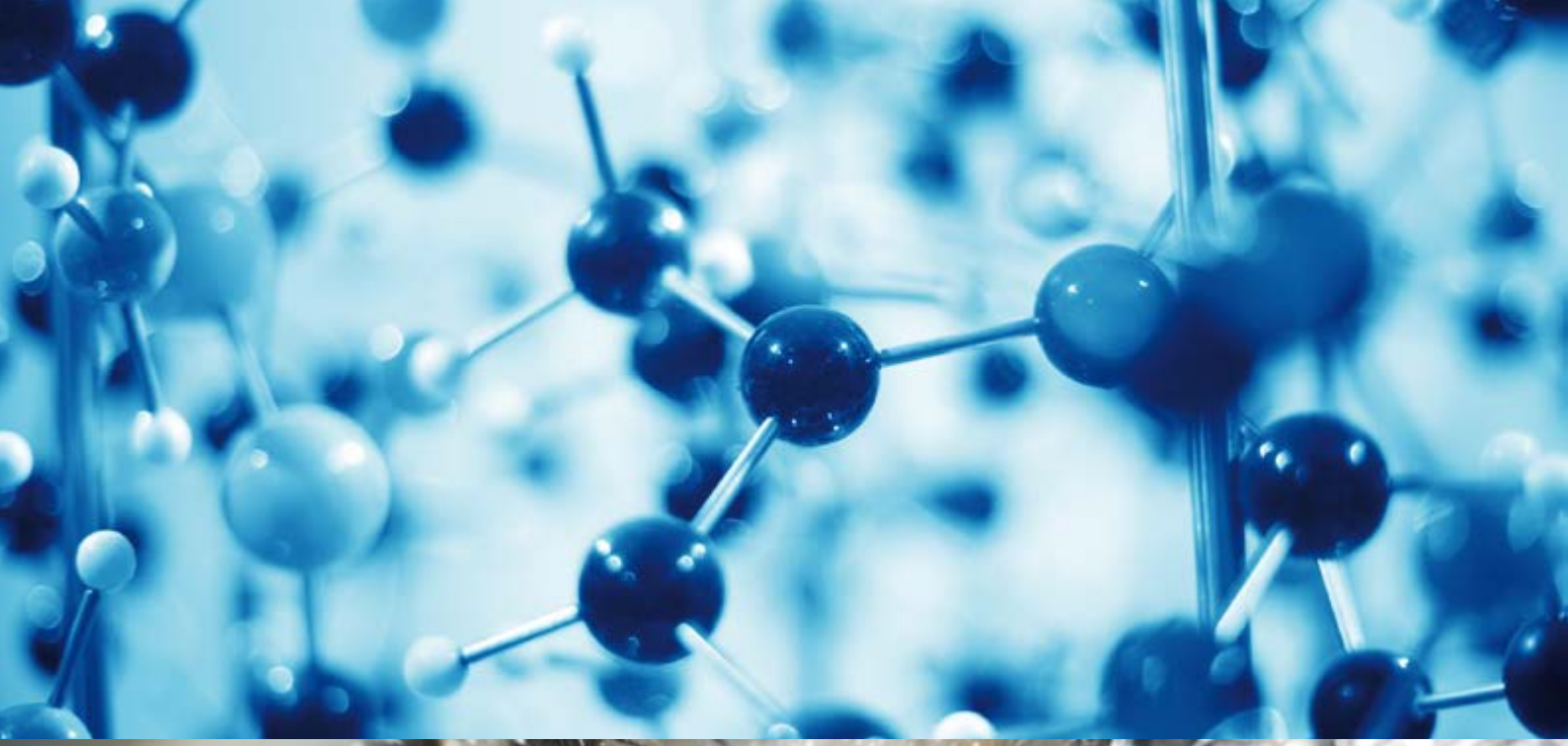
TAEN MINI

R290

Air-cooled industrial chillers.
Nominal cooling capacity 1,7 – 4,4 kW

Technical Catalogue

MTA®
Cooling, conditioning, purifying.



TAE N MINI

TECHNICAL SPECIFICATIONS

1. General

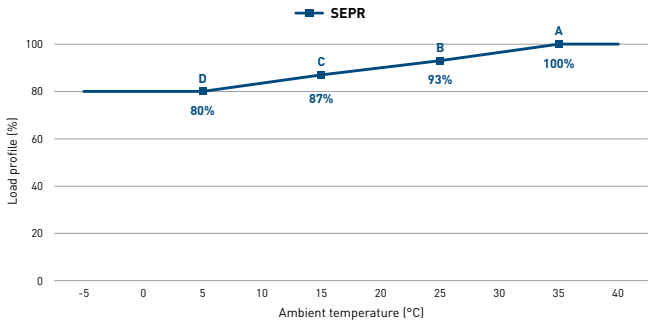
TAE N Mini is an air-cooled liquid chiller, designed for industrial application and indoor installation. TAE N Mini is therefore the proper solution for all applications that require high performances, reliability, continuity of operation and reduced management costs.
The TAE N Mini range is composed by 4 models with nominal cooling capacity from 1,7 to 4,3 kW. All models are equipped with non-ferrous hydraulic circuit, high efficiency finned coil evaporator immersed in an atmospheric storage tank and hydraulic pump. The standard storage tank ensures optimum precision in the control of temperature even with highly variable thermal loads, as well as simplify the installation process. The TAE N Mini units are equipped with micro-channels condenser, axial fans and hermetic rotary compressors installed on a single refrigeration circuit. The refrigerant fluid is the R290, natural and ecological solution (GWP = 3, ODP = 0). The handling of all TAE N Mini is provided by a parametric microprocessor control capable of managing all the main functions, including outlet water temperature control, alarms, and user interface.
The TAE N Mini units are available in standard version with electrical power supply 230V/1Ph/50Hz.
The standard product, intended for EEC and EFTA states, is subject to:

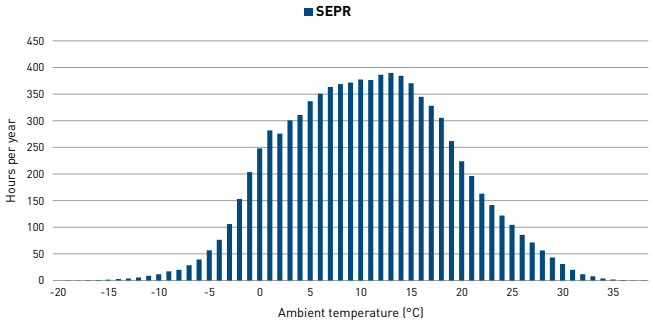
- Machinery Directive 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EU;
- ERP Directive 2009/125/EC for seasonal energy efficiency SEPR HT (*);
- The electrical equipment is designed in conformity of EN 60204-1 regulation.

