

**Installation and commissioning**  
**( IU-0011-EN-200906 )**

**PLATE HEAT EXCHANGER**  
**FOR DOMESTIC HOT WATER**

**PLAKEO**  
**Electronic Control Box**

## **SUMMARY**

<b>WARNING .....</b>	<b>3</b>
<b>TECHNICAL DATA SHEET .....</b>	<b>4</b>
<b>GENERAL CHARACTERISTICS .....</b>	<b>5</b>
<b>PLATE EXCHANGER .....</b>	<b>5</b>
<b>MATERIALS.....</b>	<b>6</b>
<b>HYDRAULIC CONNECTIONS .....</b>	<b>13</b>
<b>REGULATION.....</b>	<b>18</b>
<b>COMMISSIONING / MAINTENANCE .....</b>	<b>27</b>



## WARNING

### ***Note concerning the elaboration and publication of this manual :***

This manual was elaborated and published under the direction of LACAZE ENERGIES. It covers the most recent features and descriptions of the product. The manual content and the product features may be modified without prior notice.

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### ***Please read carefully:***

- This instruction manual is an integral part of the product and must be given to the final user.
- The appliance was manufactured for the storage of hot or cold water, used in a closed circuit. Any other use shall be considered as inappropriate and dangerous.
- The appliance must not be installed in humid locations (H.R.  $\leq$  80%). Protect the appliance from water or other liquid splashes to prevent damage to the components.
- Installation must be carried out in conformity with the rules, regulations and standards currently in force, respecting the instructions of the manufacturer, by a qualified professional.
- In the case of the equipment being sold or transferred to another user, this manual must accompany the equipment, so that the new user and the installer can consult it.
- If the equipment is not used during a period of below-freezing conditions, we request that it should be drained completely. The manufacturer declines all responsibility for any damage due to frost.
- We recommend that these instructions be read carefully, and advise the exclusive use of spare parts supplied by the manufacturer, in order to obtain the best service from the product and the acknowledgement of the appliance warranty.

## TECHNICAL DATA SHEET:

<b>Serial N°:</b>					
<b>Model:</b>		<b>PLAKEO</b>			
<b>Exchanger x No. of plates</b>		X07 - plates L13 - plates			
<b>Canals</b>	<b>X07</b>	<b>L</b>	<b>-</b>	<b>R</b>	<b>S</b>
	<b>L13</b>	<b>M</b>	<b>-</b>	<b>m</b>	<b>h</b>
<b>SECONDARY CIRCUIT</b>					
<b>Secondary pump</b>					
<b>Available pressure</b>		≥ 1.0 mWc			
<b>Exchanger head loss</b>		.....mWc			

 **Warning:**

***When contacting our After Sales Service, you will be asked to quote the equipment reference information above!***

## GENERAL CHARACTERISTICS

PLAKEO is a complete domestic hot water production system, comprising:

- A plate heat exchanger with demountable plates, with a high exchange coefficient.
- A high-precision control system (control unit, sensor and motorized valve).
- A single-phase 230V circulator, simple or double.
- A safety thermostat on the DHW outlet.

This system provides you with a large quantity of domestic hot water always at the required temperature (from 45 to 60°C).

## PLATE EXCHANGER

### *Convention*

As with any exchanger, there is a hot fluid which is being cooled, and a cold fluid which is being heated.

Throughout this document we will refer to the hot water fluid circuit as the Primary Circuit, and the cold water fluid circuit as the Secondary Circuit.

### *Constitution*

The plate exchanger is made up of a series of plates held together between two supporting plates, one fixed, the other mobile. The supporting plates are connected by two braces and held in position by two tension rods (tie bolts).

On the fixed plate there are two connections, positioned as follows:

#### **Primary Circuit:**

- Inlet - top left
- Outlet - bottom right

#### **Secondary Circuit:**

- Inlet - bottom left
- Outlet - top right

The hot and cold fluids circulate between the plates which, with the aid of gaskets, are positioned so as to keep the two circuits totally separate and independent.

## MATERIALS

### 1. The plates:

The plates are made of AISI 316 L stainless steel [Z3 CND 17.12], so providing excellent resistance to corrosion (for Cl<sup>-</sup> ≤ 70 mg/l contents).

MODEL	Thickness (mm)	Distance (mm)	Surface (m <sup>2</sup> )
X07	0.5	3.00	0.070
L13	0.5	3.40	0.120

### 2. The gaskets:

These have two main functions:

- To ensure that the exchanger is water tight.
- To separate the primary and secondary circuits.

A double gasket around each plate orifice prevents mixing of the fluids. If a gasket is faulty, the liquid will leak towards the exterior of the exchanger.

PLAKEO exchanger plates are equipped with Nitrile (P) gaskets which are regularly used in heating appliances for temperatures ≤ 110°C.

### 3. The frame:

Made of S235JRG2 carbon steel and covered with 2 coats of epoxy paint of varying thickness.

MODEL	Frame weight (kg)	Operating pressure (bar)
X07	30	10
L13	105	10

### 4. Tension rods and braces:

In electro-galvanized steel class 8.8 for the threaded parts.

	X07	L13
BRACES	2 x Φ15	2 x Φ30
TENSION RODS	10 x M12	8 x M20

## Plate assembly

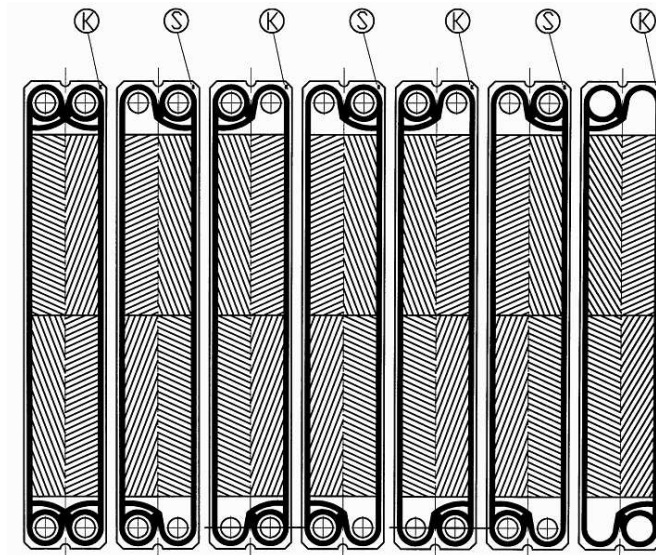
Refer to the following figures and tables to visualize the correct assembly of the plates.

## Model X07

The reference letter identifying the plate is located on the **TOP - RIGHT** corner of the plate, the plate being turned **TOWARDS** the fixed frame. To differentiate the plates, it is not sufficient to go by the reference alone, the configuration of the gaskets and the presence of the holes must be checked.

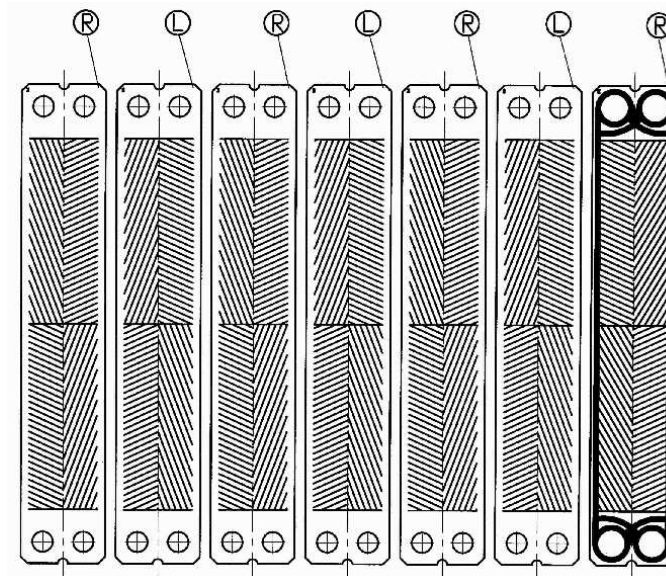
Hole	Ref.	Order N°	Canals	Gasket
4	<b>K</b>	first	facing down	1 gasket of ½ thickness against the fixed frame
4	<b>S</b>	even no.	facing up	1 open gasket on the LEFT, ref. S
4	<b>K</b>	odd no.	facing down	1 open gasket on the RIGHT, ref. K
0	<b>K</b>	last	facing up	1 open gasket on the RIGHT, ref. K. 1 gasket of ½ thickness against the fixed frame

