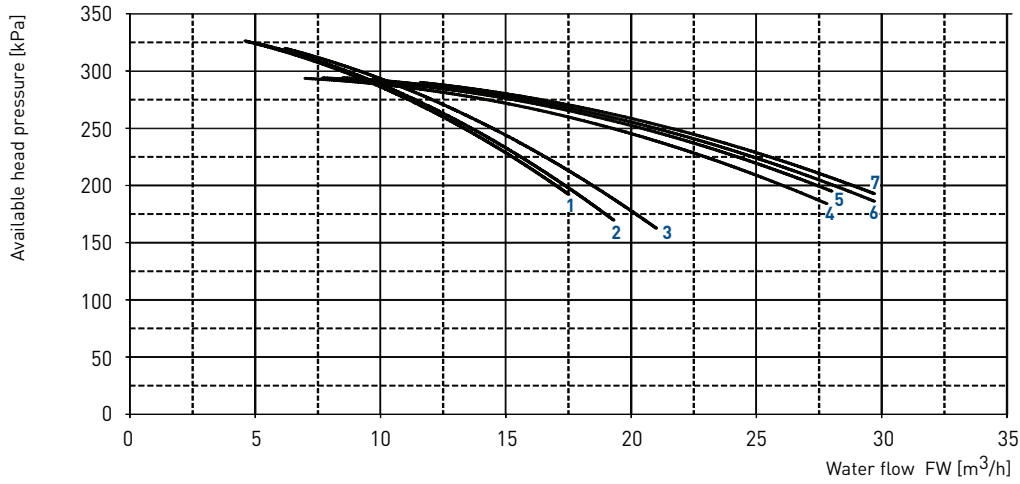
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE DOUBLE PUMP P15 AND TANK



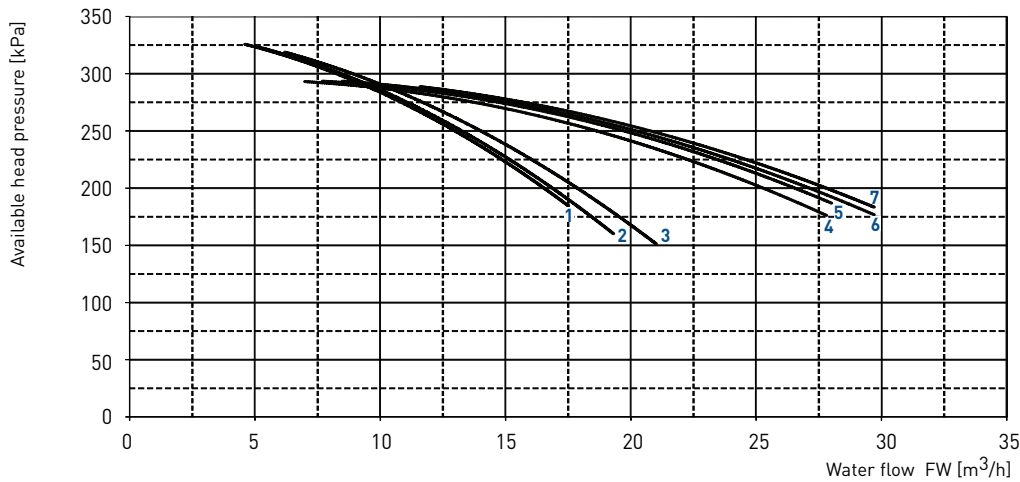
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE WITH PUMP P2



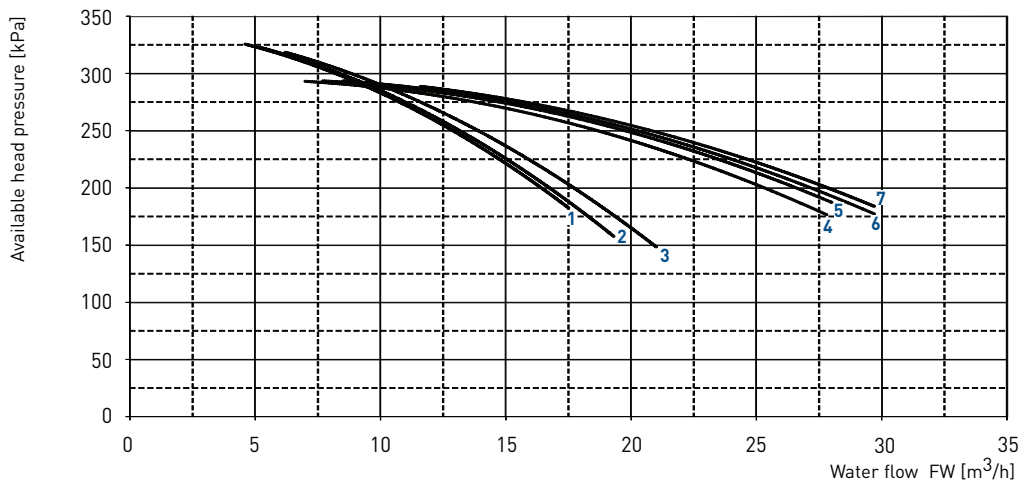
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE WITH DOUBLE PUMP P2



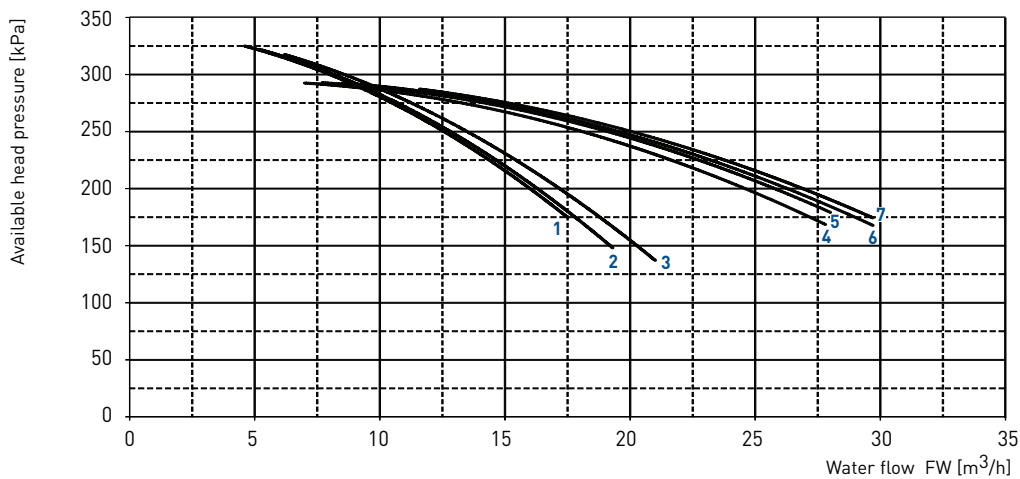
- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE WITH PUMP P2 AND TANK



- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

AVAILABLE HEAD PRESSURE DOUBLE PUMP P2 AND TANK

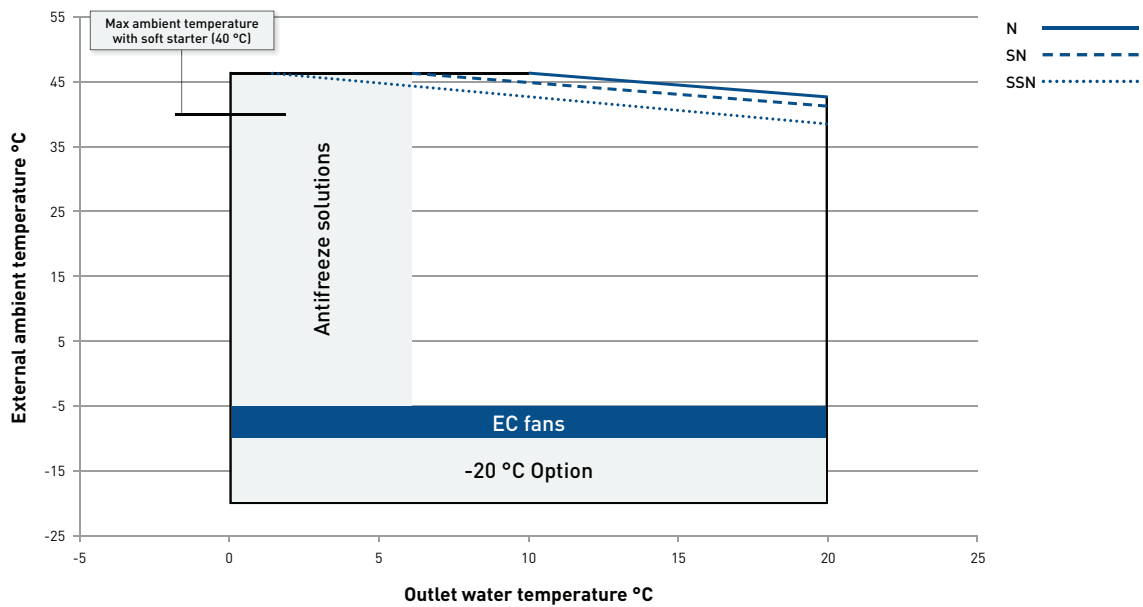


- 1 = TAT 030
- 2 = TAT 035
- 3 = TAT 040
- 4 = TAT 050
- 5 = TAT 055
- 6 = TAT 060
- 7 = TAT 065

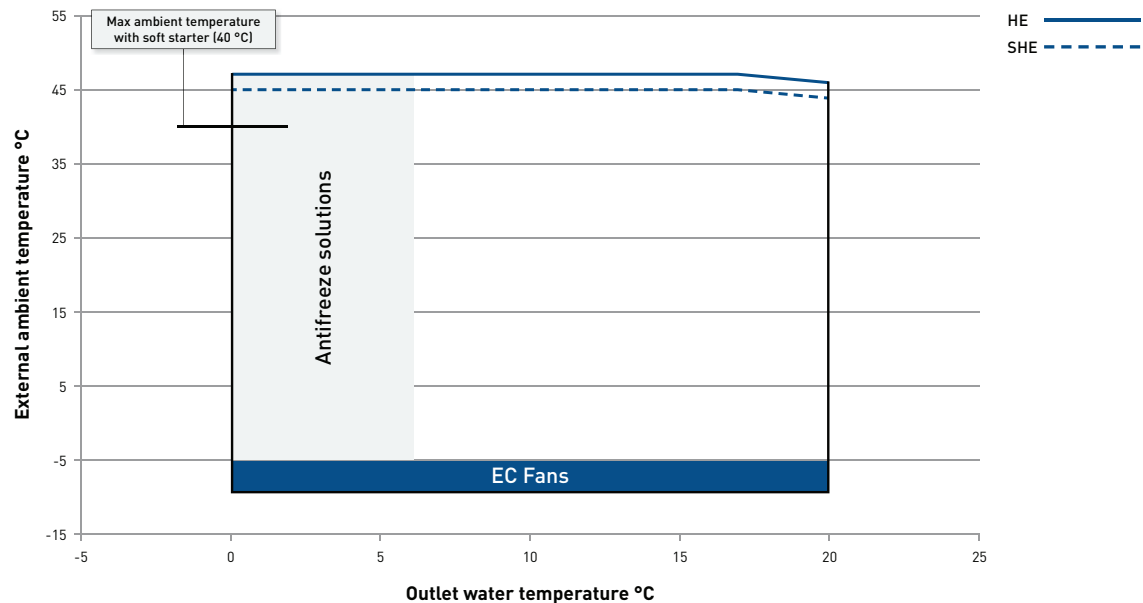
	°C	Min	Max
		N/SN/SSN/HE/SHE	N/SN/SSN/HE/SHE
External ambient temperature	°C	-5 ⁽¹⁾ / -10 ⁽²⁾ / -20 ⁽³⁾	(4)
Evaporator inlet water temperature ⁽⁵⁾	°C	4	25
Evaporator outlet water temperature	°C	0 ^(*)	20
Delta T of the water	°C	4	10
Pressure in hydraulic circuits water side without tank and pumps	barg	0	6
Pressure in hydraulic circuits water side with tank and pumps	barg	0	3
Pressure in hydraulic circuits water side with pumps without tank	barg	0	3

- (1) Referred to N, SN, SSN versions with fans with step regulation.
- (2) Referred to N, SN, SSN version with EC fans and HE and SHE versions.
- (3) Referred to units equipped with option -20 °C. This option is not available for HE and SHE versions.
- (4) See tables with the unit's performances. Units equipped with the soft starters can operate up to a maximum ambient temperature of 40 °C, after which, the unit will enter in a safety mode, in order to preserving the operation of the machine.
- (5) Comply with the heat exchanger min/max flow rate values.
- (*) For outlet water temperatures lower than 6 °C you must add a suitable quantity of antifreeze additives.

Cooling N, SN, SSN



Cooling HE, SHE



The maximum ambient temperature reported in the graph refers to an average value of the range. For exact values, refer to the performance tables.

Ambient temperature	10 °C	Standard insulation thickness 10 mm (*)					+10 mm (*)
		20 °C	30 °C	35 °C	40 °C	45 °C	47 °C
Outlet water temperature		RH Max					
0 °C	90%	80%	73%	70%	67%	65%	82%
7 °C	97%	87%	77%	75%	73%	68%	83%
15 °C	99%	95%	85%	82%	78%	75%	86%

The values in the table refer to the thickness of the thermal insulation of the hydraulic circuit and they show the maximum relative humidity above which ambient moisture condenses (these values are at the operation limits of the chillers).

(*) Closed cell thermal insulation.

CORRECTION FACTORS

CORRECTION FACTORS ΔT ≠ 5 °C

		ΔT						
		4	5	6	7	8	9	10
Cooling capacity correction factor	k1	0,993	1,000	1,007	1,015	1,021	1,029	1,036
Absorbed power correction factor	Kp1	0,997	1,000	1,003	1,006	1,009	1,011	1,014

Multiply the unit performance by the correction factors given in table ($P^* = P_{-} \times K1$, $Pa^* = Pa \times Kp1$ dove $P_{-} = Ph$ o Pf). The new water flow to the evaporator is calculated by means of the following equation: Fw (l/h) = P^* (kW) x 860 / ΔT where ΔT is the delta t of the water through the evaporator (°C).

SOLUTIONS OF WATER AND ETHYLENE GLYCOL

		% Ethylene glycol by weight					
		0	10	20	30	40	50
Freezing temperature	(°C)	0	-3,7	-8,7	-15,3	-23,5	-35,6
Cooling capacity correction factor	K2	1	0,993	0,983	0,972	0,959	0,943
Absorbed power correction factor	Kp2	1	0,997	0,993	0,989	0,984	0,978
Water flow correction factor ⁽¹⁾	K_{FWE2}	1	1,024	1,050	1,077	1,105	1,134
Pressure drop correction factor	Kdp2	1	1,100	1,187	1,260	1,317	1,362

Multiply the unit performance by the correction factors given in the table. (es. $Pf_{(new)} = Pf \times K2$);

(1) K_{FWE2} = correction factor (referred to the cooling capacity corrected by K2) to obtain the water flow with a ΔT of 5 °C

CONDENSER CORRECTION FACTORS

		Altitude					
		0	500	1000	1500	2000	2500
Cooling capacity correction factor	k3	1	0,990	0,980	0,977	0,972	0,960
Absorbed power correction factor	Kp3	1	1,005	1,012	1,018	1,027	1,034
Reduction of the max. / min. external air temperature (*)	Kt3 (°C)	0	0,6	1,1	1,8	2,5	3,3

Multiply the unit performance by the correction factors given in the table ($Pf_{(new)} = Pf \times K3$, $Pa_{(new)} = Pa \times Kp3$, $Ph_{(new)} = Ph \times K3$).

(*) To obtain the maximum (minimum) external air temperature, subtract (add) the values indicated from (to) the maximum (minimum) external air temperature in the performance table ($Ta_{(new)} = Ta - (+) Kt3$).

FOULING FACTORS

		Evaporator fouling factor (m ² °C/W)				
		0	0,000043	0,000086	0,000172	0,000344
Cooling capacity correction factor	k4	1	0,988	0,976	0,953	0,911
Absorbed power correction factor	Kp4	1	0,995	0,991	0,982	0,965

To determine the effect of fouling on the water/refrigerant heat exchanger, multiply the cooling capacity Pf by k4 and the absorbed power Pa by kp4. (e.g. $Pf_{(new)} = Pf \times k4$, $Pa_{(new)} = Pa \times kp4$).

PERFORMANCE AND TECHNICAL DATA - CONDENSING UNITS

GENERAL DATA

MCTAT

N VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	76,4	85,8	102,8	116,5	129,2	147,5	164,6
	Total absorbed power	kW	25,6	27,0	33,1	38,3	41,5	46,8	52,4
	EER	-	2,98	3,18	3,10	3,04	3,12	3,15	3,14

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 - 50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	2	2+3	3	2	3	3	3
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Axials						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	47200	46000	45300	70500	68000	68000	68000
	Absorbed power (each)	kW	2,1	2,1	2,1	2,1	2,1	2,1	2,1

Refrigerant connexions	Suction line diameter	mm	42	42	42	54	54	54	54
	Discharge line diameter	mm	28	28	28	28	28	28	28

Sound levels (3)	Sound power	dB (A)	87,5	87,1	86,7	90,3	90,1	88,8	89,9
	Sound pressure at 10 m	dB (A)	59,5	59,1	58,8	62,3	62,1	60,9	61,9

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Lenght	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	724	754	895	1077	1120	1137	1170

(1) Cooling mode: external ambient temperature: 35 °C; evaporating temperature 5 °C.

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions.

(4) Dimensions and operating weights are referred to the unit without options.

SN VERSION

030	035	040	050	055	060	065
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Cooling (1)	Cooling capacity	kW	73,7	83,6	98,9	112,6	125,1	142,2	159,3
	Total absorbed power	kW	24,8	26,3	32,9	39,2	40,4	46,1	52,9
	EER	-	2,97	3,18	3,01	2,87	3,10	3,08	3,01

Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50						
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50						

Compressor	Refrigerant gas	-	R410A						
	Type	-	Scroll						
	Compressors / Cooling circuits	n°	2 / 1						
	Capacity control	-	0 -50 -100						

Condenser coils	Condensers number	n°	2	2	2	2	2	2	2
	Rows number	n°	2	2+3	3	2	3	3	3
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94	5,94

Fans	Type	-	Assiali						
	Fans number	n°	2	2	2	3	3	3	3
	Total airflow	m ³ /h	36600	35700	34800	54000	51900	51900	51900
	Absorbed power (each)	kW	1,15	1,15	1,15	1,15	1,15	1,15	1,15

Refrigerant connexions	Suction line diameter	mm	42	42	42	54	54	54	54
	Discharge line diameter	mm	28	28	28	28	28	28	28

Sound levels (3)	Sound power	dB (A)	82,6	82,2	81,8	84,2	83,8	83,5	84,0
	Sound pressure at 10 m	dB (A)	54,6	54,2	53,8	56,3	55,9	55,5	56,0

Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110	1110
	Length	mm	2507	2507	2507	3407	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140	2140
	Weight	kg	724	754	895	1077	1120	1137	1170

(1) Cooling mode: external ambient temperature: 35 °C; evaporating temperature 5 °C.

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions.

(4) Dimensions and operating weights are referred to the unit without options.

SSN VERSION

			030	035	040	050	055	060
Cooling (1)	Cooling capacity	kW	75,6	85,2	100,0	111,1	123,9	144,1
	Total absorbed power	kW	22,8	24,3	31,1	36,0	37,7	43,3
	EER	-	3,32	3,50	3,21	3,09	3,28	3,33
Power supply (2)	Power	V/Ph/Hz	400 ± 10% / 3 - PE / 50					
	Auxiliary	V/Ph/Hz	24 - 230 ± 10% / 1 / 50					
Compressor	Refrigerant gas	-	Scroll					
	Type	-	R410A					
	Compressors / Cooling circuits	n°	2 / 1					
	Capacity control	-	0 - 50 - 100					
Condenser coils	Condensers number	n°	2	2	2	2	2	2
	Rows number	n°	3	3+4	4	3	4	4
	Total frontal surface	m ²	3,96	3,96	3,96	5,94	5,94	5,94
Fans	Type	-	Assiali					
	Fans number	n°	2	2	2	3	3	3
	Total airflow	m ³ /h	27600	27000	26300	41400	39300	39300
	Absorbed power (each)	kW	0,50	0,50	0,50	0,50	0,50	0,50
Refrigerant connexions	Suction line diameter	mm	42	42	42	54	54	54
	Discharge line diameter	mm	28	28	28	28	28	28
Sound levels (3)	Sound power	dB (A)	79,6	79,4	78,8	81,3	80,6	80,3
	Sound pressure at 10 m	dB (A)	51,6	51,4	50,9	53,3	52,6	52,3
Dimensions and weights (4)	Width	mm	1110	1110	1110	1110	1110	1110
	Lenght	mm	2507	2507	2507	3407	3407	3407
	Height	mm	2140	2140	2140	2140	2140	2140
	Weight	kg	749	778	919	1112	1155	1173

(1) Cooling mode: external ambient temperature: 35 °C; evaporating temperature 5 °C.

