



PROCESS COOLING
SOLUTIONS

TAE^{ev}_{in} TECH MINI

Air cooled industrial chillers.
Cooling capacity 1,4 – 4,8 kW



*Cooling your industry,
optimising your process.*



Cooling, conditioning, purifying.



TAE^{ev}_{in} TECH MINI

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MTA participates in the E.C.C. programme for LCP-HP. Certified products are listed on: www.eurovent-certification.com

Eurovent Certification applied to the units:
 - Air/Water with cooling capacity up to 600 kW
 - Water/Water up to 1500 kW

TECHNICAL SPECIFICATIONS

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1. General

TAEvo Tech MINI is an air cooled liquid chiller, designed for industrial use and for installation in an internal environment. TAEvo Tech MINI is therefore the solution for all applications that require high performance, reliability, continuity of operation and reduced management costs.

The TAEvo Tech MINI range is composed by 5 models with cooling capacity 1,25 - 4,80 kW. All the TAEvo Tech MINI models are equipped with a high efficiency finned coil evaporator immersed in a atmospheric hydraulic storage tank. Thanks to the technology of this evaporator and the non ferrous hydraulic circuit the TAEvo Tech MINI ensures reliable operation in particularly demanding applications and also with liquids containing impurities. The standard hydraulic storage tank also assures optimum precision in the control of temperature even in the presence of highly variable thermal loads from the user and simplifies installation.

The TAEvo Tech MINI units are equipped with a non ferrous hydraulic circuit and a finned coil condenser, axial fans and hermetic piston or rotary compressors installed on a refrigeration circuit. The refrigerant

fluids are R134a (mod. M02 - M03) and R410A (mod. M05 - M10). Management of the TAEvo Tech MINI is provided by an XR60CX parametric microprocessor control capable of managing all the main functions, including outlet water temperature control, alarms and user interface.

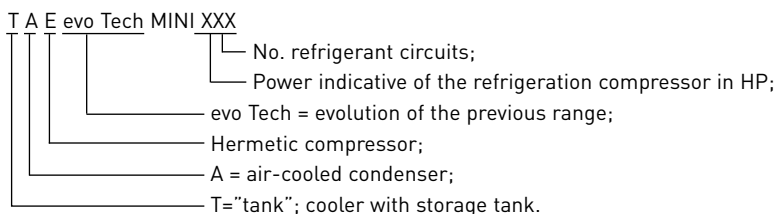
The TAEvo Tech MINI units are available in standard version with power supply dual frequency 230V/1Ph/50-60Hz (mod. M02 - M03) and 230V/1Ph/50Hz (mod. M05 - M10).

The standard product, which is intended for the states of the EEC and EFTA, is subject to:

- Electromagnetic Compatibility Directive 2004/108/EC;
- Machine Directive 2006 42;
- The electrical equipment of the machine is made in accordance with IEC standard EN 60204-1.

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

2. Nameplate



3. Advantages derived from the use of a storage tank

In a refrigeration system designed for use in an industrial process the user load may present significant and sudden variations, or working conditions that are very different from nominal conditions for long periods. Consequently the chiller supplying the plant is frequently required to operate at maximum capacity (in the proximity of its operating limits) or alternatively with periods subject to frequent ON/OFF cycles. This type of working is detrimental to the lifetime of compressors and often results in significant fluctuations of the chilled water temperature - clearly undesirable both from the energy efficiency

standpoint and also in relation to the requirements of the process. The benefits deriving from the use of the storage tank present on all the TAEvo Tech Mini units as standard can be summarised as follows:

- The units offer a reservoir of water at the preset temperature for the process to be controlled: in this manner the "energy stored" in the tank is able to compensate for the imbalances caused by sudden changes in load demand from the user.
- Operation of compressors in highly stable conditions: in this case the chiller can run with almost unvarying inlet temperature

irrespective of surrounding conditions. Together with a constant water flow rate, this is a primary condition in order to ensure the maximum lifetime of the compressors.

4. Testing

All chillers are tested in order to check correct operation. The main checks performed are as follows:

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

5. Compressor

Models M02 - M03 feature hermetic piston compressors operating with refrigerant R134a, equipped with HST starter device (CSIR Capacitor Start — Induction Run) and mounted on antivibration dampers.

6. Evaporator

High-efficiency finned coil exchanger made with copper pipes and aluminium fins.

Installed inside the water 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 particular technical solution allows TAEvo Tech MINI to operate with high flow rates and reduced pressure drops, ensuring a high level of reliability in heavy industrial applications and also with liquids containing impurities.

7. Condensing coil

Finned coil heat exchanger consisting of tubes and the manifolds in copper, corrugated fins in aluminium, shoulders in galvanized sheet metal. These coils are sized and designed utilising the latest comput-

8. Fans

Axial fans equipped with painted sickle-shaped galvanized steel sheet blades that are directly connected to the electric motor (IP54) insulation class F. All the fans' motors are provided with built-in thermal circuit breakers.

9. Refrigeration circuit

The refrigeration circuit comprises:

- **Compressor:** hermetic piston compressors operating with refrigerant R134a (Mod. M02 - M03). Models M05-M10 feature hermetic rotary compressors, operating with R410A refrigerant.
- **Evaporator:** High-efficiency finned coil exchanger made with copper tubes and aluminium fins.
- **Condenser:** finned coil heat exchanger with tubes and the manifolds in copper, corrugated fins in aluminium, shoulders in galvanized sheet metal.

10. Structure and casing

The structure is composed by a base, a top cover and the paneling. On the front panel there is the microprocessor display, the main switch (mod. M08-M10) and a green/red light (mod. M08-M10). On

- Reduction of the frequency of peaks and guarantee of sufficient duration of each period of running and each period of stopping of the compressors.

- 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.

TAEvo Tech M05-M10 models feature hermetic rotary compressors, operating with R410A refrigerant. They are equipped with run capacitor (PSC) and mounted on antivibration dampers.

The antifreeze function of the microprocessor controls the outlet temperature of the water while protecting the evaporator from the danger of freezing. All evaporators installed on the TAEvo Tech MINI chillers can work with antifreeze 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). All evaporators comply with the European Council pressure vessels directive.

erised design technology, making it possible to achieve very high EER efficiency values. The condenser is protected by removable metal filters to facilitate cleaning procedures.

The fans are statically and dynamically balanced equipped with safety grilles and mounted on the condenser plenum.

The motors feature 4 poles with external rotor to maximize the energy efficiency they are protected with a chain of thermistors.

- **Lamination device:** capillary tube / calibrated orifice.
- **HP High pressure switch:** manual reset (mod. M05-M10).
- **Schrader service valves.**
- **Filter-dryer hygroscopic molecular sieves:** it retains the impurities and any traces of moisture present in the refrigeration circuit.

