



C.P.A. S.R.L.

## MANUALE HEAT PUMPS CLIMEXEL SERIES



## SOUMMARY

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FOR ALL INFORMATION NOT CONTAINED IN THIS DOCUMENT, REFER TO THE MANUAL  
CONTAINED IN THE PRODUCT PACKAGING AND / OR TO THE TECHNICAL DATA SHEET  
INFORMATIVE

## INSTALLATION

### WARNING!!!

*The heat pump must only be installed by qualified personnel!*

#### WARNING:

- Never lift the machine by the hydraulic fittings, there is the risk of damaging the connection with the titanium exchanger located inside the machine.
- heat pump must always be placed in a vertical position, NEVER in a horizontal position



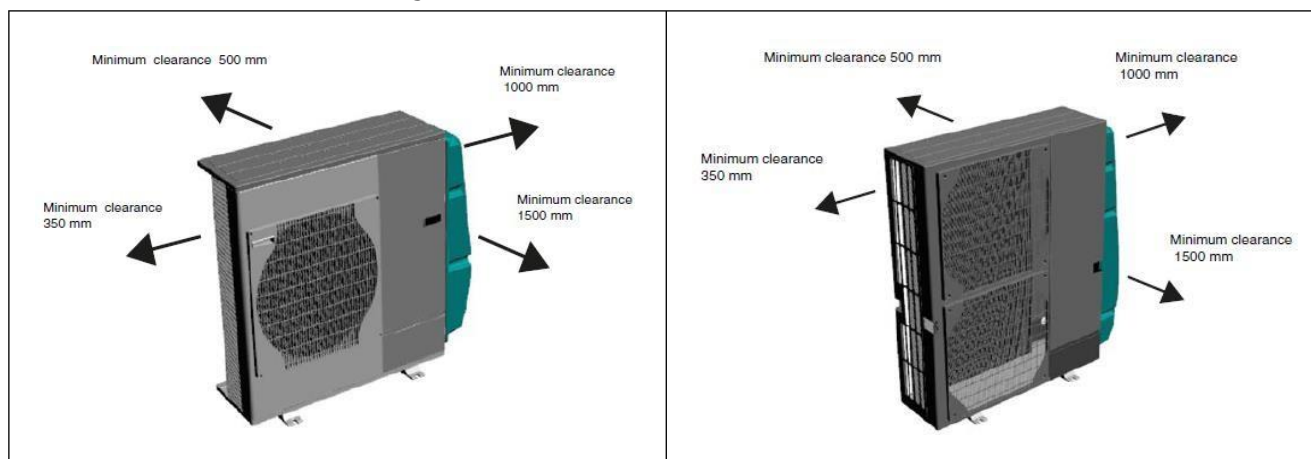
Attention! The pump must never be lifted by the hydraulic connections: risk of damage!

Warranty does not cover damage caused by poor maintenance!

## CHOICE OF THE POSITIONING AND INSTALLATION AREA

The positioning and installation of the heat pump are essential to ensure optimal operation. Usually the points to be respected are the following:

- The heat pump must be imperatively installed outdoors, and a minimum distance must be respected with any type of wall (walls, wooden walls, plant coverings ...) so as not to obstruct the circulation of air through the machine.



- The air emitted by the fans must not be re-sucked, even partially: for this reason, the machine must not be installed in a place confined by a set of walls, even if the distances indicated above are respected.
- The heat pump must not be directly exposed to prevailing winds.

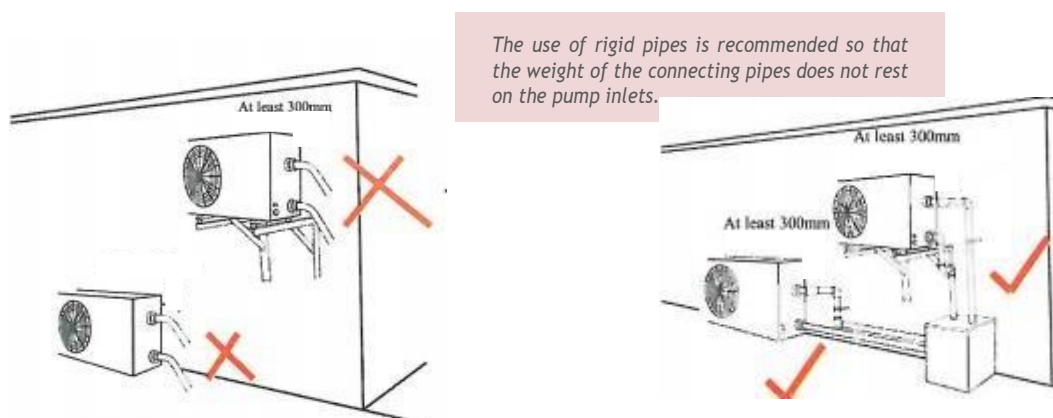
Model	M.P.I. 80M	M.P.I. 100M	M.P.I. 160M	M.P.I. 190M	M.P.I. 190T	M.P.I. 240M	M.P.I. 240T	M.P.I. 320T	M.P.I. 380T
Numero di ventole	1	1	1	2	2	2	2	2	2
Flusso d'aria [m³/h]	2100	2100	3300	6000	6000	6000	6000	8400	8400
Portata acqua [m³/h]	4<Q <5	4<Q <5	4<Q <6	5<Q <7	5<Q <7	8<Q <10	8<Q <10	10<Q <12	10<Q <12