All data in this catalogue refer to standard units and nominal operating conditions (unless otherwise specified).

(*) SEPR HT

The Seasonal Energy Performance Ratio High Temperature (SEPR HT), used in the European design context, expresses the ratio between the cooling demand and the total absorbed power of the unit during the entire year of operation, considering the maximum operating load point (Tw 12/7 °C a 35 °C) and the three partial load point with lower ambient temperature projected on the average annual temperature in Strasbourg. The higher the SEPR HT value is, the more energy efficient of the unit will be, considering the annual process cooling context with outlet water temperature 7 °C.





2. Nameplate

T A E N M XX

- XX: Power indicative of the refrigeration compressor in HP;
- M: Mini;
- N: Natural refrigerant;
- E: Hermetic compressor;
- A: A = air-cooled condenser;
- T: T="tank"; cooler with storage tank.

3. Testing

All chillers are tested to verify the correct operation. The main checks performed are as follows:
- the correct installation of all components and the refrigerant leaks tests;
- electrical safety tests as prescribed by EN 60204-1;
- correct operation of microprocessor control and the values of all 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. Is recommended to install a hydraulic filter on the inlet of evaporator.

4. Compressor

All TAE N Mini are fitted with hermetic rotary compressors, developed, and optimized for R290 refrigerant fluid. The compressor is equipped with run capacitor (PSC) and mounted on antivibration dampers to reduce the noise level. The electrical motors are cooled through the suction gas and are configured with internal thermal protection.

5. Evaporator

High efficiency finned coil exchanger configured with copper tubes and aluminium fins. Installed inside the storage tank, the evaporator cools the process fluid that flows in contact with the finned surface, exchanging heat with the refrigerant fluid evaporating inside the tubes. This design allows TAE N Mini to operate with high flow rates and reduced pressure drops, ensuring a high level of reliability in heavy industrial applications, also with liquids containing impurities. The anti-freeze function of the parametric microprocessor controls the outlet temperature of the process fluid while protecting the evaporator from the danger of freezing. All evaporators installed on the TAE N Mini chillers can work with anti-freeze solutions and, generally, with all other liquids that are compatible with the materials utilised in the hydraulic circuit (refer to the list of materials in contact with process fluids).

6. Benefits of integrated storage tank

In a system designed for industrial process the user load can suffer significant and sudden variations or the operating conditions that are very different from nominal conditions for long periods. Consequently, the chiller supplying the system operates both at full load but also with continuous on/off cycles. This scenario is harmful to the lifetime of compressors and often results in significant fluctuations of the chilled water temperature, clearly undesirable both from the energy efficiency and in relation to the requirements of the system.
The benefits deriving from the integrated storage tank can be summarised as follows:
- Availability of a water reserve for the process that must be controlled. In this way "energy stored "in the tank is able to compensate the fluctuations of user load.
- Stable operating conditions for the compressors. In this way the unit can work with constant inlet temperature regardless of external conditions. Together with the stable water flow rate this is one of main conditions to preserve the durability of compressors.
- Limitation of compressor starts ensuring a proper timing of compressors running/stopping.

7. Condensing coil

Micro-channels condenser configured with aluminium tubes and fins. The inlet/outlet connections are made completely in copper. Developed utilising the latest design technology, making it possible to achieve high efficiency values. The condenser is protected by removable metal filter to facilitate cleaning procedures.

8. Fans

Axial fans equipped with plastic blades that are directly connected to the electric motor (IP54) insulation class F. Configurated with built-in run capacitor and internal thermal protection. The fans are statically and dynamically balanced and complete with safety grides and directly mounted on the condenser plenum.

9. Refrigeration circuit

The refrigeration circuit configuration is:
- **Compressor:** rotary;
- **HP High pressure switch:** fixed calibration and manual reset;
- **Condenser:** aluminium micro-channels exchanger;
- **Molecular sieves filter dehydrator:** it retains the impurities and any traces of moisture in the refrigeration circuit;
- **Lamination device:** capillary tube;
- **Evaporator:** finned coil exchanger configured with copper tubes and aluminium fins.

10. Structure and casing

The structure is composed by a base, a top cover and the perimetral panelling. On the front panel there is the parametric microprocessor display. On the rear panel are positioned the IN/OUT process fluid connections, the hydraulic discharge, the connection for the overflow, the water pressure gauge, the fluid level display, and the electrical power supply input. The right-side panel is louvered to provide the ventilation necessary for to the condenser coil and it is removable to allow access to the components of the refrigerant and hydraulic circuits. The left side panel supports the condensing coil and the removable protective filter. The panels and the base are made of galvanized carbon steel sheet and joined together with rivets of galvanized steel or with metric screws to facilitate removal of the same. All the panels undergo a phosphor degreasing phase followed by epoxy polyester powder coating. The base is panted in RAL 5013 blue colour, while the rest of the structure and panels are in RAL 7035 light grey.
All models are equipped with eyebolts as standard.

11. Hydraulic circuit

The hydraulic circuit is open and configured with non-ferrous materials (pipe fittings of non-ferrous materials, stainless steel and/or brass and/or plastic). It's composed by:

STORAGE TANK
All models are equipped with a thermal inertial storage tank (containing the evaporator) externally protected by an insulating and anti-condensation layer. The storage tank is equipped with a drain valve, water filling and overflow connections.

HYDRAULIC BY-PASS
All TAE N Mini are equipped with an internal by-pass between the hydraulic outlet and inlet connections. In case of an incorrect closing of inlet/outlet connections, the hydraulic by-pass allows the unit and the pump to preserve their integrity, ensuring a minimum fluid flow rate necessary for both the anti-freeze warning and the pump circuit breaker alarm.
Warning: the by-pass has been designed only for preserving the integrity of the unit if the shut-off valves fail to close. The by-pass operation with continuous cycles for extended periods is strictly forbidden.

NTC TEMPERATURE PROBE
Positioned on the hydraulic circuit, it detects the outlet temperature of the process fluid from the evaporator (anti-freeze and thermostatic control functions).

PUMPS
The model M03 is equipped with a peripheral pump with impeller and body in brass, mechanical seal (silicon carbide / graphite / FPM).
The units M05 - M10 are equipped with peripheral pump with body in RYTON, front cover and impeller brass, mechanical seal (silicon carbide / graphite / FPM). The pumps feature an asynchronous 2 poles motor with thermal protection in the winding. The available head pressure is approximately 3 barg.

WATER PRESSURE GAUGE
A water pressure gauge (0-6 barg) on the unit's rear panel indicates the water pressure on the unit outlet.

MATERIALS IN CONTACT WITH PROCESS FLUID
Stainless steel, copper, brass, plastic (polyetilene) and aluminium.

