

**EN** Instructions for installation and use



# OPTIPAC 30 D-TS



**EN** Heat pump for swimming pool

# SUMMARY

<b>1. General</b> .....	<b>2</b>
1.1 General terms of delivery .....	2
1.2 Voltage .....	2
1.3 Water treatment.....	2
<b>2. Description</b> .....	<b>2</b>
2.1 Presentation .....	2
2.2 Dimensional characteristics.....	3
<b>3. Installation of the unit</b> .....	<b>3</b>
<b>4. Connections</b> .....	<b>4</b>
4.1 To have access to electric box .....	4
4.2 Hydraulic connections .....	4
4.3 Electric connections .....	4
<b>5. Regulator operation</b> .....	<b>6</b>
5.1 Presentation .....	6
5.2 Setting of the required temperature.....	6
<b>6. Starting up</b> .....	<b>6</b>
6.1 Before starting up, Check.....	7
6.2 Start up the heat pump .....	7
6.3 Checking .....	8
6.4 Troubleshooting.....	8
6.4.1 States.....	8
6.4.2 Faults.....	9
6.5 Winter storage .....	10
<b>7. Maintenance instructions</b> .....	<b>10</b>
<b>8. Recycling the product</b> .....	<b>10</b>



Available in the appendices at the end of the manual:  
- electric diagram

## 1. General

### 1.1 General terms of delivery

Any equipment, even CARRIAGE and PACKING FREE, travel at the consignee's risk. The consignee shall make reserves in writing on the carrier's delivery bill if he notes damage caused during the transport (confirmation to be sent to the carrier within 48 hours by registered mail and Acknowledgement of Receipt).

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### 1.2 Voltage

Prior to any operation, check that the voltage on the identification plate of the appliance corresponds to the mains voltage provided on site.

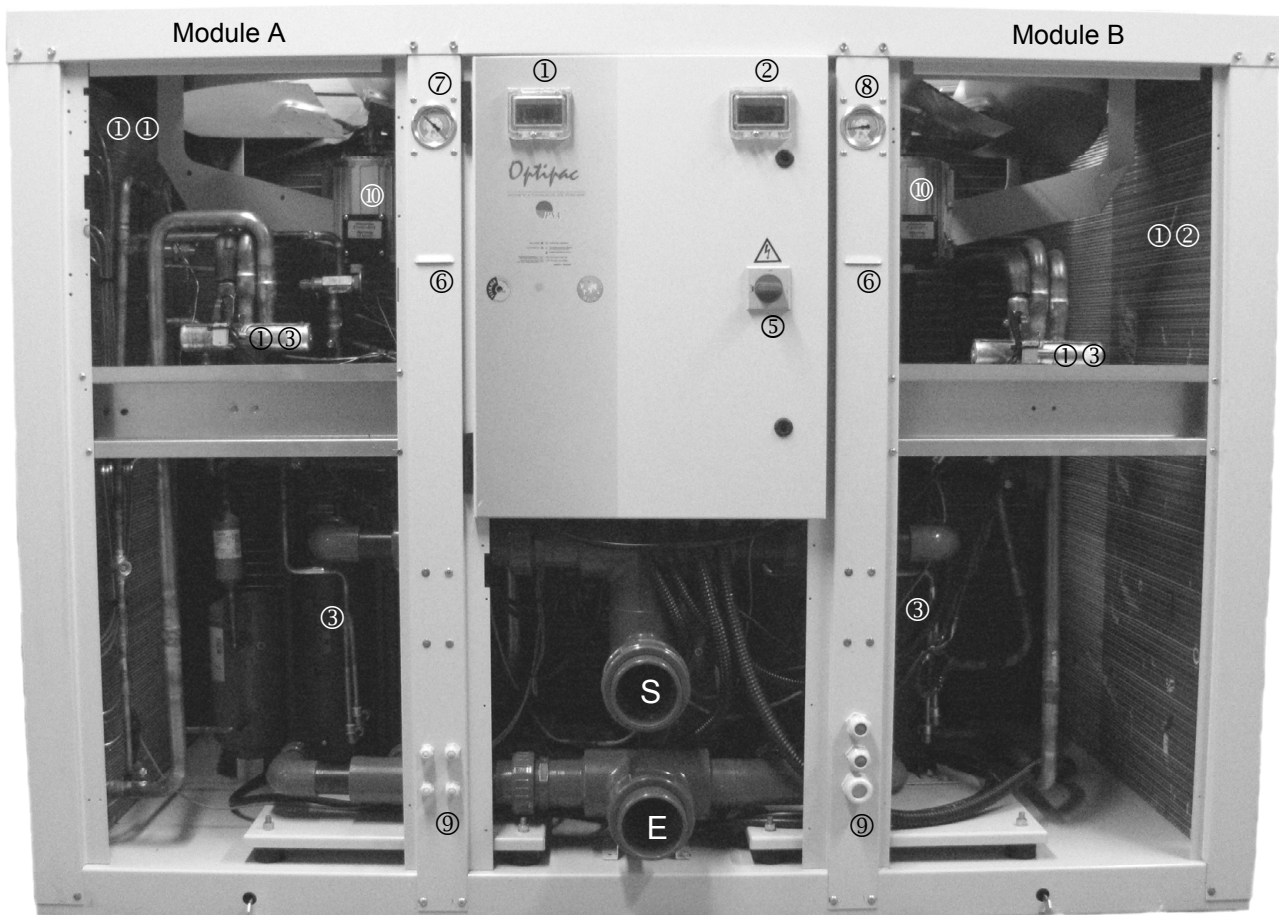
### 1.3 Water treatment

In order to use our appliances in the best conditions, swimming pool water shall comply with the following values: free chlorine: maximum 2.5 mg/L, total bromine: maximum 5.5 mg/L, pH between 6.9 and 8.0. For any other treatment, the fitter and the user shall apply to the supplier of the planned disinfection process (chemical, electrochemical or electrophysical) for the compatibility with the materials of our appliances. In any case, treatment shall be installed downstream the heating equipment.

## 2. Description

### 2.1 Presentation

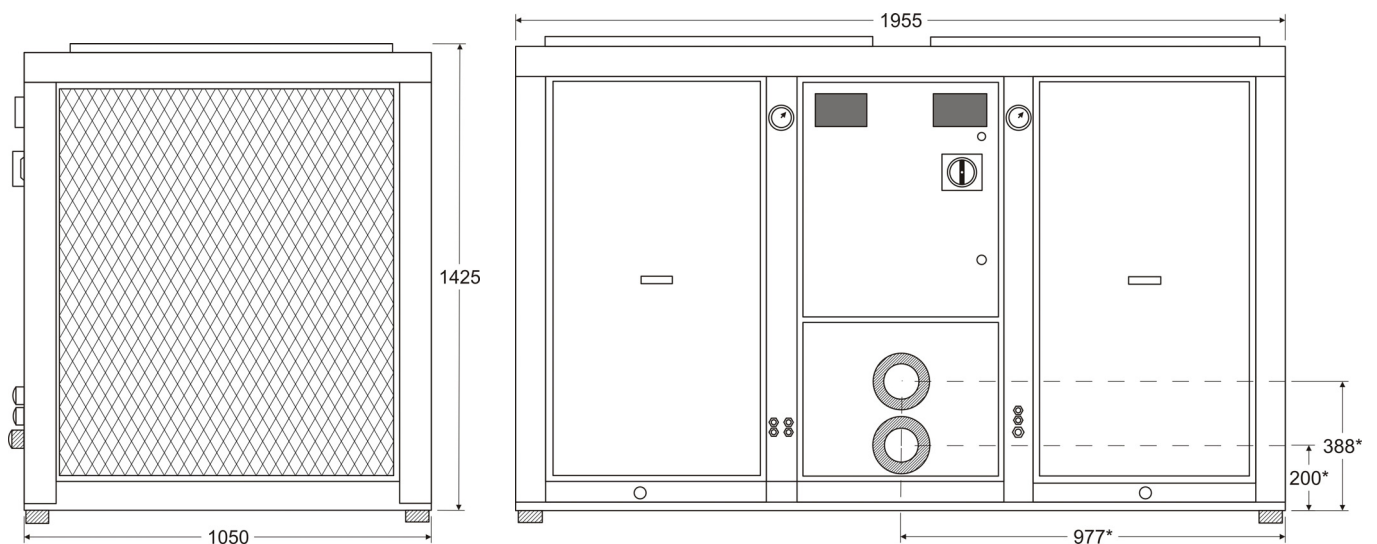
E: pool water inlet S: poll water outlet