### SIDE VIEW FIXED FRAME



*Plate assembly diagram X07- Canal "0R 3S" (front view)*

### SIDE VIEW MOBILE FRAME



*Plate assembly diagram X07- Canals "0R 3S" (rear view)*

Model	Tech. Ref.	Canals	Nt	Na	Nb	Nc	Nd	Tightening (mm)	ARRANGEMENT
AL0050	A705..25	0R 2S	5	1	2	1	1	15.0	K (SK) SK
AL0086	A707..25	0R 3S	7	1	3	2	1	21.0	K (SK) <sub>2</sub> SK
AL0115	A709..25	0R 4S	9	1	4	3	1	27.0	K (SK) <sub>3</sub> SK
AL0143	A711..25	0R 5S	11	1	5	4	1	33.0	K (SK) <sub>4</sub> SK
AL0170	A713..25	0R 6S	13	1	6	5	1	39.0	K (SK) <sub>5</sub> SK
AL0198	A715..25	0R 7S	15	1	7	6	1	45.0	K (SK) <sub>6</sub> SK
AL0220	A717..25	0R 8S	17	1	8	7	1	51.0	K (SK) <sub>7</sub> SK
AL0233	A719..25	0R 9S	19	1	9	8	1	57.0	K (SK) <sub>8</sub> SK
AL0261	A719..32	0R 9S	19	1	9	8	1	57.0	K (SK) <sub>8</sub> SK
AL0278	A721..32	0R 10S	21	1	10	9	1	63.0	K (SK) <sub>9</sub> SK
AL0295	A723..32	0R 11S	23	1	11	10	1	69.0	K (SK) <sub>10</sub> SK
AL0317	A725..32	0R 12S	25	1	12	11	1	75.0	K (SK) <sub>11</sub> SK
AL0329	A727..32	0R 13S	27	1	13	12	1	81.0	K (SK) <sub>12</sub> SK
AL0344	A729..32	0R 14S	29	1	14	13	1	87.0	K (SK) <sub>13</sub> SK
AL0355	A731..32	0R 15S	31	1	15	14	1	93.0	K (SK) <sub>14</sub> SK
AL0366	A733..32	0R 16S	33	1	16	15	1	99.0	K (SK) <sub>15</sub> SK
AL0376	A735..32	0R 17S	35	1	17	16	1	105.0	K (SK) <sub>16</sub> SK
AL0386	A737..32	0R 18S	37	1	18	17	1	111.0	K (SK) <sub>17</sub> SK
AL0399	A741..32	0R 20S	41	1	20	19	1	123.0	K (SK) <sub>19</sub> SK



**Reminder:**

- N<sub>t</sub> total number of plates
- N<sub>a</sub> front plate, 4 holes, 1 gasket of ½ thickness against frame (type K)
- N<sub>d</sub> plate without hole, 1 gasket (open to the right) (type K)
- N<sub>b</sub> intermediary plate (even number), with 1 gasket (open to the left) (type S)
- N<sub>c</sub> intermediary plate (odd number), with 1 gasket (open to the right) (type K).

**Interpretation:**

For example: the model **A721.32** (or AL0278) has canals "**OR 10S**". This means that there are **10** plates with gasket open to the left, bearing the identification letter **S** at **TOP RIGHT** (plates seen from fixed frame side).

**Model L13**

The heat exchanger is described as follows:

**L13 N m-h**

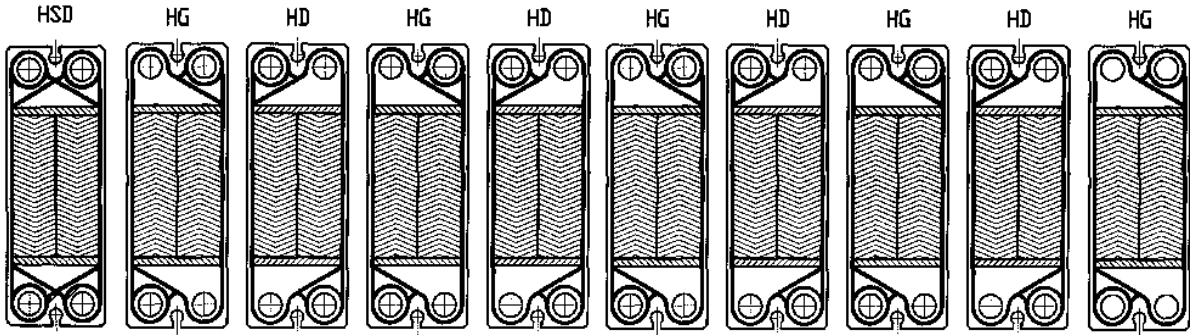
- with N, the total number of plates;
- m, the number of primary canals of type **m**;
- h, the total number of primary canals of type **h**.

There are never primary canals of type m in the AL2004 models, so m is always equal to 0.

Plate identification is made by viewing from the **FIXED FRAME** side (back of the plates – gasket side). There is no reference on the plates to differentiate them. Check the configuration of the gaskets on the plates.

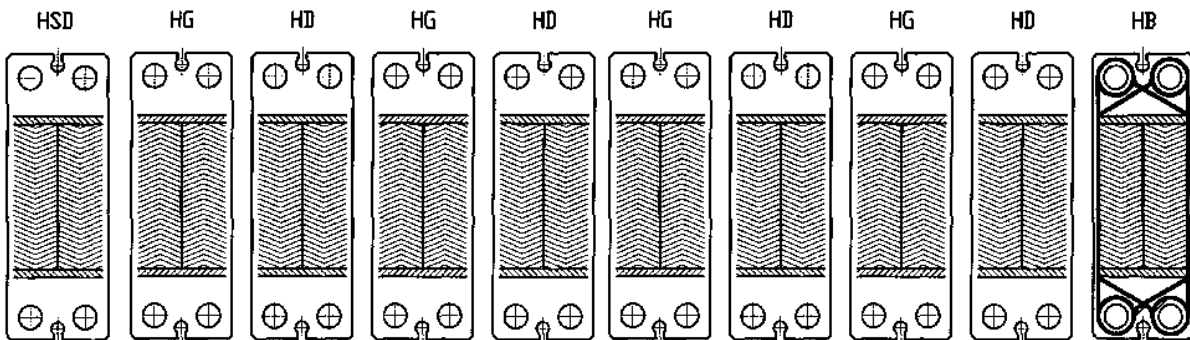
Plate	Hole	Angle	Order N°	Gasket
HSD	4	open	first	1 gasket of ½ thickness against the fixed frame; 1 gasket open to the <u>RIGHT</u> on the other side
HD	4	open	odd no.	1 gasket open to the <u>RIGHT</u>
HG	4	open	even no.	1 gasket open to the <u>LEFT</u>
HB	0	open	last	1 gasket of ½ thickness against the mobile frame

**SIDE VIEW FROM THE FIXED FRAME**



*Assembly diagram for plates L13- Example of assembly L13 10/0-5 (front)*

**SIDE VIEW FROM THE MOBILE FRAME**



*Assembly diagram for plates L13- Example of assembly L13 10/0-5 (rear)*

## Plate numbering:

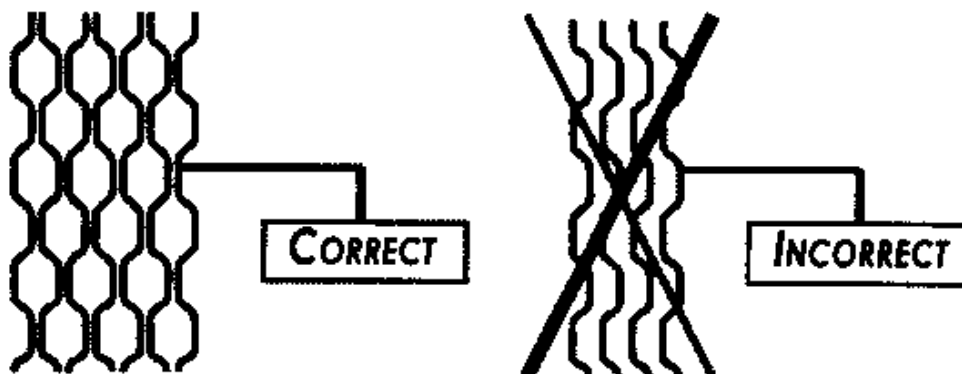
Exchanger L13 N/m-h

- N** total number of plates (even number).
- 1** Front plate **HSD**  
(type H, open angle, 1/2 gasket against fixed frame, 1 gasket open to the right on the other side)
- 1** Rear plate **HB**  
(type H, open angle, 1/2 gasket against mobile frame)
- m** intermediary plate(s) **LG**  
(type L, closed angle, 1 gasket open to the left)
- m+h-1** intermediary plate(s) **HD**  
(type H, open angle, 1 gasket open to the right)
- h-1** intermediary plate(s) **HG**  
(type H, open angle, 1 gasket open to the left)

$$N = 2 * (m+h)$$

## Plate assembly:

During assembly, the direction of the canals must be alternated: up, down, up, etc. When the exchanger is assembled, the plates, when viewed from the side of the exchanger, should form a "honeycomb" structure as in the figure below.