- La distanza che separa la pompa di calore dalla piscina non deve essere eccessiva (preferibilmente inferiore ai 10 m) al fine di limitare le dispersioni termiche nelle tubazioni di collegamento al circuito di filtrazione della piscina.
- L'accesso alla pompa di calore deve essere pratico, in modo da facilitare le operazioni di manutenzione, che possono necessitare il trasporto di materiali pesanti.
- L'acqua non si deve accumulare ai piedi della pompa di calore in caso di pioggia e la condensa risultante dal suo funzionamento deve essere evacuata correttamente (nota bene: l'eventuale condensa ai piedi della pompa di calore è la prova di un corretto funzionamento; in nessun caso può essere considerata come una perdita del liquido di raffreddamento).

The heat pump support must be stable and solid:

- Ground installation: prepare a concrete slab about ten cm thick, at least the same size as the base of the machine.
- Installation at height: the support and its fixing on the wall must resist the weight of the machine (with a safety margin) without deformation. The solidity of the support must not be compromised by oxidation of its materials over time.

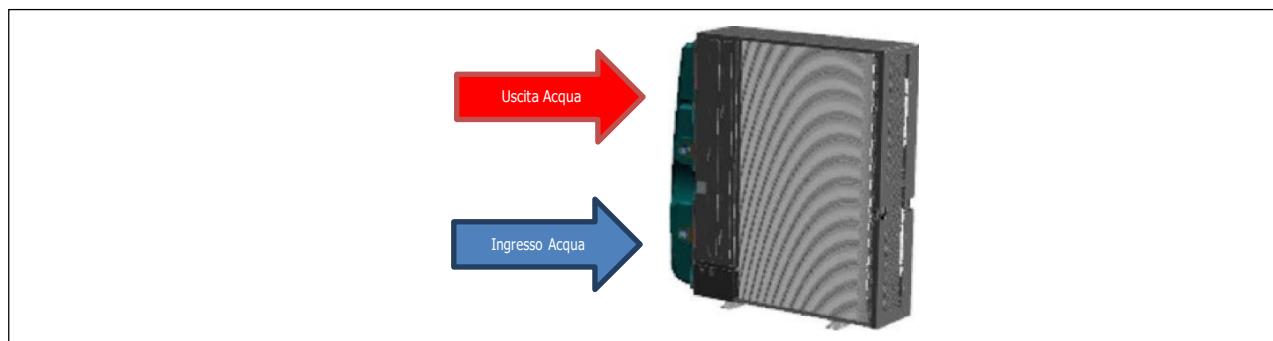
The hydraulic connections must not be constrained by the pipes: the pipes must be placed on the ground on a rigid support, or buried, and rise vertically immediately next to the pump. They must not overload the pump's hydraulic connections. In addition, it is advisable to use a rigid pipe on the vertical part up to the machine and fix it firmly to the wall using fixing collars..



Never place flammable or corrosive objects near the heat pump in order to avoid any risk of damage or accidents.

Never place the pump in the vicinity of fire extinguishing nozzles. Never keep corrosive chemicals or chemicals that can emit acid or alkaline vapours in the vicinity of the pump. If the pump is installed close to the sea, it must be protected from spray, offshore winds or sand loads. Protective panels placed at the recommended minimum distance can be used for this purpose..

## HYDRAULIC CONNECTION CIRCUIT (BY-PASS)



La circolazione dell'acqua della piscina attraverso la pompa di calore è generalmente ottenuta using a pump already placed at the level of the pool's filtration circuit (in order to avoid the attachment of an additional pump).