- phase order controller
- SCOLL compressors,
- flow rate gauges module A ⑦ and module B ⑧,
- high pressure switches,
- antifreeze sensors (stop under - 8 °C) module A and module B ⑥,
- 1/2 union fittings PVC Ø 90 to be glued (supplied),
- packing gland ⑨
- evaporators "plate fin" module A ①① and module B ①②,
- TITANIUM made condensers ③,

- control thermostats Euro Alpha FK module A ① and module B ②,
- water flow rate controller,
- HP and LP alarm,
- low pressure switches,
- general on/off switch ⑤,
- fans ⑩,
- hour meter "compressor" on module A et B
- automatic deicing by cycle reversal using 4-way valves ①③
- antifreeze protection on each water condenser

## 2.2 Dimensional characteristics



\* ± 3 mm

## 3. Installation of the unit

- the appliance shall be installed outside,
- keep a clearance of at least 0.60 meter all around the appliance, top of the appliance must be clear to evacuate the cold air produced,
- the installation must be simple and allow for easy maintenance interventions,
- the appliance shall be installed on a solid and stable socle (concrete), and be protected from flood risks. Caution: when working, the appliance will produce water due to the condensation of humidity of ambient air on the evaporator. Provide a drain in the socle to flush that water away. Place vibration reducing blocks (provided) under the feet of the heat pump,
- avoid blowing cold air to windows.
- keep the appliance out of reach of the public.
- the heat pump shall be installed at a minimum distance of the end of the pool, according to the national electric regulation. In France, the NF C 15 100 standard (section 702) specifies that this device must be installed more than 2 meters from any basin or water reserve. In case it may be subjected to water jets, provide for a minimum distance of 3.5 meters.

### Warning!

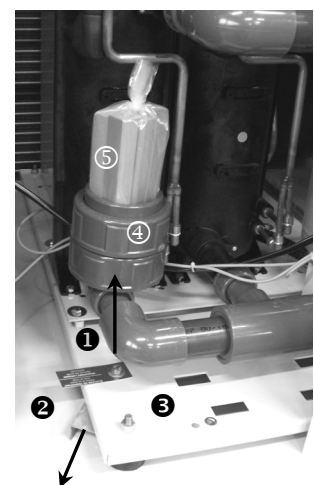
- the heat pump shall not be installed close to a flammable gas device,
- the heat pump shall not be installed close to a road in order to avoid projections of mud or stones,
- the installation as well as electric and hydraulic connections must be carried out in compliance with applicable standards, in particular standard NF C 15 100 for France (equivalent to CE I 364),
- keep the appliance out of reach of children.

Before any start up, remove the security bars of the compressor box ③:

- 1- remove the front panels with handles,
- 2- remove bolts ① (both sides),
- 3- remove bar ② (both sides).

④ 1/2 Union fittings PVC Ø 90 to be glued,  
 ⑤ silent blocks to be placed under the appliance.

**Before switching on the machine, remove the two transport flange bars from the compressor base ③.**  
 -see photo opposite-



## 4. Connections

### 4.1 To have access to electric box

First, turn rotary "on/off" switch to position "0-OFF". Open the locks with the supplied plastic keys and pull the front panel.

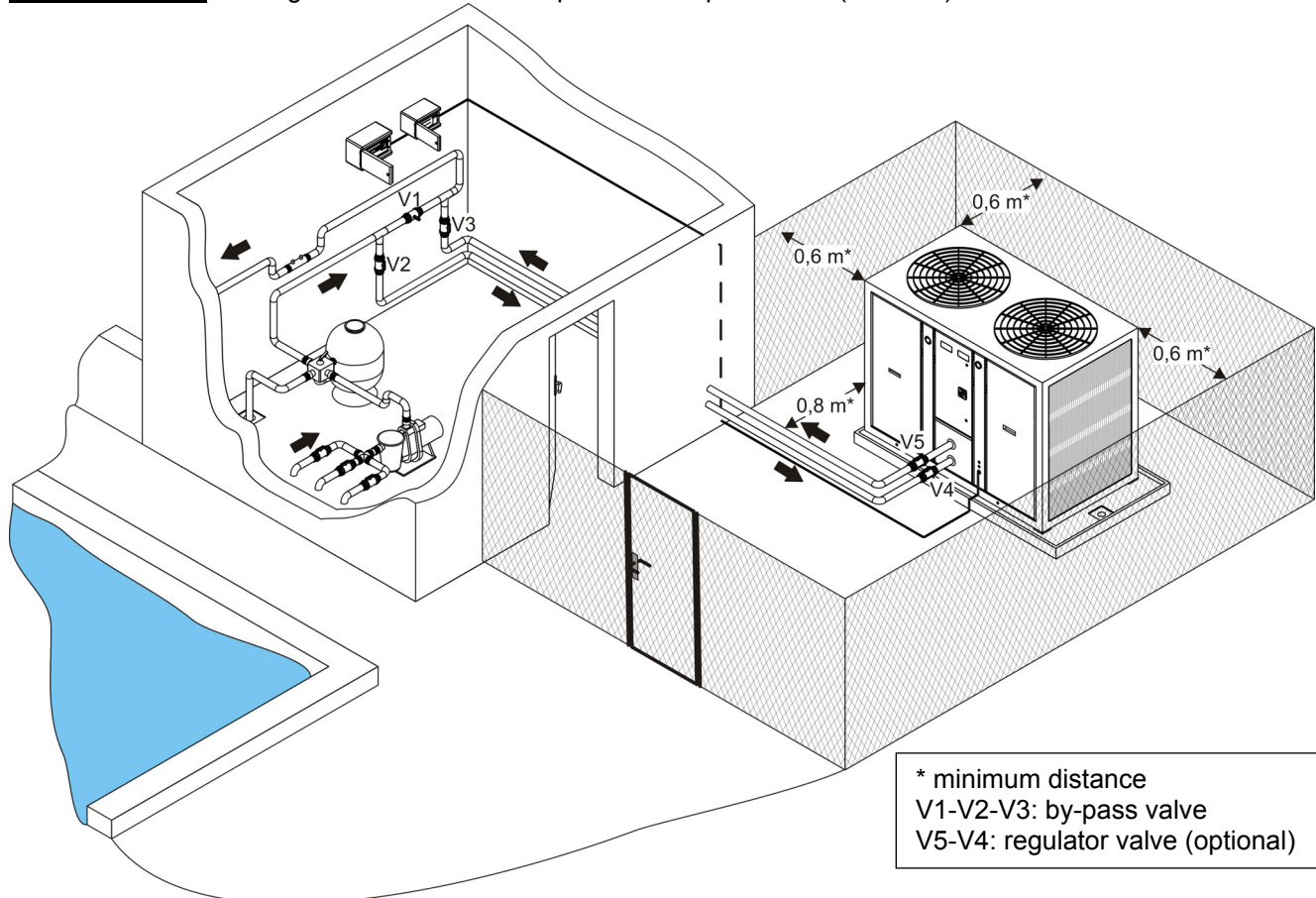
### 4.2 Hydraulic connections

Connect water inlet and outlet according to the stickers, using the removable fittings provided and  $\varnothing$  90 mm PVC pipes, from a by-pass on the filtration circuit between filter and water treatment device.