(2) Protection class IP54.

(3) Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions.

(4) Dimensions and operating weights are referred to the unit without options.

Model	Version	FLI (kW)	FLA (A)	ICF1 (A)	ICF2 (A)
030	N	33	57	179	168
	SN	32	53	170	166
	SSN	31	51	167	166
035	N	36	63	213	202
	SN	34	59	204	200
	SSN	33	57	201	200
040	N	44	75	270	258
	SN	42	71	261	256
	SSN	41	69	258	256
050	N	51	86	281	268
	SN	48	80	269	264
	SSN	47	77	265	264
055	N	56	94	328	315
	SN	53	88	316	311
	SSN	52	85	312	311
060	N	61	102	336	323
	SN	58	96	324	319
	SSN	57	93	320	319
065	N	70	116	374	361
	SN	67	110	362	357
	SSN	NA	NA	NA	NA

FLI = max power absorbed in the working limits condition (kW);

FLA = max current absorbed in the working limits condition (A);

ICF1 = start-up current at the start of the last compressor in the working limits condition (A) - with fans with step regulation.

ICF2 = start-up current at the start of the last compressor in the working limits condition with electronic fans control regulator. (A) - EC fans.

NA = not available.

Soft starter: installed on each compressor, these devices allow an average reduction of 30% of the starting current than direct start. Units equipped with a soft starter can operate up to a maximum ambient temperature of 40 °C, after which, the unit will enter in a safety mode, in order to preserving the operation of the machine. Soft starters are not compatible with capacitive elements, 60 Hz frequency and single phase power supply.

Model	Version	Octave bands (Hz)								Sound power (1)	Sound pressure(2)
		63	125	250	500	1000	2000	4000	8000	dB (A)	dB (A)10m
		Sound power level dB (A)									
030	N	62,6	73,4	80,6	81,7	82,7	78,5	70,3	64,5	87,5	59,5
	SN	58,9	69,0	75,8	76,8	77,7	73,8	66,1	60,6	82,6	54,6
	SSN	56,5	66,2	72,7	73,7	74,6	70,8	63,4	58,2	79,6	51,6
035	N	62,3	73,0	80,2	81,3	82,3	78,1	70,0	64,2	87,1	59,1
	SN	58,5	68,6	75,4	76,4	77,3	73,4	65,8	60,3	82,2	54,2
	SSN	56,3	66,0	72,6	73,6	74,4	70,6	63,3	58,0	79,4	51,4
040	N	62,0	72,7	79,9	81,0	81,9	77,8	69,7	63,9	86,7	58,8
	SN	58,2	68,2	75,0	76,0	76,9	73,0	65,4	60,0	81,8	53,8
	SSN	55,9	65,5	72,0	73,0	73,8	70,1	62,8	57,6	78,8	50,9
050	N	64,8	75,9	83,5	84,6	85,6	81,2	72,8	66,8	90,3	62,3
	SN	60,1	70,4	77,4	78,5	79,4	75,3	67,5	61,9	84,2	56,3
	SSN	57,8	67,7	74,4	75,4	76,3	72,4	64,9	59,5	81,3	53,3
055	N	64,6	75,7	83,2	84,4	85,3	81,0	72,6	66,6	90,1	62,1
	SN	59,8	70,1	77,0	78,1	78,9	75,0	67,2	61,6	83,8	55,9
	SSN	57,3	67,1	73,8	74,8	75,6	71,8	64,4	59,0	80,6	52,6
060	N	63,7	74,6	82,0	83,1	84,1	79,8	71,5	65,6	88,8	60,9
	SN	59,5	69,8	76,7	77,7	78,6	74,6	66,9	61,3	83,5	55,5
	SSN	57,0	66,8	73,5	74,5	75,3	71,5	64,1	58,8	80,3	52,3
065	N	64,5	75,6	83,1	84,2	85,1	80,8	72,4	66,4	89,9	61,9
	SN	59,9	70,2	77,2	78,2	79,1	75,1	67,3	61,7	84,0	56,0
	SSN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

(1) **Sound power:** determined on the basis of measurements taken in accordance with the standard ISO 3744.

(2) **Sound pressure at 10 m:** average value obtained in free field on a reflective surface at a distance of 10 m from the side of the condenser coils and at a height of 1.6 m from the unit support base. Values with tolerance +/- 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions.

NA = not available.

Distance	KdB
(1) L (m)	
1	15
3	10
5	6
10	0

(1) To calculate a different distance of the sound pressure level, use the formula: $dB(A)_L = dB(A)_{10m} + K_{db}$.

WORKING WEIGHTS

MODEL	N	SN	SSN
030	kg	724	749
035	kg	754	778
040	kg	895	919
050	kg	1077	1112
055	kg	1120	1155
060	kg	1137	1173
065	kg	1170	NA

NA = not available.

N VERSION

Cooling	External air temperature (°C)												t max(**) (°C)	
	27		30		32		35		38		43			
	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)		
030	0	72,9	21,5	70,2	22,6	68,4	23,4	65,6	24,6	62,6	26,0	57,3	28,4	46
	3	80,0	22,0	77,1	23,2	75,1	23,9	72,0	25,2	68,7	26,6	63,0	29,1	46
	5	84,9	22,4	81,8	23,5	79,7	24,3	76,4	25,6	73,0	27,0	67,0	29,5	46
	7	90,0	22,8	86,7	24,0	84,5	24,8	81,0	26,0	77,4	27,4	71,0	29,9	46
	8	92,6	23,1	89,3	24,2	87,0	25,0	83,4	26,3	79,6	27,6	73,1	30,2	45
	10	97,9	23,5	94,4	24,6	92,0	25,4	88,2	26,7	84,3	28,1	77,4	30,6	45
035	0	81,2	22,8	78,4	23,9	76,5	24,7	73,5	26,0	70,4	27,3	65,0	29,8	46
	3	89,1	23,4	86,1	24,5	84,0	25,3	80,8	26,6	77,4	27,9	71,5	30,4	46
	5	94,7	23,8	91,5	24,9	89,3	25,7	85,8	27,0	82,3	28,4	76,0	30,9	46
	7	100	24,2	97,0	25,4	94,7	26,2	91,0	27,5	87,3	28,9	80,7	31,4	46
	8	103	24,4	99,8	25,6	97,4	26,4	93,7	27,7	89,9	29,1	83,1	31,6	46
	10	109	24,9	106	26,1	103	26,9	99,2	28,2	95,1	29,6	88,0	32,1	45
040	0	97,0	27,8	93,6	29,1	91,4	30,1	87,9	31,6	84,3	33,3	78,2	36,5	46
	3	107	28,6	103	29,9	100	30,9	96,7	32,5	92,8	34,2	86,2	37,4	46
	5	113	29,1	109	30,5	107	31,5	103	33,1	98,7	34,8	91,7	38,1	46
	7	120	29,7	116	31,1	113	32,1	109	33,8	105	35,5	97,4	38,8	45
	8	124	30,0	119	31,4	117	32,5	112	34,1	108	35,8	100	39,1	44
	10	131	30,6	126	32,1	123	33,1	119	34,8	114	36,6	106	39,9	44
050	0	109	32,4	106	33,9	103	35,0	99,2	36,7	95,3	38,7	88,7	42,4	46
	3	121	33,2	116	34,7	114	35,8	109	37,6	105	39,6	98,0	43,4	46
	5	128	33,8	124	35,3	121	36,5	117	38,3	112	40,3	104	44,1	46
	7	136	34,4	132	36,0	129	37,1	124	39,0	119	41,0	111	44,8	46
	8	140	34,8	136	36,3	132	37,5	128	39,3	123	41,4	115	45,2	45
	10	149	35,5	144	37,1	140	38,2	135	40,1	130	42,2	122	46,1	44
055	0	121	35,2	117	36,8	114	38,0	110	39,9	106	42,0	98,5	45,9	46
	3	133	36,0	129	37,7	126	38,9	121	40,8	117	42,9	109	46,9	46
	5	142	36,6	137	38,3	134	39,5	129	41,5	124	43,6	116	47,5	46
	7	151	37,2	146	38,9	143	40,2	137	42,1	132	44,3	123	48,3	46
	8	155	37,5	150	39,3	147	40,5	142	42,5	136	44,6	127	48,6	46
	10	165	38,2	159	40,0	156	41,2	150	43,2	145	45,4	135	49,4	46
060	0	139	39,5	134	41,4	131	42,8	126	45,0	121	47,3	113	51,6	46
	3	153	40,5	148	42,4	144	43,8	139	46,0	133	48,4	124	52,8	46
	5	162	41,2	157	43,1	153	44,5	148	46,8	142	49,2	132	53,5	46
	7	172	41,9	166	43,9	163	45,3	157	47,6	150	50,0	140	54,4	46
	8	177	42,3	171	44,3	167	45,7	161	48,0	155	50,4	144	54,8	45
	10	188	43,1	182	45,1	177	46,5	171	48,8	164	51,2	153	55,7	45
065	0	155	44,0	150	46,2	146	47,8	141	50,3	135	53,1	126	58,1	46
	3	170	45,2	165	47,4	161	49,0	155	51,5	149	54,3	138	59,3	46
	5	181	46,0	175	48,2	171	49,8	165	52,4	158	55,2	147	60,3	46
	7	192	46,9	186	49,2	181	50,8	175	53,3	168	56,1	156	61,2	46
	8	198	47,3	191	49,6	187	51,2	180	53,8	173	56,6	161	61,8	46
	10	210	48,3	203	50,6	198	52,2	191	54,9	183	57,7	170	62,8	45

t evap: evaporating temperature (°C);
 Pf: cooling capacity (kW);
 Pa: total absorbed power (kW).

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5°C". All the performances of the condensing units are valid for the unit installed at a distance of 5 m and on the same floor of the remote evaporator, with pipes of the same diameter of the connections.