For this reason, it is advisable to design a branch circuit from the filtration circuit and equip it with three valves:

- An adjustable opening valve, positioned between the delivery and return connections: this allows you to adjust the ratio between the water flow that passes through the heat pump and the water flow that does not pass through it, so to obtain the debt incurred through the heat pump (compare the table).
- A valve positioned near the pump, on the water inlet pipe.
- A valve positioned near the pump, on the water outlet pipe.

These last two valves are usually always in the open position, they must be closed only when it is necessary to intervene on the pump circuit or to disassemble it.

The by-pass connections must be strictly located downstream of the filter to minimize greasing of the exchanger, and upstream of any injection of chemical products for disinfection and pH regulation (provide a space of 1.5 meters of pipes such as minimum) to minimize the risk of corrosion of the exchanger.

The injection of chemical products must be strictly subject to filtration. Make sure that the installation cannot cause accidental siphoning of the chemical product tanks since the filtration does not work.

Be very careful not to introduce impurities (pebbles, earth ...) into the pipes. These would risk clogging the exchanger during start-up.

The heat pump is equipped on one of its sides with two union joints for the entry and exit of the pool water. The water inlet and outlet pipes are to be glued on these joints. Allow to dry thoroughly before starting the water circulation circuit.

Physico-chemical parameters of the pool water:

the pool water treatment chemicals currently on the market are compatible with the materials used for the construction of the heat pump, provided that the physico-chemical characteristics of the water comply with the following recommendations:

- pH between 7 and 7.4
- hydrometric title (TH) below 20 ° C
- Cyanuric acid content (stabilizer) below 80 ppm
- Free chlorine concentration from 1.0 to 1.5 ppm
- Concentration of free bromine from 1.0 to 1.5 ppm

These characteristics must be checked at the beginning of the season, before circulating the water in the heat pump, and then regularly during the operating period..

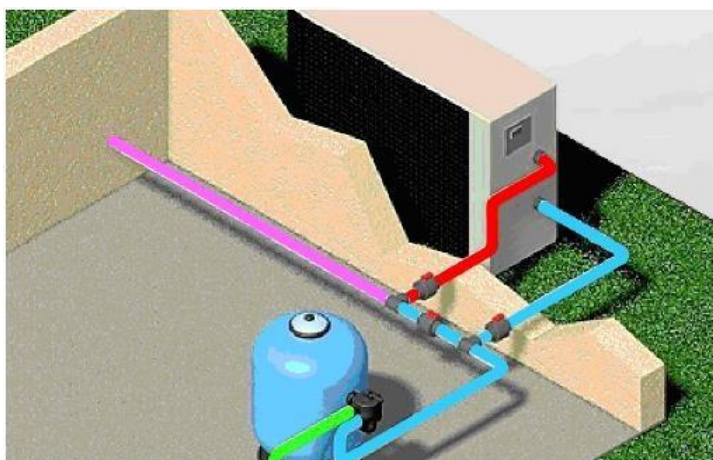
**WARNING:**

Shock treatment of swimming pool water

If "shock" treatment of the pool water is carried out, it is necessary to isolate the hydraulic circuit (using the by-pass valves) to which the heat pump is connected, before starting to increase the concentration of disinfectant and wait until this value has returned to normal before re-opening the valves.

To limit heat loss in the pipes connecting the pump to the swimming pool circuit, it is recommended that the heat pump is not moved more than 10 metres away from the swimming pool.

Beyond a certain length, the pipes must be buried at a sufficient depth (take into account the risk of ground frost according to the local temperatures encountered) and adequately insulated

**ELECTRICAL CONNECTION**

- Call in a qualified electrician to carry out this step.
- Ensure that the supply voltage, number of phases and frequency correspond to the characteristics of the heat pump (see table).
- Ensure that the cross-section of the power cable complies with the electrical characteristics of the installed pump.
- Place a 30 mA residual differential current device at the head of the heat pump supply line.
- The active conductors of the machine's power supply line must be protected by a thermal-magnetic switch or fuses of a suitable calibre for the power of the installed machine, as shown in the table below.