12. Electrical panel

The electrical cabinet is designed according to the standard EN 60204-1. It includes a power section and a control section with labelled electrical cables. The power section includes the fuse to protect the parametric microprocessor control, while the electrical sectioning is guaranteed by the cable with plug. The control section of all models includes the microprocessor control.

13. Microprocessor control

TAE N Mini is controlled and managed by the electronic microprocessor controller with parametric display and icon-based identification of functions. Through a user-friendly menu is possible to view and modify the main operating parameters.

The controller manages the following functions:
- Thermostatic control depending on the fluid outlet temperature (neutral zone);
- Process fluid output temperature display;
- Display of the history of the MIN/MAX values measured by the outlet water temperature probe;
- Management of alarm messages:
  - high condensing pressure alarm;
  - ant-freeze alarm on water at the evaporator outlet.

14. Kits

- **Dynamic set-point kit:** the controller adjusts the working set-point following the temperature read by a temperature probe placed outside the unit;
- **Hydraulic filter kit:** y-shaped protection filter to be installed on the hydraulic connection at the evaporator inlet;
- **External automatic hydraulic by-pass kit:** the kit features an adjustable pressure relief valve in bronze with proportional operating characteristics;
- **Wheels kit:** it allows the handling of the chillers and includes two fixed wheels to be installed in the rear of the unit and two movable wheels to be installed in the front of the unit;
- **Antivibration mounts kit**.

15. Options (on request)

- **P5 Pump (mod.08-10):** Non-ferrous peripheral pump type, with available head pressure of about 5 barg,
- **Hydraulic sectioning system (mod. M08-M10):** It allows the installation the unit at lower level than the user avoiding the emptying of the hydraulic circuit when the pumps stop. The kit includes a check valve on the discharge line and a normally closed solenoid valve on the return line.
- **Industrial multipole connector (mod. M08-M10):** Pair of female to male industrial connectors in for quick connection of power supply, remote ON/OFF and general alarm signal;
- **Stainless stell frame (mod. M08-M10):** Unit frame completely in AISI 304.

16. Lifting

All units are positioned and fixed to pallets, on which they can be handled by means of forklift trucks and pallet trucks. The units can also be moved even when not standing on a pallet through the eye-bolts installed on the cover panel of each unit. All models are delivered with a cardboard box packaging.

SELECTION GUIDE

Selection of a chiller is performed by means of the tables given in the "Selection guide" and by means of the Data Tables relative to eachmodel. For correct selection of a chiller it is necessary:

1) Ensure that the operating limits specified in the "Working limits" table are complied with".

2) Ensure that the flow rate of water to be cooled is between the flow values specified in the "General Data" table of each unit; excessively low flow rates will result in laminar flow and, consequently, a risk offreezing and poor temperature control; in contrast, excessively high flow rates lead to excessive load drops and possible bursting ofevaporator piping.

3) Add ethylene glycol or other antifreeze liquids when using the chiller at water outlet temperatures below 5 °C; consult the "Water and ethylene glycol solutions" table to find the quantity of ethylene glycol required and to assess the reduction in cooling duty, the increase in compressor power input, and the increase in evaporator pressure drops due to the presence of ethylene glycol.

4) If TAE N Mini models are installed at altitudes in excess of 500 m, assess the reduction of cooling performance and the increase in compressor power input values by means of the coefficients given in the"Condenser corrective coefficients" table.

5) If the temperature difference between the evaporator water inlet andoutlet differs by 5 °C, correct the cooling capacity and power input utilising the"ΔT corrective coefficients ≠ 5 °C" tables.

PERFORMANCE AND TECHNICAL DATA

GENERAL DATA

		03	05	08	10
Cooling capacity (1)	kW	1,19	1,83	2,21	2,98
Total absorbed power (1)	kW	0,43	0,66	0,81	1,10
EER (1)	-	2,81	2,77	2,72	2,72
Cooling capacity (2)	kW	1,71	2,68	3,23	4,37
Total absorbed power (2)	kW	0,35	0,59	0,73	1,01
EER (2)	-	4,86	4,54	4,43	4,33
SEPR HT (3)	-	5,14	5,01	5,04	5,01
Compressor					
Cooling circuits	N°	1	1	1	1
Compressors for each circuit	N°	1	1	1	1
Capacity control	%	0 -100	0 -100	0 -100	0 -100
Electrical power supply (4)					
Power	V/Ph/Hz	230 ± 10% / 1 - PE / 50			
Auxiliary	V/Ph/Hz	230 AC			
Condensers					
Condenser number	N°	1	1	1	1
Ranks number	N°	/	/	/	/
Total frontal surface	m^2	0,13	0,13	0,21	0,21
Axial fans					
Fans number	N°	1	1	1	1
Total airflow	m^3/h	1000	1000	1100	1100
Nominal power (each)	kW	0,09	0,09	0,09	0,09
Hydraulic group					
Water flow rate P3 (5)	m^3/h	0,12 / 0,5	0,15 / 1,5	0,15 / 1,5	0,15 / 1,5
Available pump head pressure P3 (6)	barg	3,5 / 1,3	3,7 / 1,3	3,7 / 1,3	3,7 / 1,3
Nominal power P3	kW	0,18	0,37	0,37	0,37
Tank volume	l	15	15	22	22
Water connections	Rp	1/2"	1/2"	1/2"	1/2"
Sound levels (7)					
Sound power	dB (A)	46	47	47	47
Sound pressure	dB (A)	74	75	75	75
Dimensions and installed weight (8)					
Width	mm	486	486	486	486
Length	mm	660	660	660	660
Height	mm	622	622	872	872
Weight without pump	Kg	63	65	91	94
Weight	Kg	68	71	97	100

(1) Evaporator water inlet/outlet temperature 12/7 °C, external air temperature 35 °C, total absorbed power compressor and fan;
(2) Evaporator water inlet/outlet temperature 20/15 °C, external air temperature 25 °C, total absorbed power compressor and fan;
(3) Data declared in compliance with the European Regulation (EU) 2016/2281 with regard to ecodesign requirements for cooling products and high temperature process chillers;
(4) Protection class IP 33;
(5) Mimimum and maximum water flow pump;
(6) Available head pressure at outlet unit at the minimum and maximum water flow rate;
(7) 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;
(8) The weights of the units are referred to the configuration with axial fans.
Data declared according to UNI EN 14511:2018. All data refers to standard units without accessories/options which require an electrical feeding source, without pump and in nominal working conditions. The data declared in this document anticipate those that will be published in the next release Eurovent on november.