SN VERSION

Cooling t _{evap} (°C)	External air temperature (°C)												t _{max} (**) (°C)	
	27		30		32		35		38		43			
	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)		
030	0	71,0	20,4	68,3	21,6	66,4	22,4	63,5	23,7	60,4	25,1	55,1	27,6	45
	3	77,7	21,0	74,7	22,2	72,7	23,0	69,5	24,4	66,2	25,8	60,4	28,4	44
	5	82,3	21,5	79,2	22,7	77,0	23,5	73,7	24,8	70,2	26,3	64,1	28,9	43
	7	87,1	21,9	83,8	23,1	81,5	24,0	78,0	25,3	74,3	26,8			42
	8	89,6	22,2	86,2	23,4	83,8	24,2	80,2	25,6	76,4	27,0			42
	10	94,6	22,7	91,0	23,9	88,5	24,7	84,7	26,1	80,7	27,5			41
035	0	79,8	21,8	77,0	22,9	75,0	23,7	71,9	25,0	68,8	26,5	63,2	29,0	46
	3	87,5	22,4	84,3	23,6	82,2	24,4	78,9	25,8	75,4	27,2	69,4	29,8	45
	5	92,7	22,9	89,4	24,1	87,2	24,9	83,6	26,3	80,0	27,7	73,6	30,3	44
	7	98,2	23,4	94,7	24,6	92,3	25,4	88,6	26,8	84,7	28,2	78,0	30,8	44
	8	101	23,6	97,4	24,9	94,9	25,7	91,1	27,1	87,2	28,5	80,3	31,1	43
	10	107	24,2	103	25,4	100	26,3	96,3	27,6	92,1	29,1			42
040	0	94,0	27,1	90,7	28,5	88,4	29,5	84,9	31,2	81,3	33,0	75,2	36,4	45
	3	103	28,0	99,4	29,4	96,9	30,5	93,1	32,2	89,3	34,0	82,6	37,5	44
	5	109	28,6	105	30,1	103	31,2	98,9	32,9	94,8	34,7	87,7	38,2	43
	7	116	29,3	112	30,8	109	31,9	105	33,6	100	35,5			42
	8	119	29,7	115	31,2	112	32,3	108	34,0	103	35,9			41
	10	126	30,4	121	31,9	118	33,1	114	34,8	109	36,7			40
050	0	106	32,3	103	34,0	100	35,3	96,2	37,3	92,2	39,5	85,6	43,7	46
	3	117	33,4	113	35,1	110	36,3	106	38,4	102	40,7	94,3	45,0	45
	5	124	34,1	120	35,8	117	37,1	113	39,2	108	41,5	100	45,9	44
	7	132	34,9	127	36,7	124	38,0	119	40,1	115	42,4	107	46,8	43
	8	136	35,2	131	37,1	128	38,4	123	40,5	118	42,9			42
	10	144	36,1	139	37,9	135	39,3	130	41,5	125	43,8			41
055	0	118	33,6	114	35,3	111	36,6	107	38,6	103	40,8	95,4	44,9	46
	3	130	34,5	125	36,3	122	37,6	118	39,6	113	41,9	105	46,0	45
	5	138	35,2	133	37,0	130	38,3	125	40,4	120	42,6	112	46,8	44
	7	146	35,9	141	37,8	138	39,1	133	41,2	128	43,4	119	47,6	44
	8	151	36,3	145	38,2	142	39,5	137	41,6	131	43,9	122	48,1	43
	10	159	37,1	154	39,0	150	40,3	145	42,4	139	44,7			42
060	0	135	38,3	130	40,3	127	41,7	122	44,0	117	46,5	108	51,0	45
	3	148	39,4	143	41,5	139	42,9	134	45,3	128	47,8	119	52,3	44
	5	157	40,2	152	42,3	148	43,8	142	46,1	136	48,6	126	53,2	43
	7	166	41,1	161	43,2	157	44,7	151	47,0	145	49,6			42
	8	171	41,5	165	43,6	161	45,1	155	47,5	149	50,1			41
	10	181	42,4	175	44,6	170	46,1	164	48,5	157	51,0			40
065	0	151	43,6	146	46,0	142	47,7	137	50,4	131	53,3	122	58,6	46
	3	166	45,0	160	47,4	156	49,1	150	51,8	144	54,8	133	60,2	45
	5	176	46,0	170	48,4	166	50,1	159	52,9	153	55,8	141	61,3	44
	7	187	47,0	180	49,5	176	51,2	169	54,0	162	57,0	150	62,5	43
	8	192	47,6	185	50,1	181	51,8	174	54,6	166	57,6			42
	10	203	48,7	196	51,2	191	53,0	183	55,8	176	58,9			41

t_{evap}: evaporating temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW).

(**): When the external air temperature is higher than the "t_{max}" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5°C". All the performances of the condensing units are valid for the unit installed at a distance of 5 m and on the same floor of the remote evaporator, with pipes of the same diameter of the connections.

SSN VERSION

Cooling	External air temperature (°C)												t max(**) (°C)	
	27		30		32		35		38		43			
	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)	Pf (kW)	Pa (kW)		
030	t evap (°C)													
	0	72,3	18,5	69,7	19,7	67,8	20,5	65,0	21,7	61,9	23,1	56,7	25,6	46
	3	79,3	19,1	76,4	20,2	74,4	21,1	71,2	22,3	68,0	23,7	62,2	26,2	46
	5	84,1	19,5	81,1	20,7	78,9	21,5	75,6	22,8	72,1	24,2	66,1	26,7	46
	7	89,1	20,0	85,9	21,1	83,6	21,9	80,1	23,2	76,5	24,6	70,1	27,2	46
	8	91,7	20,2	88,4	21,3	86,0	22,1	82,4	23,4	78,7	24,8	72,1	27,4	46
10	97,0	20,6	93,4	21,8	90,9	22,6	87,1	23,9	83,2	25,3	76,3	27,9	45	
035	0	80,9	20,0	78,1	21,1	76,2	21,9	73,1	23,2	70,0	24,6	64,4	27,1	46
	3	88,8	20,6	85,7	21,8	83,6	22,6	80,3	23,9	76,8	25,3	70,8	27,8	46
	5	94,2	21,0	91,0	22,2	88,7	23,0	85,2	24,3	81,6	25,7	75,3	28,3	46
	7	99,8	21,5	96,4	22,7	94,0	23,5	90,3	24,8	86,5	26,2	79,9	28,8	46
	8	103	21,7	99,2	22,9	96,7	23,8	92,9	25,1	89,0	26,5	82,2	29,0	45
	10	109	22,2	105	23,4	102	24,3	98,3	25,6	94,2	27,0	87,0	29,6	45
040	0	94,9	25,4	91,5	26,8	89,2	27,8	85,7	29,4	82,2	31,2	76,0	34,6	46
	3	104	26,3	100	27,7	97,9	28,8	94,1	30,4	90,3	32,2	83,6	35,6	46
	5	110	26,9	107	28,4	104	29,4	100	31,1	95,9	32,9	88,9	36,3	45
	7	117	27,6	113	29,1	110	30,1	106	31,8	102	33,6	94,3	37,1	44
	8	120	27,9	116	29,4	113	30,5	109	32,2	105	34,0	97,0	37,5	43
	10	127	28,6	123	30,1	120	31,2	115	33,0	111	34,8			42
050	0	105	29,6	101	31,2	98,5	32,4	94,7	34,3	90,9	36,4	84,5	40,4	46
	3	115	30,5	111	32,1	108	33,3	104	35,3	100	37,4	93,3	41,5	46
	5	123	31,1	118	32,8	115	34,0	111	36,0	107	38,2	99,4	42,3	45
	7	130	31,8	126	33,5	123	34,8	118	36,8	113	39,0	106	43,2	45
	8	134	32,2	129	33,9	126	35,2	122	37,2	117	39,4	109	43,6	44
	10	142	33,0	137	34,7	134	36,0	129	38,0	124	40,3	116	44,6	43
055	0	116	31,1	112	32,8	110	34,1	106	36,0	102	38,2	94,4	42,2	46
	3	128	32,0	124	33,8	121	35,0	116	37,0	112	39,2	104	43,2	46
	5	136	32,7	132	34,4	129	35,7	124	37,7	119	39,9	111	44,0	46
	7	145	33,4	140	35,1	137	36,4	132	38,5	126	40,7	118	44,8	46
	8	149	33,7	144	35,5	141	36,8	136	38,8	130	41,1	121	45,2	46
	10	158	34,5	153	36,3	149	37,6	144	39,6	138	41,9	129	46,1	45
060	0	136	35,7	132	37,7	128	39,1	124	41,3	119	43,7	110	48,2	46
	3	150	36,7	145	38,8	141	40,2	136	42,5	130	44,9	121	49,4	46
	5	159	37,5	153	39,6	150	41,0	144	43,3	138	45,8	128	50,3	45
	7	168	38,3	163	40,4	159	41,9	153	44,2	147	46,7	136	51,2	44
	8	173	38,7	167	40,8	163	42,3	157	44,6	151	47,1	140	51,7	43
	10	183	39,6	177	41,7	173	43,2	166	45,5	160	48,1	148	52,6	43

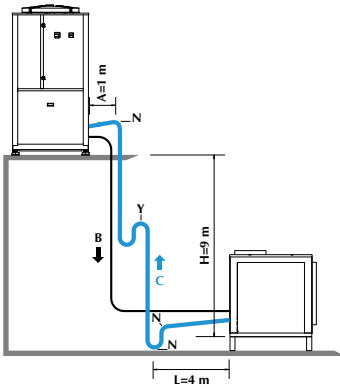
t evap: evaporating temperature (°C);

Pf: cooling capacity (kW);

Pa: total absorbed power (kW).

(**): When the external air temperature is higher than the "t max" the unit doesn't stop but the "unloading" system capacity control is activated. Interpolation is allowed. Extrapolation is not permitted. To calculate Pf, Pa and Fw for ΔT ≠ 5 °C to examine the table "Correction factors for ΔT ≠ 5°C". All the performances of the condensing units are valid for the unit installed at a distance of 5 m and on the same floor of the remote evaporator, with pipes of the same diameter of the connections.

CONDENSING UNIT INSTALLATION AND PERFORMANCE CALCULATION



The diagram shows how the unit should be installed whereby:

- Total horizontal length = A+L
- Total vertical height = H
- Total number of curves = N
- Total number of syphons = Y

Installation tips: Allow a 2° inclination for all vertical lines (A+L).

Forsee a syphon for every 4,5 m (Y) in all vertical lines.

Forsee a double curve (N+N) at the bottom of vertical lines.

The correct dimensioning and installation of the refrigerant lines between condensing and evaporating units is of fundamental importance, and must be carried out by expert personnel.