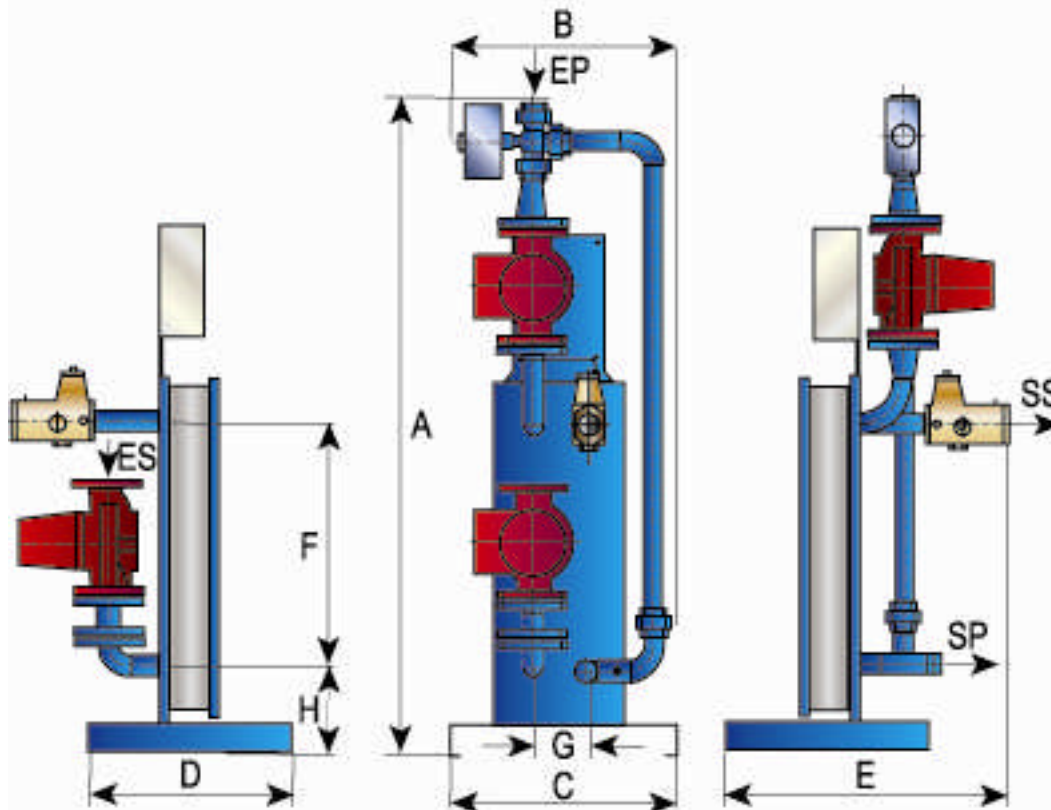


**List of exchangers L13:**

Model	Technical Ref.	Canals	N	LG	HD	HG	Tightening (mm)	IDENTIFICATION-ARRANGEMENT
AL0402	A1314..40	0m 7h	14	0	6	6	47,6	HSD (HG+HD) <sub>6</sub> HB
AL0458	A1316..40	0m 8h	16	0	7	7	54,4	HSD (HG+HD) <sub>7</sub> HB
AL0510	A1318..40	0m 9h	18	0	8	8	61,2	HSD (HG+HD) <sub>8</sub> HB
AL0558	A1320..40	0m 10h	20	0	9	9	68,0	HSD (HG+HD) <sub>9</sub> HB
AL0605	A1322..40	0m 11h	22	0	10	10	74,8	HSD (HG+HD) <sub>10</sub> HB
AL0648	A1324..40	0m 12h	24	0	11	11	81,6	HSD (HG+HD) <sub>11</sub> HB
AL0688	A1326..40	0m 13h	26	0	12	12	88,4	HSD (HG+HD) <sub>12</sub> HB
AL0721	A1328..40	0m 14h	28	0	13	13	95,2	HSD (HG+HD) <sub>13</sub> HB
AL0745	A1330..40	0m 15h	30	0	14	14	102,0	HSD (HG+HD) <sub>14</sub> HB
AL0768	A1332..40	0m 16h	32	0	15	15	108,8	HSD (HG+HD) <sub>15</sub> HB
AL0808	A2330..40	0m 15h	30	0	14	14	102,0	HSD (HG+HD) <sub>14</sub> HB
AL0846	A2332..40	0m 16h	32	0	15	15	108,8	HSD (HG+HD) <sub>15</sub> HB
AL0878	A2334..40	0m 17h	34	0	16	16	115,6	HSD (HG+HD) <sub>16</sub> HB
AL0901	A2336..40	0m 18h	36	0	17	17	122,4	HSD (HG+HD) <sub>17</sub> HB
AL0924	A2338..40	0m 19h	38	0	18	18	129,2	HSD (HG+HD) <sub>18</sub> HB
AL0955	A2334..50	0m 17h	34	0	16	16	115,6	HSD (HG+HD) <sub>16</sub> HB
AL0997	A2336..50	0m 18h	36	0	17	17	122,4	HSD (HG+HD) <sub>17</sub> HB
AL1038	A2338..50	0m 19h	38	0	18	18	129,2	HSD (HG+HD) <sub>18</sub> HB
AL1076	A2340..50	0m 20h	40	0	19	19	136,0	HSD (HG+HD) <sub>19</sub> HB
AL1114	A2342..50	0m 21h	42	0	20	20	142,8	HSD (HG+HD) <sub>20</sub> HB
AL1146	A2344..50	0m 22h	44	0	21	21	149,6	HSD (HG+HD) <sub>21</sub> HB
AL1173	A2346..50	0m 23h	46	0	22	22	156,4	HSD (HG+HD) <sub>22</sub> HB
AL1196	A2348..50	0m 24h	48	0	23	23	156,4	HSD (HG+HD) <sub>23</sub> HB
AL1217	A2350..50	0m 25h	50	0	24	24	170,0	HSD (HG+HD) <sub>24</sub> HB
AL1239	A2352..50	0m 26h	52	0	25	25	176,8	HSD (HG+HD) <sub>25</sub> HB
AL1254	A2346..50-B	0m 23h	46	0	22	22	156,4	HSD (HG+HD) <sub>22</sub> HB
AL1289	A2348..50-B	0m 24h	48	0	23	23	163,2	HSD (HG+HD) <sub>23</sub> HB
AL1323	A2350..50-B	0m 25h	50	0	24	24	170,0	HSD (HG+HD) <sub>24</sub> HB
AL1347	A2352..50-B	0m 26h	52	0	25	25	176,8	HSD (HG+HD) <sub>25</sub> HB

## HYDRAULIC CONNECTIONS

### Dimensions



<b>CE</b>	PVC ELECTRONIC CONTROL BOX (230V MONO)
<b>SA</b>	AIR SEPARATOR WITH AUTOMATIC AIR BLEED AND SENSOR Pt100
<b>PP</b>	PRIMARY PUMP [STAINLESS STEEL TURBINE, CAST IRON BODY] (230 V – 50 Hz)
<b>PC</b>	BOOSTER PUMP [STAINLESS STEEL TURBINE, CAST IRON BODY] (230 V – 50 Hz)
<b>V3V</b>	THREE-WAY MIXING VALVE [CAST IRON/BRONZE BODY]
<b>MV</b>	VALVE MOTOR 230 V 3 POINTS
<b>BP</b>	MIXING VALVE BYPASS CIRCUIT
<b>SC</b>	SUPPORT FOR ELECTRONIC CONTROL BOX [PAINTED STEEL]
<b>PL</b>	EXCHANGER PLATES 316 STAINLESS STEEL / NITRILE GASKET
<b>PF</b>	FIXED PLATFORM [PAINTED STEEL]
<b>PM</b>	MOBILE PLATFORM [PAINTED STEEL]
<b>SO</b>	WATER HEATER BASE [PAINTED STEEL]
<b>SP</b>	PRIMARY OUTLET (FEMALE UNION)
<b>EP</b>	PRIMARY INLET (MALE UNION)
<b>SS</b>	SECONDARY OUTLET (MALE UNION)
<b>ES</b>	SECONDARY INLET (MALE UNION - FLANGE)

