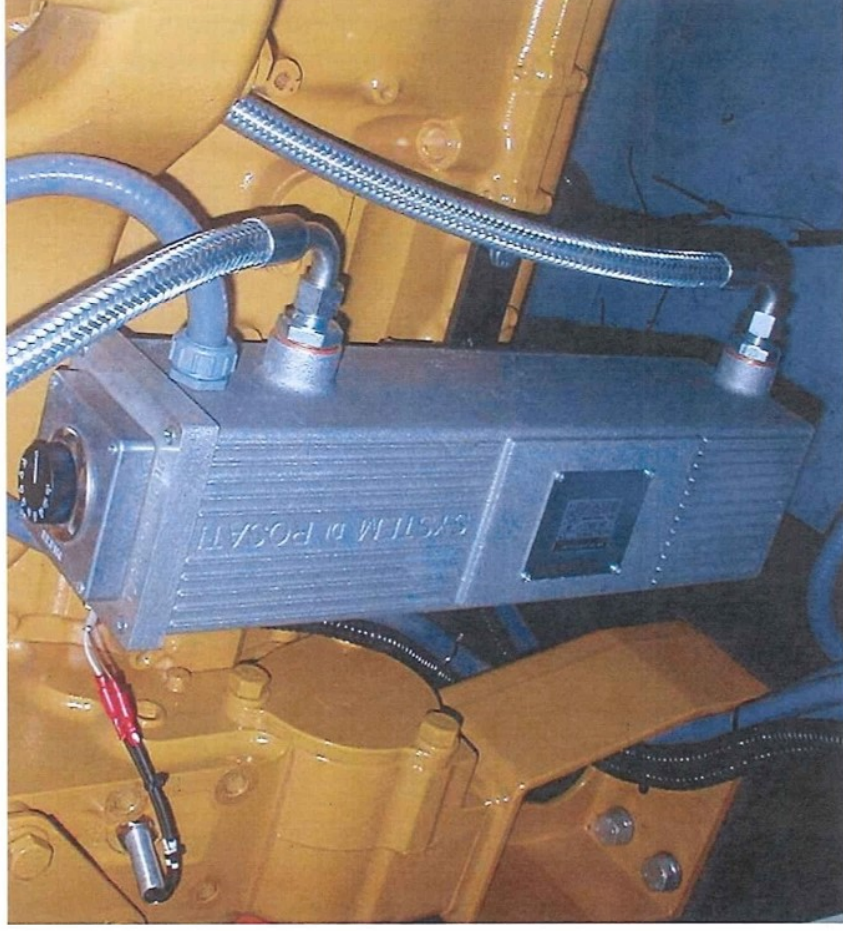


### 6.3 Engine water heater

Engine water heater is manufacture by "System di Rosati srl", type RA 3000.