- Hydraulic circuit test pressure: 3 bars

- Hydraulic circuit operating pressure: 1.5 bar

**Optipac 30D-TS:** average water flow 15 m<sup>3</sup>/h- pressure drop 1.3 mCE (0.13 bar)



### 4.3 Electric connections

- the power supply of the heat pump must pass via a protection facility and circuit-breaker (not supplied) in compliance with applicable standards and regulations,
- the appliance is foreseen for connection to the mains circuit with TT and TN.S neutral connection (according to NF C 15-100 or national standards in force),
- supply cable section:  
- Optipac 30D-TS: 4 x 16 mm<sup>2</sup> \* (three-phase 400V/3/50Hz) protection: 63 A

**\*this section is indicative and must be checked and adapted, if necessary, according to installation conditions**

- electrical protection: circuit breaker (curve D) or fuse (Am) delayed designed for motors adapted to the type of unit (refer to the protection values above) with a protection system by 30 mA differential on the incoming supply side (circuit breaker or switch).

#### Note:

- the acceptable voltage variation during operation is  $\pm 10\%$ ,
- the cable ways and ducts must be fastened,
- running assigned short-circuit = 10 kA (according to the CEI 947-2),

- possibility of connecting a remote "on/off" control thanks to a **dry contact –polarity insensitive 230V -50Hz-** between terminals 22-23 for module A and 32-33 for module B => refer to the electrical wiring diagram hereafter,
- possibility of connecting external error indicators in 230V-50Hz between terminals 20-21 for module A and 30-31 for module B => refer to the electrical wiring diagram hereafter,

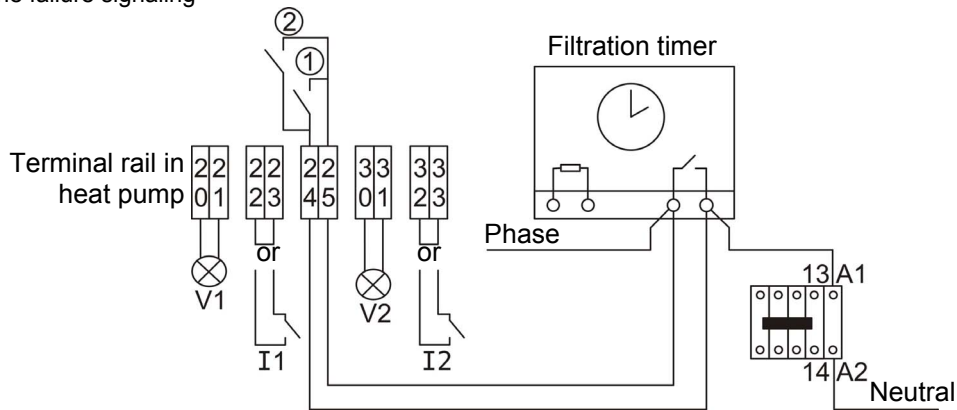
- possibility of servoing (terminals 24 and 25) in order to control the operation of the filtration pump (by a minimum 5-minute cycle every hour, with filtration maintained in operation if the basin temperature is below the demanded temperature) thanks to a dry contact (polarity insensitive, I max. = 5 A at 230 Vac with resistive load) => refer to the electrical wiring diagram below,

**By making this electrical connection, your machine automatically controls your pool's filtration,**

- it's possible to connect a remote control module <sup>(1)</sup> (with display) by module A and B. To do this use terminal: 34-35 (signals Tx-Rx) and 36-37 for 12 Vac supply of the interface A1 and A2 card.

**Connections of the following options:**

- heating priority,
- remote "on/off" control,
- machine failure signaling



- ① Euro Alpha FK Module A
- ② Euro Alpha FK Module B
- V1: failure light for module A (230Vac)
- V2: failure light for module B (230Vac)
- I1: remote "on/off" switch for module A
- I1: remote "on/off" switch for module B

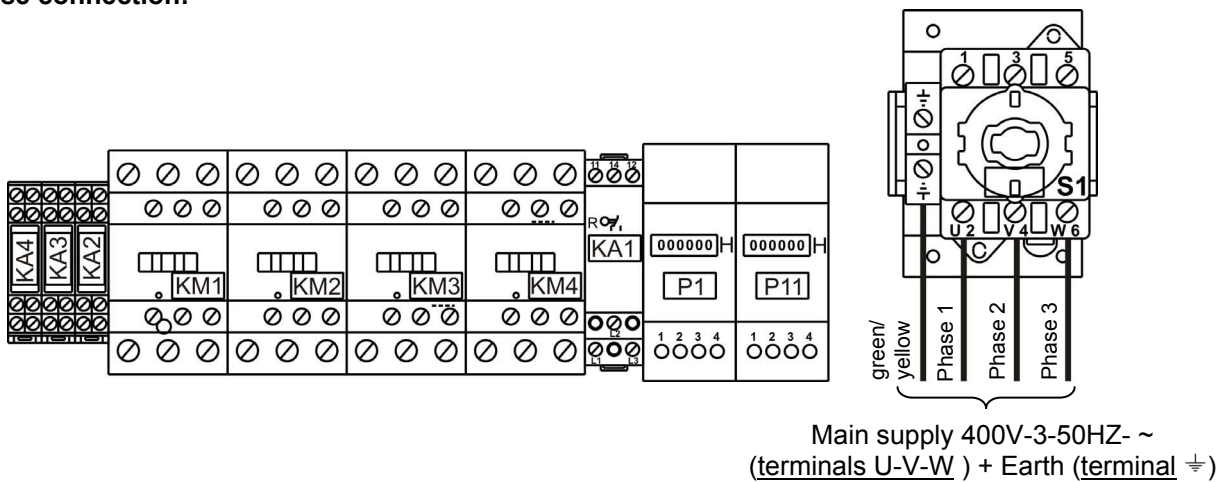
**Warning! Incorrect connection of terminals 20-21-22-23-24-25-30-31-32-33 could result in damage to the regulator and cancellation of the guarantee.**

**Important:** to connect the remote "on/off" <sup>(2)</sup> functions, fault and warning functions for filter start up, use cables with a section of at least 1mm<sup>2</sup>. Packing glands and cable inlets are available for passage of these cables into the unit. To connect the remote module <sup>(1)</sup> (maximal distance = 50 meters) use a shielded cable of 4x0.75 mm<sup>2</sup> minimum (connected to the earth harness in the heat pump).

<sup>(1)</sup> module available as an **optional extra**

<sup>(2)</sup> it is essential to use an independent cable for connection of this function (terminals 22-23 for the module A and 32-33 for the module B)

**Three-phase connection:**






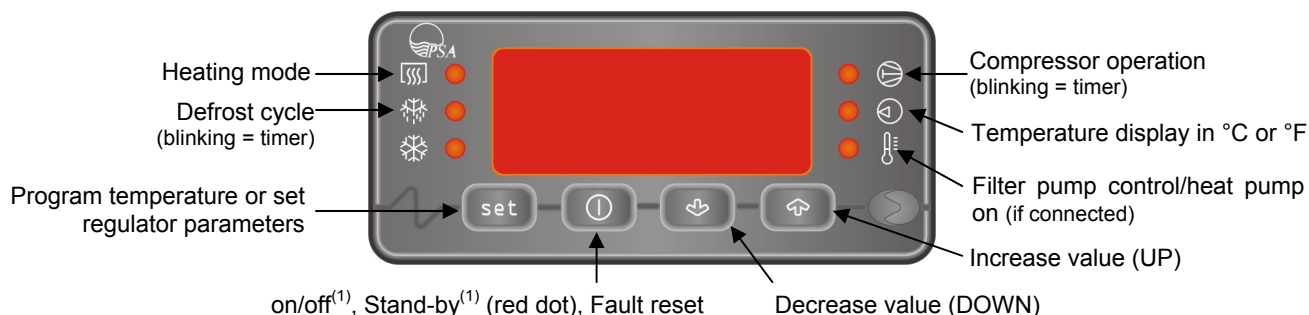
## 5. Regulator operation

### 5.1 Presentation

The **Euro Alpha FK** setting thermostat with digital display is supplied fitted in the appliance, electrically connected and pre-set in the factory for swimming pool heating.