All of the brazed welded joints are made with silver alloy and the cold pipes are insulated to prevent the condensation of moisture.

the rear panel are positioned the IN / OUT water connections, the water discharge, the connection for the overflow, the water pressure gauge, the water level display, and the 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 power coating. The base is painted 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 built with non-ferrous materials (pipe fittings of non ferrous materials stainless steel and / or brass and / or plastic). It is composed of:

INERTIAL STORAGE TANK

All models are equipped with a thermal inertial storage tank (containing the evaporator) externally insulated by an insulating and anti-condensation layer.

The tank is equipped with a drain valve a water filling connection and an overflow connection.

HYDRAULIC BY-PASS

All TAEevo Tech 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 machine and the pump to preserve their integrity, ensuring a minimum fluid flow necessary for both the anti-freeze alarm and the pump circuit breaker interventions.

Warning: the by-pass has been designed only for preserving the integrity of the machine if the shut-off valves fail to close.

12. Electrical panel

The electrical cabinet is designed and wired in compliance with the Low Voltage Directive 2006/95/EC, standard EN 60204-1 and electromagnetic compatibility directive 2004/108/EC.

It includes a power section and a control section with labelled electrical cables. For mod. M08 - M10, the control section includes a main switch, short-circuit protection (fuse) and a contactor.

13. Control and safety devices

Temperature NTC probe: installed on the hydraulic circuit, it is used to control and display the evaporator outlet water temperature and for the anti-freeze function.

14. Microprocessor control standard version

TAEevo Tech MINI is controlled and managed by the XR60CX electronic controller with parametric dual display and icon based identification of functions. Thanks to the control menu it is possible to visualize the working conditions, the parameters and the possible alarms.



XR60CX

The by-pass operation with continuous cycles for extended periods is strictly forbidden.

PUMPS

The units M02 - M03 are 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 on the unit's rear panel indicates the water pressure at the unit outlet.

MATERIALS IN CONTACT WITH WATER

Stainless steel, copper, brass, plastic, aluminum.

For mod. M02 - M05, the control section includes the fuse to protect the control and only for the M05 a power relay for compressor management; the power supply switching is ensured by the presence of a cord with plug.

The control section of all the models includes the microprocessor board and its protection fuse. Only for mod. M08-M10 is available a green/red light to signal the existence/absence of alarms.

High pressure switch with manual reset: it is installed on the refrigerant circuit high pressure side; it stops the compressor in case of anomalous working pressures.

The controller manages the following functions:

- Thermostatic control depending on the process fluid output 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 for M05-M10 models;
 - freeze alarm on water at evaporator outlet;

A voltage-free contact for M08-M10 models and a contact under tension for M02-M05 models is provided for remotisation of a general alarm signal. A digital input is available for the remote ON/OFF function.

15. Special designs

- Close temperature control version: this version offers extremely precise regulation of the outlet water temperature (hysteresis $\pm 0,5$ °C). It features an hot gas solenoid valve, controlled by a PID logic, injecting hot gas into the evaporator during partial load conditions.
- P5 Pump: peripheral pump non ferrous type, with available head pressure of about 5 barg.
- Tank level switch: in case of lack of fluid the level sensor activates an alarm that blocks the cooler to avoid any damage to the main components of the hydraulic circuit.
- Multipole industrial connector: pair of female-to-male industrial connectors in aluminium for quick connection of power supply and signal connections remote ON / OFF and general alarm).
- Dynamic set point: the controller adjusts the working setpoint following the temperature read by a temperature sensor placed outside the unit.
- Stainless steel structure.
- Water Filter Kit.
- Automatic hydraulic by-pass kit: the kit features an adjustable pressure relief valve in gunmetal with proportional operating characteristics.
- Hydraulic disconnect kit: it allows installing the unit at a lower level than the user avoiding the emptying of the hydraulic circuit when the pumps stops. The kit includes a check valve on the discharge line and a normally closed solenoid valve on the return line.
- Wheels kit: it allows the movement 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.

16. Lifting

All units are positioned and secured 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 thanks to the

eyebolts installed on the cover panel of each unit.
All the models are supplied 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 each model. 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 of freezing and poor temperature control; in contrast, excessively high flow rates lead to excessive load drops and possible bursting of evaporator 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 TAEvo Tech 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 and outlet 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 - 50/60 Hz

		02	03	05	08	10
Cooling capacity 50/60 Hz (1)	kW	1,39 / 1,53	1,78 / 1,96	2,86	3,49	4,80
Total absorbed power 50/60 Hz (1)	kW	0,44 / 0,49	0,59 / 0,66	0,62	0,83	1,10
EER 50/60 Hz (1)	-	3,17 / 3,10	3,04 / 2,94	4,62	4,21	4,36
Cooling capacity 50/60 Hz (2)	kW	0,96 / 1,06	1,24 / 1,36	2,05	2,53	3,42
Total absorbed power 50/60 Hz (2)	kW	0,43 / 0,48	0,58 / 0,66	0,70	0,92	1,22
EER 50/60 Hz (2)	-	2,25 / 2,21	2,13 / 2,08	2,94	2,74	2,80

Compressor

Cooling circuits	N°	1	1	1	1	1
Compressors for each circuit	N°	1	1	1	1	1
Capacity control	%	0-100	0-100	0-100	0-100	0-100
ESEER 50/60 Hz	-	2,25 / 2,22	2,22 / 2,17	3,30	3,07	3,18

Electrical power supply (3)

Power	V/Ph/Hz	230 ± 10% / 1 - PE / 50 - 60		230 ± 10% / 1 - PE / 50		
Auxiliary	V/Ph/Hz	230 AC				

Condensers

Condenser number	N°	1	1	1	1	1
Ranks number	N°	2	2	3	2	3
Total frontal surface	m ²	0,08	0,12	0,12	0,20	0,20

Axial fans

Fans number	N°	1	1	1	1	1
Total air flow	m ³ /h	650	700	1100	1450	1400
Nominal power (each)	kW	0,05	0,05	0,09	0,09	0,09

Hydraulic group

Water flow rate P3 (4)	m ³ /h	0,1 / 0,5	0,1 / 0,5	0,2 / 1,5	0,2 / 1,5	0,2 / 1,5
Available pump head pressure 50 Hz P3 (5)	barg	3,6 / 1,3	3,6 / 1,3	3,6 / 1,3	3,6 / 1,3	3,6 / 1,3
Available pump head pressure 60 Hz P3 (5)	barg	4,5 / 1,6	4,5 / 1,6	-	-	-
Nominal power P3	kW	0,18	0,18	0,37	0,37	0,37
Tank volume	l	15	15	15	22	22
Water connections	Rp	1/2"	1/2"	1/2"	1/2"	1/2"

Sound levels (6)

Sound power 50/60 Hz	dB (A)	74,0 / 75,0	74,0 / 75,0	75,0	75,0	75,0
Sound pressure 50/60 Hz	dB (A)	46,0 / 47,0	46,0 / 47,0	47,0	47,0	47,0

Dimensions and installed weight (7)

Width	mm	486	486	486	486	486
Length	mm	660	660	660	660	660
Height	mm	623	623	623	876	876
Weight	kg	75	77	78	96	100
Weight without pump	kg	70	72	72	90	94

(1) Evaporator water inlet/outlet temperature 20/15 °C, external air temperature 25 °C, total absorbed power compressor and fan.