## ELECTRICAL FEATURES

Model	M.P.I. 80M	M.P.I. 100M	M.P.I. 160M	M.P.I. 190M	M.P.I. 190T	M.P.I. 240M	M.P.I. 240T	M.P.I. 320T	M.P.I. 380T
Power supply [V]	230 - mono	230 - mono	230 - mono	230 - mono	400 - tri	230 - mono	400 - tri	400 - tri	400 - tri
Nominal absorption [A]	13	13	19	28	13	29.5	13	19	21
Electrical protection [A]	16	16	25	32	16	40	16	32	32
Sezione del cavo d'alimentazione	3 x 2.5 mm <sup>2</sup>	3 x 2.5 mm <sup>2</sup>	3 x 4 mm <sup>2</sup>	3 x 6 mm <sup>2</sup>	5 x 2.5 mm <sup>2</sup>	3 x 6 mm <sup>2</sup>	5 x 2,5 mm <sup>2</sup>	5 x 4 mm <sup>2</sup>	5 x 4 mm <sup>2</sup>

- The machine must be wired via the white connection box located next to the information plate.
- Remove the protective wrapping.
- Remove the 4 plastic screws from the cover of the connection box to release and remove the cover.
- Insert the power cable into the box, pushing it through the cable glands located at the bottom.
- Strip about 1 cm of each wire and connect them to the terminal, paying attention to respect the phases, neutral and earth.
- Tighten the ferrule nuts to secure the cable and make sure the seal around the cable is well seated.
- Replace the cover and screws, then replace the cover.

**Monophase**

Black: Phase  
 Blu: Neutral  
 Yellow/Green: Grounding

**Three-phase**

Black: Phase 1  
 Brown: Phase 2  
 Grey: Phase 3  
 Blu: Neutral  
 yellow/Green: Grounding



## CONDENSATE DRAIN

<p>Non perforated plug, ref 2</p> <p>Perforated plug, ref 1</p>	<p>The machine's support base must have a very slight slope (approx. 1-2%) towards the corner of the collection basin chosen for draining the condensate.</p> <p>Use one of the corner holes in the lower collection basin to drain the condensation.</p> <p>The basin is equipped with rubber plugs, one of which is perforated: this must be placed at the drainage point, as shown in the figure opposite.</p> <p>If the ground is not able to absorb the generated condensation, it will be necessary to provide for the realisation of a drain.</p>
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## START-UP

### 1. IC 121 CX CONTROLLER









The purpose of the controller is to maintain the temperature of the pool water. Its functions are as follows:

- Starting / stopping the machine
- Maintain the pool water temperature according to the temperature difference (or  $\Delta T$ ) between the inlet and outlet of the machine and the ambient temperature.
- Display the inlet and outlet water temperature and the room temperature
- Display alarms / indicate a defrosting cycle



## 2. CONTROL KEYPAD FUNCTIONS

Button	Function
	<p><b>Push and release:</b> The Set point value is shown in cooling (SetC code) and in heating (SetH code)</p> <p><b>Press and hold for 3 seconds:</b> The Set point value is shown</p> <p><b>Press and release in programming mode:</b> Allows you to access the modification of the parameters Allows the acceptance of the new parameters</p>
	<p><b>Push and release:</b> The value read by the sensor is shown</p> <p><b>Press and release in programming mode:</b> Scroll through the parameters While editing, the parameter value changes</p>
	<p><b>Push and release:</b> The value read by the sensor is shown</p> <p><b>Press and release in programming mode:</b> Scroll through the parameters While editing, the parameter value changes</p>
	<p><b>Push and release:</b> Starts and stops the machine in cooling mode</p>
	<p><b>Push and release:</b> Starts and stops the machine in heating mode</p>
	<p><b>Push and release:</b> Entering and exiting the menu, allows you to access the following parameters:</p> <ul style="list-style-type: none"> <li>– ECO / CONFRT mode</li> <li>– Display and reset of active alarms</li> <li>– Pout parameter: shows the "Step" power level</li> <li>– Activation and deactivation of "slave" mode of the "Ser" filtration pump (optional)</li> <li>– UPL parameter: factory settings</li> <li>– ALOG parameter: factory settings</li> </ul> <p><b>Press and release in programming mode:</b> Returns to the previous programming level</p>

## 3. DISPLAY



Icon	Function
°C -°F	Appears when temperature is displayed
	Appears when an alarm is detected
<b>menu</b>	Appears when the Menu button is pressed
	Appears when the defrost function is active
<b>Flow</b>	Appears when there is no or insufficient water flow
	Appears when the compressor is running
	Appears when the filtration is in series with the heat pump (optional)
	Appears when the defrost function is active while the ambient temperature is below 5 °C (optional)
	Appears when the machine is in heating or cooling mode