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**Setting principle:** a control sensor placed at the water inlet side of the heat pump measures the temperature in the pool and compares it to the target temperature. If the water temperature becomes or is lower than the target temperature, the regulator unit authorises heating after a set time of 180 seconds, the led  blinks and then remains on.






<sup>(1)</sup> stop operation in **heating mode**

#### Remarks:

- when a defrost cycle is in progress, it ends with maintaining ventilation except if the ambient temperature drops below  $-8^{\circ}\text{C}$  or if filtration is stopped (J1 and/or J2 open).
- in the case where the unit requests heating (leds  and  on or  on and  blinking) led  remains on (contact 24-25 closed) for 120 seconds then switches off (contacts 24-25 open).

### 5.2 Setting of the required temperature

Press key  to display the required temperature, without releasing, press key  to increase or  to decrease. Release both keys, the temperature of the water is then displayed.

**Advice:** the maximum target temperature is limited to  $30^{\circ}\text{C}$  in order to protect the swimming pool liner. This high target may, however, be modified by the installer, but at his own responsibility.

The temperature control will run the heat pump (and the filtration pump if remote connection 24-25 is used) until the required temperature is reached. Then, the heat pump will automatically cut off.

## 6. Starting up

### Technical features:

Optipac 30D-TS	Tair = $2^{\circ}\text{C}$ ; Twater = $26^{\circ}\text{C}$ ; humidity = 82%	Tair = $15^{\circ}\text{C}$ ; Twater = $26^{\circ}\text{C}$ ; humidity = 69%
Power restored	61 KW	82 KW
Power consumed	20 KW	22 KW
Current consumption	38 A	40 A
Water flow-rate	24m <sup>3</sup> /h	
Maximale current consumption	43.2 A	
Acoustic power	85 dBA	
Acoustic power at 10 m	57 dBA	
Refrigerant charge (R407C)	2 x 5440 g	
Net weight	720 kg	

- index of protection (heat pump): **IP 24** (**IP 44** for electrical equipment)  
(IPXXB for mechanical risks)



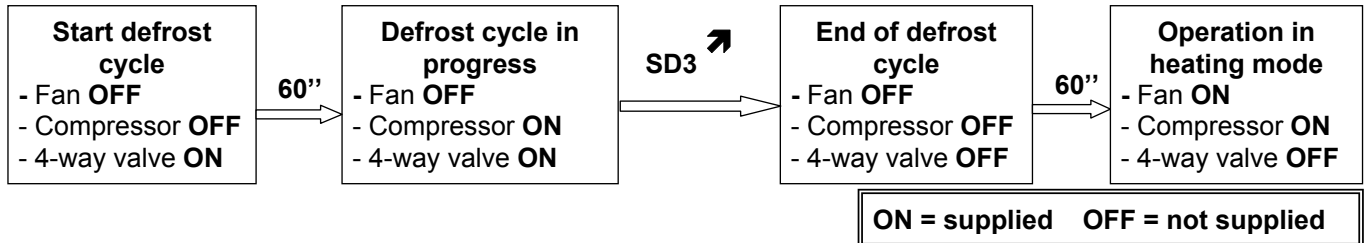
**Do not vent R407C into atmosphere: R407C is a fluorinated greenhouse gas, covered by Kyoto Protocol, with a Global Warming Potential (GWP) = 1653 - (Directive of the EC 842/2006).**

### Heat pump operating conditions:

- the outside temperature must be higher than  $-8^{\circ}\text{C}$  (automatic shut-off by anti-frost sensor SD2) and below  $+38^{\circ}\text{C}$ ,
- a sufficient water flow must pass into the heat pump.

**Note:** the heat pump stops heating the pool water when it starts a defrost cycle by inverting the cycle.

A defrost cycle is started (led «defrost cycle» **on**) when the defrost sensor SD3 (located in the cooling circuit) detects a temperature of less than  $-5^{\circ}\text{C}$  **and** a minimum time between two defrost cycles has been attained or when the regulator is switched on. If the time between cycles has not been attained (with  $\text{SD3} < -5^{\circ}\text{C}$ ) the Led «defrost cycle» is **blinking**.



**Reminder:** during the defrost cycle a steam cloud (water vapour) may appear from the back of the unit (after a defrost cycle, when the fan is restarted. This cloud is evacuated to the back of the unit).

This unit is equipped with a *titanium heater condenser/unit heater anti-frost system controlled by an anti-frost sensor (SD2) connected to a regulator ("rA" displayed during operation).*

### WARNING!

This titanium condenser/unit cooler **anti-frost safety** device is **only functional when the unit's electrical power supply remains switched on** (always regulator on or in stand-by).

## 6.1 Before starting up, Check







- that the hydraulic connections are correctly tightened,
- that there is no water leak,
- that the appliance is stable (with a level gauge and spirit level),
- that the cables are correctly connected to their terminals,  
**incorrectly tightened cables may cause overheating of terminals,**
- that the cables cannot be damaged by sharp metal sheets or elements,
- the earth connection,
- that no tools or other objects have been left inside the appliance.

## 6.2 Start up the heat pump

- switch on the heat pump power supply protection device located inside the filter control cabinet,
- start filtration,
- set the by-pass and setting valves\* as follows:
  - valve 1 slightly closed to increase the filter pressure from 150 to 200g (0.15 to 0.20 bar),
  - valve 2 fully open,
  - valve 3 fully open,
  - valve 4 fully open,
  - valve 5 half closed,

\* see paragraph 4.2

If the valves (4 & 5) are not present, open valve 2 and close valve 3 half-way,

- check that the swimming pool water hydraulic circuit has been vented,
- turn rotary "on/off" switch to position "I-ON",
- start the heat pump if it is in stand-by mode (red dot) by pressing , "On" appears on the display for a period of 5 seconds before displaying the water temperature, otherwise the temperature displays directly,
- set the target temperature (  +  or  +  ) => if the pool should be heated: led  blinks and then remains on after approximately 2 to 3 minutes maximum and the heat pump starts,

5 minutes after re-start of the heat pump (fan + compressor), check the water flow pressure gauge display and set valve 3 or 5 in order to bring the needle into the green zone (beginning of season {cold water}: position at the start of the green zone).



**Note:** traces of humidity, if any, at the machine's base are due to a condensation (normal) of the steam contained in the air.


**Reminder:** if, when setting the by-pass and setting valves, the flow rate is less than  $1.5 \text{ m}^3/\text{h}$  the heat pump will not function (the flow switch remains open and the regulator displays the message "Aid" alternating with the water temperature). Adjust the setting valves: 5 (if present) or 3 and 1.



When the heat pump is running:

- if the flow rate switch switches (J1-J2) on or off for a period longer than or equal to 3 seconds, a timer of 130 seconds\* min. is activated before the unit starts again,
- \* for information: this time period may increase during a defrost cycle or if the compressor stop time is less than 180 seconds
- in case of a power failure, a timer of 125 seconds starts when the power supply is restored before the unit starts again,

Observation: when the water attains the target temperature (leds  and  off) the heat pump switches off automatically.

Reminder: the 3-phase heat pump is equipped with a phase order control system (KA1) used to check that the phase order is correct at start up (and during operation) and to signal a phase order fault (regulator indicates “dCP” fault and the state light R or  (according to model) on KA1 inside the unit is off). In that event, *switch off and isolate the unit* and it is sufficient to invert two phase wires directly on the main supply terminal.

