

SWIMMING POOL HEATER PLASTIC SHELL

USER MANUAL

Model : PHP120/ PHP150/ PHP250



CE RoHS

-Please read this operating manual before using the Heat Pump-

Introduction

Congratulations. You've just bought a reversible heat pump to warm or cool your swimming pool.

This device is installed according to the current standards and is ready to be used.

The following remarks are very important for unimpeded use:

- **The heat pump operates only in cooperation with the filtration unit, so both must be switched on.**
- **At the start of the season or in a short low-temperature period, you must increase the time of operation: the heat-pump needs more time to compensate for thermal losses.**
- **Use of an insulating cover is strongly recommended.**
- **If an extended period of low temperatures is expected, you should prepare the pump for freezing conditions or increase filtration time to 24h/24.**

Please read the manual completely.

When things are not clear to you, please don't hesitate to contact your engineer.

We wish you a long bathing season in your swimming pool at comfortable temperatures.

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1- Warning

This manual is an integral part of the machine and must always be reachable in your technical room.

This Heat pump is meant exclusively for heating or cooling swimming pools. Any other non-conform and random use will be considered as dangerous and unsuitable.

The assembly, the electric connection and the start up must be carried out by specialized and professional staff.

It is essential to maintain the temperature in the swimming pool lower than the value recommended by the swimming pool's manufacturer.

You'll have to inform your retailer of any breakdown or error message ; have the maintenance works done by specialized staff.

In a concern of constant improvement, our products can be modified without notice; the pictures or the characteristics described in this manual are not contractual.

2- Safety Instructions

Do not go up on the Heat pump or do not try and move it once installed. Never cover (risk of overheating). Keep out of reach of children, and do not to let them play around, inform them of the dangers of this machine.

Never introduce a stick or your fingers into the protective grille of the ventilation ; the last one turns very quickly. Never clean the machine with the water jet.

Never disconnect the machine when it's working ; for any intervention even of cleaning, stop the machine, by pressing first on the key OFF; in the event of an emergency, cut off the current on the table. Do not draw on the electric wire (risk of electric shock 230 volts)

3-Technical characteristics

Model		PHP120	PHP150	PHP250
Air discharge		Vertical	Vertical	Vertical
Shell material		Plastic	Plastic	Plastic
Heating capacity	KW	12.8	15.2	25
Rated power in	KW	2.7	3.4	5.9
COP		4.6	4.45	4.3
Noise	dB(A)	49	50	55
Power supply	V/Ph/Hz	230/1/50	230/1/50	400/3/50
Rated current in	A	12	14.8	8.5
Max current in	A	20	25	16
Temperature	°C	5-40	5-40	5-40
Compressor	Brand	Toshiba	SANYO	SANYO
	Type	Rotary	Scorll	Scroll
Refrigerant	Type	R410a	R410a	R410a
Manometer		Yes	Yes	Yes
Fan quantity		1	1	1
Min water fiow	L/min	90	100	130
Water connect	Inch	2	2	2
Heat exchanger		Titanium PVC	Titanium PVC	Titanium PVC
Flow switch		Yes	Yes	Yes
Pressure protect		HP and LP	HP and LP	HP and LP
Display		LED	LED	LED
Auto-defrost		Yes	Yes	Yes
Microcomputer control		Yes	Yes	Yes
Wire control		Option	Option	Option
Packing method		Wood	Wood	Wood
Packing dimension	LXWXH(mm)	670/610/958	670/610/958	793/725/980
Unit dimension	LXWXH(mm)	740/670/1090	740/670/1090	840/755/1105
Net/shipping weight	Kg	72/83	87/98	125/138
Loading quantity(40HQ)	Sets	96	96	84
Model for heating only		KS120N	KS150N	KS250N

Heating capacity is based on inlet water temperature 25°C,Ambient air temperature 24°C(DB)/19°C(WB)

4 –Principle of working

The Heat pump uses the free heat contained in the outside air to transmit it to the swimming pool water.

The ventilator located in the heat pump has the air circulated on the radiator with gills.

When the Heat pump heats the swimming pool, the air blown is fresher than the outside air.

In the contrary, when the heat pump cools the swimming pool, the air blown is heater than the outside air.

You can regulate the temperature to which you want to heat your swimming pool.

Careful : Increase the required temperature does not increase the heating power (example: your swimming pool is at 18°C; if you want 28°C, don't post 35°C to reach more quickly 28°C).