CONNECTION SIZE BY MODEL

		030	035	040	050	055	060	065
MCTAT	Suction line diameter	mm	42	42	42	54	54	54
	Discharge line diameter	mm	28	28	28	28	28	28

Calculate the equivalent length using the formula (whereby CE and SE are calculated using the below table):

$$\text{total equivalent length (Le)} = \text{total horizontal length (A+L)} + \text{total vertical height (H)} + \text{equivalent curve length (CE)} + \text{equivalent syphon length (SE)}$$

EQUIVALENT LENGTH FOR CURVES AND SYPHONS

	m	External / internal tube diameter (mm)								
		10 / 8,5	12 / 10,5	16 / 14	18 / 16	22 / 20	28 / 25	35 / 32	42 / 39	54 / 50
Equivalent length for curve	m	0,3	0,38	0,48	0,60	0,80	1,1	1,4	1,8	2,4
Equivalent length for syphon	m	1,1	1,5	1,9	2,4	2,7	3,4	4,4	5,4	7,1

Now calculate the equivalent length correction factor (K5) using the table below:

CORRECTION FACTORS FOR DISTANCE AND DISLEVEL

	Vertical height (H) (m)	K5	Equivalent length Le (m) MCTAT				
			5	10	15	20	30
evaporator below unit	0	K5	1,00	0,99	0,97	0,95	0,92
	4,5	K5	0,99	0,98	0,96	0,94	0,91
	9,0	K5	-	-	0,95	0,93	0,90
	13,5	K5	-	-	-	0,92	0,90
evaporator above unit	0	K5	1,00	0,98	0,96	0,94	0,91
	4,5	K5	0,99	0,97	0,95	0,93	0,90
	9,0	K5	-	-	0,94	0,92	0,89
	13,5	K5	-	-	-	0,91	0,89

Also verify that the equivalent length (Le) and the vertical height (H) do not exceed the maximum value allowed for the given unit, using the below table:

		030	035	040	050	055	060	065
MCTAT	Maximum equivalent length (Le)	m	30	30	30	30	30	30
	Maximum vertical height (H)	m	13,5	13,5	13,5	13,5	13,5	13,5

It is now possible to calculate the units installed capacity (kW_i) as per the following formula: kW_i = kW_n (nominal capacity) x K5.

Working example for an MCTAT 040 (refer also to above diagram)

Total equivalent length (Le) = total horizontal length (A+L) + total vertical height (H) + equivalent curve length (CE) + equivalent syphon length (SE).

Horizontal length	L	m	4
Horizontal length	A	m	1
Vertical height	H	m	9
Syphon ø 42	Y	m	5,4
Double lower curve	N+N	m	3,6
Upper curve	N	m	1,8
Equivalent total length		m	24,8 --> 25 m

Given that, for MCTAT 040, the maximum value for Le is 30 m and for H is 13,5 m, so the above installation is permitted. The capacity can now be calculated as kW_i = kW_n x K5, whereby K5 for an MCTAT with Le = 25 m and H = 9 m is 0,915 (interpolated value).

kW _n	Nominal capacity (T evap = 5 °C, T ambient = 35 °C)	104,2
K5	Correction factor	0,915
kW _i	Installed capacity (T evap = 5 °C, T ambient = 35 °C)	95,3

	°C	Min	Max
		N/SN/SSN	N/SN/SSN
External ambient temperature	°C	-5 ⁽¹⁾ / -10 ⁽²⁾ / -20 ⁽³⁾	[4]
Evaporating temperature	°C	0	12

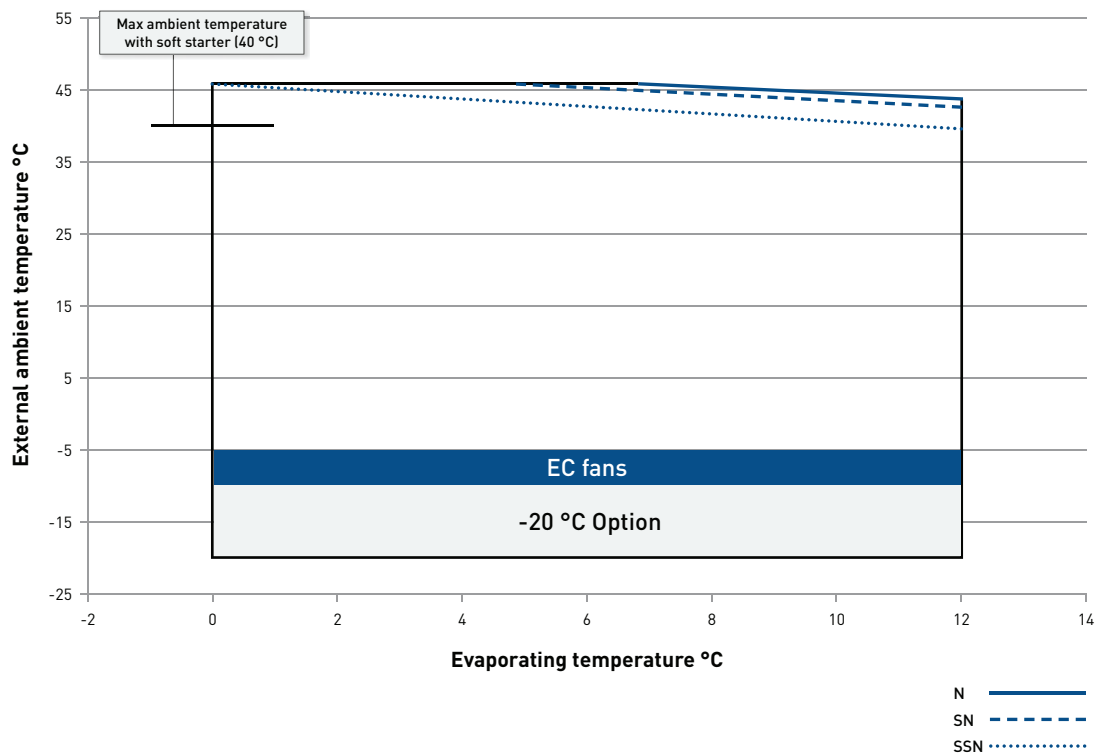
(1) Referred to N, SN, SSN versions with fans with step regulation.

(2) Referred to N, SN, SSN version with EC fans.

(3) Referred to units equipped with -20 °C Option.

(4) See tables with the unit's performances. Units equipped with a soft starter can operate up to a maximum ambient temperature of 40 °C, after which, the unit will enter in a safety mode, in order to preserving the operation of the machine.