**WARNING! This operation must be carried out by a qualified and authorised professional.**




### 6.3 Checking

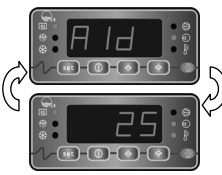
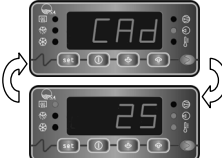
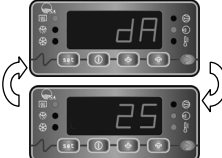
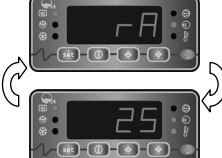
Check that the heat pump stops heating when:

- the target temperature on the digital display thermostat is decreased,
- filtration is switched off or valve 2 or 4 closed.


### 6.4 Troubleshooting









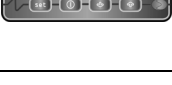



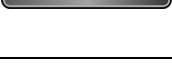





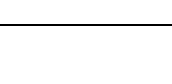
#### 6.4.1 States

 : example of the pool water temperature display	 : Alternating	Info: led  remains on for 120 seconds after the status signal (except in the case of a defrost cycle with the remote “on/off” function (“CAD”) and SD3 < 2°C).
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Message	Designation	Cause	Remedy	Reset	Alarm
	Flow switch open for more than 3 seconds	1- filter pump is off (filter timer is outside the operating time limit), 2- insufficient water flowing through the unit, 3- flow controller damaged or disconnected.	1- wait for the programmed filter time period, <b>test possible in mode : filtration “manual”,</b> 2- adjust the by-pass, <b>filtration on,</b> 3- change or reconnect the flow controller.	Automatic after timer	NO
	control remote started	Contact of the remote control open	1- switch the remote control (contact closed), 2- contact a ZPCE-approved technician to check the cable linking the remote control box to the unit.	Automatic	NO
	Anti-frost safety triggered	Outside temperature too low (< -8°C)	Wait for natural rise of outside temperature	Automatic	NO
	Anti-frost protection heater is on	Outside temperature too low (< +3°C) with compressor off	Wait for natural rise of outside temperature	Automatic	NO

## 6.4.2 Faults

Info: led  remains on for 120 seconds after a fault is indicated (except in the case of a "dC" indication when the heat pump remains operational).

Message	Designation	Cause	Remedy	Reset	Alarm
	Control sensor fault	Sensor defective or disconnected	Replace or reconnect the sensor	Cut power supply or press button  if "dSr" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Anti-frost sensor fault	Sensor defective or disconnected	Replace or reconnect the sensor	Cut power supply or press button  if "dSA" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Defrost sensor fault	Sensor defective or disconnected	Replace or reconnect the sensor	Cut power supply or press button  if "dSd" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Low pressure fault in refrigerating circuit	Insufficient refrigerant	Consult a ZPCE-approved technician to look for leaks and refill refrigerant	Automatic (if less than 4 faults within an hour) or by pressing the button  if "dbP" starts blinking	YES (terminals 20-21 and/or 30-31 )
	High pressure fault in refrigerating circuit	1- water and air mixture passing in the appliance, 2- refrigerant overload.	1- purge hydraulic circuit, 2- consult a ZPCE-approved technician to check the refrigerant level	Automatic (if less than 4 faults within an hour) or by pressing the button  if "dHP" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Phase order fault (only on three-phase heat pumps)	1- incorrect wiring at unit supply terminals, 2- modification of phase order by electrical supplier, 3- temporary failure of one or several phases.	1- check wiring at unit supply terminals, 2- contact your local electricity supplier to ensure no modifications have been made to your supply.	Cut power supply or press the button  if "dCP" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Triggering of thermal protection device(s) (Q1-Q2-Q3-Q4 reset manually via the electrical box) or the fan's internal safety device (F1-F11 automatically reset)	1- over-current on the power supply line of the fan and/or the compressor, 2- overheating of the fan motor.	Arrange for a visit by a ZPCE approved engineer to analyse the causes of these breakdowns.	By resetting the thermal protection device(s) (Q1-Q2-Q3-Q4) + pressing the button  if "dt" starts blinking	YES (terminals 20-21 and/or 30-31 )
	Time fault of the defrost	Incorrect signal from the defrost sensor or defrost cycle too long (> one hour)	Consult a ZPCE-approved technician to check the sensor and operation of the defrost cycle.	Cut power supply or press the button  if "dtd" starts blinking (after stand by "Ofr5" => "." and switch the regulator "On" again by pressing  )	YES (terminals 20-21 and/or 30-31 )
	EEPROM fault	Incorrect parameter data in the regulator EEPROM	Consult a ZPCE-approved technician to replace the regulator	Cut off power	YES (terminals 20-21 and/or 30-31 )
	Connection fault	Remote control module (optional) incorrectly connected or declared present for the regulator but in reality absent	Consult a ZPCE-approved technician and refer to the installation instructions of the remote control module	Automatic	NO

## 6.5 Winter storage

- press the button  to switch the regulation to «stand-by», **DFr5** is displayed for 5 seconds before a small red dot appears,
- close the valves 2 and 3 of the by-pass,
- open valves 4 and 5 next to the unit (if present),
- drain the water condenser (**RISK OF FROST**) by unscrewing the two pool water inlet and outlet unions on the side of the heat pump,
- lightly retighten the two unions to avoid any risk of foreign bodies entering the condenser,
- do not hermetically seal the unit (risk of condensation).

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**Incorrect winter storage automatically cancels the GUARANTEE.**

## 7. Maintenance instructions

### Tasks to be carried out by a qualified and authorised person.

The following operations must be carried out at least once a year:

- clean the evaporator at the back of the heat pump (with a soft brush and gentle water spray),  
**never use a high-pressure cleaner for this operation**
- check the settings,
- check safety devices,
- check the presence of refrigerant (check the pressure gauge needle with the compressor switched off),
- check sealing of the cooling circuit,
- check electrical connections and terminals (retighten the supply cable terminals).
- check earth connections.
- checking of the direction of rotation of the compressor on the three-phase heat pumps (in the case of a modification about the phase), to see § 6.2,
- do not use solvents to clean the outside of your unit, “PAC NET” offers an optional specific cleaning kit.

### **IMPORTANT**

**Before working on the appliance, ensure that the power supply is disconnected and secured. All interventions must be carried out by persons who are qualified and authorised to work on this type of equipment.**

## 8. Recycling the product



This device is subject to directive EU 2002/96/CE (with regard to WEEE). At the end of its life, the device should be disposed of at a waste centre or given to the seller when purchasing an equivalent new product.