(2) Evaporator water inlet/outlet temperature 12/7 °C, external air temperature 35 °C, total absorbed power compressor and fan.

(3) Protection class IP 33.

(4) Minimum and maximum water flow pump.

(5) Available head pressure at outlet unit at the minimum and maximum water flow rate.

(6) 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.

(7) The weights of the units are referred to the configuration with axial fans.

Data declared according to UNI EN 14511:2013.

ELECTRICAL DATA - 50/60 Hz

Model	Version	Hz	FLI (kW)	FLA (A)	ICF (A)
02	P3	50	0,8	5,5	17
	P3	60	1,1	6,1	17
03	P3	50	1,0	5,8	22
	P3	60	1,3	6,3	22
05	P3	50	1,5	7,2	20
08	P3	50	1,8	8,3	22
10	P3	50	2,2	9,8	27

Model	Version	Hz	FLI (kW)	FLA (A)	ICF (A)
02	SP	50	0,5	3,9	15
	SP	60	0,7	4,1	15
03	SP	50	0,7	4,2	20
	SP	60	0,8	4,3	20
05	SP	50	1,0	4,7	17
08	SP	50	1,3	5,8	19
10	SP	50	1,7	7,3	24

SP = without pump;

P3 = P3 pump;

FLI = max power absorbed in the working limits condition;

FLA = max current absorbed in the working limits condition;

ICF = Start-up current at the start of the last compressor in the working limits condition.

SOUND LEVELS - 50/60 Hz

Model	Hz	Octave bands (Hz)								Power	Pressure
		63	125	250	500	1000	2000	4000	8000		
		Sound power level Lw dB (A)								dB (A)	dB (A) _{10m}
02	50	41,8	54,8	67,1	69,4	68,8	64,6	56,9	47,4	74,0	46,0
	60	43,1	55,8	68,5	70,0	69,8	65,6	57,1	49,9	75,0	47,0
03	50	41,8	54,8	67,1	69,4	68,8	64,6	56,9	47,4	74,0	46,0
	60	43,1	55,8	68,5	70,0	69,8	65,6	57,1	49,9	75,0	47,0
05	50	42,8	56,0	68,1	70,2	69,9	65,5	57,3	48,5	75,0	47,0
08	50	42,8	56,0	68,1	70,2	69,9	65,5	57,3	48,5	75,0	47,0
10	50	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	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: $\text{dB(A)}_L = \text{dB(A)}_{10m} + K_{db}$.

PERFORMANCE DATA - 50 Hz

TAEvo Tech MINI

02		External air temperature ta (°C)																		ta max (°C)						
		25			32			35			38			40			43				45					
		Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw		Pf	Pa	Fw			
Glycol	tu	[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]	[kW]	[kW]	[m³/h]	
20%	0	0,78	0,35	0,13	0,71	0,37	0,12	0,68	0,37	0,12	0,65	0,38	0,11	0,64	0,38	0,11	0,61	0,39	0,10				0,69	0,42	0,12	44
20%	3	0,91	0,37	0,16	0,83	0,39	0,14	0,80	0,39	0,14	0,77	0,40	0,13	0,75	0,41	0,13	0,72	0,42	0,12				0,77	0,45	0,13	45
	5	1,02	0,38	0,17	0,93	0,40	0,16	0,89	0,41	0,15	0,86	0,42	0,15	0,83	0,43	0,14	0,80	0,44	0,14				0,80	0,44	0,14	45
	7	1,09	0,39	0,19	1,00	0,42	0,17	0,96	0,43	0,16	0,92	0,44	0,16	0,89	0,44	0,15	0,85	0,45	0,15				0,82	0,46	0,14	45
	9	1,16	0,41	0,20	1,06	0,43	0,18	1,02	0,44	0,17	0,98	0,45	0,17	0,95	0,46	0,16	0,90	0,47	0,16				0,88	0,48	0,15	45
	11	1,24	0,42	0,21	1,13	0,44	0,19	1,08	0,45	0,19	1,04	0,47	0,18	1,01	0,47	0,17	0,96	0,49	0,16				0,93	0,50	0,16	45
	13	1,31	0,43	0,23	1,20	0,45	0,21	1,15	0,47	0,20	1,10	0,48	0,19	1,06	0,49	0,18	1,01	0,50	0,17				0,98	0,51	0,17	45
	15	1,39	0,44	0,24	1,27	0,47	0,22	1,21	0,48	0,21	1,16	0,49	0,20	1,12	0,50	0,19	1,07	0,52	0,18				1,03	0,53	0,18	45
	17	1,48	0,45	0,25	1,35	0,48	0,23	1,29	0,50	0,22	1,23	0,51	0,21	1,19	0,52	0,20	1,13	0,54	0,19				1,09	0,55	0,19	45
	20	1,62	0,47	0,28	1,46	0,50	0,25	1,39	0,52	0,24	1,32	0,53	0,23	1,27	0,54	0,22	1,20	0,56	0,21							43

03		External air temperature ta (°C)																		ta max (°C)						
		25			32			35			38			40			43				45					
		Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw		Pf	Pa	Fw			
Glycol	tu	[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]	[kW]	[kW]	[m³/h]	
20%	0	1,03	0,48	0,18	0,94	0,51	0,16	0,90	0,52	0,15	0,87	0,53	0,15	0,84	0,53	0,14				0,93	0,57	0,16				42
20%	3	1,19	0,50	0,20	1,09	0,53	0,19	1,04	0,54	0,18	1,00	0,55	0,17	0,97	0,56	0,17				1,04	0,60	0,18	1,01	0,60	0,17	44
	5	1,32	0,52	0,23	1,21	0,55	0,21	1,16	0,57	0,20	1,11	0,58	0,19	1,08	0,58	0,19				1,04	0,60	0,18	1,07	0,62	0,18	45
	7	1,41	0,54	0,24	1,29	0,57	0,22	1,24	0,58	0,21	1,19	0,59	0,20	1,16	0,60	0,20	1,11	0,62	0,19				1,07	0,62	0,18	45
	9	1,50	0,55	0,26	1,37	0,58	0,24	1,32	0,60	0,23	1,27	0,61	0,22	1,23	0,62	0,21	1,18	0,63	0,20				1,15	0,64	0,20	45
	11	1,59	0,56	0,27	1,46	0,60	0,25	1,40	0,61	0,24	1,35	0,63	0,23	1,31	0,64	0,22	1,26	0,65	0,22				1,22	0,66	0,21	45
	13	1,69	0,57	0,29	1,55	0,61	0,27	1,49	0,63	0,26	1,43	0,64	0,25	1,39	0,65	0,24	1,33	0,67	0,23				1,30	0,68	0,22	45
	15	1,78	0,59	0,31	1,64	0,63	0,28	1,58	0,64	0,27	1,51	0,66	0,26	1,47	0,67	0,25	1,41	0,69	0,24				1,37	0,70	0,24	45
	17	1,89	0,60	0,33	1,74	0,64	0,30	1,68	0,66	0,29	1,61	0,68	0,28	1,57	0,69	0,27	1,51	0,71	0,26							43
	20	2,08	0,62	0,36	1,91	0,67	0,33	1,84	0,68	0,32	1,77	0,70	0,30	1,72	0,72	0,30										42

