

*Choose the reliability of a tank in 100% stainless steel  
with interior and exterior welding*



# **STAINLESS STEEL**

**Installation - Maintenance - Operation**

## **TANK FOR PRODUCTION OR STORAGE OF DOMESTIC HOT WATER**

**( IU-0013-EN-201112 )**

## **FOREWORD**

Dear customer,

Thank you for choosing a LACAZE ENERGIES Stainless Steel tank.

In your own interest, we invite you to follow and to observe the instructions given in this manual and to ensure that the required maintenance is carried out by qualified personnel, in order to maintain the appliance at its maximum efficiency level.

We remind you that failure to comply with the instructions contained in this manual will result in invalidation of the warranty.

The manufacturer cannot be held responsible in any case of damage to persons, animals or objects due to failure to comply with the instructions contained in this manual and supplied with the equipment.

## SUMMARY

<b>FOREWORD.....</b>	<b>2</b>
<b>NOTE CONCERNING THE MANUAL.....</b>	<b>4</b>
<b>CONDITIONS OF APPLICATIONS OF THE WARRANTY.....</b>	<b>5</b>
<b>SECURITY WARNING.....</b>	<b>7</b>
<b>TECHNICAL FEATURES .....</b>	<b>8</b>
<b>INSTALLATION.....</b>	<b>15</b>
<b>USE AND MAINTENANCE ADVICE.....</b>	<b>20</b>
<b>WATER QUALITY .....</b>	<b>21</b>
<b>PRACTICAL ADVICE .....</b>	<b>22</b>

## Note concerning the elaboration and publication of this manual



### NOTE !

This manual has been developed and published under the direction of LACAZE ENERGIES. It covers the most recent or known to date features and descriptions of the product.

The content of this manual and the specifications of the product may be modified without prior notice.

LACAZE ENERGIES reserves the right to modify, without prior notice, the features and elements contained in the following pages. LACAZE ENERGIES will not be responsible for any damage (including consecutive damage) caused by reliance on the presented elements. This includes, but is not limited to, typing and translating mistakes and other errors relating to the publication.

© 2011 LACAZE ENERGIES



### Please read carefully

- This instruction booklet is an integral part of the product and must imperatively be given to the user.
- The appliance was manufactured for the purpose of the storage and production of domestic hot water and chilled water. Any other unauthorized use will be considered improper 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.
- The installation must be carried out in compliance with the rules, regulations and standards currently in force at the place of installation, observing the manufacturer's instructions and by a qualified professional.
- In the case of the equipment being sold or transferred to another user, this booklet must accompany the equipment, so that the new user and the installer can consult it.
- In the case of the equipment not being used during a period of below-freezing conditions, we ask that it should be completely drained. The manufacturer declines all responsibility for any damage due to frost.
- We strongly recommend that these instructions are read carefully before commencing any operation, such as installation, commissioning, maintenance, etc. and to use only spare parts supplied by the manufacturer to ensure best service and recognition of the warranty.

## CONDITIONS OF APPLICATION FOR THE MANUFACTURER'S WARRANTY

Our warranty is limited to the exchange, repair or replacement (supply) in our factory at Leyme (France) of parts acknowledged to be defective by our technical service, according to our general conditions of sale. All other damage, transportation and labor costs which may result, are excluded. The replacement, repair or modification of parts during the period of warranty will not result in a prolongation of the period of warranty.

Our stainless steel tanks are guaranteed, from the date of delivery, against perforations in continental climatic conditions and for the duration specified on the warranty certificate delivered with the appliance



### Limitations of warranty

Are excluded from the warranty the appliances whose deterioration is due to the following:

- Bad electrical connection, and in particular:
  - Absent or insufficient circuit breaking power of the contactors.
  - Incorrect connection of remote controls and switches.
  - Power surges.
  - Incorrect grounding of the tank and/or faults or absence of insulation.
- Supply water pressure superior to nominal pressure and/or excessive variation of pressure (***contact us in case of non-constant pressure***).
- Bad handling during assembly and installation (particularly connecting to electricity without prior filling of the hydraulic circuit; mechanical shocks).
- Overpressure resulting from the use of security units of which the rating is superior to the service pressure.
- Overpressure due to the use of safety groups which do not comply with NFD36-401, NFE29-410 (and following) or Lacaze Energies recommendations
- Depression resulting from the absence of sufficient air during draining.
- Depression in functioning > 0, 1 bar or 100 mbar.
- Faults in maintenance of the heating elements or the security units.
- Insufficient quality of the supply water (see page 21).
- Corrosion of inlet / outlet nozzles, resulting from a defective or improper connection (tightness default)
- Normal wear and tare of the shell.
- Accessories dismantled or separated outside our factory.
- Generally, failure to comply with the present instruction manual.



**Attention!**

*Please consult us regarding the limits of use of a chlorinated product (e.g. bleach in installations where our SS tanks are installed) for curative and / or preventive treatment against Legionnaire's disease.*

*The clauses of this certificate of warranty do not exclude the buyer from his legal rights relating to defects and hidden vices, under the conditions of article 1641 of the Civil Code and of those related to responsibility for faulty products.*