## CONFORMITY CERTIFICATE

Z.P.C.E. declares that the herewith products or ranges:

**Swimming pool Heat pumps: Optipac 30 D-TS**



are in conformity with the provisions:

➔ **of the ELECTROMAGNETIC COMPATIBILITY directive 89/336/EEC.**

➔ **of the LOW VOLTAGE directive 73/23/EEC.**

### ADDITIONAL RECOMMENDATIONS

**In relation with the Pressurised Equipment Directive (PED-97/23/CE)**

#### **1. Installation and maintenance**

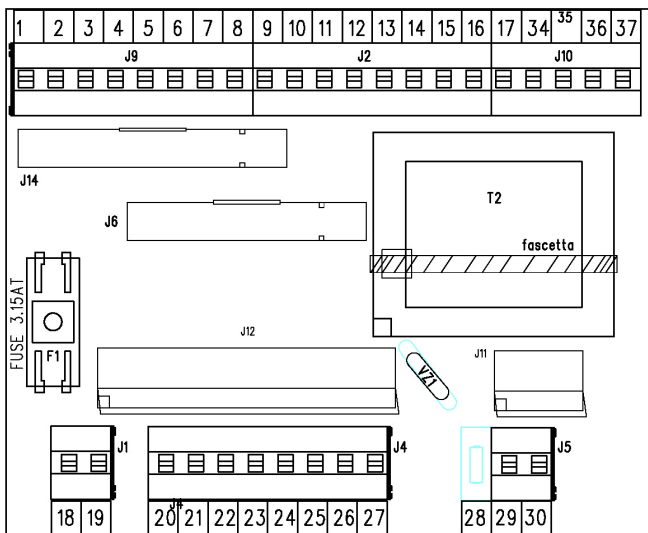
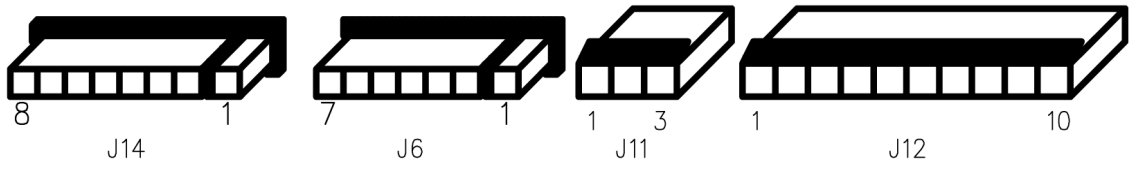
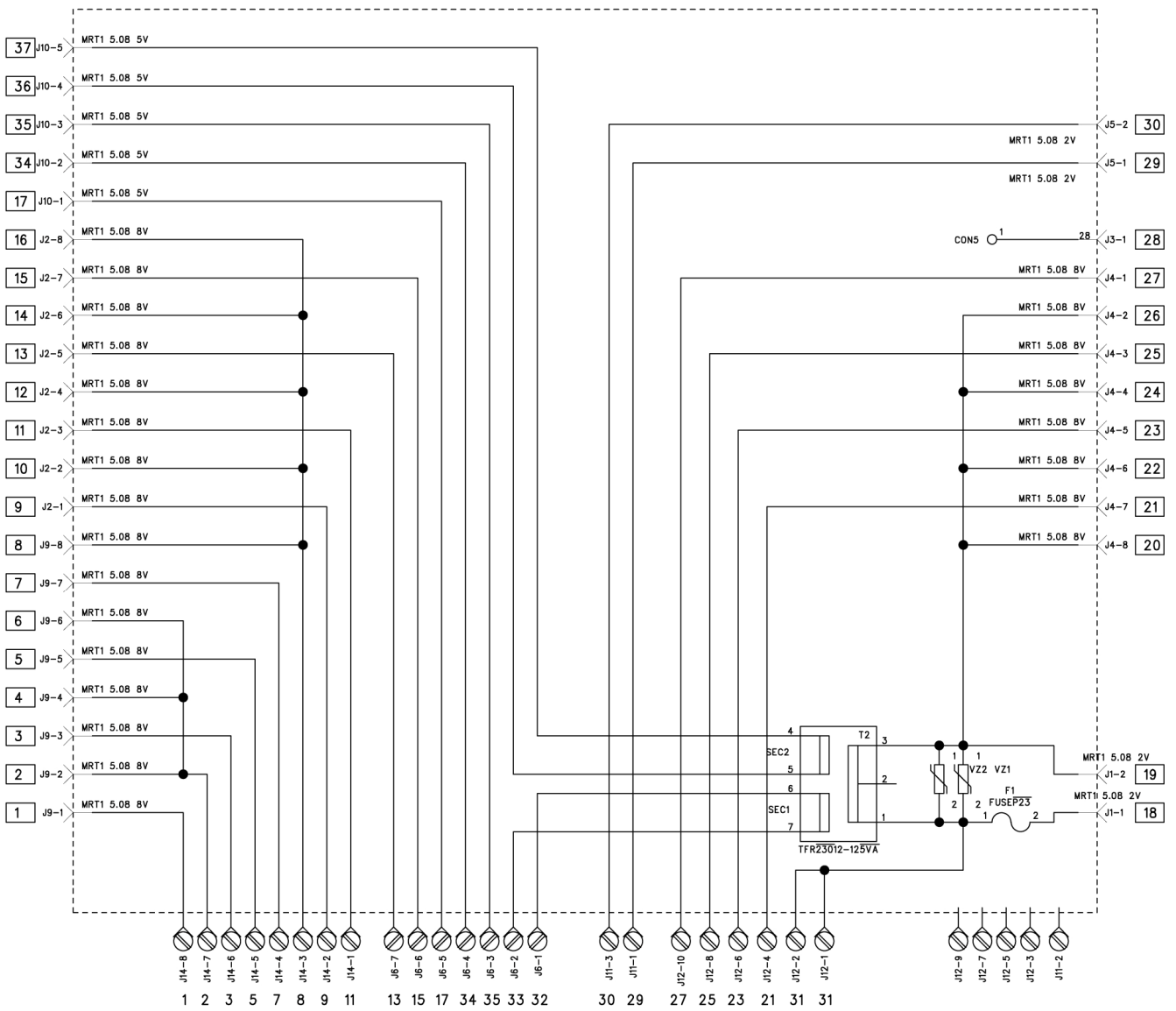
- before beginning any installation, commissioning, operation or maintenance work, the persons responsible for these tasks must have read and understood all instructions and recommendations contained in the unit installation instructions as well as in the project technical file.
- the person responsible for final acceptance of the unit must carry out a visual inspection to detect any damage the unit may have suffered during transport: refrigeration circuit, electrical enclosure, frame and casing.
- the unit may not be installed close to:
  - a heat source,
  - combustible materials,
  - the air duct inlet of an adjacent building.
- for certain appliances, it is essential to fit protection grids if the unit is installed in an area which is unprotected and easily accessible.
- the appliance may only be installed, commissioned, serviced and repaired by properly qualified persons in accordance with directives, laws, valid regulations and acceptable professional practice.
- during installation, repair and maintenance work, it is strictly prohibited to step on pipes and hoses as these could break and the escaping refrigerant could cause serious scalding.
- when servicing the appliance, the composition and state of heat carrying fluid must be checked, as well as the absence of any refrigerant.
- during the annual unit sealing test in accordance with valid legislation, the high and low pressure switches must be checked to ensure they are securely fastened to the refrigeration circuit and that they shut-off the electrical circuit when tripped.
- during maintenance work, ensure there are no traces of corrosion or oil around refrigeration components.
- before beginning work on the refrigeration circuit, isolate the appliance and wait several minutes before removing the temperature or pressure sensors. Certain elements such as the compressor and associated piping may attain temperatures in excess of 100°C and high pressures with the consequent risk of severe scalding.