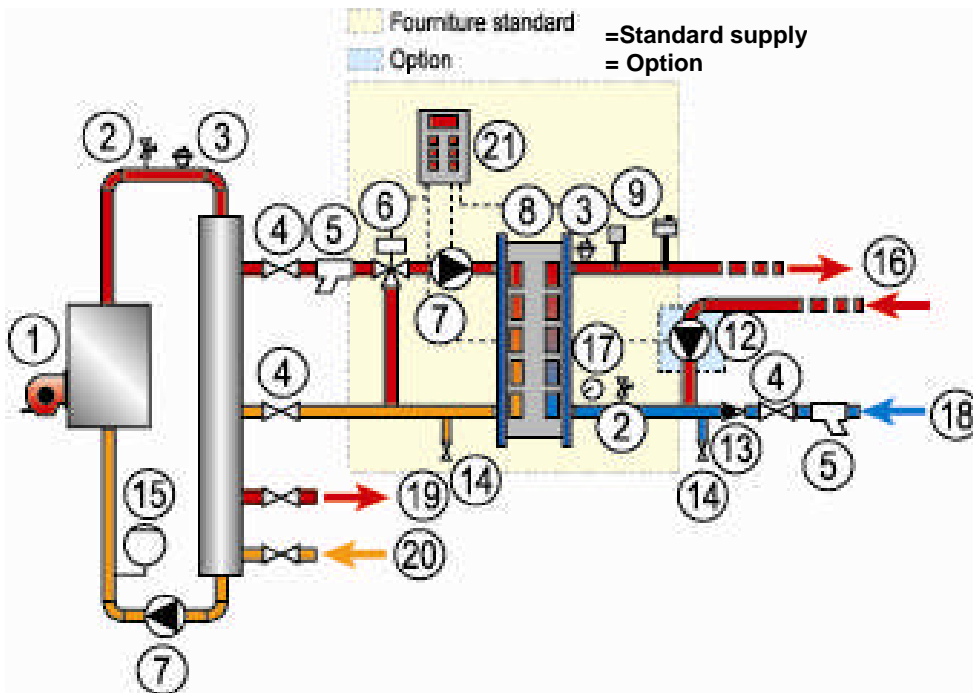
### Principal dimensions

Model	Tech. Ref.	EP	SP	ES	SS	A	B	C	D	E	F	G	H
AL0050	A705..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0086	A707..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0115	A709..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0143	A711..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0170	A713..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0198	A715..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0220	A717..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0233	A719..25	1"	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0261	A719..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0278	A721..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0295	A723..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0317	A725..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0329	A727..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0344	A729..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0355	A731..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0366	A733..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0376	A735..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0386	A737..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0399	A741..32	1"1/4	1"	1"1/4	1"	1 400	430	300	300	470	640	60	128
AL0402	A1314..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0458	A1316..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0510	A1318..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0558	A1320..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0605	A1322..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0648	A1324..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0688	A1326..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0721	A1328..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0745	A1330..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0768	A1332..40	1"1/2	1"1/2	DN 40	1"1/2	1 460	550	590	500	720	592	135	220
AL0808	A2330..40	1"1/2	2"	DN 50	2"	1 520	550	590	500	720	592	135	220
AL0846	A2332..40	1"1/2	2"	DN 50	2"	1 520	550	590	500	720	592	135	220
AL0878	A2334..40	1"1/2	2"	DN 50	2"	1 520	550	590	500	720	592	135	220
AL0901	A2336..40	1"1/2	2"	DN 50	2"	1 520	550	590	500	720	592	135	220
AL0924	A2338..40	1"1/2	2"	DN 50	2"	1 520	550	590	500	720	592	135	220
AL0955	A2334..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL0997	A2336..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1038	A2338..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1076	A2340..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1114	A2342..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1146	A2344..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1173	A2346..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1196	A2348..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1217	A2350..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1239	A2352..50	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1254	A2346..50-B	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1289	A2348..50-B	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1323	A2350..50-B	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220
AL1347	A2352..50-B	2"	2"	DN 50	2"	1 540	650	590	500	720	592	135	220

## Main operating diagram

There are two operating modes:

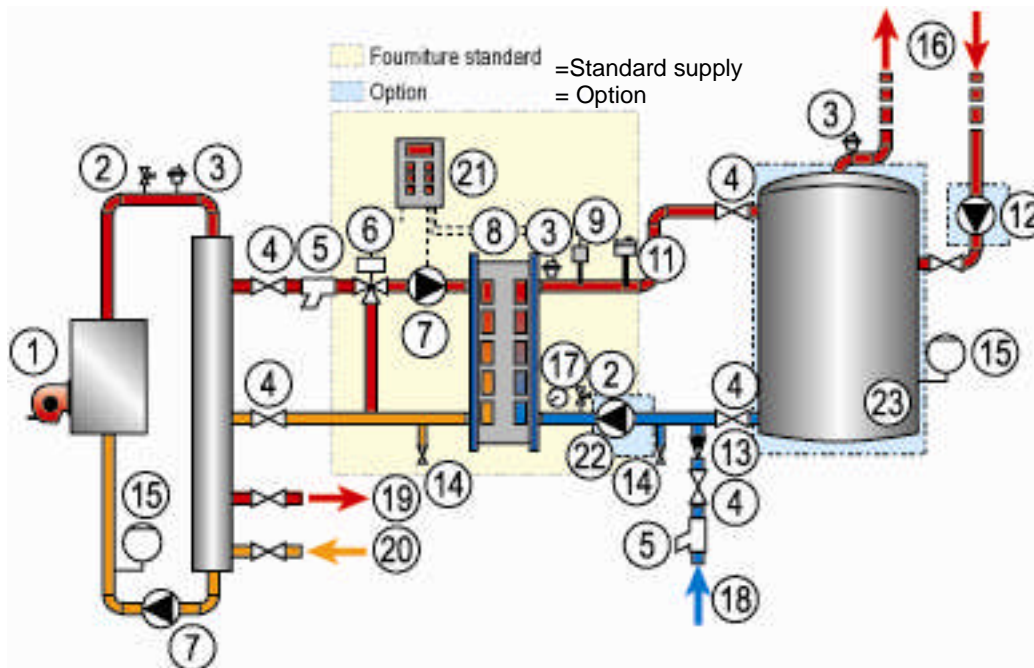
### 1. Instantaneous



*(Indicative operating diagram)*

1	Generator	11	Safety thermostat (optional)
2	Safety valve	12	Circulator / loop
3	Degasser	13	Non return valve
4	Isolation valve	14	Drainage valves
5	Filters	15	Expansion system
6	Motorized three way valve	16	DHW departure
7	Primary pump	17	DHW return
8	Plate exchanger	18	Cold water inlet
9	Control sensor	19	Heating system departure
10	Thermometer	20	Heating system return

## 2. Semi-Instantaneous



*(Indicative operating diagram)*

1	Generator	11	Safety thermostat (optional)
2	Safety valve	12	Circulator / loop
3	Degasser	13	Non return valve
4	Isolation valve	14	Drainage valves
5	Filters	15	Expansion system
6	Motorized three way valve	22	DHW departure
7	Primary pump	21	DHW return
8	Plate exchanger	18	Cold water inlet
9	Control sensor	19	Heating system departure
10	Thermometer	20	Heating system return

**Warning:**

***In all cases, we expressly recommend that circulation of water between the plates is maintained, even when no water is being drawn off.***

***(Pump 12 and 7 in permanent operation)***



## Primary circuit data

The primary pump flow rate is indicated below, along with the available pressure for the connections (**maximum loss of pressure in the conduits**).

**⚠ N.B.** The indicated flow rate is the normal operating flow rate, whatever the water temperature of the primary inlet.