**Data plate**

French version	English version
 <p><b>BP 2, Z.I. – 46120 Leyme (France)</b>            Tél: 05 65 40 39 39 / Fax: 05 65 40 39 40            Email: info.lacaze-energies@groupe-cahors.com</p>	 <p>ZONE INDUSTRIELLE - B.P.2 - 46120 LEYME - FRANCE            TEL. : 0033 565 403 939 FAX. : 0033 565 403 940</p>
<p><b>RESERVOIR TYPE</b> <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span></p>	<p><b>HOT WATER TANK</b></p>
<p>CAPACITE (L): <input type="text"/></p> <p>TEMPERATURE: <input type="text"/> (°C)  <small>(continue)</small></p> <p>EQUIPEMENT: <input type="text"/></p> <p>PUISSANCE: <input type="text"/> (kW)</p> <p>DATE MES: <input type="text"/></p>	<p>TYPE: <input type="text"/></p> <p>Capacity (L): <input type="text"/></p> <p>Max WP (bar): <input type="text"/></p> <p>Max WT (°C): <input type="text"/></p> <p>Serial No: <input type="text"/></p>
<p>PRESSION (Ps): <input type="text"/> (bars)</p> <p>TEMPERATURE: <input type="text"/> (°C)  <small>(maxi en pointe)</small></p> <p>N° SERIE: <input type="text"/></p> <p>FABRICATION: <input type="text"/></p> <p>ALIMENTATION: <input type="text"/>  <small>(Régime)</small></p>	<p>READ THE INSTALLATION AND MAINTENANCE MANUAL            BEFORE INSTALLATION / MAINTENANCE</p>



DATA PLATE POSITION



## Security warnings



### WARNING!

The installation, adjustment and maintenance of the appliance must be carried out by a qualified professional in compliance with the rules, regulations and standards in force.



### DANGER!

Maintenance work or eventual repairs to the appliance must be carried out by a qualified professional or person approved by the manufacturer. We strongly recommend that the appliance be covered by a yearly maintenance contract from the first year of operation.

Insufficient or irregular maintenance can compromise the operational security of the appliance and cause damage to persons, animals or objects for which the manufacturer can in no case be held responsible (e.g. scale on the thermostat and/or valve.)

**The exclusive use of spare parts supplied by the manufacturer is strongly advised in order to obtain the best service from the appliance and the acknowledgement of the product warranty.**



### WARNING!

To tighten and loosen the appliance connections, especially the manhole cover, use only appropriate wrenches (e.g. torque wrench). Nonconformity of use (joints, bolts, tightening torque etc.) and/or inappropriate tools can cause serious damage (e.g. leakages).



### NOTE !

By «Qualified Professional», we understand a person possessing technical knowledge in the field of components and of heating / production of domestic hot water (DHW) installations.

## TECHNICAL FEATURES

### 1. Tank

Stainless steel specialist, LACAZE Energies applies all its know-how in the fabrication of the tanks.

The tanks are made of austenitic stainless steel, type X2CrNiMo17-12-2 (EN1.4404 – ASTM 316L) or X2CrNi18-9 (EN1.4307 – ASTM 304L), by interior/exterior electric welding. The tanks are pickled and passivated before insulation.

These types of stainless steel are well adapted to the fabrication of DHW tanks and find their application for specific purposes, such as medical, alimentary, high temperature environments, etc.

The range of standard tanks referred to in this manual extends from 500 to 10.000 litres.

#### **N.B.:**

- The service temperature is strictly limited to 95°C maximum;
- The working pressure is strictly limited to 7 bars.

***Outside these operating instructions, please consult us.***

### 2. Thermal insulation

According to version, three types of insulation are possible:

- Mineral wool 16 kg/m<sup>3</sup>, thickness 50 mm, and jacket PVC, fire rated M1.
- Mineral wool 16 kg/m<sup>3</sup>, thickness 50 mm, and glass fabric jacket, fire rated M0.
- Rock wool 40 kg/ m<sup>3</sup>, thickness 50 mm or 100 mm, fire rated M0, and metal jacket (Aluminium quality 3105 or 3005, filmed on one side).

***In standard version, the inferior dished end is not insulated.***

***Recommandation :  
Concerning the protective film on the metal sheet jacket, this must be removed as soon as possible. In case of prolonged exposure to ultraviolet rays the film may become difficult to remove.***

### Performances of the thermal insulation:

The thermal loss (heat loss) through storage is calculated against a cooling constant (**Cr**) in Watts.hour per liter per Kelvin and per day. According to the dimensions of our tanks with a **Naturol** 032 insulation ( $\lambda = 0,032$  W/m.K, Lambda thermal insulation conductivity coefficient), the results of the Cr calculation are set out in the following table:

Tank cooling constants (Cr)				
Tanks		Glass wool Naturol		
		Th 60	Th 100	
Models	D (mm)	CR 50 (Wh/day.K.L)	CR 100 (Wh/day.K.L)	
500	650	0,098	0,060	
750	800	0,080	0,049	
1000H	800	0,075	0,046	
1000B	950	0,068	0,042	
1500H	950	0,063	0,039	
1500B	1 100	0,060	0,037	
2000H	1 100	0,055	0,034	
2000B	1 300	0,052	0,032	
2500	1 300	0,050	0,031	
3000	1 300	0,048	0,030	
4000	1 500	0,042	0,026	
5000	1 500	0,040	0,025	
6000	1 500	0,039	0,024	
8000	1 900	0,033	0,020	
10000	1 900	0,032	0,019	

The following table shows the calculation values for Cr for tanks with **Rockwool insulation** with Lambda thermal conductivity  $\lambda=0.038$  W/(m.K):

<b>Tank cooling constants (Cr)</b>			
<b>Tanks</b>		<b>Mineral wool 213</b>	
		<b>Th 50</b>	<b>Th 100</b>
<b>Types</b>	<b>D (mm)</b>	<b>CR 50 (Wh/day.K.L)</b>	<b>CR 100 (Wh/day.K.L)</b>
500	650	0,136	0,072
750	800	0,111	0,058
1000H	800	0,103	0,054
1000B	950	0,094	0,050
1500H	950	0,088	0,046
1500B	1100	0,083	0,044
2000H	1100	0,077	0,041
2000B	1300	0,072	0,038
2500	1300	0,069	0,036
3000	1300	0,067	0,035
4000	1500	0,058	0,030
5000	1500	0,056	0,029
6000	1500	0,054	0,028
8000	1900	0,046	0,024
10000	1900	0,044	0,023