ELECTRICAL DATA

Model	Version	FLI (kW)	FLA (A)	ICF1 (A)
03	SP	0,6	2,7	17
05	SP	0,8	3,8	20
08	SP	1,0	4,5	20
10	SP	1,3	6,0	25

Model	Version	FLI (kW)	FLA (A)	ICF1 (A)
03	P3	0,9	4,3	19
05	P3	1,4	6,6	23
08	P3	1,6	7,3	23
10	P3	1,9	8,8	28

SP = without pump;
P3 = P3 pump;
FLI = max power absorbed in the working limits condition;
FLA = max current absorbed in the working limits condition;
ICF1 = Start-up current at the start of the last compressor in the working limits condition.

SOUND LEVELS

Model	Octave bands (Hz)								Power	Pressure
	63	125	250	500	1000	2000	4000	8000		
	Sound power level Lw dB (A)								dB (A)	dB (A)10m
03	41,8	54,8	67,1	69,4	68,8	64,6	56,9	47,4	74,0	46,0
05	42,8	56,0	68,1	70,2	69,9	65,5	57,3	48,5	75,0	47,0
08	42,8	56,0	68,1	70,2	69,9	65,5	57,3	48,5	75,0	47,0
10	42,8	56,0	68,1	70,2	69,9	65,5	57,3	48,5	75,0	47,0

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.

Distance (1) L (m)	KdB
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+Kdb.

PERFORMANCE DATA

03		External air temperature ta (°C)																					ta max (°C)
		25			32			35			38			40			43			45			
Glycol	tu	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	
	(°C)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	
20%	0	1,1	0,4	0,2	1,0	0,4	0,2	1,0	0,4	0,2	0,9	0,4	0,2	0,9	0,4	0,2	0,9	0,5	0,2	0,9	0,5	0,2	45
20%	3	1,2	0,4	0,2	1,1	0,4	0,2	1,0	0,4	0,2	1,0	0,4	0,2	1,0	0,4	0,2	1,0	0,5	0,2	0,9	0,5	0,2	45
	5	1,3	0,4	0,2	1,2	0,4	0,2	1,1	0,4	0,2	1,1	0,4	0,2	1,1	0,5	0,2	1,0	0,5	0,2	1,0	0,5	0,2	45
	7	1,3	0,4	0,2	1,2	0,4	0,2	1,2	0,4	0,2	1,2	0,4	0,2	1,1	0,5	0,2	1,1	0,5	0,2	1,1	0,5	0,2	45
	9	1,4	0,4	0,2	1,3	0,4	0,2	1,3	0,4	0,2	1,2	0,5	0,2	1,2	0,5	0,2	1,2	0,5	0,2	1,1	0,5	0,2	45
	11	1,5	0,4	0,3	1,4	0,4	0,2	1,4	0,4	0,2	1,3	0,5	0,2	1,3	0,5	0,2	1,2	0,5	0,2	1,2	0,5	0,2	45
	13	1,6	0,4	0,3	1,5	0,4	0,3	1,4	0,4	0,2	1,4	0,5	0,2	1,4	0,5	0,2	1,3	0,5	0,2	1,3	0,5	0,2	45
	15	1,7	0,4	0,3	1,6	0,4	0,3	1,5	0,4	0,3	1,5	0,5	0,3	1,5	0,5	0,2	1,4	0,5	0,2	1,4	0,5	0,2	45
	17	1,8	0,3	0,3	1,7	0,4	0,3	1,6	0,4	0,3	1,6	0,5	0,3	1,5	0,5	0,3	1,5	0,5	0,3	1,5	0,5	0,2	45
	20	1,9	0,3	0,3	1,8	0,4	0,3	1,7	0,4	0,3	1,7	0,5	0,3	1,6	0,5	0,3	1,6	0,5	0,3	1,5	0,5	0,3	45

05		External air temperature ta (°C)																					ta max (°C)
		25			32			35			38			40			43			45			
Glycol	tu	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	
	(°C)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	
20%	0	1,6	0,5	0,3	1,5	0,6	0,3	1,5	0,6	0,3	1,4	0,6	0,3	1,4	0,7	0,3	1,4	0,7	0,2	1,3	0,7	0,2	45
20%	3	1,7	0,6	0,3	1,6	0,6	0,3	1,6	0,6	0,3	1,5	0,7	0,3	1,5	0,7	0,3	1,5	0,7	0,3	1,4	0,7	0,3	45
	5	1,9	0,6	0,3	1,8	0,6	0,3	1,7	0,7	0,3	1,7	0,7	0,3	1,6	0,7	0,3	1,6	0,7	0,3	1,6	0,7	0,3	45
	7	2,0	0,6	0,3	1,9	0,6	0,3	1,8	0,7	0,3	1,8	0,7	0,3	1,7	0,7	0,3	1,7	0,7	0,3	1,7	0,8	0,3	45
	9	2,2	0,6	0,4	2,0	0,6	0,3	2,0	0,7	0,3	1,9	0,7	0,3	1,9	0,7	0,3	1,8	0,8	0,3	1,8	0,8	0,3	45
	11	2,3	0,6	0,4	2,2	0,7	0,4	2,1	0,7	0,4	2,1	0,7	0,4	2,0	0,7	0,3	2,0	0,8	0,3	1,9	0,8	0,3	45
	13	2,5	0,6	0,4	2,3	0,7	0,4	2,3	0,7	0,4	2,2	0,7	0,4	2,2	0,8	0,4	2,1	0,8	0,4	2,1	0,8	0,4	45
	15	2,7	0,6	0,5	2,5	0,7	0,4	2,4	0,7	0,4	2,4	0,7	0,4	2,3	0,8	0,4	2,3	0,8	0,4	2,2	0,8	0,4	45
	17	2,8	0,6	0,5	2,7	0,7	0,5	2,6	0,7	0,4	2,5	0,8	0,4	2,5	0,8	0,4	2,4	0,8	0,4	2,3	0,8	0,4	45
	20	3,1	0,6	0,5	2,9	0,7	0,5	2,8	0,7	0,5	2,7	0,8	0,5	2,7	0,8	0,5	2,6	0,8	0,4	2,5	0,9	0,4	45