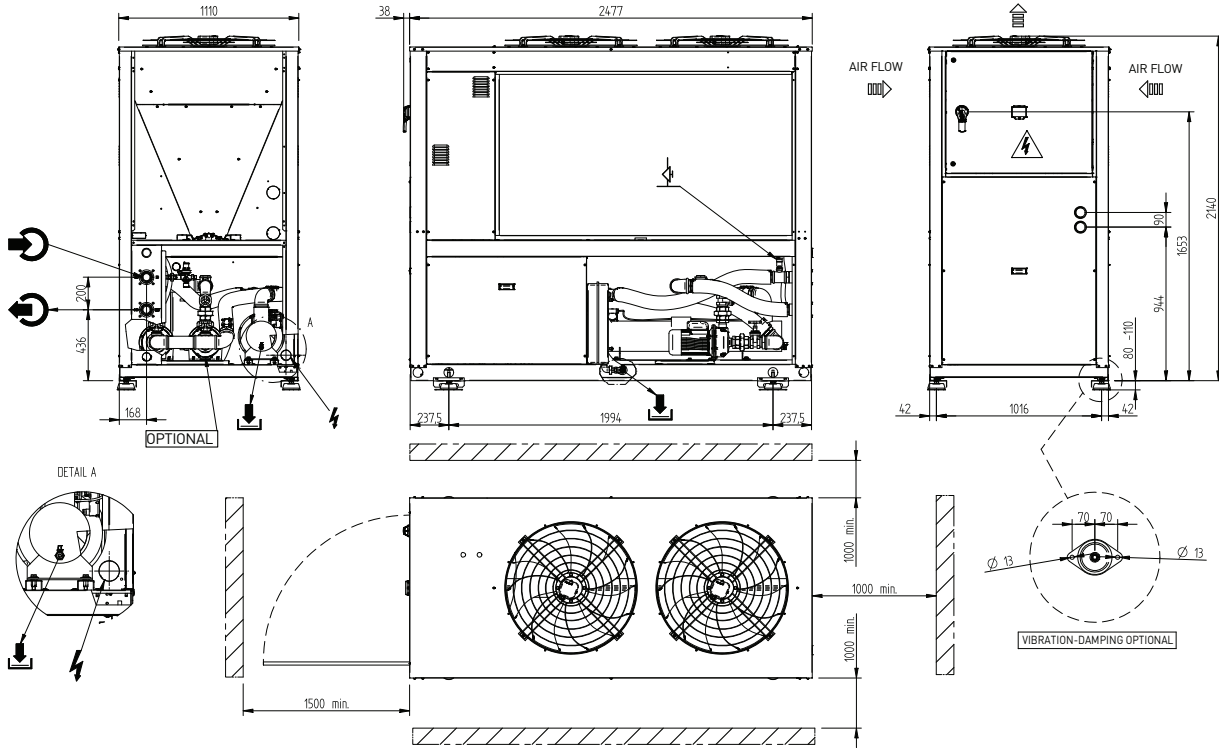
MCTAT N, SN, SSN



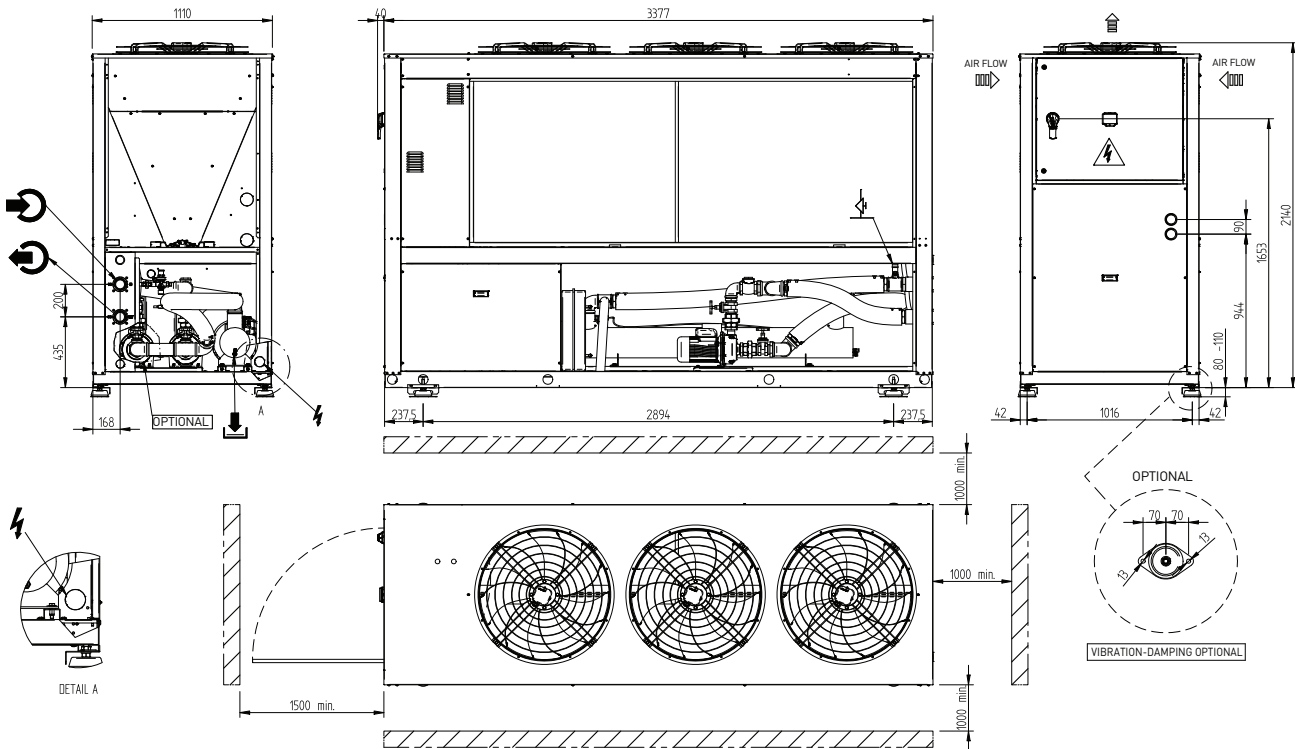
The maximum ambient temperature reported in the graph refers to an average value of the range. For exact values, refer to the performance tables.

OVERALL DIMENSIONS

TAT 030 - 035 - 040 Evaporator shell and tubes type



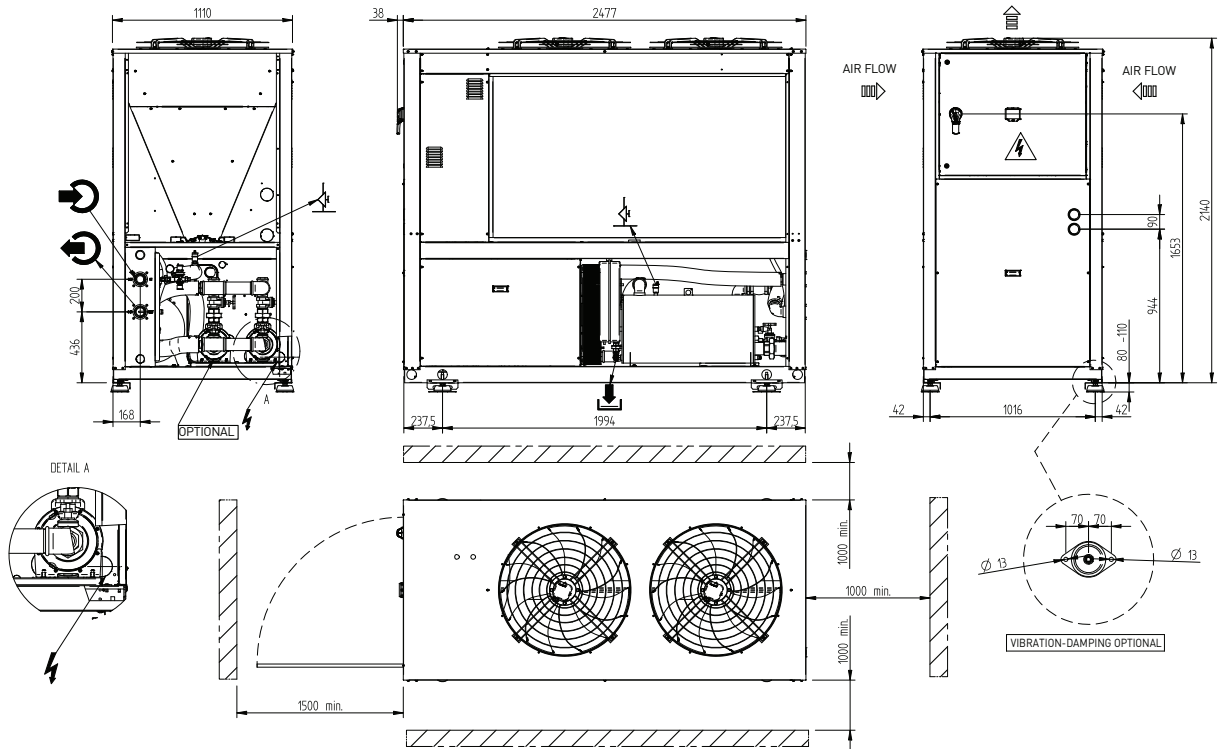
TAT 050 - 055 - 060 - 065 Evaporator shell and tubes type



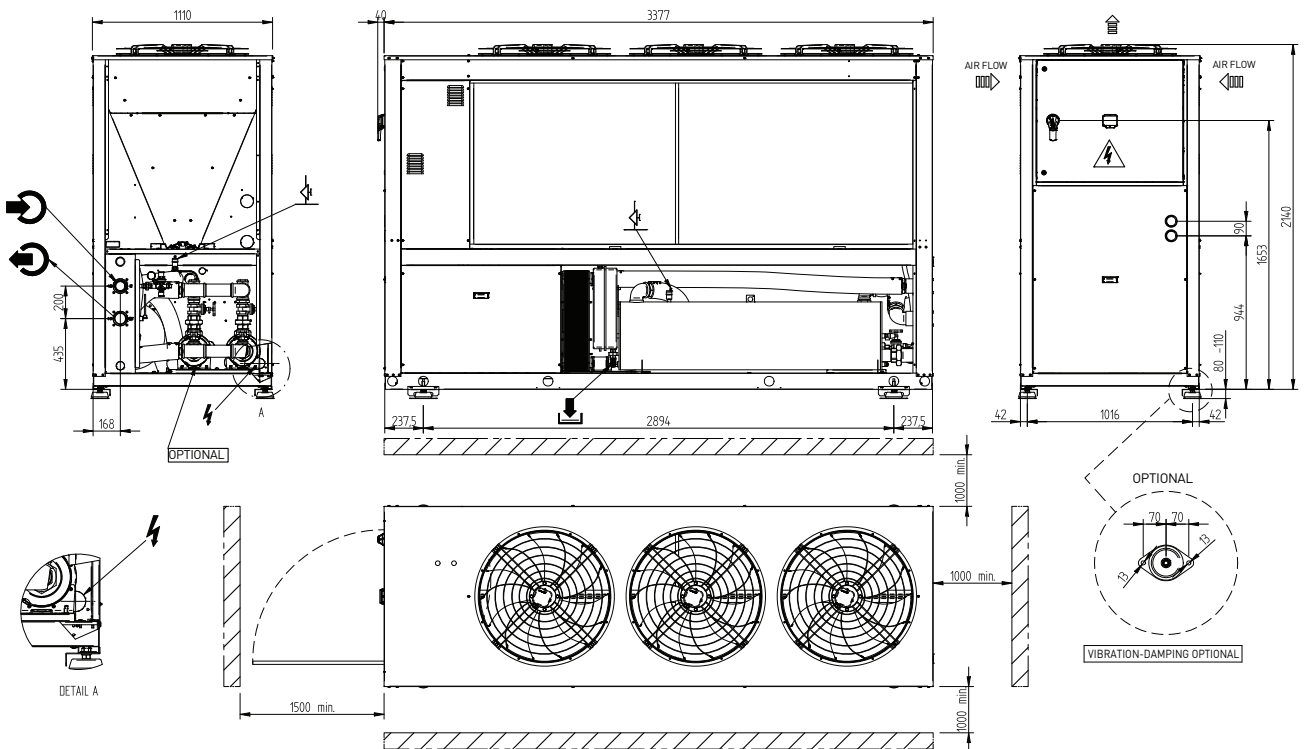
		030	035	040	050	055	060	065
Water inlet	Ø IN	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Water outlet	Ø OUT	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

- : Evaporator water inlet
- : Evaporator water outlet
- : Water discharge
- : Power supply
- : Air flow




TAT 030 - 035 - 040 Evaporator plates type





TAT 050 - 055 - 060 - 065 Evaporator plates type

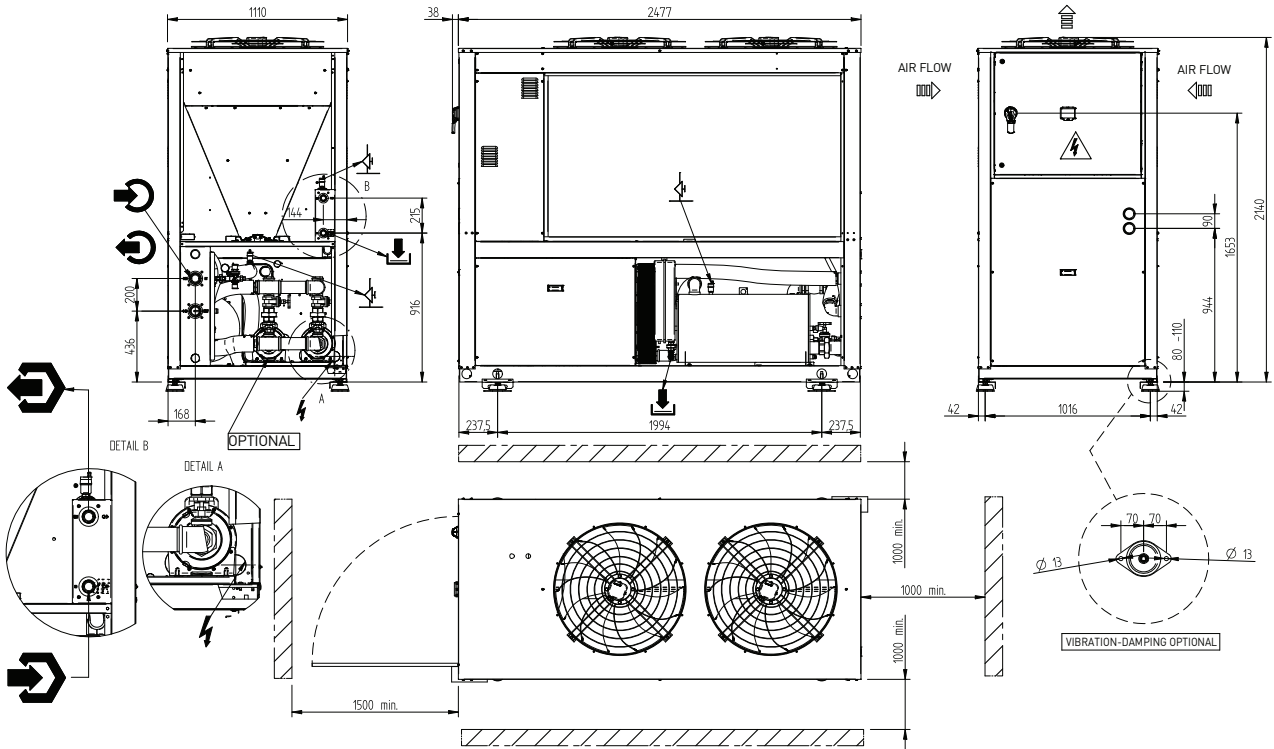


		030	035	040	050	055	060	065
Water inlet	Ø IN	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Water outlet	Ø OUT	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