**NOTE !**

**According to the (French) order of 24.05.2006 on thermal regulations (RT 2005), the electric accumulation water heaters must have a cooling constant inferior or equal to :**

- For  $V_s \leq 500$  L :  $Cr = 1,25 \times V_s^{-0,33}$
- For  $V_s > 500$  L :  $Cr \leq 2 \times V_s^{-0,4}$

*Examples :  $V_s = 300$ L ->  $Cr = 0,190$  ;  $V_s = 750$ L ->  $Cr = 0,142$*

For tanks with exchangers or buffer tanks, in the absence of data from the manufacturer, the cooling constant ( $Cr_{REF}$ ) can be calculated according to the following formula proposed as a default value within TH-C (RT2005) rules:

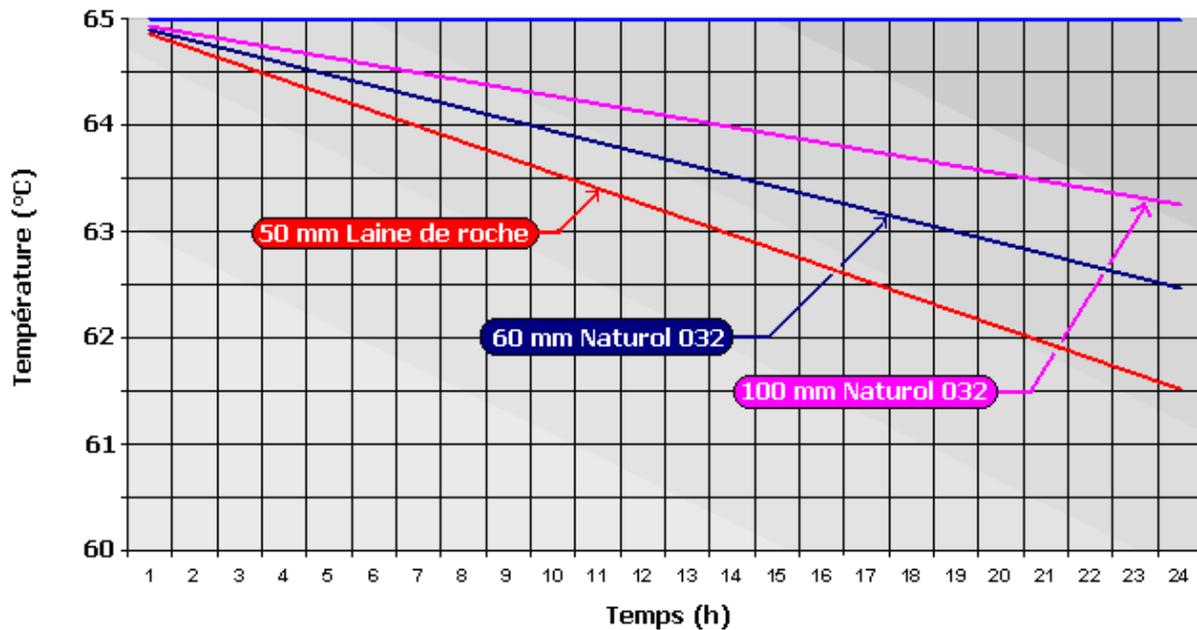
**$Cr_{REF} = 3.3 \times V_s^{-0,45}$  ( $V_s$  : Volume of stored water in liters)**

According to the formula above, the results of the calculation are presented in the following table:

<b>Model</b>	500	750	1000H	1000B	1500H	1500B		
<b>Cr<sub>REF</sub></b>	0,209	0,171	0,148	0,148	0,126	0,126		
2000H	2000B	2500	3000	4000	5000	6000	8000	10000
0,107	0,107	0,100	0,094	0,080	0,072	0,067	0,058	0,052

One can notice that the insulation performances of our tanks are largely superior to those of reference.

As an example, on a 1500 liter tank (Ø950 mm), see below the evolution of the temperature of hot water inside the tank in relation to time, a characteristic cooling curve of the hot water, initially at 65°C, in a 20°C environment [exterior convection coefficient = 10 W/(m.K)].



NT: Laine de roche = Rock wool

### 3. Equipment (according to version)

#### Most common electrical equipment.

The heating elements are usually armored electric resistances (INCOLOY\* pins), mounted on DN50 – DN40 boss up to 12 kW or on M77 threaded rings from 15 kW on.

The operating tension is 230/400 V (**star coupled**) up to 24 kW inclusive and 400 V tri (**triangle coupled**) for 30 and 35 kW.

Up to 20 kW (or 30 A), the electric heating elements can be equipped with

a safety and regulation control box, allowing their use without exterior power contactor. The working temperature is limited in this case to  $70 \pm 7$  °C (safety device with manual resetting calibrated to 95°C).

- *Incoloy 825 version up to 12 kW,*
- *Standard version in Incoloy 800 starting from 15 kW and in Incoloy 825 on demand.*

#### Possible electrical equipment

The tanks can also be equipped with electric heating elements that can be changed without draining the tank: these are heating cartridges with low load ratio [6 W/cm<sup>2</sup>] (1 x 230V – 50 Hz), located in a pocket made of stainless steel.