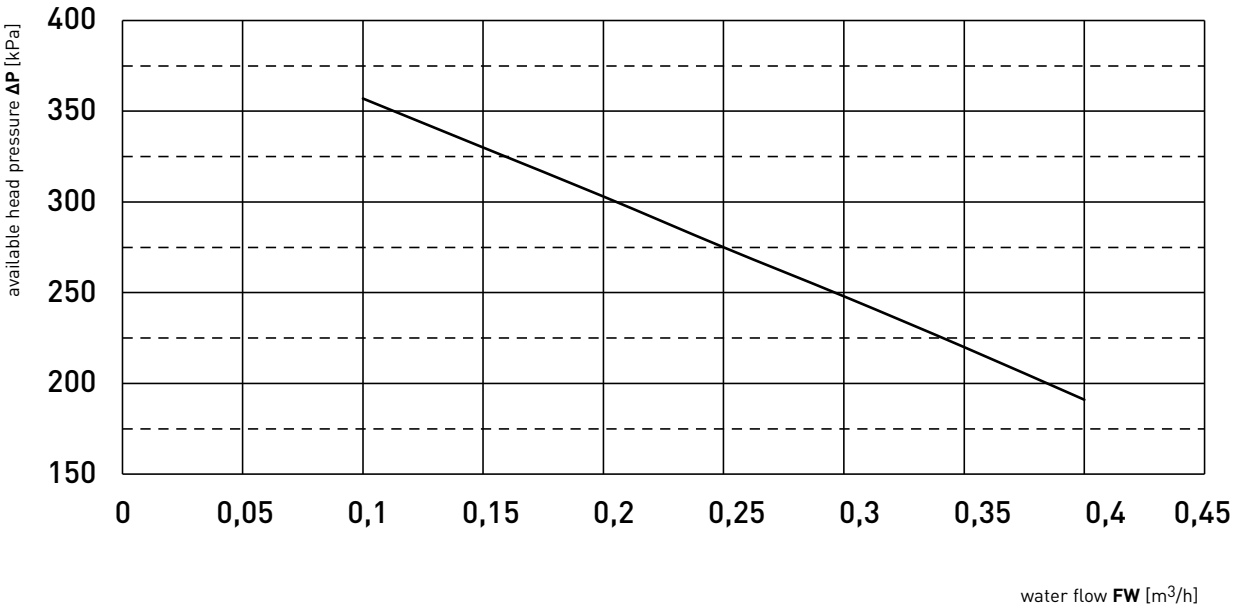
08		External air temperature ta (°C)																					ta max (°C)
		25			32			35			38			40			43			45			
Glycol	tu	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	
	(°C)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	
20%	0	2,1	0,7	0,4	1,9	0,8	0,3	1,8	0,8	0,3	1,7	0,8	0,3	1,7	0,8	0,3	1,6	0,9	0,3	1,6	0,9	0,3	45
20%	3	2,2	0,7	0,4	2,0	0,8	0,4	2,0	0,8	0,4	1,9	0,8	0,3	1,8	0,8	0,3	1,8	0,9	0,3	1,7	0,9	0,3	45
	5	2,4	0,7	0,4	2,2	0,8	0,4	2,1	0,8	0,4	2,0	0,8	0,3	2,0	0,9	0,3	1,9	0,9	0,3	1,9	0,9	0,3	45
	7	2,5	0,7	0,4	2,3	0,8	0,4	2,21	0,81	0,38	2,1	0,8	0,4	2,1	0,9	0,4	2,0	0,9	0,3	2,0	0,9	0,3	45
	9	2,7	0,7	0,5	2,5	0,8	0,4	2,4	0,8	0,4	2,3	0,9	0,4	2,2	0,9	0,4	2,2	0,9	0,4	2,1	0,9	0,4	45
	11	2,8	0,7	0,5	2,6	0,8	0,4	2,5	0,8	0,4	2,4	0,9	0,4	2,4	0,9	0,4	2,3	0,9	0,4	2,3	1,0	0,4	45
	13	3,0	0,7	0,5	2,8	0,8	0,5	2,7	0,8	0,5	2,6	0,9	0,4	2,5	0,9	0,4	2,5	1,0	0,4	2,4	1,0	0,4	45
	15	3,23	0,73	0,55	3,0	0,8	0,5	2,9	0,9	0,5	2,8	0,9	0,5	2,7	0,9	0,5	2,6	1,0	0,4	2,5	1,0	0,4	45
	17	3,4	0,7	0,6	3,1	0,8	0,5	3,0	0,9	0,5	2,9	0,9	0,5	2,8	0,9	0,5	2,7	1,0	0,5	2,7	1,0	0,5	45
	20	3,7	0,7	0,6	3,3	0,8	0,6	3,2	0,9	0,6	3,1	0,9	0,5	3,0	0,9	0,5	2,9	1,0	0,5	2,8	1,0	0,5	45

10		External air temperature ta (°C)																					ta max (°C)
		25			32			35			38			40			43			45			
Glycol	tu	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	
	(°C)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	(kW)	(kW)	(m³/h)	
20%	0	2,7	0,9	0,5	2,5	1,0	0,5	2,4	1,0	0,4	2,4	1,1	0,4	2,3	1,1	0,4	2,2	1,1	0,4	2,2	1,2	0,4	45
20%	3	3,0	0,9	0,5	2,8	1,0	0,5	2,7	1,1	0,5	2,6	1,1	0,5	2,5	1,1	0,5	2,4	1,2	0,4	2,4	1,2	0,4	45
	5	3,2	0,9	0,5	2,9	1,0	0,5	2,8	1,1	0,5	2,7	1,1	0,5	2,7	1,2	0,5	2,6	1,2	0,4	2,5	1,2	0,4	45
	7	3,3	0,9	0,6	3,1	1,1	0,5	2,98	1,10	0,51	2,9	1,1	0,5	2,8	1,2	0,5	2,7	1,2	0,5	2,7	1,3	0,5	45
	9	3,6	1,0	0,6	3,3	1,1	0,6	3,2	1,1	0,6	3,1	1,2	0,5	3,0	1,2	0,5	2,9	1,3	0,5	2,9	1,3	0,5	45
	11	3,9	1,0	0,7	3,6	1,1	0,6	3,4	1,2	0,6	3,3	1,2	0,6	3,3	1,3	0,6	3,1	1,3	0,5	3,1	1,3	0,5	45
	13	4,1	1,0	0,7	3,8	1,1	0,7	3,7	1,2	0,6	3,5	1,2	0,6	3,5	1,3	0,6	3,3	1,3	0,6	3,3	1,4	0,6	45
	15	4,37	1,01	0,75	4,0	1,1	0,7	3,9	1,2	0,7	3,8	1,3	0,6	3,7	1,3	0,6	3,5	1,4	0,6	3,5	1,4	0,6	45
	17	4,6	1,0	0,8	4,2	1,2	0,7	4,1	1,2	0,7	3,9	1,3	0,7	3,9	1,3	0,7	3,7	1,4	0,6	3,6	1,4	0,6	45
	20	4,7	1,0	0,8	4,3	1,2	0,7	4,2	1,2	0,7	4,0	1,3	0,7	3,9	1,3	0,7	3,8	1,4	0,7	3,7	1,5	0,6	45