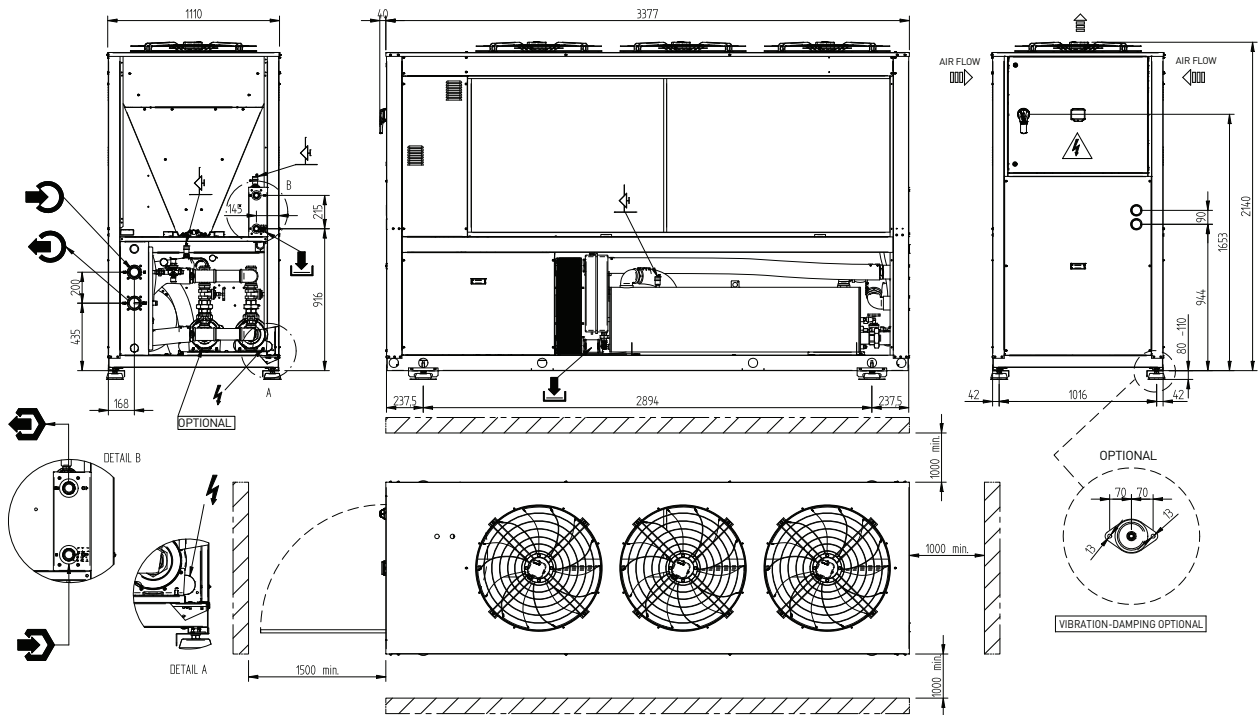
-  : Evaporator water inlet
-  : Evaporator water outlet
-  : Water discharge

-  : Power supply
-  : Air flow

TAT 030 - 035 - 040 Partial heat recovery



TAT 050 - 055 - 060 - 065 Partial heat recovery

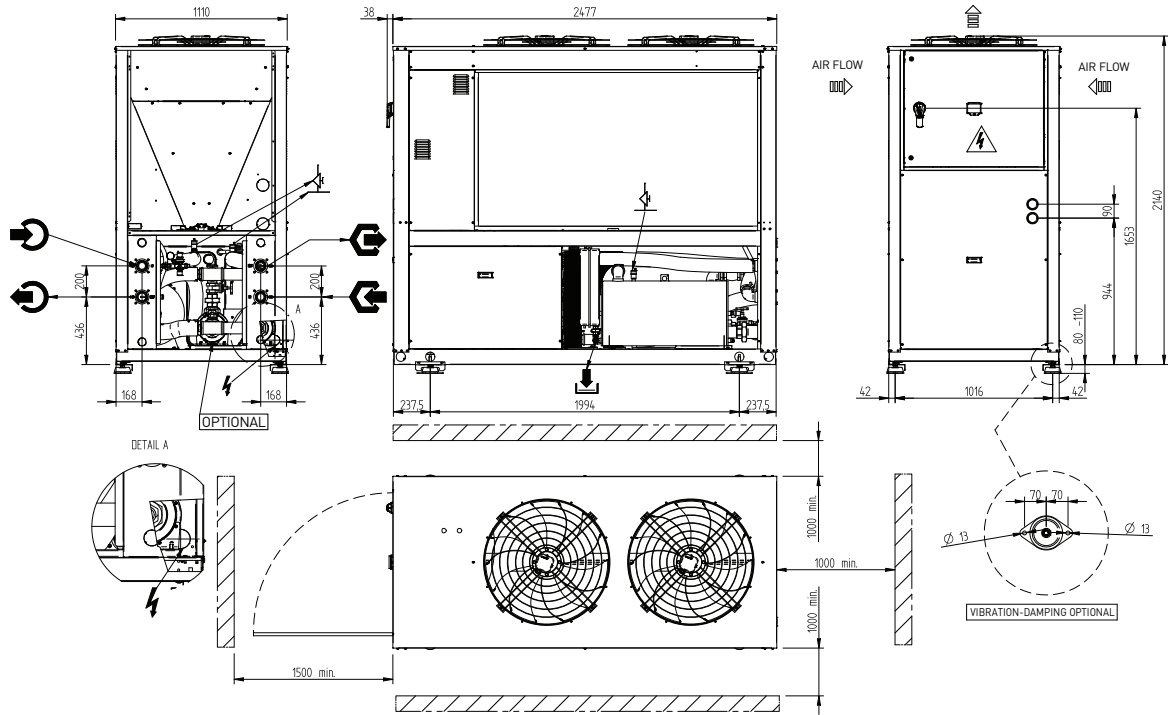


		030	035	040	050	055	060	065
Desuperheater water inlet	Ø IN	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"
Desuperheater water outlet	Ø OUT	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"	Rp 1"
Evaporator water inlet	Ø IN	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Evaporator water outlet	Ø OUT	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

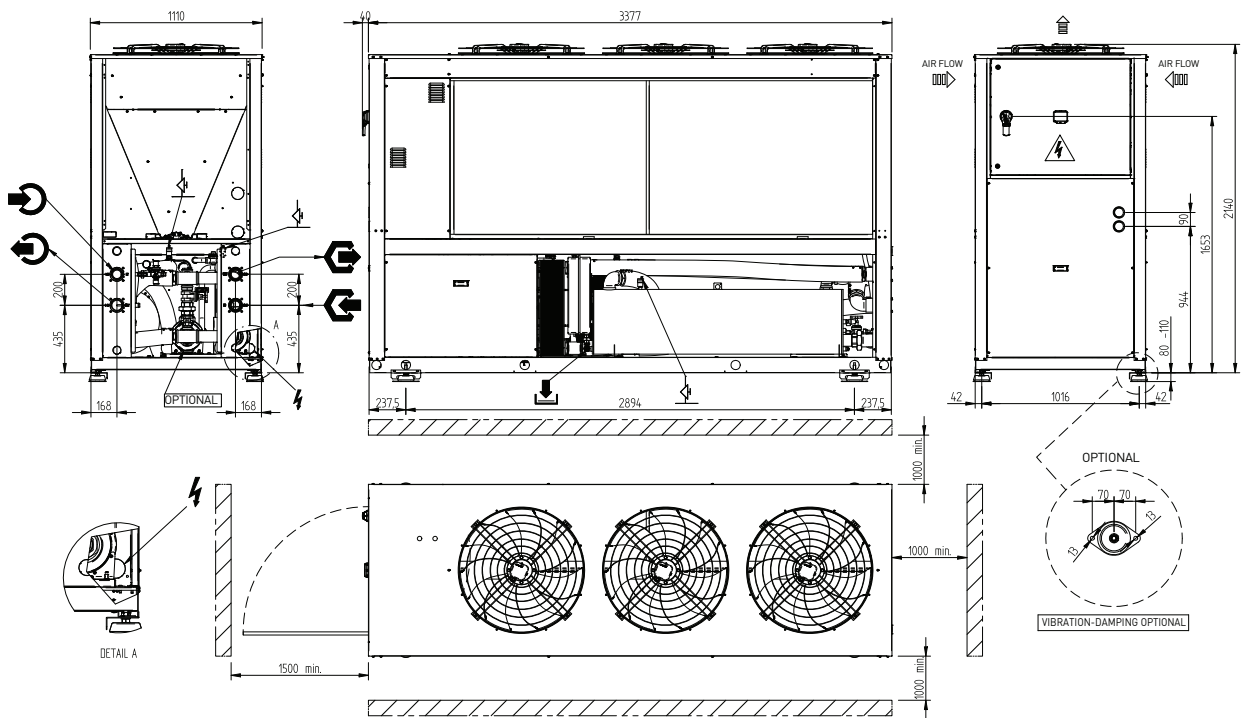
- : Desuperheater water inlet
- : Desuperheater water outlet
- : Evaporator water inlet
- : Evaporator water outlet