The electrical equipment includes 3 to 9 heating cartridges, being the equivalent to 1 to 3 heating elements. The power is 3 x 2000 W minimum and up to 9 x 3000 W maximum (the unit power of a cartridge is 2000, 2500 or 3000W). The cartridges are star-

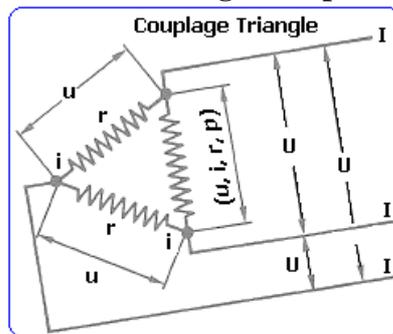
coupled and need a feeding tension of 3 x 400 V, 50 Hz.

For any power, the heating cartridges can be equipped with a box that combines safety and temperature regulation, with integrated power contactor.

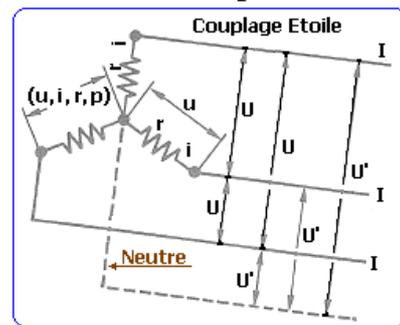


NOTE

### Triangle Coupled



### Star Coupled



## U-Tube Heater

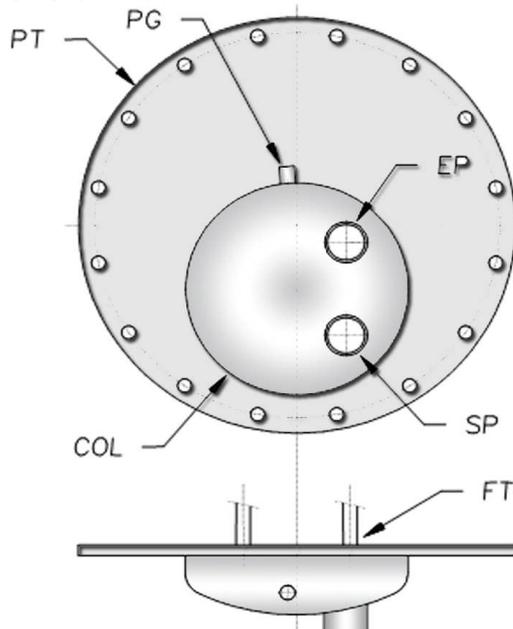
The dismantlable U-tube heater is fixed on a manhole Ø400 mm after mounting an asbestos-free fiber joint, using galvanized steel nuts and bolts class **8.8**. The tube bundle is made of stainless steel AISI 316L.

The standard operating conditions are:

- **Primary:** 90/70 °C
- **Secondary:** 10 to 60°C

for a heating duration of 1.5, 2, 2.25, 3, 3.25 or 4.25 hours according to the installed power and the tank volume.

### General Plan



### Parts List:

- PT- U-tube plate SS Ø490
- PG- air vent orifice
- EP- primary circuit inlet
- SP- primary circuit outlet
- COL- collector
- FT- stainless steel tube bundle

**Mounting of d250 dome on d400 manhole**

The heater's power varies according to the primary and secondary temperatures.  
 The indicated power is always the average power.



**Nota Bene**

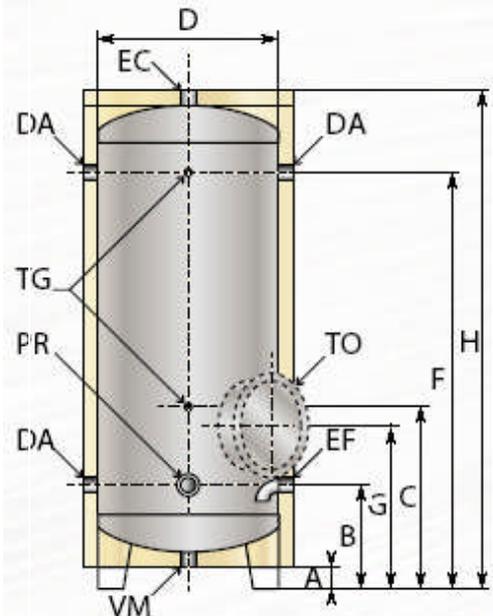
**Irrespective of the type of regulation, the temperature reading point on the tank must IMPERATIVELY be situated above the heating element.**

### Gaz Equipment

For gaz equipment « Hydrogaz® » range please refer to following IU notices (manuals):

- Industrial Version: IU-0004-FR-201102
- TRG Version : IU-0003-FR-200906
- TRGV Version : IU-0019-FR-200906

### Standard dimensions of tanks 500 to 3000L



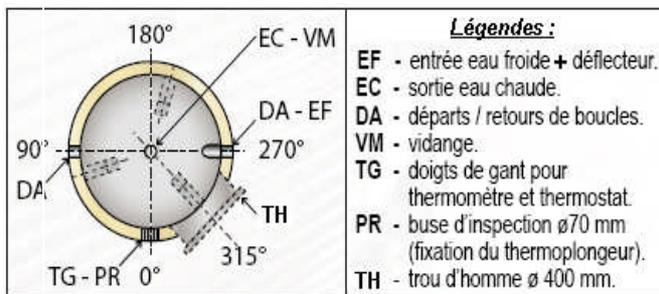
Capacité (litres)	A (mm)	B (mm)	C (mm)	D (mm)	F (mm)	G buse Ø 400	H (mm)	EC VM DA EF	TG	PR	Poids (Kg) sans réchauf	Poids (Kg) avec réchauf
500	90	410	860	650	1.420	660	1.760	2" 1/2"	M77	100	145	
750	90	440	890	800	1.450	690	1.820	2" 1/2"	M77	155	200	
1.000 H **	90	440	890	800	2.000	690	2.370	2" 1/2"	M77	175	225	
1.000 B **	90	475	925	950	1.485	725	1.890	2" 1/2"	M77	175	225	
1.500 H **	90	475	925	950	2.035	725	2.440	2" 1/2"	M77	215	270	
1.500 B **	90	510	960	1.100	1.520	760	1.960	2" 1/2"	M77	215	270	
2.000 H **	90	510	960	1.100	2.070	760	2.510	2" 1/2"	M77	380	425	
2.000 B **	90	560	1.010	1.300	1.570	810	2.060	2" 1/2"	M77	380	425	
2.500	90	560	1.010	1.300	1.820	810	2.310	2" 1/2"	M77	435	480	
3.000	90	560	1.010	1.300	2.120	810	2.610	2" 1/2"	M77	480	540	