05		External air temperature ta (°C)																		ta max (°C)						
		25			32			35			38			40			43				45					
		Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw		Pf	Pa	Fw			
Glycol	tu	[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]	[kW]	[kW]	[m³/h]	
20%	0	1,72	0,58	0,29	1,66	0,63	0,28	1,61	0,66	0,27	1,55	0,69	0,26	1,50	0,70	0,26	1,43	0,73	0,25				1,52	0,77	0,26	43
20%	3	1,97	0,59	0,34	1,86	0,65	0,32	1,79	0,68	0,31	1,72	0,70	0,29	1,66	0,72	0,28	1,58	0,75	0,27				1,65	0,80	0,28	45
	5	2,19	0,60	0,38	2,03	0,66	0,35	1,95	0,69	0,33	1,87	0,72	0,32	1,81	0,74	0,31	1,71	0,77	0,29				1,71	0,77	0,29	45
	7	2,32	0,60	0,40	2,14	0,67	0,37	2,05	0,70	0,35	1,96	0,73	0,34	1,90	0,75	0,33	1,80	0,79	0,31				1,73	0,81	0,30	45
	9	2,46	0,61	0,42	2,26	0,68	0,39	2,16	0,71	0,37	2,06	0,74	0,35	2,00	0,76	0,34	1,90	0,80	0,33				1,83	0,82	0,31	45
	11	2,59	0,61	0,44	2,37	0,68	0,41	2,28	0,72	0,39	2,17	0,75	0,37	2,10	0,78	0,36	2,00	0,81	0,34				1,93	0,84	0,33	45
	13	2,72	0,62	0,47	2,50	0,69	0,43	2,39	0,73	0,41	2,29	0,76	0,39	2,22	0,79	0,38	2,11	0,82	0,36				2,03	0,85	0,35	45
	15	2,86	0,62	0,49	2,62	0,70	0,45	2,51	0,73	0,43	2,41	0,77	0,41	2,33	0,80	0,40	2,22	0,84	0,38				2,15	0,86	0,37	45
	17	3,01	0,62	0,52	2,76	0,70	0,47	2,65	0,74	0,46	2,54	0,78	0,44	2,47	0,81	0,42	2,35	0,85	0,40				2,28	0,88	0,39	45
	20	3,25	0,63	0,56	2,99	0,71	0,51	2,88	0,75	0,49	2,75	0,79	0,47	2,67	0,82	0,46	2,55	0,87	0,44							43

08		External air temperature ta (°C)																		ta max (°C)						
		25			32			35			38			40			43				45					
		Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw		Pf	Pa	Fw			
Glycol	tu	[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]	[kW]	[kW]	[m³/h]	
20%	0	2,16	0,75	0,37	2,02	0,82	0,35	1,95	0,86	0,33	1,88	0,89	0,32	1,82	0,91	0,31				1,95	0,98	0,33	1,88	1,01	0,32	42
20%	3	2,43	0,77	0,42	2,27	0,85	0,39	2,19	0,88	0,38	2,11	0,92	0,36	2,05	0,94	0,35	1,95	0,98	0,33				2,05	1,04	0,35	45
	5	2,66	0,78	0,46	2,48	0,87	0,42	2,39	0,91	0,41	2,30	0,95	0,39	2,23	0,97	0,38	2,13	1,02	0,36				2,13	1,02	0,36	45
	7	2,82	0,79	0,48	2,62	0,88	0,45	2,53	0,92	0,43	2,43	0,96	0,42	2,36	0,99	0,40	2,25	1,04	0,39				2,18	1,07	0,37	45
	9	2,98	0,80	0,51	2,77	0,89	0,47	2,67	0,94	0,46	2,57	0,98	0,44	2,50	1,01	0,43	2,38	1,06	0,41				2,31	1,10	0,40	45
	11	3,14	0,81	0,54	2,92	0,91	0,50	2,82	0,95	0,48	2,71	1,00	0,47	2,64	1,03	0,45	2,53	1,09	0,43				2,44	1,13	0,42	45
	13	3,31	0,82	0,57	3,08	0,92	0,53	2,97	0,97	0,51	2,87	1,02	0,49	2,79	1,06	0,48	2,67	1,12	0,46				2,59	1,16	0,44	45
	15	3,49	0,83	0,60	3,24	0,94	0,56	3,14	0,99	0,54	3,02	1,05	0,52	2,95	1,09	0,51	2,83	1,15	0,49				2,74	1,20	0,47	45
	17	3,68	0,84	0,63	3,43	0,96	0,59	3,31	1,01	0,57	3,20	1,08	0,55	3,12	1,12	0,54	2,99	1,19	0,51							43
	20	3,89	0,86	0,67	3,61	0,98	0,62	3,49	1,04	0,60	3,37	1,11	0,58	3,28	1,16	0,56										42

10		External air temperature ta (°C)																		ta max (°C)						
		25			32			35			38			40			43				45					
		Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw	Pf	Pa	Fw		Pf	Pa	Fw			
Glycol	tu	[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]	[kW]	[kW]	[m³/h]	
20%	0	2,89	0,99	0,49	2,70	1,09	0,46	2,60	1,14	0,45	2,50	1,19	0,43	2,42	1,23	0,41				2,61	1,33	0,45	2,52	1,37	0,43	42
20%	3	3,30	1,01	0,56	3,06	1,12	0,52	2,94	1,17	0,50	2,82	1,23	0,48	2,74	1,27											

PERFORMANCE DATA - 60 Hz

02		External air temperature ta (°C)																					ta max (°C)	
		25			32			35			38			40			43			45				
Glycol	tu (°C)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)		
20%	0	0,86	0,40	0,15	0,79	0,41	0,13	0,76	0,42	0,13	0,72	0,42	0,12	0,70	0,43	0,12	0,68	0,44	0,12	0,66	0,44	0,11		44
20%	3	1,01	0,41	0,17	0,92	0,43	0,16	0,88	0,44	0,15	0,85	0,45	0,15	0,83	0,46	0,14	0,79	0,47	0,14	0,77	0,47	0,13		45
	5	1,13	0,43	0,19	1,03	0,45	0,18	0,99	0,46	0,17	0,95	0,47	0,16	0,92	0,48	0,16	0,88	0,49	0,15	0,85	0,50	0,15		44
	7	1,20	0,44	0,21	1,10	0,47	0,19	1,06	0,48	0,18	1,01	0,49	0,17	0,98	0,50	0,17	0,94	0,51	0,16	0,91	0,52	0,16		45
	9	1,28	0,46	0,22	1,17	0,48	0,20	1,12	0,49	0,19	1,08	0,51	0,18	1,05	0,52	0,18	1,00	0,53	0,17	0,97	0,54	0,17		45
	11	1,37	0,47	0,23	1,25	0,50	0,21	1,19	0,51	0,20	1,14	0,52	0,20	1,11	0,53	0,19	1,06	0,55	0,18	1,02	0,56	0,18		45
	13	1,45	0,48	0,25	1,32	0,51	0,23	1,26	0,53	0,22	1,21	0,54	0,21	1,17	0,55	0,20	1,12	0,57	0,19	1,08	0,58	0,19		45
	15	1,53	0,49	0,26	1,39	0,53	0,24	1,33	0,54	0,23	1,27	0,56	0,22	1,23	0,57	0,21	1,17	0,59	0,20	1,13	0,60	0,19		45
	17	1,63	0,51	0,28	1,48	0,55	0,25	1,42	0,56	0,24	1,35	0,58	0,22	1,31	0,59	0,22	1,24	0,61	0,21	1,20	0,62	0,21		44
	20	1,77	0,53	0,31	1,61	0,57	0,28	1,53	0,59	0,26	1,45	0,61	0,25	1,40	0,62	0,24	1,32	0,63	0,23	1,27	0,65	0,22		43