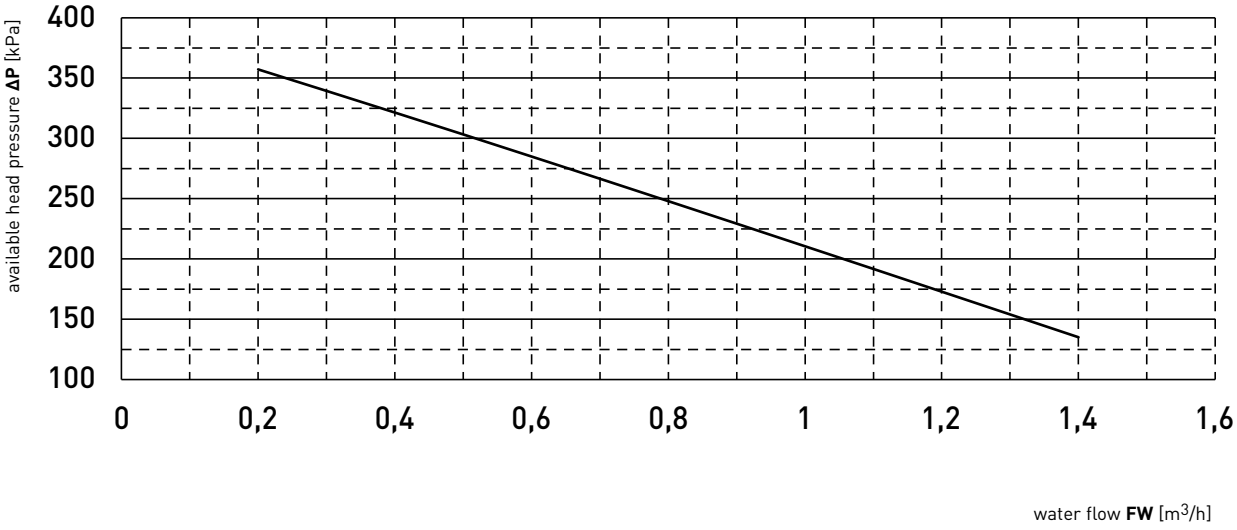
tu: evaporator outlet water temperature;
ta: external air temperature;
Pf: cooling capacity;
Pa: total power absorbed;
Fw: water flow rate (ΔT = 5 °C).
Interpolation is allowed, extrapolation is not permitted.
To calculate Pf, Pa and Fw for ΔT≠ 5 °C when examining the table "Correction factors for ΔT ≠ 5 °C".
Value includes the correction factor for ethylene glycol.
Data declared according to UNI EN 14511:2018. All data refers to standard units without accessories/options which require an electrical feeding source, without pump and in nominal working conditions. The data declared in this document anticipate those that will be published in the next release Eurovent on november.

EVAPORATOR PRESSURE DROPS AND AVAILABLE HEAD PRESSURE

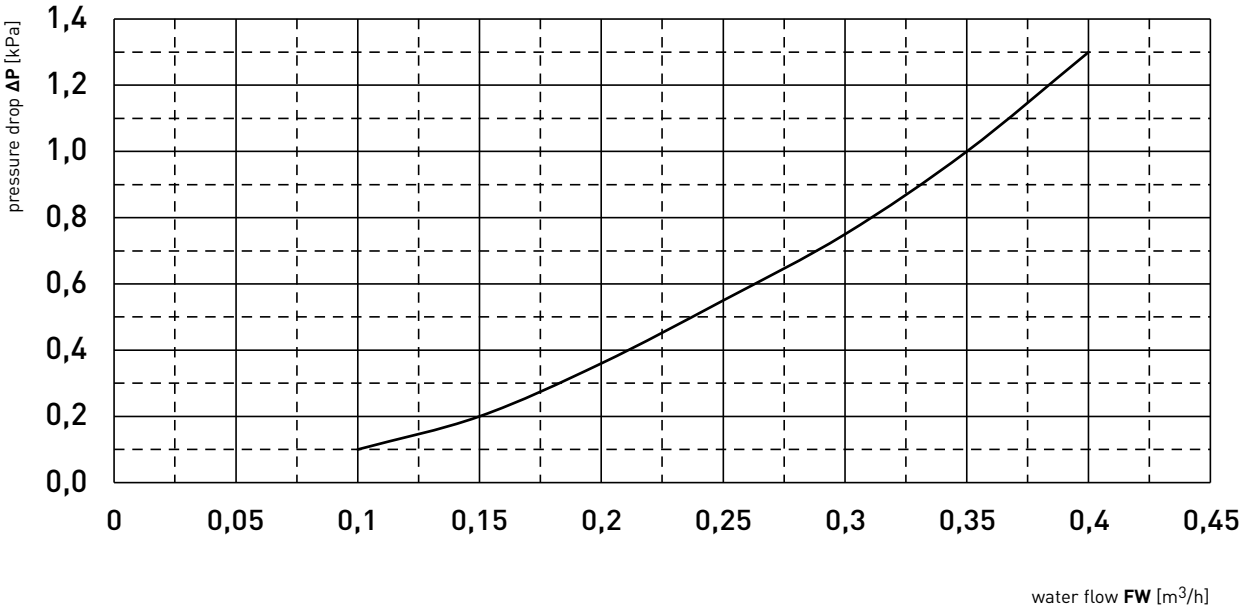
AVAILABLE HEAD PRESSURE WITH P3 PUMP MODEL M03



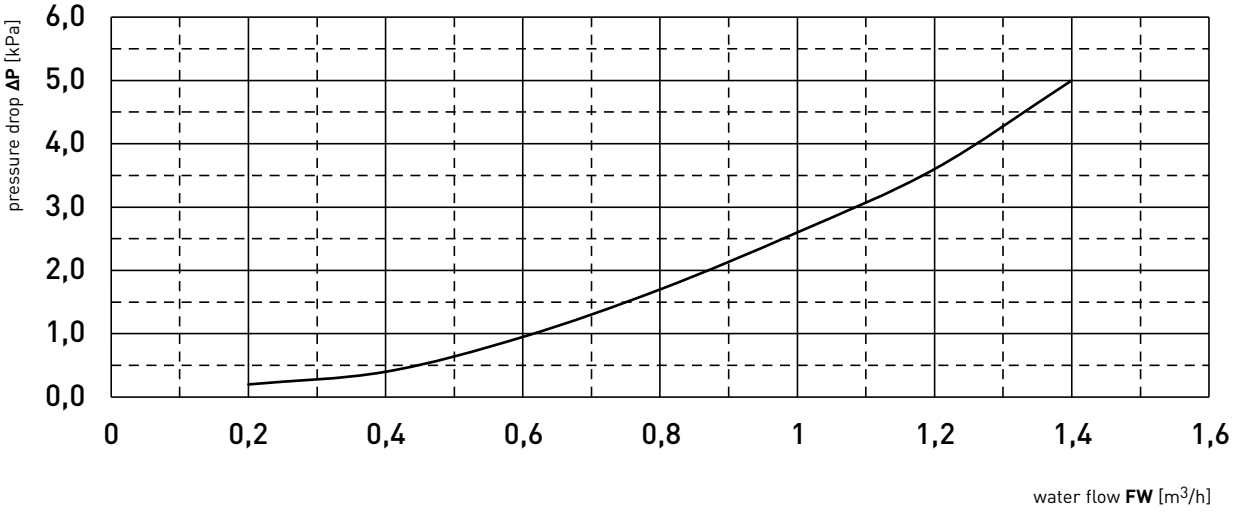
AVAILABLE HEAD PRESSURE WITH P3 PUMP MODEL M05/M08/M10