\*\* Nota : H = Version haute B = Version basse

Note: H = High version B = Low version

### Standard range technical data

(Other possibilities on request)

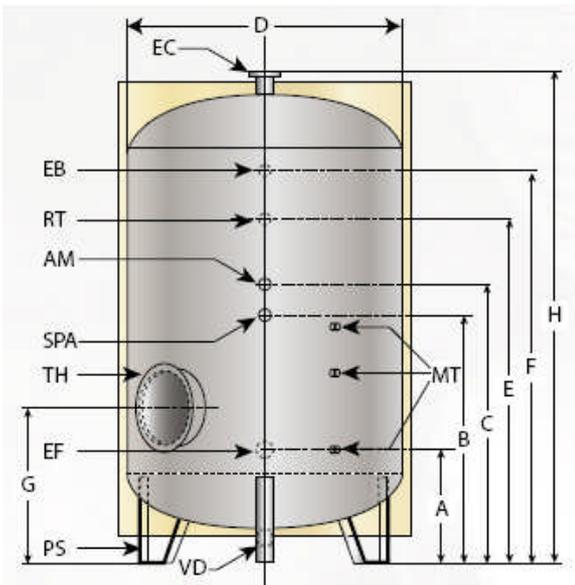


Capacité (litres)	Puissance électrique (kW)		Temps de réchauffage	
	ECS = 10/60°C en 6H		ECS 10/60°C (RP = 90/70°C)	
	Thermo-plongeur	Barillets (n x kW)	Réchauffeur seul	Réchauffeur mixte
500	6	6 (3 x 2)	2 H	4 H
750	9	7,5 (3 x 2,5)	2 H	4 H
1.000	12	12 (6 x 2)	2 H	4 H
1.500	15	18 (6 x 3)	2 H	4 H
2.000	20	18 (6 x 3)	2 H	4 H
2.500	24	27 (9 x 3)	3 H 15	4 H
3.000	30	27 (9 x 3)	3 H 15	4 H

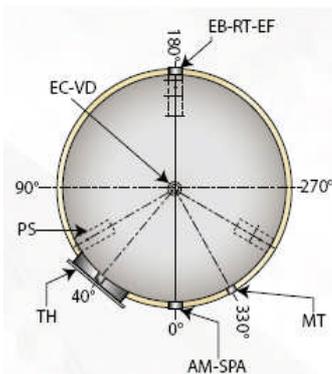
**NT.** Puissance=Power; ECS=DHW; Thermoplongeur=Immersing Heater; Barillets=Cartridges; Réchauffeur=Heater, Poids sans rechauf=Weight w/o heater, Poids avec rechauf=Weight with heater

4000 to 10 000L

**Dimensions :**



Capacité (litres)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	Poids sans réchauff. (kg)	Poids avec réchauff. (kg)
4000	630	1.760	-	1.500	1.655	2.170	860	2.800	680	780
5000	630	1.310	1.645	1.500	2.220	2.790	860	3.400	790	910
6000	630	1.405	1.895	1.500	2.460	3.290	860	3.920	890	1.030
8000	730	1.270	1.745	1.900	2.090	2.700	960	3.425	1.140	1.290
10000	730	1.505	1.995	1.900	2.540	3.390	960	4.120	1.310	1.510



Plan valable pour toutes les versions, sauf 8 & 10m<sup>3</sup> mixtes.

**Légende :**

- EC Départ eau chaude : bride plate DN 80/PN16
- EB Retour boucle de réchauffage DN 50 PDG
- RT Retour boucle du réseau DN 50 PDG
- MT 3 manchons 3/4"G (thermomètre, thermostat)
- AM Anneau de manutention (sauf 4m<sup>3</sup>).
- TH Trou d'homme de visite ø 400 mm.
- PS 3 pieds support de cuve (3X120°)
- SPA Support d'armoire électrique
- EF Entrée eau froide DN 80 PDG
- VD Vidange DN 50 PDG

**Caractéristiques modèles standards**

(Autres possibilités sur demande)

Capacité (litres)	P. électrique (kW - élect. ou mixte) 10/60°C / 6 H	Temps de réchauffage ECS 10/60°C (RP = 90/70°C)	
		Réchauffeur seul	Réchauffeur + élect.
4000	40 (2 X 20)	2	3
5000	48 (2 X 24)	2	3
6000	60 (2 X 30)	2	3
8000	90 (3 X 30)	2	3
10000	105 (3 X 35)	2	3

NT : Key

EF= Cold water inlet ; EC= Hot water outlet; EB=Heating loop return; RT=Network return loop; DA=loop depart/return; VM&VD=Drainage; TG&MT=sensors nozzles; PR=inspection hand-hole d70mm; TH= manhole d400mm;AM=Handling ring; SPA=Control box support;

P. électrique= Electric power; Temps de réchauffage=Recovery time ; Réchauffeur seul=Heater alone ; Réchauffeur +élect. Heater + electric

## INSTALLATION

### General Warnings



#### **Warning!**

*Our water storage and production equipment must be installed with respect of trade practices, in conformity with the rules, regulations and standards in force:*

- ☞ *Recommendations of D.T.U. (particularly DTU 60.1)*
- ☞ *Instructions of this manual*



#### **DANGER!**

This appliance must be exclusively destined for the use for which it was conceived. Any other use shall be considered as incorrect and potentially dangerous.