Model	Technical Ref.	Prim. flow (m <sup>3</sup> /h)	ΔP (mCE)	Model	Technical Ref.	Prim. flow (m <sup>3</sup> /h)	ΔP (mCE)
AL0050	A705..25	1,25	1	AL0402	A1314..40	8,90	1
AL0086	A707..25	1,80	1	AL0458	A1316..40	9,70	1
AL0115	A709..25	2,20	1	AL0510	A1318..40	10,30	1
AL0143	A711..25	2,60	1	AL0558	A1320..40	10,80	1
AL0170	A713..25	3,00	1	AL0605	A1322..40	11,30	1
AL0198	A715..25	3,40	1	AL0648	A1324..40	11,70	1
AL0220	A717..25	3,70	1	AL0688	A1326..40	12,00	1
AL0233	A719..25	3,80	1	AL0721	A1328..40	12,30	1
AL0261	A719..32	4,40	1	AL0745	A1330..40	12,50	1
AL0278	A721..32	4,60	1	AL0768	A1332..40	12,70	1
AL0295	A723..32	4,80	1	AL0808	A2330..40	14,20	1
AL0317	A725..32	5,10	1	AL0846	A2332..40	14,50	1
AL0329	A727..32	5,20	1	AL0878	A2334..40	14,80	1
AL0344	A729..32	5,40	1	AL0901	A2336..40	15,00	1
AL0355	A731..32	5,50	1	AL0924	A2338..40	15,20	1
AL0366	A733..32	5,60	1	AL0955	A2334..50	17,50	1
AL0376	A735..32	5,70	1	AL0997	A2336..50	17,90	1
AL0386	A737..32	5,80	1	AL1038	A2338..50	18,20	1
AL0399	A741..32	5,90	1	AL1076	A2340..50	18,50	1
				AL1114	A2342..50	18,80	1
				AL1146	A2344..50	19,10	1
				AL1173	A2346..50	19,40	1
				AL1196	A2348..50	19,60	1
				AL1217	A2350..50	19,80	1
				AL1239	A2352..50	20,00	1
				AL1254	A2346..50-B	21,70	1
				AL1289	A2348..50-B	21,90	1
				AL1323	A2350..50-B	22,10	1
				AL1347	A2352..50-B	22,30	1

## Secondary circuit data

Refer to the technical data sheet for the appliance shown at the beginning of this instruction manual.

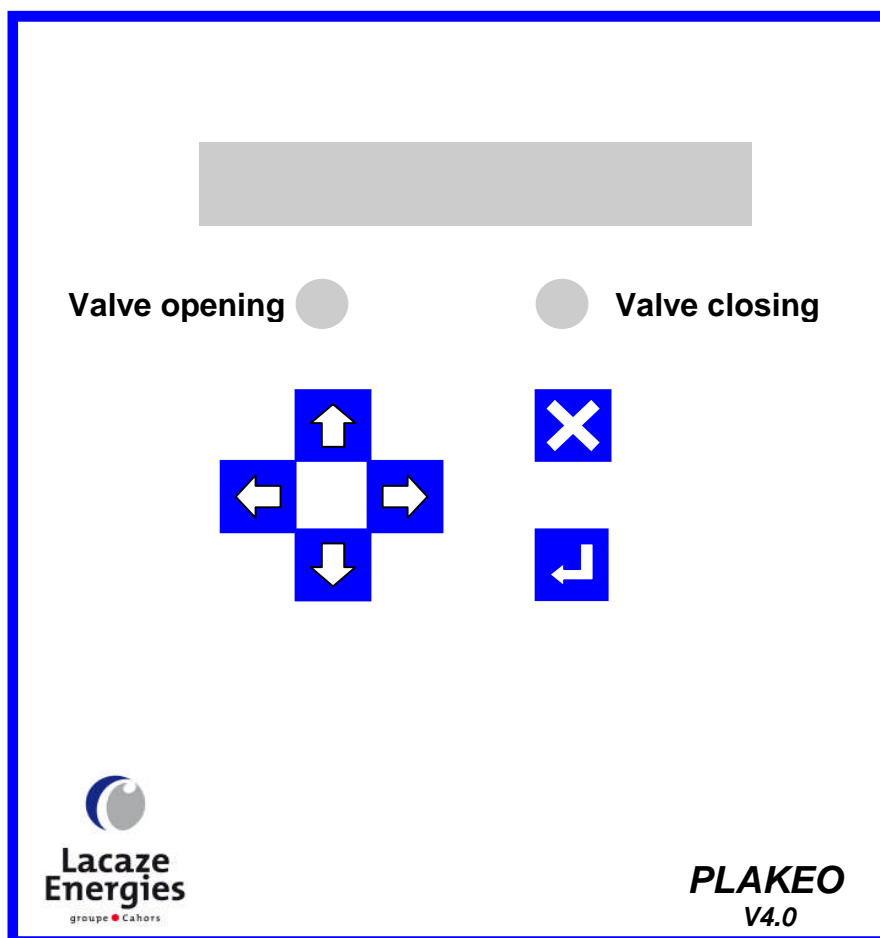
## REGULATION

### Basic principles

The control unit pilots the servo-motor of the three way valve according to the temperature of the secondary circuit, measured by a Pt100 rapid-reaction sensor located at the outlet of the exchanger. This device minimizes the risk of scaling in the circuit and ensures the stability of the domestic hot water temperature, whatever the power required (within the limits of maximum exchanger power).

Please note that the temperature of incoming water to the primary circuit is always inferior to the temperature of the system, due to the mixer setting of the three way valve. This device reduces the risk of clogging of the plate exchanger.

When connecting the PLAKEO unit to mains power, a cycle of initialization is carried out, with complete opening and closing of the valve. During this phase, the pump(s) is/are stopped.



## Settings

The appliance has been factory preset so it is not always necessary to modify the preset program. It is necessary, however, to check that the date and time are correct. It is also possible to check the various regulation settings (day and night temperature, high and low temperature alarms, pump inversion timing, 'turbo' mode regulation, etc.).

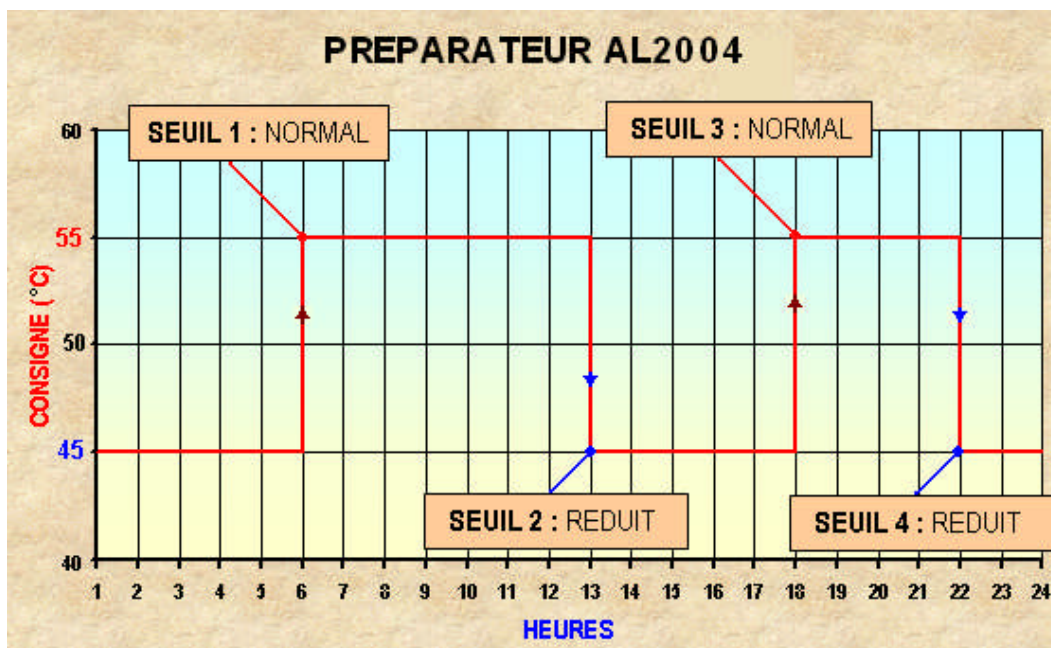
- The back-lit digital display shows permanently, on two lines:
  - The temperature of the water measured by a probe (bottom right).