5 - Using when it's cold

When the outside temperature decreases and that the air becomes radiator. This is normal (*).

To avoid a strong thickness of white frost which would prevent the air to circulate through the gills of the radiator, the Heat pump launches regularly and automatically an operation of defrosting which is accompanied with the stopping of the compressor during a few minutes.

In addition the Heat pump is regulated in factory to go into auto defrost when the defrosting sensor temperature becomes lower than -7°C, and start again When the defrosting sensor temperature go up to 10°C. The two temperature value -7°C and 10°C are default value. You can choose your own adjustments for the two temperatures by using the procedure described at the paragraph "Adjustment of defrosting", or by calling your retailer.

(*) the fluid which circulates in the Heat pump thanks to a compressor, is, at the time of the passage in this radiator at an high negative temperature (same principle used in your freezer).

6 - Checking before and after starting

Before starting:

Your machine is tested and regulated in factory, however it is advised to carry out the following controls before starting :

- electric connections correctly carried out**
- installation carried out according to our recommendations**
- correct connection of arrival and exit water pipes according to the written indications**

(For more details on the rules of establishments refer to the document: Of INSTALLATION AND MAINTENANCE)

- no foreign things on the machine or fixed on the grids of the radiator**

After starting:

Ensure that operation is regular; if high vibrations occur, stop the Heat pump and call your fitter.

7 – Instructions

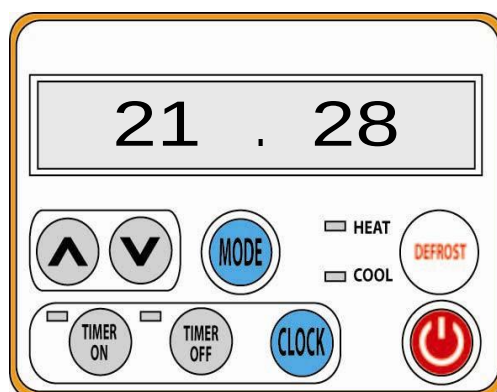
Careful :

The first pressure on the key ON/OFF gives the authorization of starting the Heat pump; the latter will start within a variable time: shortest within 1 second and longest within 4 minutes.

From its starting the heat pump heats or cools the swimming pool water, and will automatically stop when the required temperature has been reached; don't stop its operation unnecessarily.

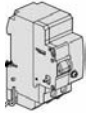
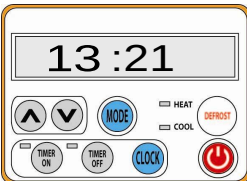
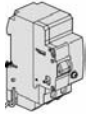
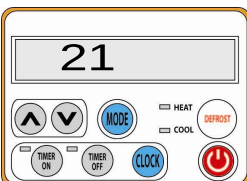
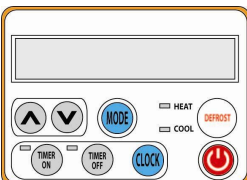
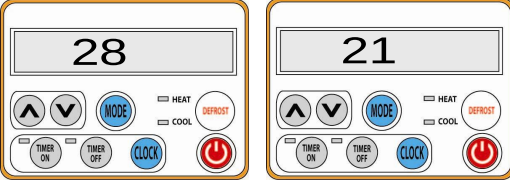
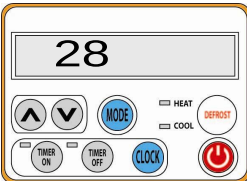
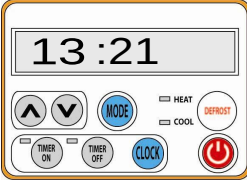
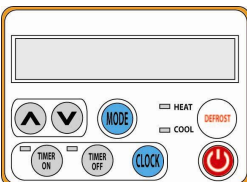
If you have to stop the Heat pump operation (for example to pass from the heating mode to the cooling mode), you will observe that the Heat pump will start again after 4 minutes.

