

# INSTALLATION INSTRUCTION

## Heat pump type 35 and 51

The heat pump is intended to heat swimming pools and whirlpools. Before installing the heat pump, read the instructions carefully to avoid possible future breakdowns.

The reported capacity depends on the temperature of the air and the pool water. On cold days the heat pump may run for longer before the pool reaches the right temperature than on hot days. In cold weather it is always economical to cover the pool when it is not in use, especially at night. About 60-70% of the heat is lost from the surface of the water in the pool. Covering the pool also extends the life of the heat pump.

The heat pump must always be installed outdoors, since it draws energy from the surrounding air. It must be well ventilated and must not be enclosed or screened in such a way that circulation of the air is obstructed. The distance between the heat pump (the fan exhaust) and a wall, fence, bushes etc must not be less than one metre. The distance between the air intake of the heat pump and a wall, fence or bushes, must not be less than half a metre. Efficiency will be reduced if exhaust air can reach the air intake. The heat pump can be installed higher or lower than the surface of the water in the pool, but not by more than two metres either way. Avoid installing the heat pump close to sensitive walls, such as a bedroom wall.

When the heat pump has been put in place, install the pool water pipes as follows:

- The water pipe from the pool filter must be connected to "in" on the heat exchanger of the heat pump.
- The return pipe to the pool inlet must be connected to "out" on the heat exchanger of the heat pump.

**The flexible connecting hoses supplied must be used to connect to the heat exchanger of the heat pump. The union coupling with o-ring connects to the heat exchanger and must be tightened by hand.**

The heat pump needs a certain amount of resistance in the heat exchanger to work properly. In rare cases it may be necessary to close the valve slightly on the outgoing return pipe, to increase the resistance in the heat exchanger.

The heat pump starts when the pressure in the heat exchanger goes above 0.2 bar (2 H(m)).

Heat pump type 35 is designed for a flow rate of about 230 l/min and type 51 for a flow rate of 300 l/min. In installations with flow rate higher than that of the particular model, some of the flow must bypass the heat pump.

Chlorine, acid, etc., must be dosed after the heat pump, to avoid corrosion in the heat exchanger.

## Very important!

To protect the heat pump, construct a roof over it which overhangs the heat pump by 300 mm all round. The roof should be 150 mm above the heat pump. This will protect the equipment from rain and snow.

Employ a qualified electrician for permanent electrical installation of the heat pump to the electricity supply.

Short-circuit protection for type 35: 10A and for type 51: 16A. Single-phase 230V.

**The heat pump must be installed with an on-off switch and an earth fault relay.  
Only an accredited refrigeration company may carry out work on the refrigeration circuit.**

## OPERATION of types 35 and 51

For the heat pump to work, the pool filter system must be running.

- When the pool water is circulating, switch on the power to the heat pump.
- On the heat pump there is an adjustable electronic thermostat graduated 0-10, which is used to increase the pool water temperature from 0 to maximum. Set the knob to 10. Within about three minutes the heat pump compressor starts. When the pool water reaches the desired temperature, turn the knob back until the fan stops.
- At the beginning of the season, when the water in the pool is cold, the heat pump will run continuously for a long time before the pool reaches the correct temperature. When the pool water has reached the correct temperature, the heat pump stops automatically and starts again when necessary.
- For a higher water temperature, increase the thermostat setting by turning the knob clockwise.
- For a lower water temperature, reduce the thermostat setting by turning the knob anticlockwise.
- The running time of the heat pump depends on the temperature of the water and the air, on the air humidity, sunlight, wind, etc., and may vary from day to day.
- During the summer, the evaporator at the heat pump fan will need cleaning. A vacuum cleaner may be used.
- **Switch off the heat pump when backwashing, or if the filter pump is off.**

## Winter and the risk of frost

Before winter and when there is a risk of frost, all water must be drained from the heat pump. If there is any water left in the heat exchanger it may suffer frost damage.

- Switch off the power to the heat pump and disconnect the two union couplings on the heat exchanger.
- Tilt the unit to remove any water that may still be in the heat exchanger under the heat pump.
- Cover the heat pump in winter and protect it from rain and snow, but ensure that there is good ventilation to prevent the formation of condensation. The heat pump can withstand the cold if no water is left in it.
- Before the summer, and before starting the heat pump, remove from the air intake any leaves, pine needles and other dirt which may obstruct circulation and so reduce the efficiency of the heat pump.
- To clean the heat pump, wipe it down with soapy water.

## Built-in safety functions in the heat pump

### Condensation

When the heat pump is running, condensation runs from the drain hole on the side of the heat pump; this is normal. Check that the condensation can drain off freely.

### Frost

When the air temperature falls below +10 °C, ice may form on the heat pump evaporator. When the amount of ice is excessive, an automatic defrosting cycle starts. After the defrosting cycle, the heat pump starts its normal program automatically and continues to heat the pool. When the temperature falls below +5 °C the heat pump stops automatically. It starts again when the outside temperature increases.