PRESSURE DROPS WITHOUT PUMP MODEL M03



PRESSURE DROPS WITHOUT PUMP MODEL M05/M08/M10



WORKING LIMITS AND CORRECTION FACTORS

WORKING LIMITS

External air temperature		Evaporator inlet water temperature		Evaporator outlet water temperature		Delta T of the water		Lamination device
Min	Max	Min	Max	Min	Max	Min	Max	
°C		°C		°C		°C		
5	45 (1)	5	35	0	30	4	10	Capillary

For outlet water temperature <+5 °C and external air temperature <= 0 °C, it is necessary to use an antifreeze solution.
(1) Reference values for the complete series. The maximum external air temperature is refered to the outlet water temperature equal to 15 °C. See data tables with the unit's performances based on the user temperatures.
Note: - for the min/max ΔT evaporator side take referece to the selection software.

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 (kW)	Kf1	1,00	0,99	0,98	0,97	0,96	0,93
Absorbed power correction factor (k W)	Kp1	1,00	0,99	0,98	0,98	0,97	0,95
Water flow correction factor (1) (m^3/h)	KFWE1	1,00	1,02	1,05	1,07	1,11	1,13
Pressure drop correction factor (kPa)	Kdp1	1,00	1,08	1,17	1,25	1,33	1,41

Multiply the unit performance by the correction factors given in the table (Pf* = Pf x Kf1). If the value already includes the glycol correction factor do not use this table. (1) KFWE1 = Correction factor (refers to the cooling capacity corrected by Kf) to obtain the water flow with a ΔT of 5 °C.

CORRECTION FACTORS ΔT ≠ 5 °C (WATER EVAPORATOR)

		ΔT						
		4	5	6	7	8	9	10
Cooling capacity correction factor	kf4	0,99	1,00	1,01	1,01	1,02	1,02	1,03
Absorbed power correction factor	kp4	0,99	1,00	1,00	1,01	1,01	1,04	1,08

Multiply the unit performance by the correction factors given in table. The new water flow to the evaporator is calculated with the following equation: Fw (l/h) = Pf* (kW) x 860 / ΔT where ΔT is the delta T of the water through the evaporator (°C).

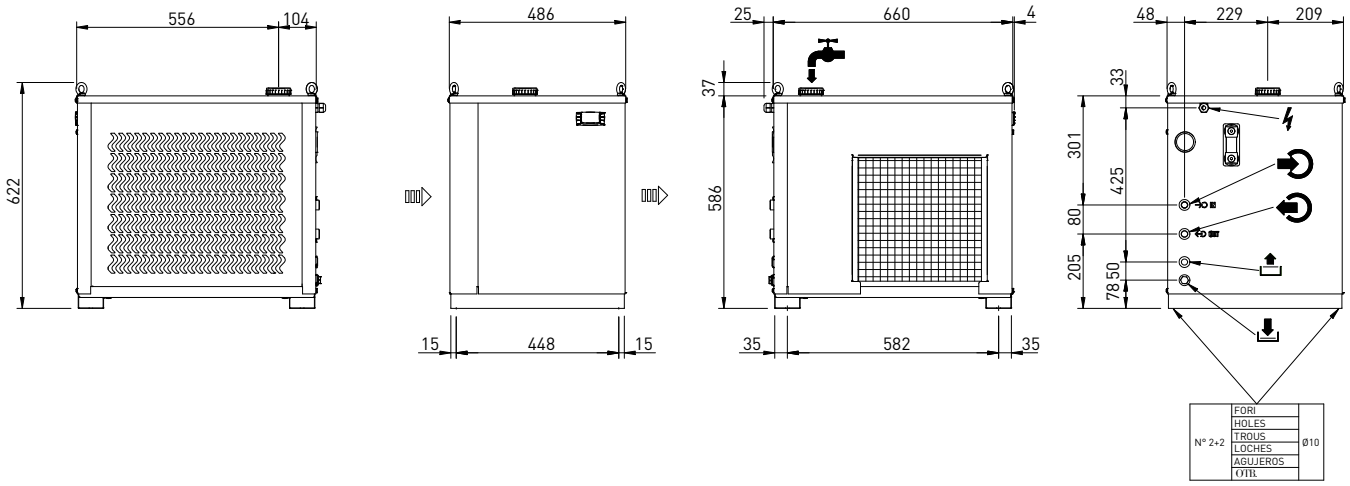
CONDENSER CORRECTION FACTORS

		Altitude (m)				
		0	500	1000	1500	2000
Cooling capacity correction factor (kW)	Kf3	1	0,990	0,980	0,977	0,972
Absorbed power correction factor (kW)	Kp3	1	1,005	1,012	1,018	1,027
Derating of the max external air temperature (*)	Kt3(°C)	0	0,6	1,1	1,8	2,5

Multiply the unit performance by the correction factors given in table (Pf* = Pf x Kf3, Pa* = Pa x Kp3).
(*) To obtain the maximum external air temperature, subtract the values indicated from the maximum external air temperature in the performance table (Ta* = Ta-Kt3).

OVERALL DIMENSIONS

TAE N Mini 03 - 05



	03	05
Water inlet	Rp 1/2"	Rp 1/2"
Water outlet	Rp 1/2"	Rp 1/2"