Description of the order and display panel :

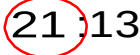
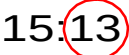
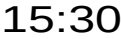


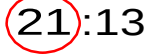
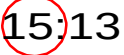
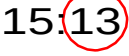
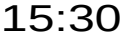
Buttons	Function
	ON / OFF
	Heating mode & Cooling mode selection / Defrost Setting
 HEAT	Light of heating mode running / Flashing when heat pump defrosting
 COOL	Light of cooling mode running (invalid in the heating only system)
	Adjustment of the temperature desired; Adjustment of the start and stop hour;
	Adjustment of the temperature desired; Adjustment of the start and stop hour;
	Force Defrost / Temperature display
	To adjust the current hour and function timetable (set a starting hour)
	To adjust the current hour and function timetable (set a stopping hour)
	To set the hour

Procedure of use

	External appliance or button of heat pump	Display	Heat pump answer
Put the heat pump under tension	Engage the circuit breaker of the heat pump 		Indicate the current hour
Put in circulation the Heat pump into the pipes	Engage the circuit breaker of pump of filtration 		Indicate the current hour
Start	Press the button 		Start between 1 second and 4 minutes in the last active mode (heating or cooling)
Go from heating mode to cooling mode or inversely from cooling to heating	Press the button 		Stop for 4 minutes, reverse of cycle and restart in a new mode
Set the wished temperature into the Heat Pump	Up and Down  adjustable from 5°C to 35°C (Cooling mode)* 10°C to 35°C (Heating mode)		The heat pump heats or cools until the required temperature
Stop	Press the button 		Immediately stop and wait
Switch off	Use the circuit breaker of pump of filtration 		Completely stop

Adjustment of operation timetable(timer):

Setting the time	If the pump is running , press  to stop it.	
	Press on the  for 5 seconds. The hour setting mode is activated, the hours light.	 The left-digit flash
	Set the hour using the  	
	Press 	 The right-digit flash
	Set the minutes using the  	
	press around 10  once again(or wait seconds, the display will leave the setting mode by itself)	

Setting times of hours (TIMER)	Press on the  for 5 seconds.	 The left-digits (hour) flash
	Set the hour using the  	
	Press  to go to minutes setting	 The right-digits (hour) flash
	Set the minutes using the  	
	Press  to confirm the setting	

Settings

Manual defrosting:

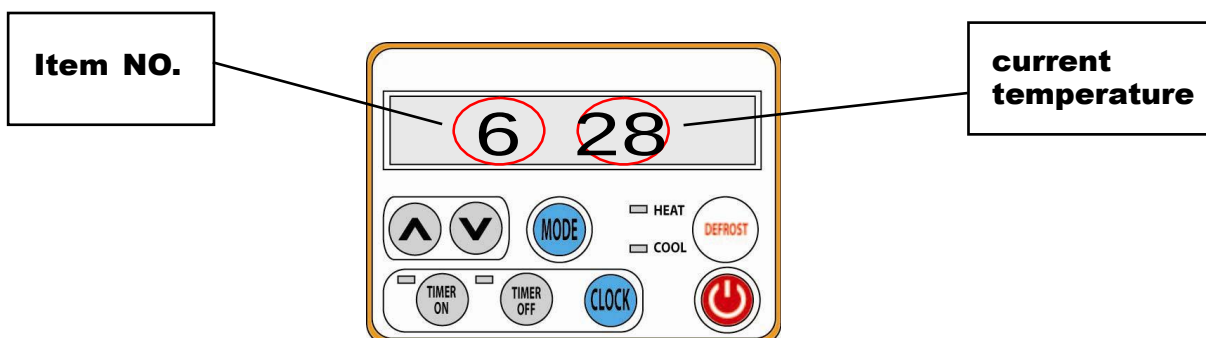
The heat pump is set for defrosting automatically.

Under special conditions, it is possible to force defrosting by pressing the button . The default force defrost time is 8 minutes. This defrosting could be stopped by pressing the button OFF.

Temperature display:

Press on  for 4 seconds to enter the Temperature display.

Press on  again to enter the next item temperature display.



Item NO.	Meanings
6	Temperature of the water
7	Temperature of the ambient
8	Defrost sensor temperature
9	Compressor exhaust temperature