03		External air temperature ta (°C)																					ta max (°C)		
		25			32			35			38			40			43			45					
Glycol	tu (°C)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)	Pf (kW)	Pa (kW)	Fw (m³/h)			
20%	0	1,14	0,54	0,19	1,04	0,57	0,18	1,00	0,58	0,17	0,96	0,59	0,16	0,93	0,60	0,16	0,89	0,61	0,15	0,86	0,61	0,15		42	
20%	3	1,31	0,57	0,22	1,20	0,60	0,20	1,15	0,61	0,20	1,10	0,62	0,19	1,07	0,63	0,18	1,03	0,64	0,18	1,00	0,65	0,17		44	
	5	1,46	0,59	0,25	1,33	0,62	0,23	1,28	0,64	0,22	1,23	0,65	0,21	1,19	0,66	0,20	1,14	0,67	0,20	1,11	0,68	0,19		44	
	7	1,55	0,61	0,27	1,42	0,64	0,24	1,36	0,66	0,23	1,31	0,67	0,22	1,27	0,68	0,22	1,22	0,69	0,21	1,18	0,70	0,20		45	
	9	1,65	0,62	0,28	1,51	0,66	0,26	1,45	0,67	0,25	1,39	0,69	0,24	1,36	0,70	0,23	1,30	0,71	0,22	1,26	0,72	0,22		45	
	11	1,75	0,64	0,30	1,60	0,68	0,28	1,54	0,69	0,26	1,48	0,71	0,25	1,44	0,72	0,25	1,38	0,74	0,24	1,34	0,75	0,23		45	
	13	1,85	0,65	0,32	1,70	0,69	0,29	1,64	0,71	0,28	1,57	0,73	0,27	1,53	0,74	0,26	1,47	0,76	0,25	1,43	0,77	0,24		45	
	15	1,96	0,66	0,34	1,79	0,71	0,31	1,73	0,73	0,30	1,66	0,75	0,29	1,62	0,76	0,28	1,55	0,78	0,27	1,51	0,79	0,26		45	
	17	2,08	0,68	0,36	1,91	0,73	0,33	1,84	0,75	0,32	1,77	0,77	0,30	1,72	0,78	0,30	1,65	0,80	0,28					43	
	20	2,27	0,71	0,39	2,09	0,76	0,36	2,01	0,78	0,35	1,94	0,80	0,33	1,89	0,81	0,32									41

tu: evaporator outlet water temperature;

ta: external air temperature;

Pf: cooling capacity;

Pa: total power absorbed;

Fw: water flow rate ($\Delta T = 5 \text{ }^\circ\text{C}$).

Interpolation is allowed, extrapolation is not permitted.

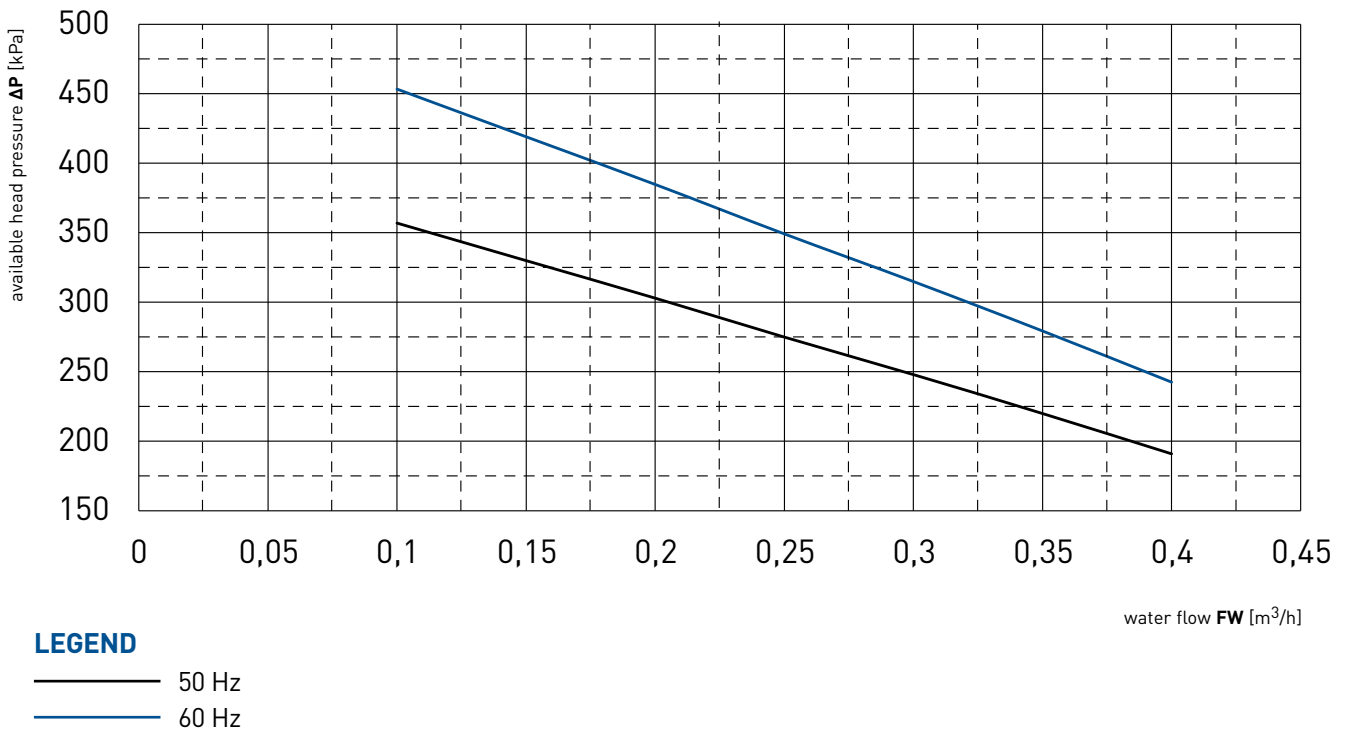
To calculate Pf, Pa and Fw for $\Delta T \neq 5 \text{ }^\circ\text{C}$ when examining the table "Correction factors for $\Delta T \neq 5 \text{ }^\circ\text{C}$ ".