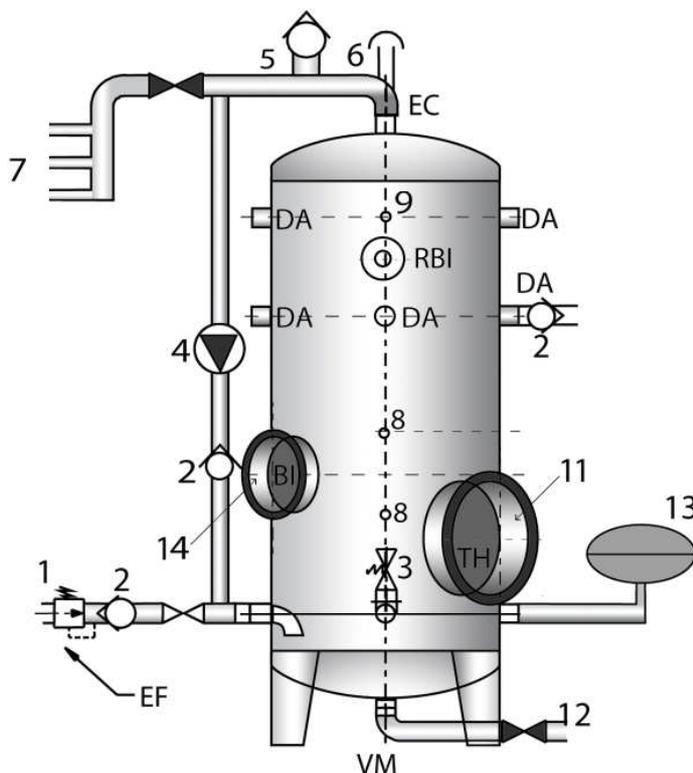


#### **Attention!**

The appliance must only be installed by a professionally qualified person who, under his own responsibility, can guarantee the respect of the standards/regulations in force.

### Typical connection plan for the installation (indicative)

See below the typical connection plan and recommendations:



#### **Parts List :**

- 1- Pressure controller + anti-hammer
  - 2- Non return valve
  - 3- Safety valve (non adjustable)
  - 4- Circulation pump for homogenization
  - 5- Vacuum-breaking system (on the upper part)
  - 6- De-gassing (on HW outlet)
  - 7- Distribution network + anti-hammer
  - 8- Regulation/safety thermostat
  - 9- Thermometer
  - 11- Ø400mm Manhole (and/or equipment)
  - 12- Drainage
  - 13- Expansion system
  - 14- Ø250mm Inspection hole (and/or equipment)
- DA Loop return  
 RBI immersion heater (optional)

**⚠ Nota Bene : Unless otherwise specified the safety valves will be calibrated at 7 bar max.**

## Recommendations:



**Attention!**

The typical hydraulic plan presented above is purely indicative. For dimensioning and configuration of the installation, it is necessary to approach a qualified consulting body.



**Attention!**

Always provide for a connection to drains from the drainage outlet (clearly visible and of a siphon funnel type), in correspondence with the safety valve rated at 7 bar.



**Attention!**

It is necessary to install:

- at least one safety valve calibrated for a pressure of max 7 bars\*;
- an expansion system of a capacity adapted to absorb the variations of water volume in the circuits connected directly to the tank(s), due to heating and cooling.



**DANGER!**

In case of the absence of a connection to drains, the eventual intervention of the safety valve can cause damage to people, animals or objects for which the manufacturer cannot in any case be held responsible.



**Attention!**

It is necessary to install:

- an air-bleed vent on the upper part of the tank in order to evacuate (or introduce) gas (air) during filling (or draining);
- an adapted de-gasser on the hot water outlet to capture the micro-bubbles and to evacuate them from the circuit.



**Attention!**

It is obligatory to install:

- a rapid drainage valve for the evacuation of sediments, according to the regulations in force;
- according to the configuration of the installation, a vacuum breaking valve on the upper part of the tank, in order to protect the tank from depression in case of accidental breaking of pipes causing the drainage of the tank.



**Attention!**

- Do not mix different metals favorable to electro-chemical couples – galvanic battery (e.g. Copper/Steel). Avoid particularly copper elements (tubes, couplings, bends, etc.) upstream of the tank.



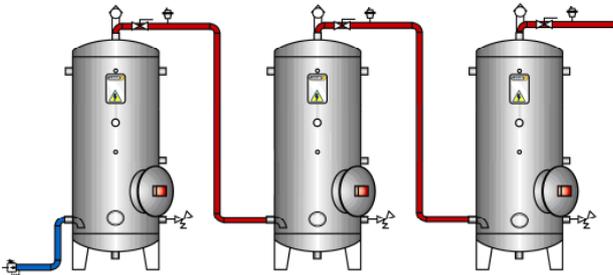
**Attention!**

Grounding is compulsory according to the regulations in force.