- The operating mode "Normal" "Reduced" or "Légio" (anti Legionnaire's disease) (bottom left).
- The system date (day of week, date and hour) on the top line.

In the case of one or more faults occurring, these are shown on the bottom line.

- Significance of the terms "NORMAL" and "REDUCED"(REDUIT):  
 The PLAKEO control panel allows, for each day of the week, two adjustments **NORMAL/REDUCED** to be made in order to save energy.

As an example, the following programming can be made:




Setting "NORMAL"	<b>55 °C</b>	Setting "REDUCED"	<b>45 °C</b>
THRESHOLD 1 "NORMAL"	06:00	THRESHOLD 3 "NORMAL"	18:00
THRESHOLD 2 "REDUCED"	13:00	THRESHOLD 4 "REDUCED"	22:00

## List of menus:

The PLAKEO control box provides access to the following menus:

- **CALENDAR:**  
for setting the times of switching between NORMAL / REDUCED for each day of the week.
- **TEMPERATURES:**  
for setting the values "NORMAL" and "REDUCED".
- **LEGIO.:**  
To activate the anti-Legionnaires disease function (thermal shock at a temperature superior to 70°C), adjust its duration, set the day and hour as well as the desired temperature.
- **SYSTEM:**
  - to eventually protect the system by an access code;
  - to adjust the parameters of regulation P, I or D;
  - to set duration of alarm at the end of anti-Legionnaires disease cycle;
  - to set timing of start of temperature alarms;
  - to adjust the hysteresis value for start of alarms;
  - to define a maximum and minimum value for alarm;
  - to adjust the difference of temperature which activates the mode "TURBO";
  - to redefine the number of primary and secondary pumps;
  - to define pumps changeover
  - to deactivate the output of the PLAKEO control panel;
  - to reset to factory preset values.

## ● MANUFACTURER:

 **Menu exclusively reserved for the manufacturer and not accessible!!**

## ● DATE / TIME:

for setting the time on the PLAKEO control box.

## ● FAULTS:

- to display fault history;
- to discharge a serious general fault (pump problem, sensor fault, etc.).

## Navigation:

Navigation of the menus is by the six keys situated on the front of the PLAKEO control box.

One press on the key will produce the menu. To pass to the next menu, press again on the key, and so on.



To access the content of a menu, press:



To access the value to be changed, use the keys:



To modify the value selected, use the keys:



To validate the modifications, use:





To abandon the modifications, use the key:



**Note:** *after 30 seconds of inactivity, you will be returned to the standard display.*

### Menu CALENDAR:

Access the menu by tapping  then   
 the following settings can be made:

**Set the day** (MON, TUE, WED, THU, FRI, SAT, SUN), **the Threshold no.** ("STEP") (1, 2, 3, 4), **the Hour** (@) and **the Mode** (Normal / Reduct).

**VALIDATE THE SETTINGS BY PRESSING THE ENTER KEY** 

The default values are the following (for each day of the week):

<b>MON</b> @ <b>06:00</b>	STEP: <b>1</b> Mode : <b>Normal</b>
<b>MON</b> @ <b>00:00</b>	STEP: <b>3</b> Mode : <b>Normal</b>
<b>MON</b> @ <b>22:00</b>	STEP: <b>2</b> Mode : <b>Reduct</b>
<b>MON</b> @ <b>00:00</b>	STEP: <b>4</b> mode : <b>Reduct</b>

**Note:** the value 00:00 signifies that the threshold is not used.

### Menu TEMPERATURES

**Adjust the temperature setting in « NORMAL » mode and in « REDUCED » mode. The reduced temperature must be lower than the normal temperature.**

Default values are below:

Mode Reduced	T = <b>45°C</b>
Mode Normal	T = <b>55°C</b>

### Menu LEGIO:

**Activate Yes or No the anti-Legionnaire's thermal shock by selecting its duration (Delay= 0 to 120 mn), the Day (D = Mon to Sun), start time (T) as well as the desired temperature (T= 70 to 95°C).**

Default values are below:



With= <b>NO</b>	Delay = <b>90</b>
D= <b>WED</b>	T= <b>02:00</b> T= <b>70</b>

## Menu SYSTEM:

### Key in the access code

(by default 0000)

Enter access code  
**0000**



Find the right setting by tapping   
( to exit menu).

### Eventual modification of the regulation parameters:

*Proportional band*  
(in % : **16**)  
*Integral time*  
(in sec. : **20**)  
*Derived time*  
(in sec. : **5**)

REGUL. PARAM.  
P= **016** I=**020** D=**005**



**Note:** *In case of instability of the regulation, increase the proportional band, decrease the derived action time then increase the integral time.*

Access the next setting by pressing   
( to exit the menu).

### To change the access code:



(by default 0000):

Enter a new code  
**0000**

Access the next setting by pressing   
( to exit the menu).



When the anti Legionnaire's disease program is activated, the temperature of the water in the tank is increased to at least 70°C. This value being normally higher than the high alarm threshold, the user will set the duration "**LEGIO ALARM DELAY**" (from 0 to 12 h) at which the high alarm is neutralized (inactive).

LEGIO ALARM DELAY  
**00:00**

Access the next setting by pressing   
( to exit the menu).



The value "**FAULT DELAY**" (duration in seconds, adjustable from 0 to 120) is the time before the alarm is set off (high and low) or mode "**TURBO**" is engaged.

FAULT DELAY  
**45** secondes

Access the next setting by pressing   
( to exit the menu).



The value "**HYSTERESIS**" (in °C, adjustable from 0 to 90) defines the difference (in relation to the threshold) for setting off the alarms (high to low) or of exiting from mode "**TURBO**".

HYSTERESIS  
Value : **2** °C

Access the next setting by pressing   
( to exit the menu).

The value "**LOW ALARM DELTA**" (in °C, adjustable from 0 to 90) defines the difference (*below*) compared to the set temperature in "**REDUCED**" mode of engagement of the low alarm.



LOW ALARM DELTA  
**10 °C**

Access the next setting by pressing   
 to exit the menu).

The value "**HIGH ALARM DELTA**" (in °C, adjustable from 0 to 90) defines the difference (*below*) compared to the set temperature in "**NORMAL**" mode of engagement of the low alarm.



HIGH ALARM DELTA  
**10 °C**

**Note: When "HIGH ALARM" is engaged, the primary pump is stopped.**

Access the next setting by pressing   
 to exit the menu).

The value "**TURBO GAP**" (in °C, adjustable from 0 to 90) defines the difference (*below*) compared to the set temperature in "**TURBO**" mode. In this mode, **in the presence of a double primary pump**, the second motor is started, allowing the set temperature value to be reached more quickly.



TURBO GAP  
**8 °C**

Access the next setting by pressing   
 to exit the menu).

The type of primary pump or secondary pump can be reset:  
 value 0 : no pump  
 value 1 : simple pump.  
 value 2 : double pump.


The default values depend on the equipment delivered. The following screen is shown just as an example.

Pumps PRIM.	: <b>2</b>
Pumps SEC.	: <b>1</b>

Access the next setting by pressing   
 to exit the menu).

The time of changeover of the pumps can be reset. Each motor operates 12 hours per day. During the period previous to the time of changeover of pumps, motors 2 and 4 are activated. In the period following the time of changeover of pumps, motors 1 and 3 are activated.


Pumps Changeover  
at : **12:00**

Access the next setting by pressing  (X to exit the menu).

For checking or testing, all the output can be deactivated. (**Yes or No**).


Outputs OFF  
**No**

**Note: In case of modification, don't forget to reactivate the output (value = No).**

Access the next setting by pressing  (X to exit the menu).

In case of errors in the modifications, it is possible to recall all the preset values (**Yes or No**)

Recall Factory Setting  
: **No**

Access the next setting by pressing  (X to exit the menu).

## Menu MANUFACTURER

The date of manufacture of the appliance as well as the configuration of the primary and secondary pumps, have been preset in the factory. ***This menu is not accessible to the user!***

Manufacturer ONLY  
Code 0000

Date of manufacture:

If necessary, reset the date.

Date of manufacture  
**01/01/2011**

## Menu FAULTS:

The list of faults can be accessed by pressing the Enter key. The list of recent faults (the last 8) will be shown by pressing the "DOWN" or "UP" keys.