## OPERATIVE GUIDE

## 4. START-UP

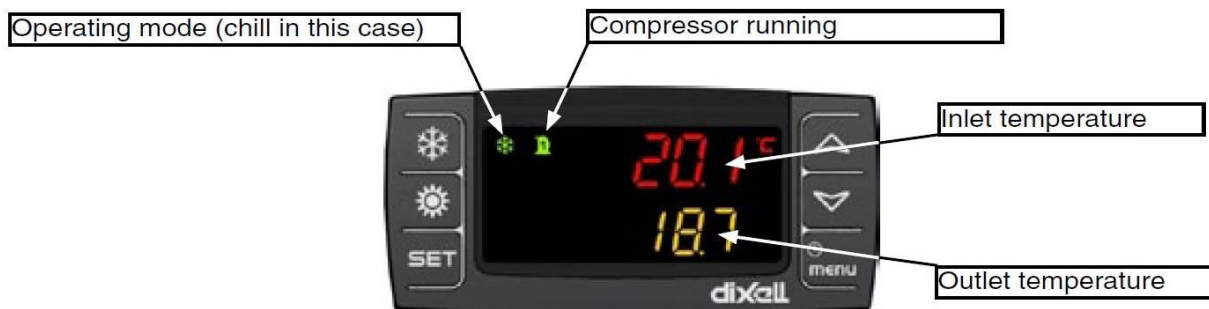
Once the electrical wiring and hydraulic connection operations have been completed, in accordance with the previous paragraphs:

	Press to start cooling mode
	Press to start heating mode

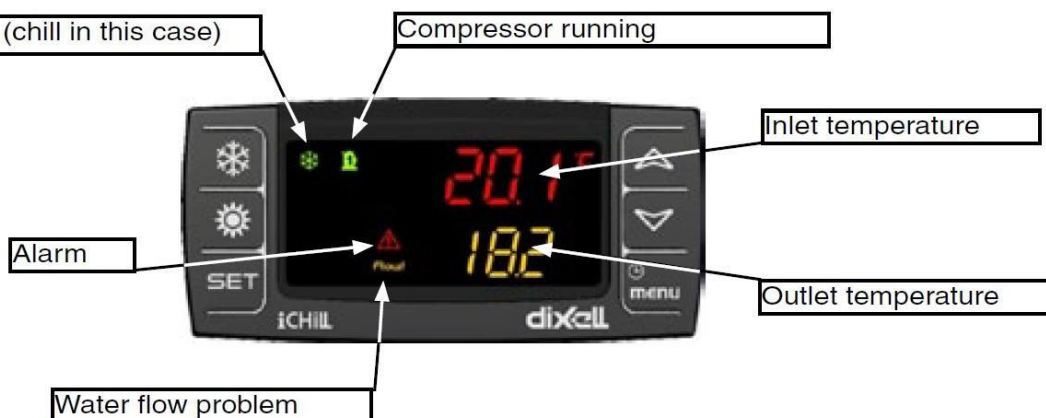
**CAUTION: THERE MAY BE AN INTERVAL OF SEVERAL MINUTES BETWEEN THE MOMENT THE MACHINE IS ACTIVATED AND THE START OF ITS OPERATION.**

Quando la macchina è in funzione il display mostra la temperatura in ingresso( in rosso ) ed in uscita ( in giallo ) dell'acqua simultaneamente



## 5. DISPLAY – CORRECT FUNCTIONING



## 6. DISPLAY-SIGNAL OF ANOMALY



## 7. STOP

	Press to stop the pump when it is in cooling mode
	Press to stop the pump when in heating mode



Display con macchina in spegnimento

## 8. SET POINT DISPLAY AND PROGRAMMING



Press and release the "SET":

- In the lower part of the screen the cooling set point "SetC" or the heating set point "SetH" is displayed.
- The set point is displayed at the top of the screen.

Set point selection:

- 1) Press and hold the SET SET key for 3 seconds
- 2) The current set point is displayed on the screen, flashing
- 3) Use the ▼ or ▲ keys to select the new setting
- 4) Save the setting by pressing "SET" or wait 15 seconds.

Please note:

In heating mode, the set point setting range is between 20 and 35 ° C. In cooling mode, the set point setting range is between 7 and 40 ° C

## 9. ECO / COMFORT MODE SELECTION



Selection of Eco or Comfort mode:

- 1) Press the "MENU" button
- 2) Press the ▼ or ▲ keys to scroll through the parameters until "Mode" is displayed.
- 3) Press the "SET" button, the mode will start flashing
- 4) Save the current setting by pressing "SET" or wait 15 seconds.
- 5) Use the ▼ and ▲ keys to display the desired "Eco" or "Conf" mode
- 6) Press the "SET" button to save this setting.