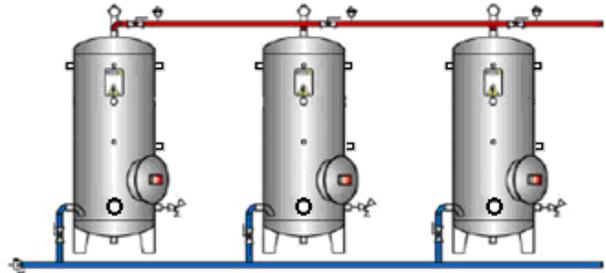
**\* In order to prevent the permanent activation of the safety valve, it is strongly recommended to set the maximum service pressure to a value equal to the calibrated value minus 5 to 10%, i. e. between 6.30 and 6.65 bar.**

**Some typical examples of installation (indicative)**

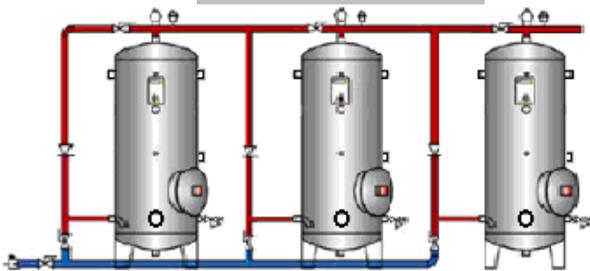
SERIAL



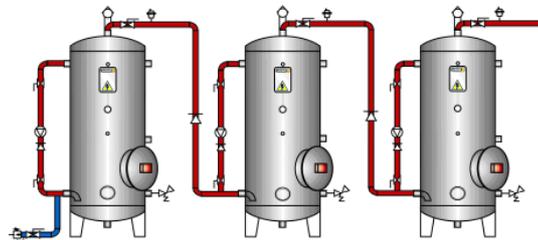
PARALLELE



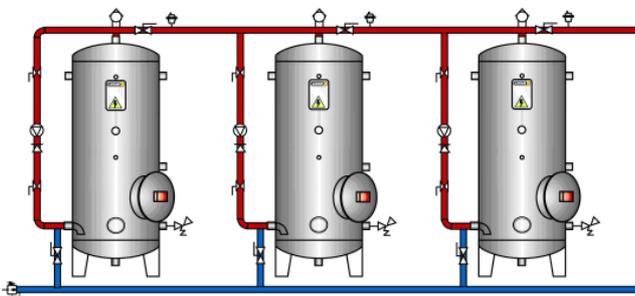
SERIAL PARALLELE



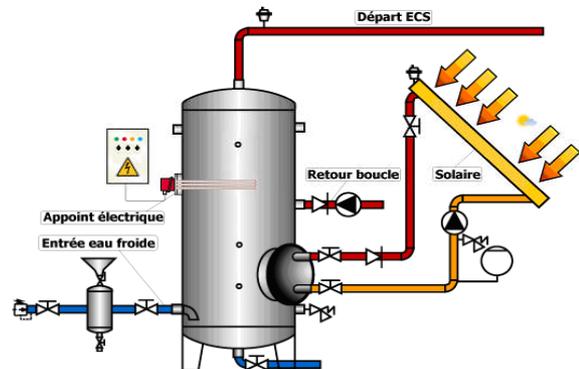
SERIAL HOMOGENISATION



PARALLELE HOMOGENISATION



SOLAR HOT WATER + ELECTRIC TOP-UP



**KEY :**

-  De-gasser
-  Vacuum-breaker
-  Butterfly valve
-  Non-return valve

-  Pressure controller
-  Safety valve
-  Pump
-  Expansion valve

## Tightening of the nuts and bolts of the manhole cover

The mounting of the manhole cover (cover plate / companion flange) and the mounting of the nuts and bolts is carried out in the factory following a pre-defined procedure.

However, during transportation or/and handling the nuts and bolts may loosen due to vibrations and various stresses (temperature, pressures, etc.). We therefore recommend that you follow the safety procedures below:

- ensure that the bolts are tightened to the specified torque after installing equipment on site because they may have loosened during the phases of storage and / or transport.
- At the first filling ensure that there are no leaks
- After the first month of use, check the torque and absence of leaks

As an example, here are some recommended tightening torques ( $\mu = 0,2$ ):

Manhole Type	TH400	TH400	TH400	TH500	TH500
Gasket (3 mm)	m=2,5 ; y=12				
Ps (bar)	7	6	4	7	4
*Cs (Nm)	150	150	150	180	180
**Csm (Nm)	155	155	155	232	232

\*  $C_s$  : recommended tightening torque (washer on nut side + dry mounting)

\*\*  $C_{sm}$  : maximum tightening torque (washer on nut side + dry mounting)  
 (TH = manhole)



**Warning!**

***It is highly advisable to use a new gasket (replace the used gasket) at the reassembly of the manhole after each opening of the tank.***

## Filling

Once all hydraulic connections of the installation have been made, proceed to water filling through the cold water inlet. Make sure that the air bleed valve is open during filling.

## First Commissioning

The first commissioning must always be carried out by a professionally qualified person. Lacaze Energies declines all responsibility in case of damages caused to persons, animals or objects, following the failure to comply with this instruction.

Before connecting the appliance to the heating installation, carry out a thorough washing of the piping with an adequate product with the purpose of eliminating all impurities such as filings, welding, various debris, oil and grease which could be present in the circuits.

The heating elements should never be commissioned if the tank is not entirely filled with water. Ensure that the tank is completely filled by drawing water (for instance from a drawing point at the hot water outlet) before the first heating.



**DANGER!**

***Connecting to electricity without filling the tank leads to irreparable destruction of the immersion heating elements. (Damage not covered by warranty!)***

Check the presence and the correct setting of the safety and regulation devices, particularly the thermostat and the safety valve, and check their correct functioning. It is to be noted that this adjustment is only approximate and further adjustments need to be made to obtain the desired temperature.

## **USE AND MAINTENANCE ADVICE**

In order to ensure the durability of the tank, it is recommended to follow the instructions below, without this being required benefit for the warranty.