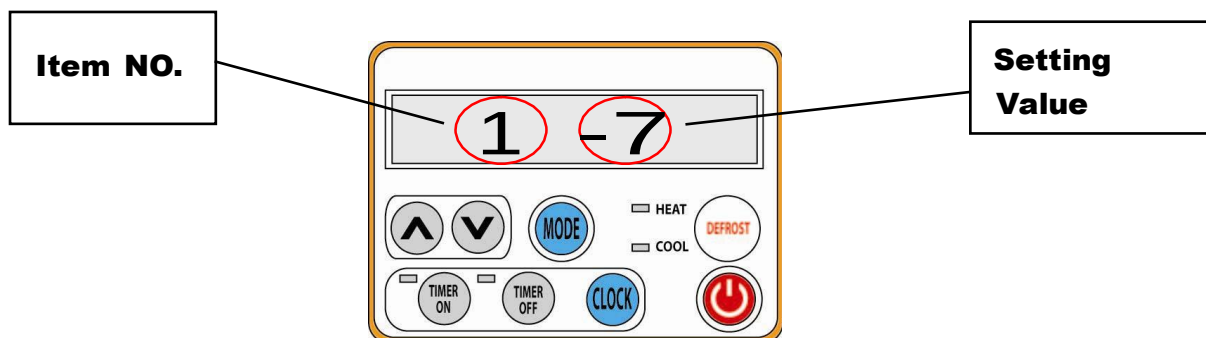
Defrosting setting:

Press on  for 3 seconds to enter the Defrosting setting.

Set each parameter using  and  according the table below.

Press on  to enter the next Item ;

After setting the value, the defrosting setting will exit automatically after several seconds. And the system will memorize the last value of each setting.



Parameter NO.	Meanings	Range	Default Value	Remark
0	Flow switch detection	0 / 1	0	adjustable
1	Defrost starts temperature	-30~0℃	-7℃	adjustable
2	Defrost stops temperature	0~30℃	10℃	adjustable
3	Interval of defrost	30~90min	45min	adjustable
4	Time of defrost	1~20min	8min	adjustable

Detection of flow switch (0 / 1):

A) When choosing 0, the detection does not work in 10 minutes after compressor running; 10 minutes later start to detect, if it is display error code Eb, machine will be stop then.

B) When choosing 1, it starts to detect as soon as compressor start, if it is display error code Eb, machine will be stop then.

Reset Button:

when press the button



for 4 seconds, and the following points will

return to initial state (Windows default):

0. Flow switch detection : 0

1. Defrost starts temperature: -7℃

2. Defrost stops temperature: 10℃

3. Interval of defrost : 45 minutes

4. Time of defrost : 8 minutes

8- Water Flow and refrigerating circuit pressure

After putting into service, do the settings of pressure of the refrigerant circuit for having an optimal operating of the heat pump, following:

Stage 1:

Access to the seal of the filling gas valve in removing the rubber cover ; before starting the Heat Pump, connect the manometer, the needle must shows before starting and to an ambient temperature around 20°C, a pressure from 14 to 16kg/cm².



Stage 2:

Close completely the by pass valve and open largely inlet and outlet valves of the Heat Pump; in these conditions the totality of the water flow goes by the Heat Pump.

Put into service the Heat Pump in heating mode, wait for the indicated pressure being stabilized; the correct setting of the pressure is from 28 to 30 kg/cm²;

In most of cases (pump of filtration given a flow until 20m³/h) you do not have to open the by pass valve.

If the stabilized pressure is under 28kg/cm², the progressive opening of the by pass valve will allow rising this pressure.

The adjustment of the by pass valve done, you have in principle no reason to modify it during the season. See the paragraph "Environment problem" too.

9- Defrosting

The defrosting is necessary only in heating mode.

Sequences of the defrosting:

1- Start

The defrosting is engaged if the following conditions are at the same time fulfilled:

- the compressor and the fan motor run without stopping;
- the defrosting sensor temperature lower than 3°C, and the duration of time more than 45 minutes;
- the defrosting sensor temperature goes down to -7°C(factory setting).

2- The compressor and the fan stop

3- After 10 seconds, the 4 way valve shifts

4- Five seconds after its stop, the compressor starts alone and the accumulated freeze on the gills becomes melting, what is generally with a steam cloud.

5- Stop:

The defrosting stops if one of the following conditions is fulfilled:

- the defrosting operates 20 seconds and the detected temperature by the defrost sensor goes up to 10°C(factory setting).

- the defrosting mode had run totally 8 minutes

6- The compressor stops

7- After 10 seconds the 4 way valve shifts

8- Five seconds after its stop the compressor and the fan start for restarting in heating mode.