In "COMFORT" mode the machine will operate at maximum power until the set point temperature is reached. In "ECO" mode the machine will adjust the power according to the water and air temperature in order to optimize electricity consumption.

## 10. SETTINGS AND CONTROLS

### A. CHECKING THE FLOW THROUGH THE BY-PASS:

The amount by which the pool water temperature is raised by passing through the titanium heat exchanger depends on two factors:

- flow rate (adjustable)
- the temperature difference between the incoming heat transfer fluid and the incoming pool water. The higher the ambient temperature, the greater the heat transferred to the fluid at the inlet of the heat exchanger.

The temperature difference between the inlet and outlet of the heat pump varies depending on the operating conditions of the machine:

- diminuirà con la diminuzione della temperatura dell'aria ambiente e / o aumenterà la temperatura dell'acqua da piscina
- aumenterà con l'aumentare della temperatura dell'aria ambiente e / o diminuirà la temperatura dell'acqua da piscina.

To regulate the flow rate of the by-pass loop, the machine must be operating at full power, i.e. the set point temperature is more than 3°C above the pool water temperature for at least 20 minutes. Under these conditions, and only under these conditions, the by-pass must be adjusted to obtain a delta T of 3°C.

Please note:

The efficiency of heat transfer between the heat transfer fluid and the pool water will decrease if the heat exchanger is encrusted (scale, etc.) or partially clogged. This can prevent the pool water from reaching the set point even with the bypass valves configured to minimise the flow rate through the bypass loop..

## 11. INITIAL HEATING-START-UP PHASE

The first time the heat pump is started or when it is restarted at the beginning of the season, the pool water must be heated by several degrees to reach the desired temperature (set point).

In addition to minimising heat loss from the pool (use of a cover), it is often necessary to leave the filtration system running 24 hours a day, so that the heat pump is also running 24 hours a day to heat the water to the set point in an acceptable time.

When taking these precautions, the initial heating period could take between 2 and 4 days depending on the daytime and night-time hours (although the air temperature may be high during the day, nights are often quite cold at the beginning of the season).

Translated with [www.DeepL.com/Translator](http://www.DeepL.com/Translator) (free version).

Please note:

The heat pump only operates while the filtration is running. The length of the daily filtration cycles may be insufficient for the heat pump to properly maintain the pool water temperature around the set point. In this case, lengthen the filtration cycles and cover the pool while it is not in use to limit heat loss from the pool.

## 12. DEFROST CYCLE

As the air passes over the evaporator fins, the water contained condenses into small drops. If the ambient air is cold, these droplets could freeze and therefore would no longer be able to drain by gravity from the bottom of the machine. The frost then slowly accumulates on the fins, creating an insulation over time that would prevent the transfer of heat from the air to the heat transfer fluid.

The heat pumps are equipped with a device that automatically detects the excessive accumulation of ice and triggers the defrost by inversion of the cycle.

The defrosting phase lasts a few minutes. The heat pump then returns to normal operation and, if necessary, another defrost phase can be activated. An audible click (movement of the 4-way valve) accompanies the beginning and the end of the cycle inversion.

Please note:

- The more humid the air, the more quickly the frost will accumulate.
- Traces of residual frost may persist, however repeated defrost cycles should not cause these accumulations to grow.
- The thermodynamic defrost works correctly down to -7 ° C. Below this temperature the machine must be switched off.
- Quando the weather is cold and humid, the heat pump could engage in subsequent defrosting cycles. The time dedicated to defrosting is subtracted from the time taken to heat the pool, thus reducing the caloric power supplied by the machine.
- The speed and efficiency of the defrosting phase directly depend on the pool water temperature.

## 13. PERIODIC MAINTENANCE

Regularly check that dirt has not accumulated on the evaporator (pollen, earth, cuts, etc.).

Clean if necessary:

- stop and unplug the machine,
- or rinse gently with water (do not use a high pressure hose, this could damage the fins)
- or use a soft brush to clean between the fins
- Depending on the rate of dirt accumulated on the evaporator, the floor of the machine must be cleaned regularly by a professional to prevent blocking or blocking the flow of condensate.
- Periodically check that the impeller blades are not dirty or damaged.
- Check the heat transfer fluid pressure and electrical connections annually by a professional.
- Clean the cabinet that houses the machine Clean the cabinet with soapy water and a soft cloth. Never use abrasive products or organic solvents.