### Delay

The heat pump has several safety functions to prevent short running times and frequent starts. A three-minute delay between switching on and the compressor starting is therefore normal. The heat pump also has a pressure switch which switches it off if the water flow is too low or non-existent.

The heat pump compressor has an overheating limit control. If the heat pump stops because the compressor temperature goes too high, the power to the heat pump must be switched off to allow the overheating limit control to reset automatically.

### **NOTE: Very important!**

The warranty is void if the heat pump is used incorrectly or is not installed properly. The connecting hoses supplied must be connected to the heat pump heat exchanger and must be tightened by hand.

The pool water properties must be as follows:

pH: 7.2-7.8

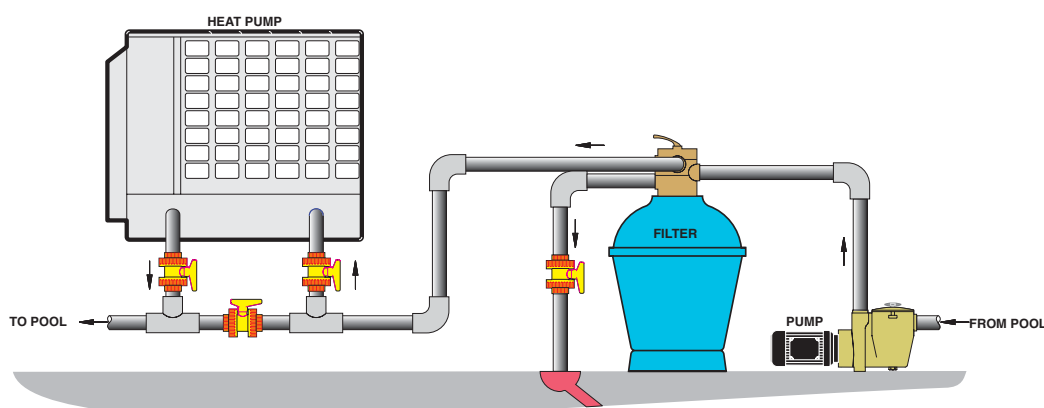
Chlorine content: max 3 mg/l (ppm)

Chloride content: below 0.5%

Calcium hardness: 200-1000 mg/l (ppm)

Note that if the properties of the water are not correct, the heat pump may be damaged. Bathers may suffer from irritation of the eyes and mucous membranes.

In such cases the warranty is void.



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## **OPERATIONAL SYSTEM**

### **Water flow and existing water pump**

To filter the pool water each day, the water pump will come on and off according to the existing timer device. The heater will only heat if there is water running through it and it operates long enough.

### **Water pressure switch**

When water starts flowing through the unit the water pressure switch will activate and allow the unit to run. When the circulation pump timer stops the water flow, the water pressure switch will shut the unit off. When the pump restarts for the next day, the pressure switch will activate and allow the heater to run again.

### **Thermostat control and settings**

Turning up the thermostat will start the unit. When the pool water has been heated to the thermostat setting, the unit will shut off. When the pool water temperature loses one or two degrees, the thermostat will activate the unit. There are no temperature graduate numbers printed on the thermostat face. To obtain an exact temperature for a pool, turn the thermostat  $\frac{3}{4}$ " of the way up and then place a pool type thermometer in the pool water itself. Once the water has reached your target temperature on the thermometer, turn the thermostat knob backwards until the heater just shuts off. Therefore your thermostat will be set at the thermometer reading.

### **Fan-air circulation**

Once the thermostat is activated the fan will begin to turn. To collect the heat from the air, the fan circulates warmer air through the evaporator air coil.

### **Evaporator air coil**

The fan circulates the warmer outside air through the evaporator air coil to collect any available heat. The cooler refrigerant absorbs this heat. This evaporates the refrigerant into a gas. Therefore the compressor can compress the gas to maximize the gained heat from the air.

### **Compressor**

Once the fan is running, the compressor will start. The compressor pumps and compresses refrigerant gas. When gas is compressed it gets very hot and intensifies the energy and then is released to the pool water. This compressed hot gas is pumped through the heat exchanger where it delivers heat to the pool water passing through the same heat exchanger.

### **Water heat exchanger**

The compressed hot gas releases its heat to the pool water inside the heat exchanger. The heat exchanger coil (condenser) is made of titanium with outer body made of titanium. The refrigerant is transformed into a liquid (condensed) state as it releases its heat to the pool water. Therefore, it is also referred to as a condenser coil. The titanium heat exchanger is designed for a maximum transfer surface area and strength.

### **System overview**

The heat pump system uses 407C refrigerant to transfer the heat from the outside air to the pool water.