#### **2. Repair**

- all work on the refrigeration circuit must be carried out with total respect of valid safety regulations and acceptable professional practice: recuperation of refrigerant, nitrogen brazing, etc...
- all brazing work must be carried out by a qualified brazer/welder,
- in the case of units filled with R407C, refer to the specific indications in the installation instructions.
- this unit contains pressurized components, some of which may be manufactured by ZPCE, this is the case of piping elements. Only use the original spare parts indicated in the spare parts list to replace a defective refrigeration component
- replacement pipes must always be made of copper in compliance with standard NF EN 12735-1.
- leak detection, pressure test:
  - never use oxygen or dry air, risk of fire or explosion,
  - use dry nitrogen or the mixture of nitrogen and refrigerant indicated on the name plate,
  - the test pressure for both the high and low pressure circuits must not exceed 20 bar and 15 bar in the case the device is equipped of the manometer option.
- the high pressure circuit pipes are made of copper and have a diameter equal to or greater than 1"5/8. A certificate as indicated in §2.1 in compliance with standard NF EN 10204 will be requested from the supplier and filed in the installation technical documentation.
- the use of non-original spare parts, modifications to the refrigeration circuit, replacement of the refrigerant with a refrigerant type other than that indicated on the name plate, use of the appliance under conditions outside the application limits indicated in the associated documentation will result in a cancellation of the EC label and PED conformity and the person who carried out these modifications will be sole responsible for the consequences.
- the technical data relative to the safety requirements of the various applicable directives must be indicated on the name plate. **This data must be recorded in the unit installation instructions which are included in the installation technical file:**
  - **model – code – serial number,**
  - **maximum and minimum OT,**
  - **OP,**
  - **year of manufacture,**
  - **EC label,**
  - **manufacturer's address,**
  - **refrigerant and weight,**
  - **electrical parameters,**
  - **thermo-dynamic and acoustic performance**

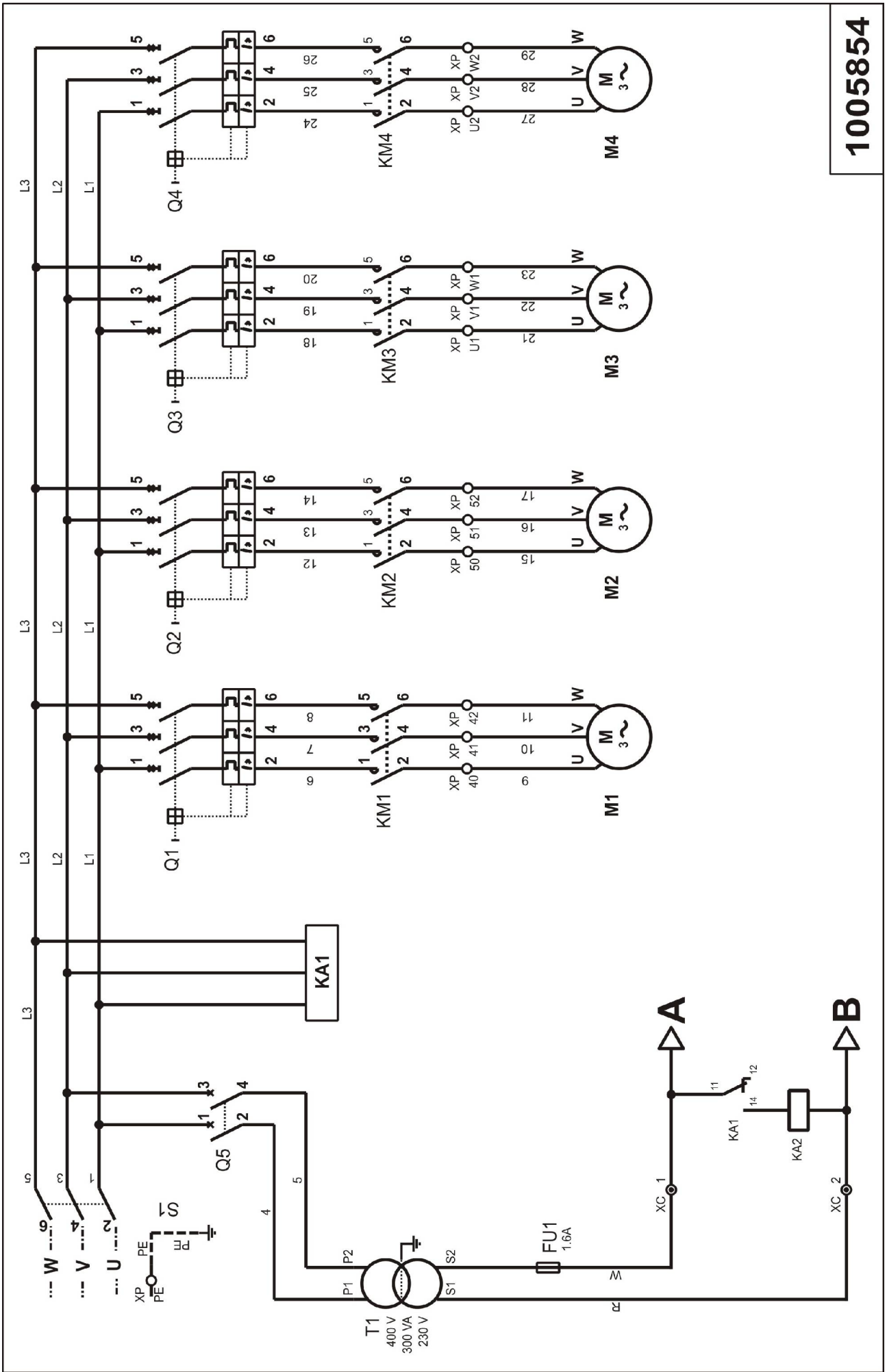
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# Electric diagram