FAULTS  
LIST



The PLAKEO control box memorizes the following faults (up to 8 maximum):

**high alarm**

temperature too high (primary pump stopped)

**low alarm**

temperature too low

**primary pump fault**

fuse blown or integrated thermal motor protection engaged (\*)

**secondary pump fault**

fuse blown or integrated thermal motor protection engaged (\*)

**no sensor**

broken sensor (primary pump stopped)

**sensor short circuit**

sensor short circuit (primary pump stopped).

(\*): **according to pump model.**

In case of 4 successive faults occurring with the pumps in less than an hour, the **general alarm** circuit is permanently activated until cancelled by the operator.

When the display shows:

CLEAR FAULTS

Pressing the key "ENTER" allows you to carry it out.

This can happen for instance when the thermal protection of the motor or IPSOTHERM (according to pump model) is requested.

Please note that the faults history is not affected by this operation. To clear the content of the memory, interrupt the electric power supply to the control box (switch ON/OFF).

**NB:** When the anti-Legionnaire's disease program is activated, the water in the tank is brought to a temperature of "**Legio Consigne**" (min 70°C). As this value is normally superior to the threshold of high alarm, the user should set the duration of "**LEGIO ALARM DELAY**" within which the high alarm is neutralized (deactivated).



**In the case where the water distribution temperature is limited, it is essential to ensure that the water in the tank has reached a sufficiently low temperature before being distributed to points of use.**

**SD CARD**

It is compulsory the use a formatted SDCard for recording the data in a .csv file.

## Web Page

The controller has a built-in web server which allows reading of operating parameters in real time, changing preset values and visualization of faults.

4 pages are accessible with two security levels:  
(level 1: reading; level 2: modification of preset values)

### State of variables

- Summary of inputs and outputs of the controller and their status.

- Downloading of the file of registration of operating parameters.

- Resetting to 0 of the file. (All data is stored on a file, if the maximum number of lines is reached, the data will be overwritten.)

### Faults

- List of faults in progress.

- Fault history.

- Download the fault history.

- Management rules to send email alert.

  - Allows you to select certain parameters to send email alert or not.

  - Critical: 1 email / day at the moment when the fault occurs

  - Non-critical: 1 email / day at the end of the day

  - Active or not:

### System

- After Sales Service contacts

- Documentation

- Version of the program

- Change of passwords

### Help

### Exit

## Supplementary equipment (according to model)

VALVE		SENSOR	SERVO- MOTOR	
Sauter	Siemens		Sauter	Siemens
BXN025F200	VXG 48.25 Kvs=10 m <sup>3</sup> /h	Pt 100 Ω	AVM105F100	SQS 359.03 Tc= 35 s
BXN032F200	VXG 48.32 Kvs=16 m <sup>3</sup> /h	Pt 100 Ω		SQS 359.03 Tc= 35 s
	VL3TL40 Kvs=25 m <sup>3</sup> /h	Pt 100 Ω		SQS 359.03 Tc= 35 s
	VXG 41.50 Kvs=40 m <sup>3</sup> /h	Pt 100 Ω		SQX 32.03C Tc= 35 s

## Electrical connections

Provide a single-phase 230 V power supply for the electrical control box, using a cable adapted to the power consumption (see electrical connection diagram).

Provide a protected electricity transmission line in compliance with regulations in force on the installation site. **Earthing is obligatory.**

Please note that the pumps supplied are equipped with a thermal protection system via Ipsotherm (excessive temperature detection system) concealed in the wiring of the motor. This thermal protection is supplemented by a fuse protection (short circuit protection).

### Note:

If the water heating system is equipped with a primary double pump and/or a secondary double pump, the second motor is automatically brought into operation in case of fusion of the protection fuse, or if the integrated temperature detection system (IPSOTHERM) is activated (\*).

However, if there is an abnormal drop in the hot water temperature, the second motor of the primary pump will also be brought into operation (if the temperature drops below the preset value minus the "**ECART TURBO**" value).

(\*) according to the type of pump used

## COMMISSIONING/ MAINTENANCE

### Commissioning

It is essential to provide isolating valves on the 4 exchanger outlets, as well as drainage valves.

It is also necessary to provide an expansion system for the fluids used in a closed circuit (primary circuit). Always provide safety valves for each of the circuits (see "**Hydraulic connections**").

***It is strongly recommended that the inlets and outlets for each fluid are equipped with thermometers and monometers which indicate the correct functioning of the appliance as well as flow meters on each of the inlets.***

The air must be bled from the pipes. We advise you to fill the two circuits simultaneously. Always avoid filling the system too rapidly and the 'water hammer' effect, which could affect the standing to pressure of the exchanger.

Provide a source of power for the electric control box/regulation unit. Switch to the "**On**" position. Make any necessary adjustments (see the section entitled "**Regulation**"). It is normal to have the error message "Temperature too low" appear when putting the heater into operation and until the low temperature level is reached.

Check the entry and exit temperatures for each of the two fluids. If necessary, adjust the respective flows by using the regulation valves, in order to obtain the required temperatures. Note the values obtained for temperature and head loss (decrease in pressure) in the exchanger maintenance booklet.

### Maintenance

The system is unlikely to become clogged up as long as fluids compatible with plate exchanger technology are used (**waterTH < 15°F**). Systematic maintenance of the exchanger is not necessary if this rule is followed.

However, regular monitoring of the air vent valves and safety shut-off devices is necessary.

Careful monitoring of exchanger head loss and the respective temperatures of the In /Out fluids is essential.

In fact, if clogging occurs, there will be a noticeable increase in head loss ( $\Delta P =$  ***difference in read values between the inlet manometer and that of the outlet***), due to reduction of the section of the fluid passage, as well as an important variation in the  $\Delta T$  for the operating conditions of the corresponding clogged circuit (variation of the exchange coefficients).

Please note however that variations in exchanger performance do not always mean that it is clogged. It is always necessary to check the entry temperatures of the fluids and the flow rate before reaching a conclusion, as they have a great influence on exchanger performance (**see following recommendations**).

If clogging is discovered, the exchange surfaces must be cleaned.

Before opening the exchanger, ensure the following instructions are observed:

- Let the exchanger cool down for as long as necessary. Make sure you isolate hydraulically the primary and secondary circuits.
- Bring the pressure down by opening the purge valves.
- Open the exchanger and mark the plates.

 **When removing the plates, wearing of gloves is recommended!**

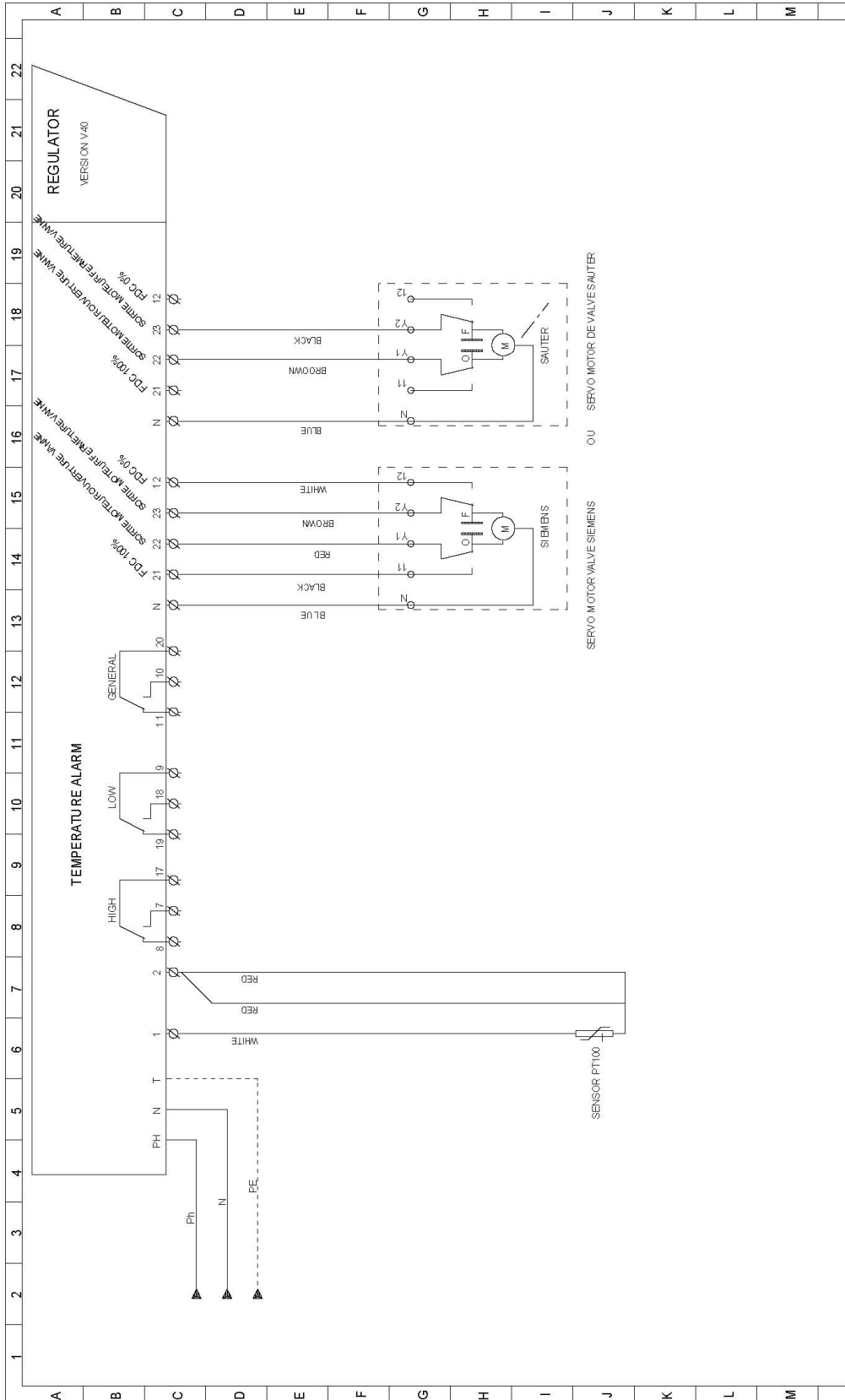
If two or more plates are stuck to each other they need to be separated carefully, so that the gaskets remain attached to the correct plate. The exchange surface should then be rinsed with a water jet and scrubbed with a nylon (or equivalent material) brush. Take care not to damage the gasket. If necessary, use a nitric acid solution at 5%, then rinse abundantly.