- : Water discharge
- : Power supply
- : Air flow





TAT 030 - 035 - 040 Total heat recovery






TAT 050 - 055 - 060 - 065 Total heat recovery

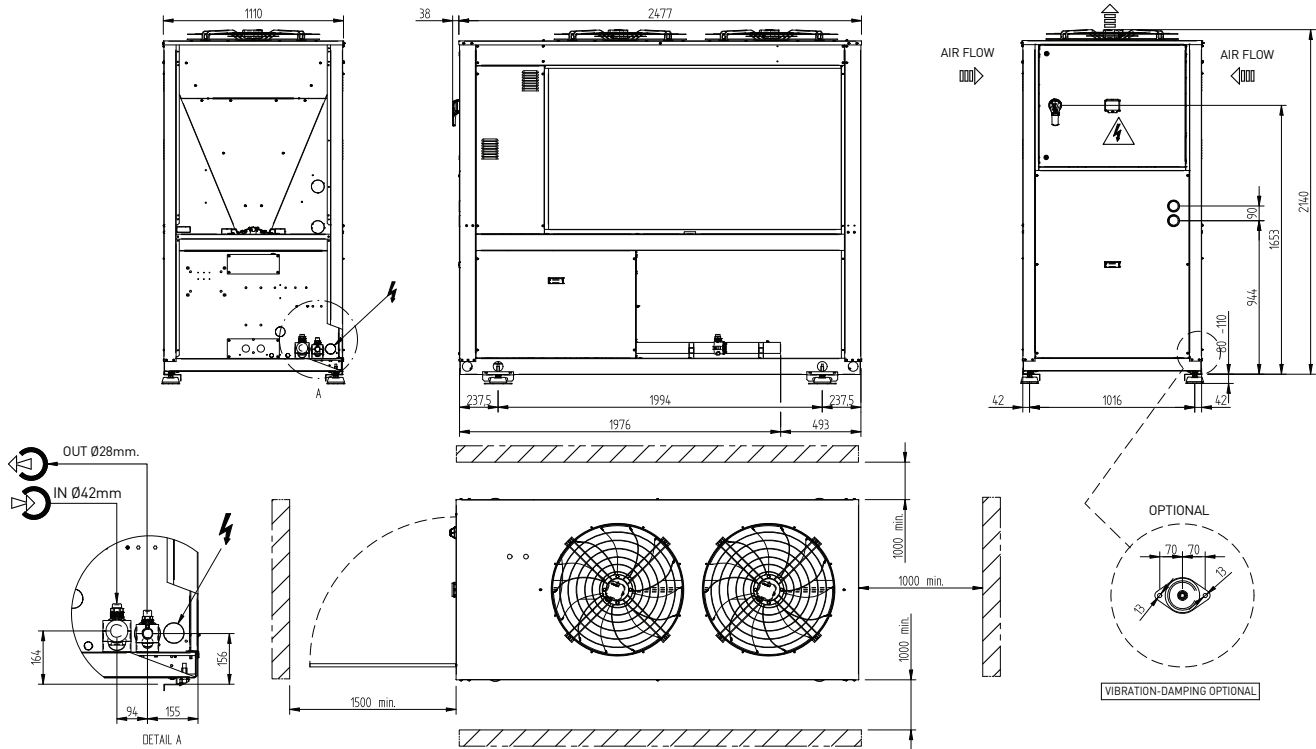


		030	035	040	050	055	060	065
Heat Recovery water inlet	Ø IN	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Heat Recovery water outlet	Ø OUT	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Evaporator water inlet	Ø IN	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"
Evaporator water outlet	Ø OUT	Rp 2"	Rp 2"	Rp 2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"	Rp 2 1/2"

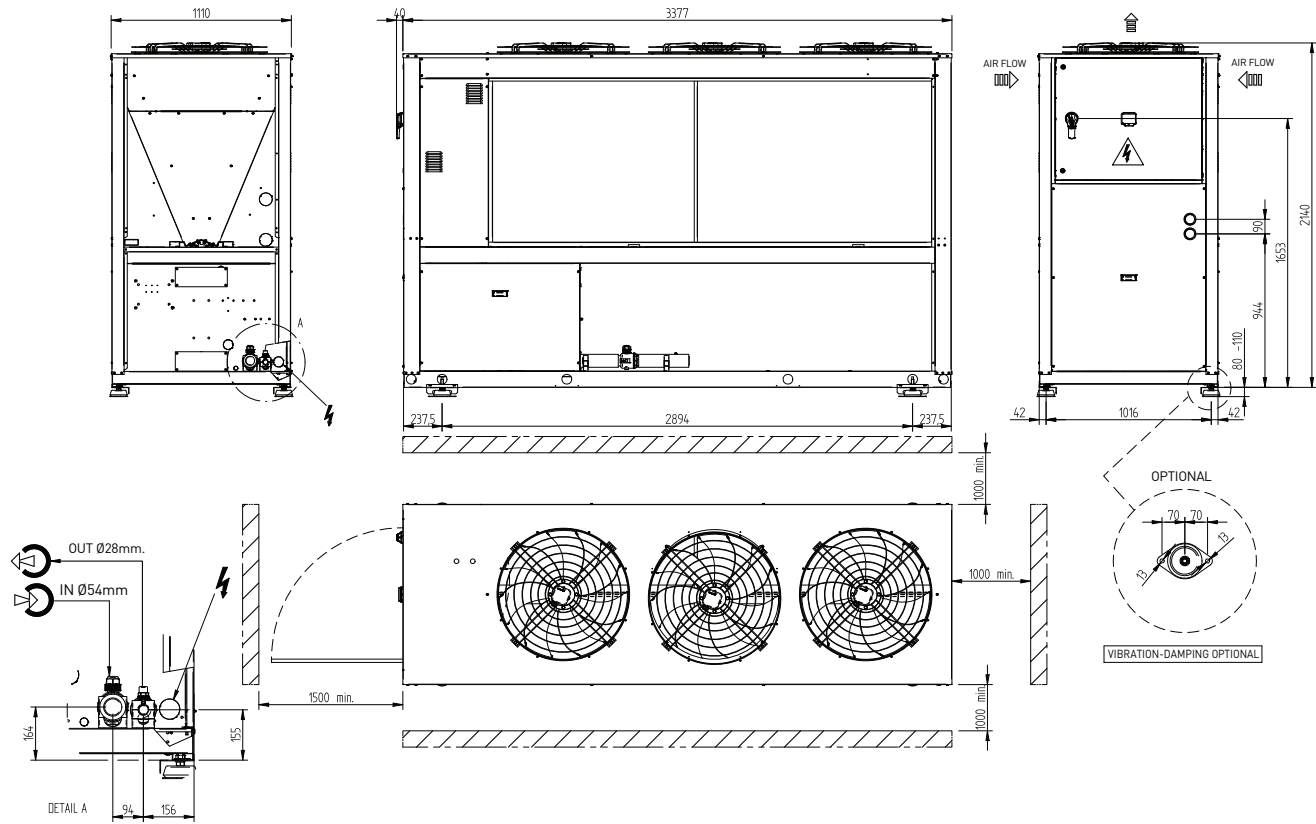
-  : Heat Recovery water inlet
-  : Heat Recovery water outlet
-  : Evaporator water inlet
-  : Evaporator water outlet

-  : Water discharge
-  : Power supply
-  : Air flow



MCTAT 030 - 035 - 040 Condensing units





MCTAT 050 - 055 - 060 - 065 Condensing units



		030	035	040	050	055	060	065
Suction line	Ø IN	42 mm	42 mm	42 mm	54 mm	54 mm	54 mm	54 mm
Discharge line	Ø OUT	28 mm	28 mm	28 mm	28 mm	28 mm	28 mm	28 mm

 : Suction line
 : Discharge line

 : Power supply
 : Air flow

INSTALLATION GUIDE

The installation of the chiller/heat pump must adhere to the following (for condensing units refer also to the specific information contained in this document):

- a) The units must be installed level to guarantee a correct return of the oil to the compressor.
- b) To observe the correct space requirements as indicated in the catalogue for maintenance and airflow.
- c) Where possible, to install the unit in a way to minimise the effects of noise, vibration, etc. In particular, do not install the chiller in areas where the noise could cause nuisance as under windows or between two residences. The vibrations transmitted to the ground must be reduced by using anti-vibration mounts, flexible joints on the water pipelines and on the conduit containing the cable of the electrical supply.
- d) For electrical connections, always consult the electrical drawings dispatched with each chiller.
- e) Make the unit's hydraulic connection as indicated:
 - anti-vibration joints;
 - shut off valves;
 - vents on the highest points of the installation;
 - drains on the lowest points of the installation;
 - pump and expansion vessel;
 - water filter (0,5 mm mesh for models 030-035-040 and with 0,8 mm mesh for models 050-055-060-065) on the evaporator inlet.
- f) Place a suitable wind barrier in proximity of the condenser coils if the chiller works with external air temperature below 0 °C and there is a possibility that the condenser coils could come in contact with wind speed higher than 2 m/s.
- g) In the case of cooling/heating capacity greater than the maximum available from a single unit, the hydraulic system of the chiller can be connected in parallel, possibly selecting the same type of unit just to avoid water flow imbalance.
- h) When high temperature differences of the fluid to be treated, the hydraulic system of the chillers can be connected in series so each chiller provides a portion of the ΔT in the water.
- i) When utilising multiple units in parallel, with the condenser coils face to face it is necessary to assure a minimum distance between the condensers coils. The minimum distances recommended between the units are suggested in the overall dimensions.
- l) In the case of water flow greater than the maximum allowed by the unit, it is necessary to fit a by-pass between inlet and outlet of the chiller.
- m) In the event of water flow lesser than the minimum allowed by the unit, fit a by-pass between outlet and inlet of the chiller.
- n) It is recommended to purge all air from the hydraulic system because a small quantity of air could cause freezing in the evaporator.
- o) During inactivity in winter, the hydraulic system must be discharged or, alternatively, antifreeze must be used. Again we suggest, specifically for brief unit stops and only for external air temperature up to -10 °C, the use of an antifreezing heater around evaporator and other antifreezing heaters on the cooling circuit tubes.
- p) Must be avoided the operation of the pumps in the absence of water, even during startup.

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- Air/Water with cooling capacity up to 600 kW
- Water/Water up to 1500 kW



GOST Certification



Cooling, conditioning, purifying.