Value includes the correction factor for ethylene glycol.

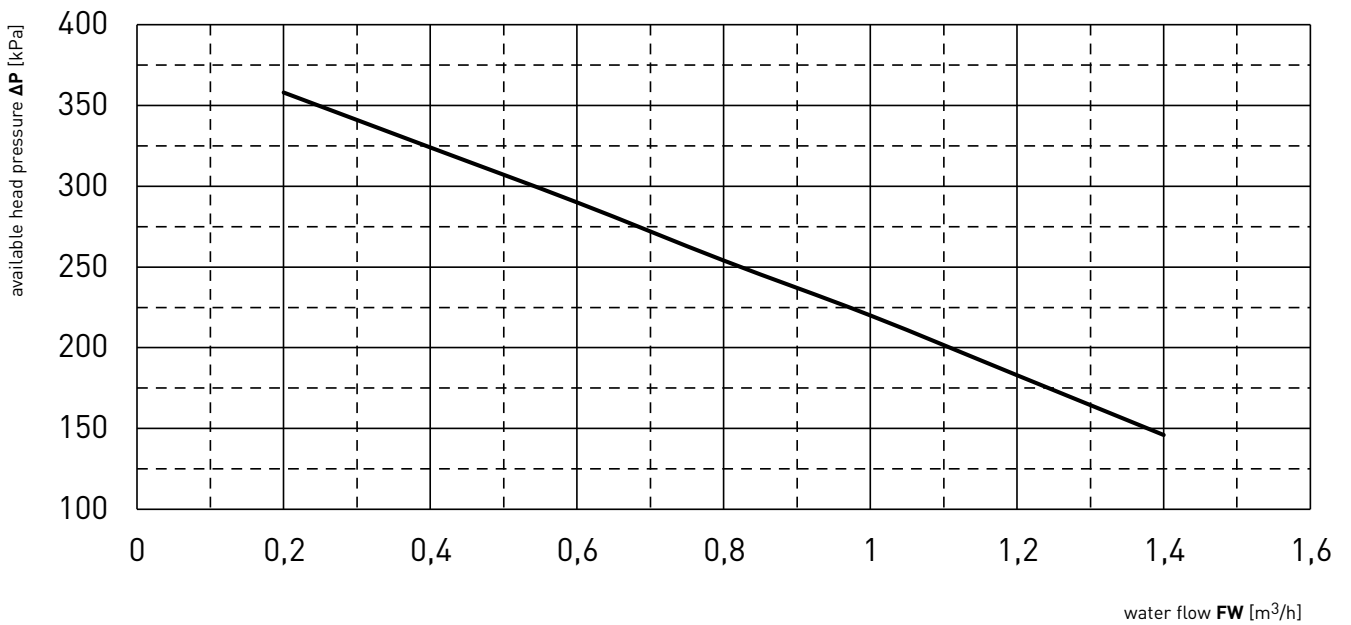
Data declared according to UNI EN 14511:2013.

EVAPORATOR PRESSURE DROPS AND AVAILABLE HEAD PRESSURE

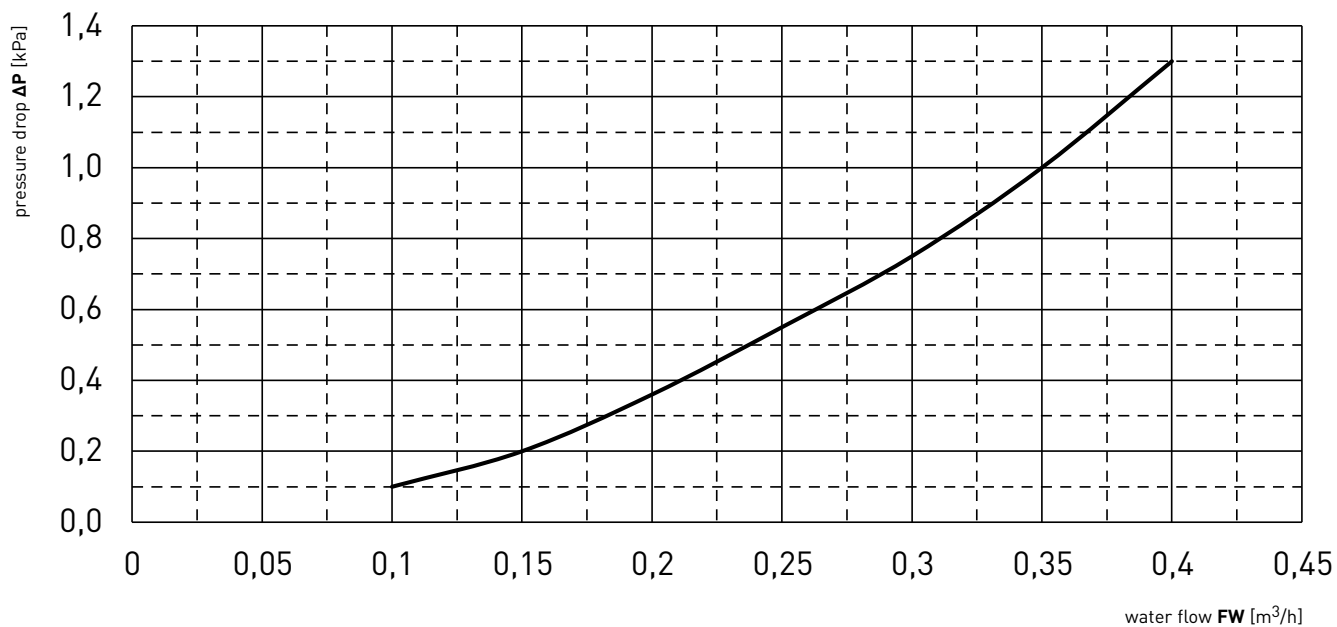
AVAILABLE HEAD PRESSURE WITH P3 PUMP MODELS M02/M03 - 50/60 Hz