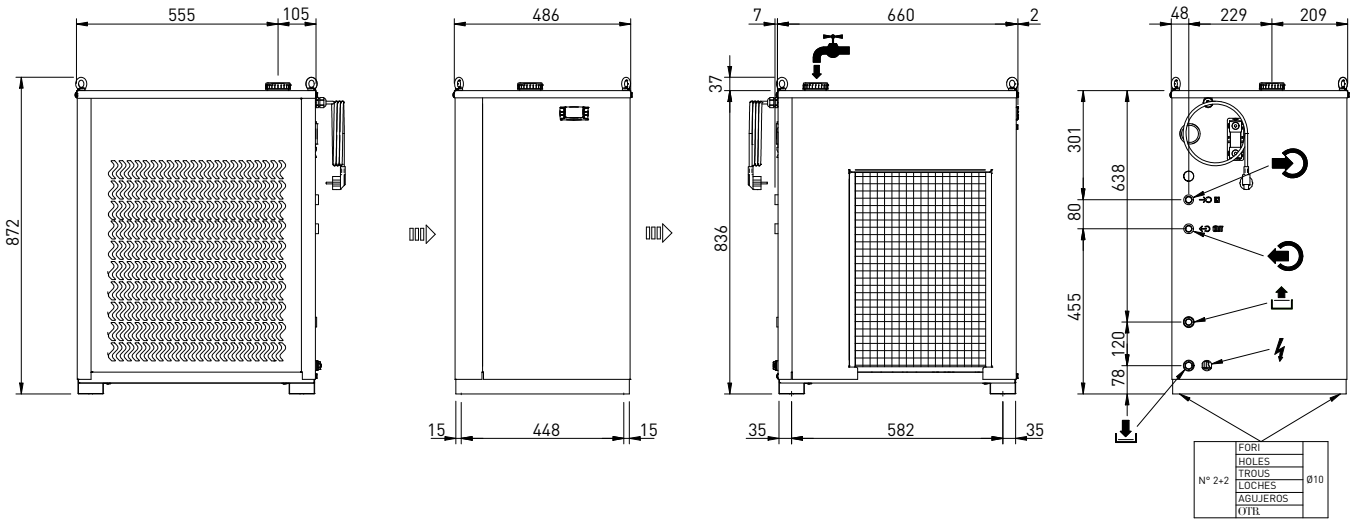
** Holes

Power supply

Overflow = Rp 1/2"

Water discharge = Rp 1/2"

TAE N Mini 08 - 10



	08	10
Water inlet	Rp 1/2"	Rp 1/2"
Water outlet	Rp 1/2"	Rp 1/2"

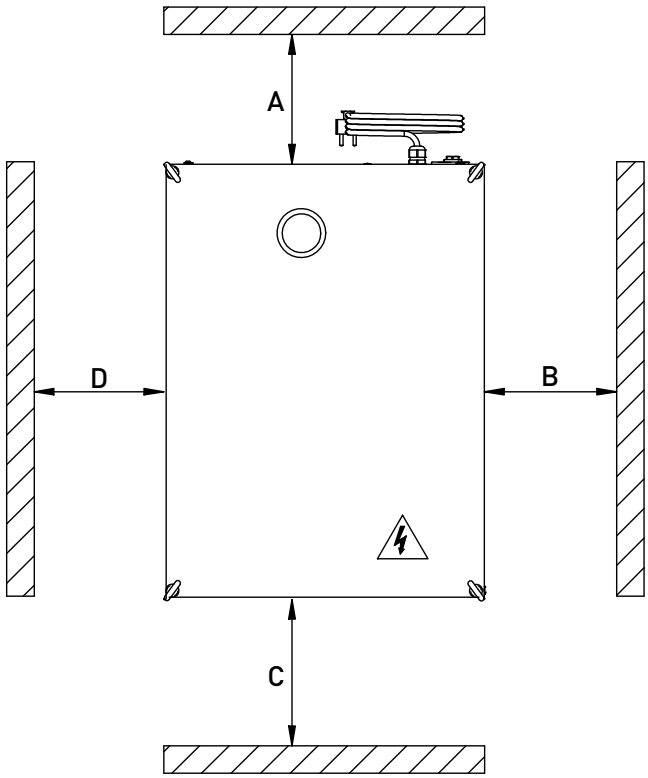
** Holes

Power supply

Overflow = Rp 1/2"

Water discharge = Rp 1/2"

CLEARANCES



Minimum distance to respect (mm).

	A	B	C	D
TAE N Mini 03	750	750	1000	750
TAE N Mini 05	750	750	1000	750
TAE N Mini 08	750	750	1000	750
TAE N Mini 10	750	750	1000	750

INSTALLATION GUIDE

The chillers must be installed in compliance with the following indications:

a) The units must be installed horizontally to ensure correct return of oil to the compressors (please note that fan suction and discharge takes place from the sides of the machine.

b) Ensure the clearances prescribed in the catalogue are observed.

c) To the extent possible, place the machine so as to minimize the effects due to the noise, vibration, etc. Specifically, ensure the units are installed as far as possible from areas in which noise emissions could result in disturbance; in this context do not install the chiller under windows or between two residential units Vibration transmitted to ground must be reduced by the use of antivibration devices mounted beneath the unit, flexiblecouplings on the water piping connections and on the trunking containing the electrical power feeding cables.

d) Always hook up the electrical connection of the unit with reference to the wiring diagram supplied with it.

e) Make the machine hydraulic connections, installing the following:
- shut-off valves (gate valves) to isolate the unit from the hydraulic circuit;
- air venting valves at the highest points of the circuit;
- drain valves at the lowest points of the circuit;
- strainer (0,5 / 0,8 mm mesh) at unit inlet to protect the exchanger from any metal chips or debris in the piping.

f) If the application requires cooling capacities that are greater than the maximum available with a single unit, the chillers can be hydraulically connected in parallel, provided the units in question are identical to avoid creating situations of imbalance in waterflow rates.

g) It is essential to ensure an adequate volume of air on the intake and delivery sides of the condensing coils. It is also important to avoid problems of recirculation of air between the intake and delivery sides to avoid impairment of theunit's performance or even a shut-down of normal operation. When using several chillers connected inparallel with the condensing coils located facing each other it is essential to maintain a minimum distance between the condensing coils. For the minimum distance values refer to the technical catalogue.

h) If it is necessary to treat water flow rates that are higher than the maximum permissible flow rate associated with the chiller, it isadvisable to set up a by-pass between the chiller inlet and outlet.

i) If it is necessary to treat water flow rates that are lower than the minimum permissible flow rate associated with the chiller, it isadvisable to set up a by-pass between the chiller outlet and inlet.

l) Always ensure all the air is bled out of the hydraulic circuit to ensure correct operation.

m) Always drain the hydraulic circuit during winter shutdowns; alternatively, ensure the circuit is filled with a suitable antifreeze solution.

n) The unit must be positioned in an environment without ignition sources in continuous operation (for example open flame sources). The unit must be installed according to a minimum surface area as indicated in the following table:

Model TAEN	M03	M05	M08	M10
Min. surface (m^2)	10	10	15	15

These values take into account a minimum room height of 2.7 m and considering the following classification in accordance with Standard EN 378-1:
- Type of controlled occupation (Class B);
- Position of the unit in the occupied room (Class 1).

For proper installation, must be followed and expected a local safety standard. Without a specific local regulations the references must be the Standard EN 378 "flammable refrigerants". The end user have to verify whether approvals from the competent authorities are required for the installation of the unit.

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EAC Declaration

Cooling, conditioning, purifying.