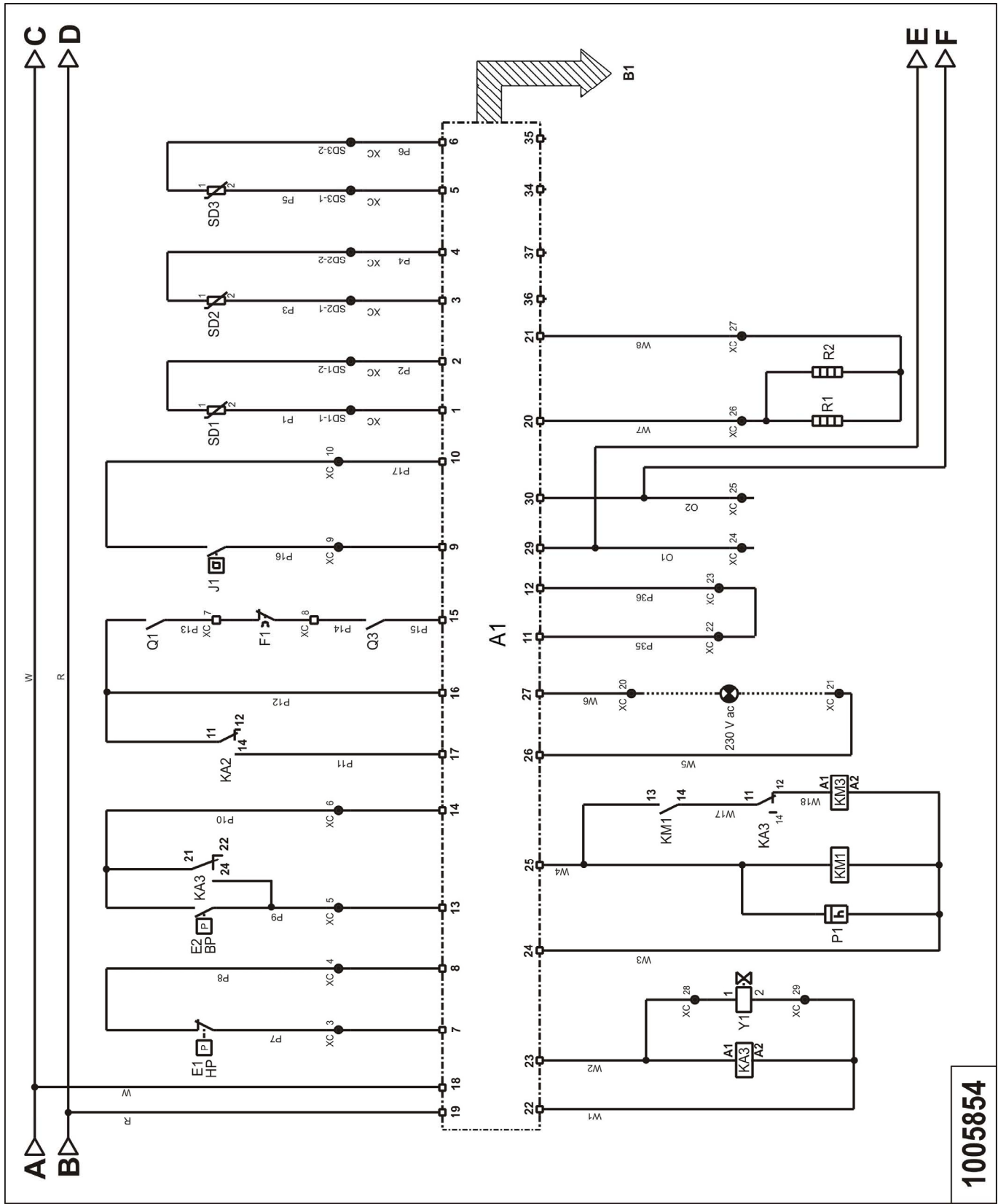


towards J6 and J14 ← → towards J11 and J12

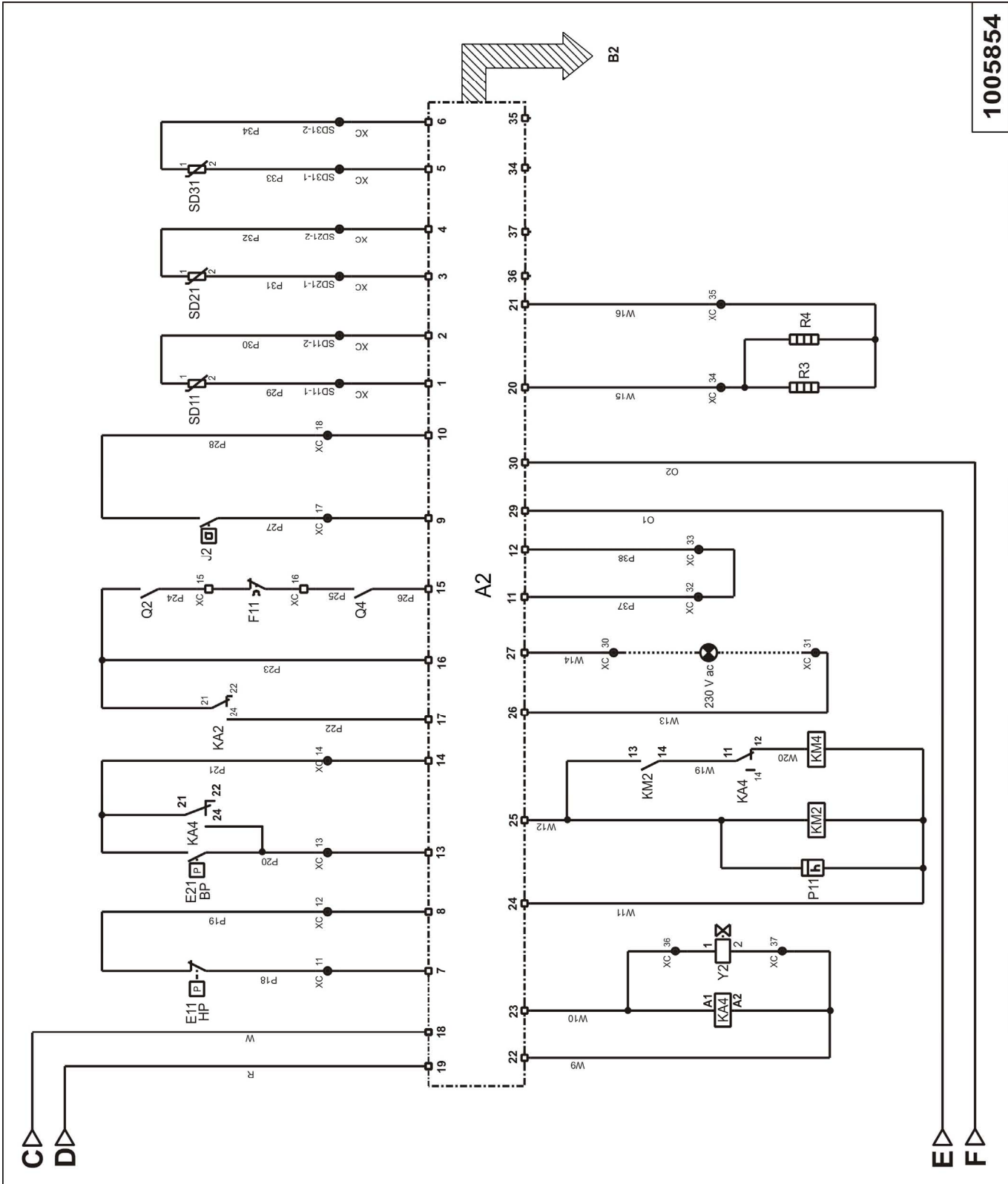




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	<b>Anglais</b>
<b>U-V-W</b>	Power supply (400/3/50+T)
<b>A1</b>	Connection Interface board (circuit A)
<b>A2</b>	Connection Interface board (circuit B)
<b>11-12</b>	Remote "on/off"
<b>26-27</b>	Alarm lamp
<b>34-35</b>	Remote control
<b>36-37</b>	Outlet 12 Vac
<b>B1</b>	Euro Alpha regulator (circuit A)
<b>B2</b>	Euro Alpha regulator (circuit B)
<b>E1</b>	High Pressure switch (circuit A)
<b>E11</b>	High Pressure switch (circuit B)
<b>E2</b>	Low Pressure switch (circuit A)
<b>E21</b>	Low Pressure switch (circuit B)
<b>F1</b>	Fan motor safety (circuit A)
<b>F11</b>	Fan motor safety (circuit B)
<b>FU1</b>	230V control circuit fuse
<b>J1</b>	Flow switch (circuit A)
<b>J2</b>	Flow switch (circuit B)
<b>KA1</b>	Phase order relay
<b>KA2</b>	Auxiliary relay Of KA1
<b>KA3</b>	Defrost relay (circuit A)
<b>KA4</b>	Defrost relay (circuit B)
<b>KM1</b>	Compressor contactor (circuit A)
<b>KM2</b>	Compressor contactor (circuit B)
<b>KM3</b>	Fan contactor (circuit A)
<b>KM4</b>	Fan contactor (circuit B)
<b>M1</b>	Compressor (circuit A)
<b>M2</b>	Compressor (circuit B)
<b>M3</b>	Fan motor (circuit A)
<b>M4</b>	Fan motor (circuit B)
<b>P1</b>	Time meter (circuit A)
<b>P11</b>	Time meter (circuit B)
<b>Q1</b>	Compressor circuit breaker (circuit A)
<b>Q2</b>	Compressor circuit breaker (circuit B)
<b>Q3</b>	Fan circuit breaker (circuit A)
<b>Q4</b>	Fan circuit breaker (circuit B)
<b>Q5</b>	Control circuit breaker
<b>R1-R2</b>	Anti-frost heater (circuit A)
<b>R3-R4</b>	Anti-frost heater (circuit B)
<b>S1</b>	Main On/Off switch
<b>SD1</b>	Control sensor (circuit A)
<b>SD2</b>	Anti-frost sensor (circuit A)
<b>SD3</b>	Defrost sensor (circuit A)
<b>SD11</b>	Control sensor (circuit B)
<b>SD21</b>	Anti-frost sensor (circuit B)
<b>SD31</b>	Defrost sensor (circuit B)
<b>T1</b>	Transformer
<b>Y1</b>	3-way valve (circuit A)
<b>Y2</b>	3-way valve (circuit B)

Handwriting practice lines consisting of 20 horizontal dashed lines.



# ZODIAC

Plaque signalétique – Product name plate

Votre installateur – Your installer

**Chauffage et déshumidification de piscines – Heating and dehumidification of pools**

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**Global provider of innovative pool products and services**  
**Produits et services innovants pour la piscine**