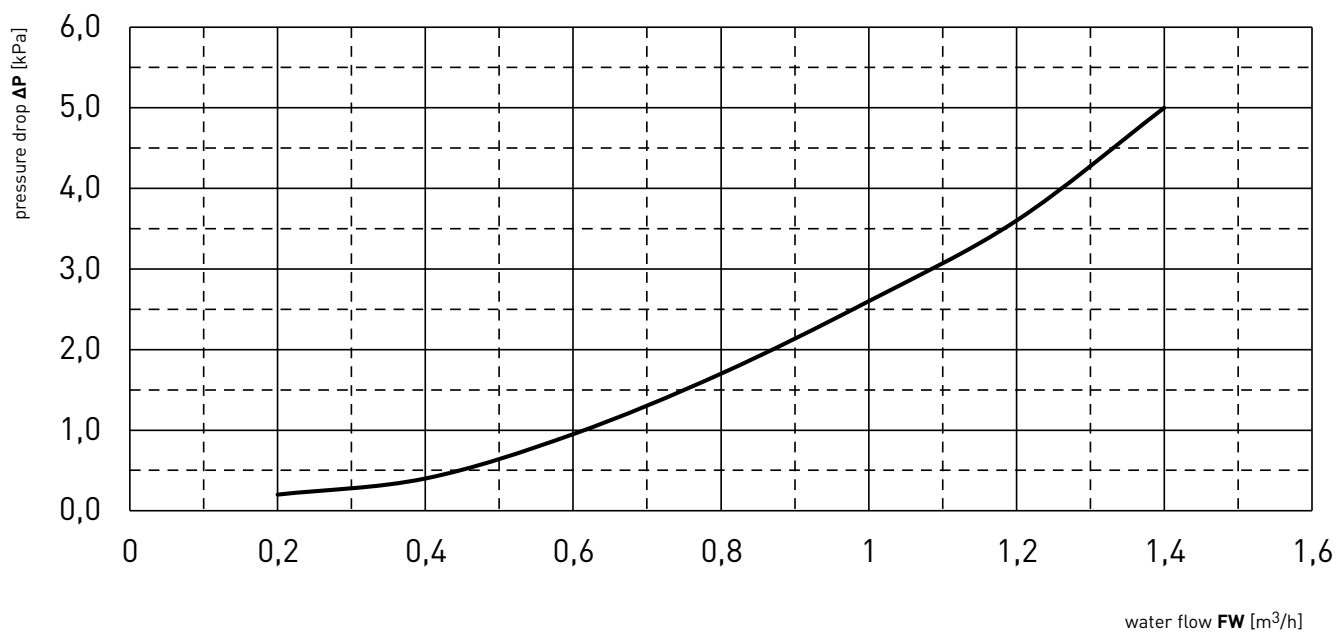
AVAILABLE HEAD PRESSURE WITH P3 PUMP MODELS M05/M08/M10



PRESSURE DROPS WITHOUT PUMP MODELS M02/M03



PRESSURE DROPS WITHOUT PUMP MODELS M05/M08/M10



TAEvo Tech MINI

WORKING LIMITS AND CORRECTION FACTORS

WORKING LIMITS

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

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 referred 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 reference to the selection software.

SOLUTIONS OF WATER AND ETHYLENE GLYCOL

		% Ethylene glycol by weight			
		0	10	20	30
Freezing temperature	(°C)	0	-3,7	-8,7	-15,3
Cooling capacity correction factor (kW)	Kf1	1,00	0,99	0,98	0,97
Absorbed power correction factor (kW)	Kp1	1,00	0,99	0,98	0,98
Water flow correction factor ⁽¹⁾ (m ³ /h)	K _{FWE1}	1,00	1,02	1,05	1,07
Pressure drop correction factor (kPa)	Kdp1	1,00	1,08	1,17	1,25

Multiply the unit performance by the correction factors given in the table ($Pf^* = Pf \times Kf1$). If the value already includes the glycol correction factor do not use this table. (1) K_{FWE1} = 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: $Fw (l/h) = Pf^* (kW) \times 860 / \Delta T$ where ΔT is the delta T of the water through the evaporator (°C).

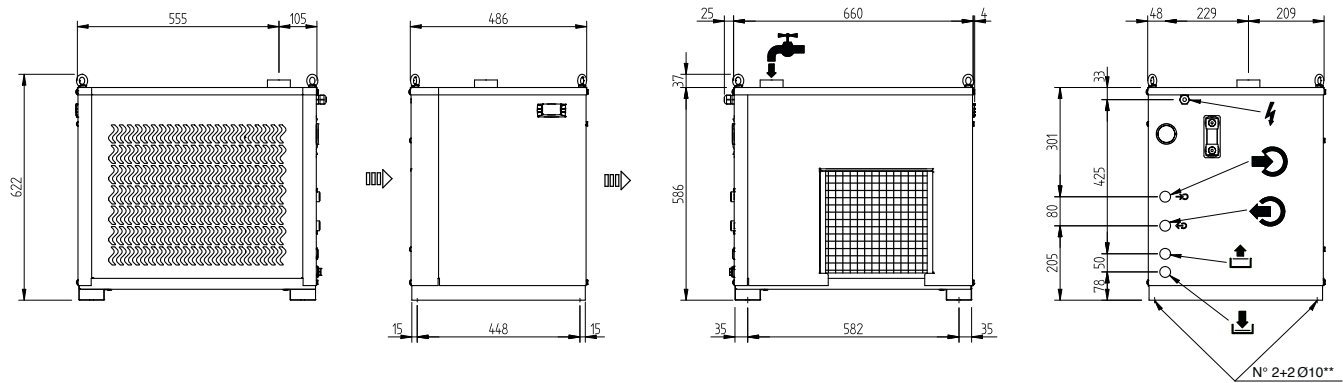
CONDENSER CORRECTION FACTORS

		Altitude (m)					
		0	500	1000	1500	2000	2500
Cooling capacity correction factor (kW)	Kf3	1	0,990	0,980	0,977	0,972	0,960
Absorbed power correction factor (kW)	Kp3	1	1,005	1,012	1,018	1,027	1,034
Derating of the max 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 table ($Pf^* = Pf \times Kf3$, $Pa^* = Pa \times Kp3$). [*] 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

TAEvo Tech MINI 02 - 03 - 05



		02	03	05
	Water inlet	Rp 1/2"	Rp 1/2"	Rp 1/2"
	Water outlet	Rp 1/2"	Rp 1/2"	Rp 1/2"

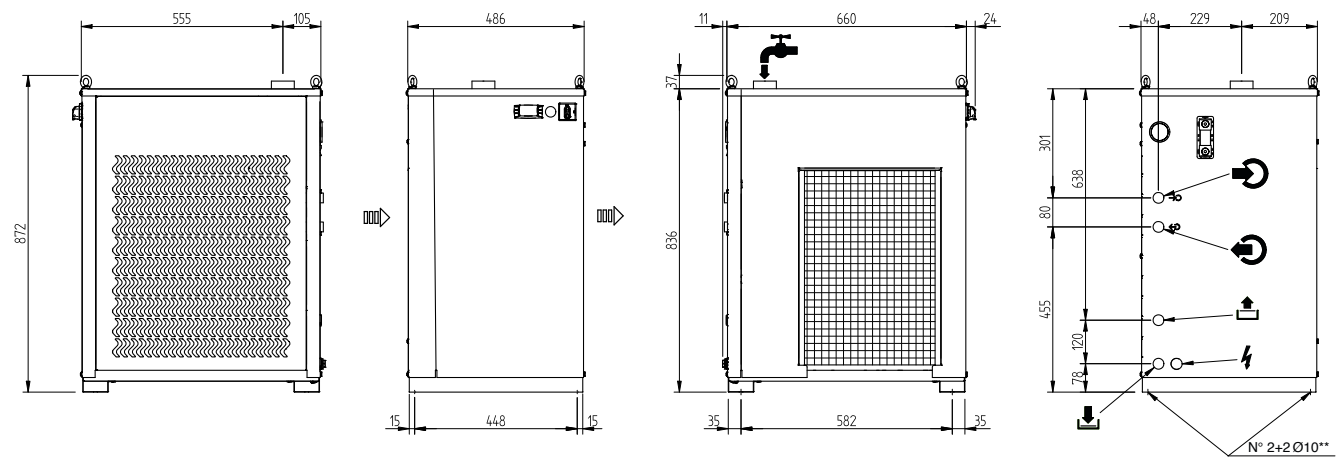
** Holes

Power supply

Overflow = Rp 1/2"