## 14. WINTERING

- Stop the machine

If the heat pump is heating up, stop it.

Please note:

Never stop the heat pump during a thermodynamic defrosting phase or only after one, this could cause problems when the heat pump is restarted at the beginning of a subsequent season (subsequent triggering of the "HP" mechanism before the heat pump).

Trigger the switch in the electrical panel.

Disconnect the machine, wind up the cable and store it.

➤ **Bleeding the heat exchanger**

Close the by-pass valves to hydraulically isolate the machine.

Unscrew the upper coupling and then the lower coupling: the water will drain from the machine by gravity..

The heat exchanger must be drained to avoid the risk of freezing of any stagnant water, which could damage its internal components; the titanium exchanger, the flow sensor, etc..

## 15. PROBLEM SOLVING

### *Heat pump is not powered (displays white)*

- Has the earth leakage circuit breaker protecting the heat pump become jammed?
- Are the electrical connections (in the electric panel, connection box, etc.) correctly tightened?

### *La pompa di calore è alimentata (display accesa), ma non avviene nulla all'avvio*

- The machine is in the resting phase (lasts 3 to 5 minutes)
- Is the set point correct? Value entered correctly
- Is filtration running?

### *The heat pump starts up but the earth leakage circuit breaker trips.*

- Is/are the earth leakage circuit breaker or thermal magnetic circuit breaker for the heat pump line not of the D-curve type?
- Has the permissible amperage of the main switch in the house or utility room been exceeded?
- Is the amperage of the thermal protection of the line supplying the heat pump too low?
- Is the house located at the end of the power supply line? If so, could a significant voltage drop at start-up explain this phenomenon, etc.?

### *The heat pump is running, but does not heat the water properly*

- Check that the water is correctly heated as it flows through the heat pump (1 to 5°C depending on the model): if this is the case, the water is correctly heated but the heat loss from the pool is too high (cold nights, pool not protected by an isothermal cover, etc.).
- The heat pump is undersized in relation to the volume of the pool.
- The duration of the programmed daily filtration cycles is insufficient.
- Check that the set point is correct
- The air circulation through the evaporator may be obstructed: check that the minimum distances between the heat pump and nearby obstacles have been respected
- Check that the evaporator is free of moss, dust, pollen, etc. o Check that the air circulation through the evaporator is not obstructed.



*The heat pump does not carry out the defrost cycle correctly*

- Does the thermodynamic defrosting phase start? Acoustic sound + change in compressor pitch and (partial) ice melting.
- Ice remains on the bottom of the evaporator: condensate does not drain:
- The heat pump is not tilted slightly towards the condensate drain hole
- The condensate drain hole is blocked.

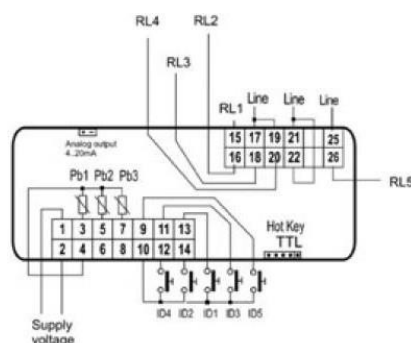
## 16. ALARM CODE LIST

Code	Description	Cause	Remedy/Reset
P1	Sensor alarm Pb1 heat exchanger input	Faulty sensor or false contact	Automatic reset when sensor is replaced or contact is verified
P2	Sensor alarm Pb2 heat exchanger outlet	Faulty sensor or false contact	Automatic reset when sensor is replaced or contact is verified
P3	Sensor alarm Pb3 room temperature	Faulty sensor or false contact	Automatic reset when sensor is replaced or contact is verified
FLOW	Flow sensor alarm	Filtration stopped or sensor damaged	Restore flow or replace sensor
DIAL	Machine allarm	Machine in Fault mode (internal board)	Remove tension for at least 5 minutes
EE	EEPROM alarm	Loss of date from the thermostat's EEPROM memory	Replace in thermostat
ACF1	Configuration alarm	Incorrect configuration of the thermostat. Input and/or output temperature not configured.	Automatic reset after successful configuration of parameters