10 - Regular operations of maintenance

Washing the sand filter of your filtration installation :

Stop the Heat pump

Wintering :

Stop and put the heat pump out of tension

Stop and put the filtration pump out of tension

Close the 2 isolating valves nearest of the Heat pump

Entirely unscrew the 2 connections on the Heat pump and have each pipe slip to make leave the openings coming out from the heat pump ; the Heat pump gets empty, wait for the complete emptying. (THE EXCHANGER MIGHT BURST IF IT HAS NOT EMPTIED COMPLETEY)

Put back each pipe to its place and screw again the connections to entirely close again (to avoid little animal's entry)

Remark : supplement the draining of your filtration installation or call your fitter (all your installation must be protected against the freezing)

Maintenance :

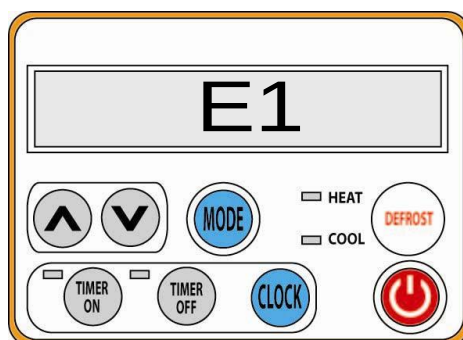
Make sure that nothing comes to block the gills radiator, if it's necessary clean it with a soft brush (no water jet under pressure)

Make sure that the gills are right, rectilinear, if it's necessary rectify them with a fine comb

Make sure that the flue of the condensates is not blocked

11- Error codes and how to solve them :

This table explains the error codes caused by a defective regulating component or by a security operation. You have to call your retailer.



Screen and state of the heat water pump	Component	Possible	Intervention	Second reason if the intervention is without effect
E 1 The heat pump continues running	Water temp sensor	Sensor disconnected, non supplied or defective	Check the connections, the wires, change it or replace the electronic card	
E 2 The compressor stops and after the fan stops too	Ambient air temperature sensor	Sensor disconnected, non supplied or defective	Check the connections, the wires, change it or replace the electronic card	
E 3 The heat pump continues running	Outlet compressor temperature sensor	Sensor disconnected, non supplied or defective	Check the connections, the wires, change it or replace the electronic card	
E 4 Compressor and fan stop	Defrosting system	The defrosting is incomplete and the automatism decides to stop the heat pump	Increase lightly the water flow going into the heat pump; the effect is to increase the temperature of the refrigerant in the evaporator.	
E 5	Magnetic ammeter	The compressor stops 3 times in 24h because of intensity excess in the compressor	Environment problem	
E 6 Compressor and fan stop	Outlet compressor temperature sensor	Outlet compressor temperature detected up to 105°C more than 3 times in 24h	Environment problem	
E 7 Compressor and fan stop	Magnetic circuit breaker	Electric current leak from the compressor, from the fan or from an electrovalve; electric safety system of the heat pump	Switch off the current and call an electrician for repairing or replacing the defective component	
E b	Flow switch	Flow switch disconnected, non supplied or defective	Check the connections, the wires, change it or replace the electronic card	
The compressor hums without starting and the electric supply breaks	Starting condenser of the compressor	The condenser is defective	Replace the condenser	Compressor piston clamped, call a refrigerating engineer
E 9	High pressure pressostat	Pressostat is disconnected, or defective	Call a refrigerating engineer who will do the necessary controls of the circuit pressure	
E A	Low pressure pressostat	Pressostat is disconnected, or defective	Call a refrigerating engineer who will do the necessary controls of the circuit pressure	

12-Problems / solutions :

The difficulties met the most often can be solved by reading the table below.

If nothing corresponds to the list, or if the solutions applied do not solve the problem, refer to **DIRECTIONS FOR INSTALLATION AND MAINTENANCE** or contact your retailer.

Difficulty	Observation	Probable cause	Explanation / Solution
The heat pump does not start	Extinct screen	No power	Check that the circuit breaker of the table is engaged in the technical room
	Extinct screen and heat pump supplied in power	The power supply is defective	Call your retailer
	Extinct screen, filtration is working	The in and out pipes of the heat pump are reversed or the flow switch is not sufficient	Check on the heat pump that the in and out pipes are not reversed. Check the filtration pump works or is not defused
Water is running below the heat pump	The water comes from the bottom of the heat pump	Drain of the condensates not installed or stopped : black, plastic conduit prolonged with a flexible pipe of evacuation	It's natural : these condensates are caused by condensation of the humid air on the gilds of the evaporator
The temperature of the swimming pool is increasing very slowly	The heat pump works	The rising in temperature is more or less rapid according to the volume of the swimming pool and to the climatic conditions. An isothermic cover will improve the performances in heating	
White frost or ice appears outside on the gilds of the evaporator	The layer of the white frost is thin	The outside temperature is low and the air is humid	See the paragrah 5 of this manuel
	The layer of the white frost is thick (the blades of the ventilator may rub on the ice much thicker inside)	Outside temperature very low and air very humid	The automatic de-icing is not sufficient ; stop the heat pump for the operations of wintering
The heat pump emits noises of vibration or sheet	The vibrations can be located or the heat pump is not stable	It's not horizontal or not well fixed ; the pipes may have moved into the pump during the transport or the installation	Call your retailer