**Important: Concentrated nitric acid can seriously damage the skin and mucous membranes! Great care is recommended when handling these solutions as well as the wearing of protective goggles and gloves.**

If the exchanger is not totally clogged up, chemical cleaning is preferable. A nitric acid solution ( $\text{HNO}_3$ ) diluted to 0.70% in volume is introduced into the circuits at a **maximum temperature of 70°C**. Ensure that all the exchange surfaces are rinsed abundantly after cleaning.

- A partially or completely detached gasket must always be **glued** back before replacing the plates.
- Reassemble the plates in the same order and same position (top/bottom), respecting the tightening values given (see "Exchanger").
- Tighten the plates in a regular manner (symmetrically and in parallel). In practice, the 4 tension rods at the extremities should be removed first and replaced last.



**Lacaze Energies**  
\$116

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Norm	Date	Rev.	Verif.
			SR

COFFRET REGUAL2100

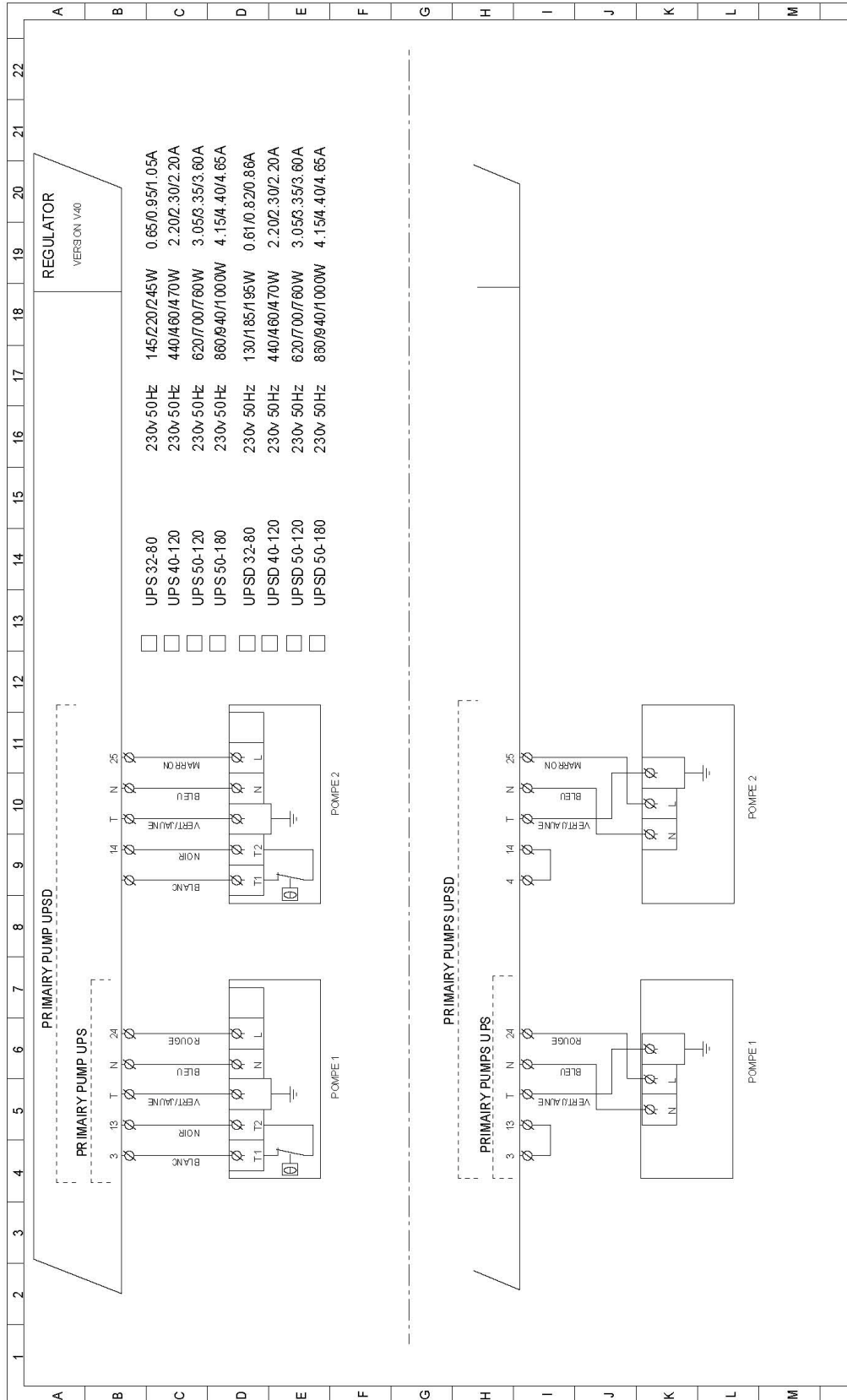
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PREPARATEUR EAU CHAUDE

AL2004V40

S/AL2004

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SR	POMPE PRIMAIRE	S/AL2004	
Norm	Date	Rev.	Verif.









**NOTE (Wiring Diagram)**

	Function	Terminal No.	Terminal No.	Terminal No.
<b>LACAZE ENERGIES</b> <b>Zone Industrielle - BP2</b> <b>46700 Leyme - France</b>	Sensor PT100	1	2	
	Input FDC 0% valve	12		
	Input FDC 100% valve	21		
	Input default T° pump 1	3	13	
<b>Type:</b> <b>PLAKEO - V4.0</b>	Input default T° pump 2	4	14	
	Input default T° pump 3	5	15	
	Input default T° pump 4	6	16	
	Output pump 1 (Primary)	24	N	
<b>Control Panel Serial No.</b> <i>(see inside)</i>	Output pump 2 (Primary)	25	N	
	Output pump 3 (Secondary)	26	N	
	Output pump 4 (Secondary)	27	N	
<b>AC Input:</b> <b>230V 50 HZ / VA</b>	Output motor opening valve	22	N	
	Output motor closing valve	23	(N)	
	Output alarm T° low	17:COM	7:COM	8:NF
	Output alarm T° high	9:COM	18:COM	19:NF
	Output general alarm	20:COM	10:COM	11:NF

Couleur (fr)	Colour(en)
blanc	white
jaune	yellow
rouge	red
noir	black
bleue	blue
marron	brown
vert	green

**PLAKEO**  
**ELECTRIC CONTROL BOX V4.0**

**INSTRUCTION MANUAL**  
**( IU-0011-EN-200906 )**