## 17. ALLARM RESET

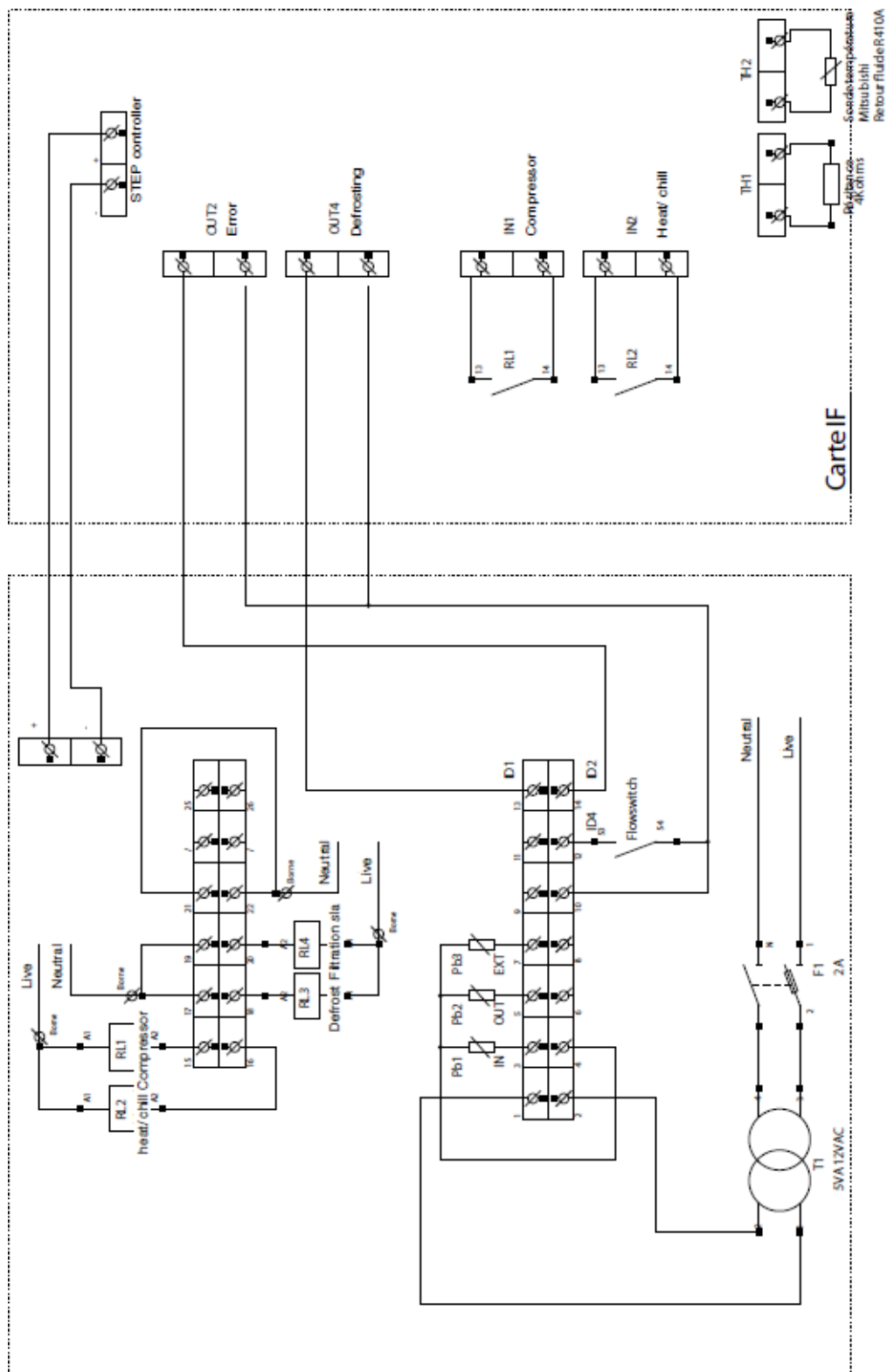
- Press the "MENU" key
- Use the ▼ or ▲ keys to scroll through the parameters until "Alrm" is displayed.
- Press the "SET" key, the previously selected selection mode is selected
- Use the ▼ or ▲ keys to scroll through the alarms
- While "Rst" is displayed at the top of the screen, press the "SET" key
- Press the "MENU" key to exit the menu.

## 18. WIRING DIAGRAM



n°	
1	4-way valve
2	Machine error
3	Not in use
4	Control flow
5	Not in use
PB1	Heat exchanger inlet sensor
PB2	Heat exchanger outlet sensor
PB3	Ambient temperature sensor
RL1	Compressor (start/stop)
RL2	Heating/cooling mode
RL3	Defrost start (optional)
RL4	Slave filtration (optional)

## 19. ELECTRICAL SCHEME



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