13- Further recommendations:

Linked to the Directive of the under Pressure Equipment (PED-97/23/CE)

1. Installation and Maintenance

- ☐ Before any intervention on the machine, installation, startup, use, maintenance, the staff will have to know all of the instructions and recommendations shown into the notice of the apparatus, and the technical file of the project.
- ☐ The staff taking delivery of the apparatus, will have to control visually that the apparatus has not had any damage during the transport : refrigerating circuit, electric box, frame and carrossery.
- ☐ It's prohibited to use the apparatus near :
 - a. a heat source
 - b. combustible materials
 - c. a return air grille of air of an adjacent building
- ☐ For some apparatuses, you have to use the protective grille if it's located in a place of which the access is not ruled.
- ☐ The apparatus must be installed, started, maintained, repaired by a qualified staff, with respect to the requirements of the directives, laws, rules of the country and with respect to the rules of the profession.
- ☐ During the installation, repairing, maintenance, you are not allowed to use pipes as a footboard. The pipe could break under the weight, and the refrigerant could entail serious burns
- ☐ During the maintenance of the apparatus, you'll control the composition and the state of the coolant fluid, and that there is no trace of refrigerant.
- ☐ During the annual control of the sealing of the apparatus, with respect to the rules in force, check that the high and low pressure controllers are connected directly to the refrigerating circuit and that they cut the electric circuit in case of release.
- ☐ During the maintenance, make sure that there are no traces of corrosion or of oils around the refrigerating components.
- ☐ Before intervening on the refrigerating circuit, you have to stop the apparatus and to wait for a few minutes, before posing temperature or pressure gauges. Some equipment as the compressor and the pipes can reach temperatures superior to 100°C and high pressures can entail serious burns.

10 Repairing

- ☐ Any intervention on the refrigerating circuit will have to be done with respect to the code of practice and safety in force into the profession : recovery of the refrigerant, brazing under nitrogen, etc.
- ☐ Any brazing will have to be done by qualified brasors.
- ☐ For the apparatuses filled of R 407 C, refer to the specific instructions into the use notice.
- ☐ The pipes will have to be replaced only by copper tube conform to the NF EN 12735-1.
- ☐ Detection of leaks, case of test under pressure :
 - Never use oxygenate or dry air, due to fire or explosion hazard
 - Use nitrogenize dehydrated or a mixture of nitrogenize and refrigerant as shown on the descriptive badge
 - The pressure of the test side low and high pressure must not exceed 20 bars and 15 bars when the apparatus is equipped with a manometer.
- ☐ As regards the pipes of the high pressure circuit, made with copper tube of a diameter equal or superior to 1'' 5/8, you'll have to request a certificate §2.1 according to the norm NF EN 1020004 to the supplier and keep the certificate into the technical file of the installation.
- ☐ Any replacement of a piece by another one, any modification of the refrigerating circuit, any replacement of the refrigerant by a fluid different from the one shown on the descriptive badge, any use of the apparatus beyond the applications shown into the documentation, would entail the cancellation of the marking CE conform to the PED, and would be placed under the responsibility of the person having done those modifications.
- ☐ The technical information concerning the requirements of safety of the differents directives applied, are shown on the descriptive badge. All of these pieces of information must be registered on the installation notice of the apparatus, which must be shown on the technical file of the installation :

- Model - code – serial number
- TS maxi and mini
- PS
- Year of manufacturing
- Marking CE
- Address of the manufacturer
- Refrigerant and weight
- Electrical parameters
- Thermodynamic and acoustic performances

DECLARATION OF CONFORMITY
Heat pumps of swimming pools
PHP120N/R PHP150N/R PHP250N/R

are conform to the provisions
of the directive ELECTROMAGNETIC
COMPATIBILITY 89/336/CEE

of the directive LOW PRESSURE
73/23/CEE