- Limit the working temperature to 95°C
- Do not soften water under TH 8°F, but maintain a TH<15°F
- Monitor the quality of water used, including the "chloride" parameter.
- Do not exceed the indicated service pressure

The frequency of the maintenance depends on the nature of the water stored and the flow. Therefore, it is up to the users to define the maintenance according to each use,

without exceeding the maximum periods described below:

- Operate the safety valves (once per month)
- Check the functioning of the degasser (once per month)
- Full opening of the drainage valve (once per month)
- Verify and validate the water quality (once per quarter)
- Check and clean the heating elements (1 or 2 times per year)
- Maintenance of the water treatment (4 times per year)
- Cleaning, descaling and disinfecting of the tank to fight against Legionella (at least once per year)

## WATER QUALITY

Stainless steel tanks are designed for storage or production of domestic hot water. Consequently, the water will be of drinking water quality intended for human consumption: any other application must be notified to us by recorded mail.

In order to best protect the accessories mounted on the tank and to benefit from the manufacturer's warranty, it is necessary that :

- the concentrations of chlorides in the water are inferior to 70 mg/l and the use of chlorinated products (such as bleach) is strictly limited (see below) :
- Ryznar index < 8,5 at 20°C.

It is strongly recommended the use of a quality of water conforming to DTU N° 60.1 – Additive N° 3. Otherwise, a complementary water treatment is required, if the water quality is in one or several of the conditions below (measured at 20°C):

Resistance < 2 200 Ω.cm	Resistance > 4 500 Ω.cm	CO <sub>2</sub> free > 15 mg/l (ppm)
TH > 15 °F	Chlorides (Cl-) > 71 mg/l	Sulphates (SO <sub>4</sub> <sup>2-</sup> ) > 96 mg/l
RYZNAR index > 8,5		

## PRACTICAL ADVICE

In order that the tanks are used under the best conditions, to ensure:

- longevity of the tank
- safety of use
- validity of warranty etc.,

we remind you to observe and respect the following recommendations / operating instructions :

### Hydraulic connections :

- Each installation must have a hydraulic safety system against:
  - ***overpressure in the distribution network,***
  - ***overpressure due to rise in temperature (expansion during heating)***
  - ***overpressure due to failure of a thermostat or a relay contactor***
- Before making the hydraulic connection, the supply pipe work must be thoroughly cleaned in order to avoid introducing metallic or other particles in the tank.
- The safety valve outlet must not be blocked. This implies that the drainage tube has a continuous and sufficient slope as well as diameter adapted to the network. It is strongly recommended to be connected to a funnel type "funnel" to visualise the working of the valve.
- Monitor the pressure variation in the network before and after the tank. Ensure that the pressure is constant and that there is no strong variation ( $\Delta P < 1$  bar). Do not exceed the recommended service pressure. Verify that you have followed the recommended hydraulic connection plan.

### Other recommendations:

- Do not use adjustable safety valves. Use valves of dimensions adapted to the installed power and /or flow (NF P 52001).
- Trade practices must be respected, in particular the dielectric coupling assembly on the hot water outlet between the tank and the network, to avoid galvanic corrosion.
- The heating elements, designed for immersion, must never be used without water, under penalty of the immediate destruction of the tank.
- The electric connections must be made in accordance with the rules, regulations and standards in force at the place of installation (NF C15-100 etc.). Grounding of the tank is obligatory. The installation must have a safety cut out and protection device upstream of the water heater.

## COMMISSIONING AND MAINTENANCE:

- Before commissioning, it is strongly recommended that the tank is washed in order to eliminate all waste matter or residue. Then the tank should be emptied after the first heating (closely respecting the minimum cooling time) or disinfected using compatible authorised products.
- When draining the tank, make sure there is sufficient air admission to avoid tank depression.
- The frequency of maintenance operations will depend on the nature of the water stored and its mode of use. Therefore, it is up to the users to define the maintenance according to each use, without exceeding the maximum periods described below::
  - For a few seconds, turn the safety valve(s) to the drainage position allowing the evacuation of possible deposits (once a month)
  - Verify the functioning of the degasser(s) (once a month)
  - Open the drainage valve completely (once a week)
  - Verify and validate the water quality (once every 3 months)
  - Examine and clean the heating elements (once or twice a year)
  - Maintenance of water treatment (4 times a year)
  - Cleaning, descaling and disinfection of the tank to combat against Legionella (at least once a year)
- Materials and cleaning products to be avoided:
  - Wire brushes and wire wool pads;

- Scouring powders may scratch certain stainless steel surfaces (e.g. mirror polished);
- All materials of doubtful cleanliness;
- All products based on bleach or other chlorine derivatives. For disinfection, these may sometimes be used diluted and at cold or for limited periods of contact. In this case it is **imperative** to wash out the installation thoroughly after disinfection!

***Consult us concerning continued disinfection based on chlorine products (such as bleach).***

***Use of hydrochloric or hydrofluoric acid is STRICTLY FORBIDDEN.***

### Possible anomalies:

- Continuous flow of water through the safety device (valve):
  - Check the mains pressure. If it is superior to the recommended service pressure, install a pressure reducer on the mains supply. If the pressure is correct, clean the valve on the safety device.
- Loss of pressure on the hot water tap:
  - Heavy scaling. Drain the appliance, then descale and verify the safety device.
- If a continual leakage of steam or hot water vapour is noticed from the drain or during the opening of a drawing tap:
  - Cut off the electricity supply for the electric equipment or cut off the supply to the primary circuit for the equipment with exchanger. Alert the installer.

**TANK FOR THE PRODUCTION AND STORAGE OF  
DOMESTIC HOT WATER  
STAINLESS STEEL**

**INDICATIVE INSTALLATION, OPERATION AND WARRANTY  
MANUAL  
(IU-0013-EN-201112)**