Water discharge = Rp 1/2"

TAEvo Tech MINI 08 - 10



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

** Holes

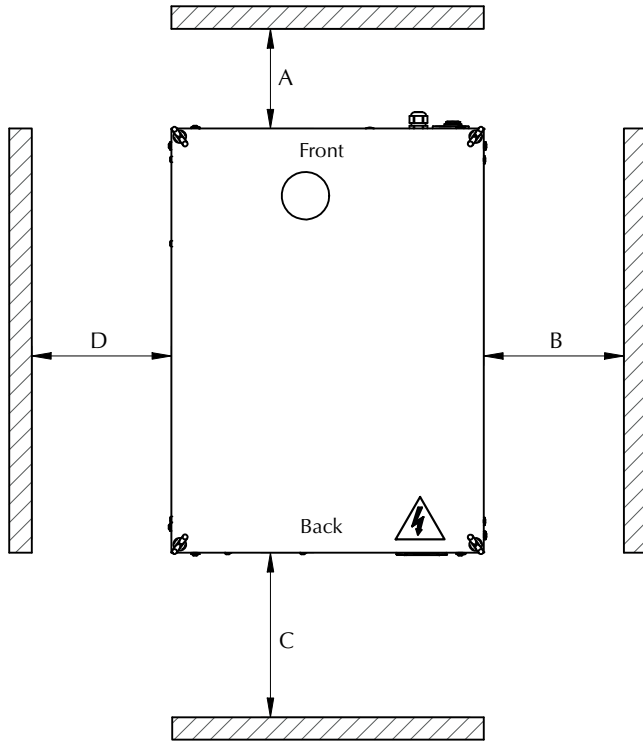
Power supply

Overflow = Rp 1/2"

Water discharge = Rp 1/2"

TAEvo Tech MINI

CLEARANCES



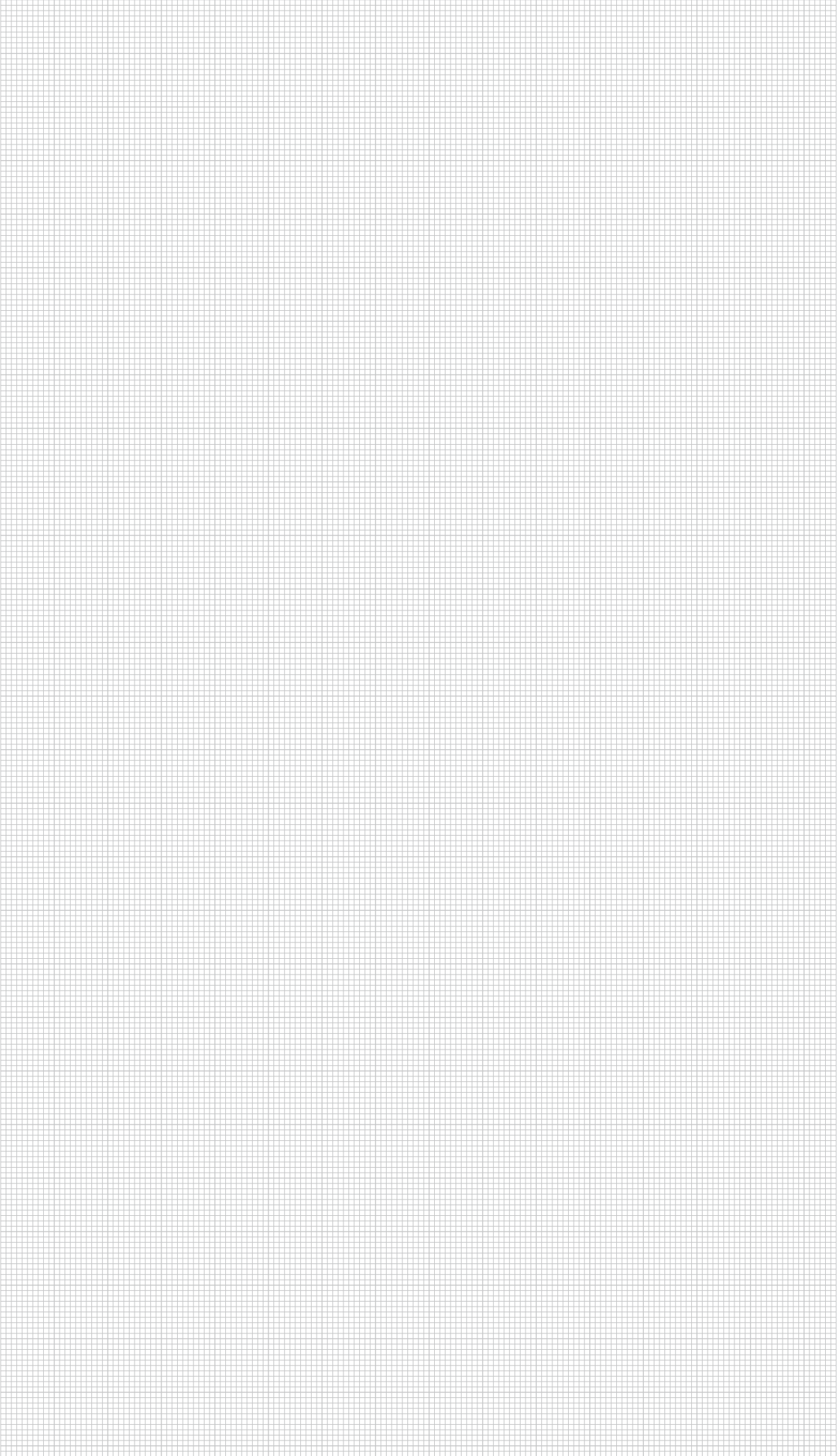
Minimum distance to respect (mm).

	A	B	C	D
TAE_{evo} Tech MINI 02	750	750	750	1000
TAE_{evo} Tech MINI 03	750	750	750	1000
TAE_{evo} Tech MINI 05	750	750	750	1000
TAE_{evo} Tech MINI 08	750	750	750	1000
TAE_{evo} Tech MINI 10	750	750	750	1000

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, flexible couplings 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 the unit's performance or even a shut-down of normal operation. When using several chillers connected in parallel 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 is advisable 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 is advisable 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.





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