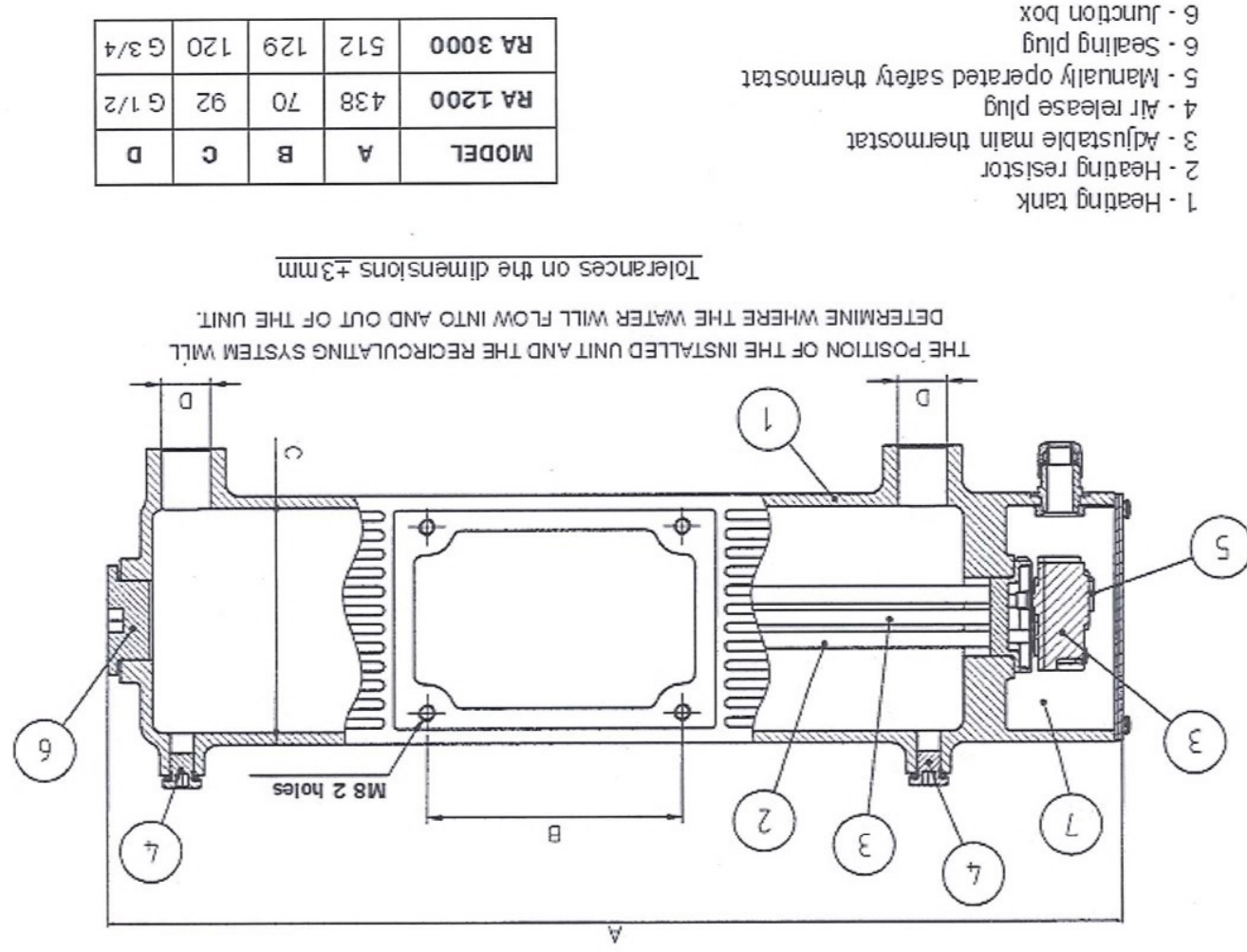
#### Model RA 3000

Rated absorbed power.....	3000 W
Power supply .....	230V 50-60Hz single phase
Absorbed current .....	13 A
Insulation class .....	Class 1
Dielectric strength .....	1500 V/3"
Protection class .....	IP 65
Duty .....	ED-100%
Maximum temperature may be regulated manually .....	80°C ±10%
Main thermostat on-off cycles .....	minimum no. 25.000
<b>The number of cycles depends on the installation and on the atmospheric conditions</b>	
Dimensions (see attached diagram) .....	page 4
Wiring diagram (see attached diagram) .....	page 13
Safety thermostat setting .....	100°C ±10%
Nominal testing pressure of the tank .....	6 bar
Total weight .....	6 Kg

Pic. 6-1 Engine water heater and its technical data

Below, drawing with main components is reported.

### Model RA 1200 - RA 3000



Following, Instruction Manual of Engine water heater by "System di Rosati srl" is reported.

instruction  
manual and  
technical  
features

**SYSTEM di ROSATI**



**SYSTEM di ROSATI s.r.l.**  
60030 MONSANO (ANCONA) - ITALY - Via Veneto, 24  
Tel. ++39.0731.605631 (2 linee) - Fax ++39.0731.605641  
<http://www.systemrosati.com> - E-Mail: [info@systemrosati.com](mailto:info@systemrosati.com)

**Water  
heaters**

**Model:** RA 400  
RA 1200  
RA 3000

COD.RISACIN REV.4



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SYSTEM ROSATI

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## 14 Warranty

SYSTEM ROSATI

- illegible the original information upon delivery or installation of the products. If no other date is on the product, the manufacture date specified in the original information located on the product will be recognized as the only valid date.
- 9) **System** is directly liable for products manufactured by **System**; **System** is indirectly liable for products purchased from other manufacturers.
  - 10) Products presumed defective by the dealer and/or customer must be returned to **System**, free of carriage
  - 11) When **System** is liable for defective products, the Warranty will apply only to replacement and repaired products, and therefore does not concern any other dealer and/or customer claims if either party has not respected the conditions set forth in paragraph 6. Replaced or repaired products will be returned to dealers and/or customers located in national territory, and by way of carrier chosen by and at the expense of **System**
  - 12) **System** will notify the dealer and/or customer if **System** is not liable for defective products. These products will continue to be available to the dealer and/or customer for 60 days from the date of notification by **System**, after which time the dealer and/or customer will lose the right to make any demands or claims and all expenses, including freight costs, will be debited to the dealer/customer.
  - 13) **System** guarantees examination of all products presumed defective and relevant notification will be sent within 30 days after receipt of the product.
  - 14) Products presumed defective by the dealer and/or customer must be accompanied by a detailed technical report. If the product is not accompanied by a detailed technical report, the presumed causes will be defined by **System** based on its extensive and knowledgeable experience
  - 15) The warranty terms and conditions stated above are an integral part of the user and instruction documentation in the product sales agreement, which the customer automatically accepts and acknowledges at the time of purchase. If the agreement is not included in the purchase, the purchaser must contact the manufacturer to request a copy.
  - 16) Dealers and/or customers may submit any other terms and conditions not listed here to be included in subsequent agreements. All submitted requests will be subject to evaluation by **System**.
  - 17) With regards to special products built on customers demand, **System** will produce only the requested quantities since we are not obliged to have final products to supply as spare parts, even in case of possible replacement as mentioned in the guarantee.
  - 18) The declarations of conformity and all the technical data stated concern the **System** products tested in laboratory. If **System** doesn't receive any particular specifications from the customer, with regards to the application and the operation, and therefore doesn't know the specific precariousness which the product could be subject to, such declarations or data should be taken into consideration only as laboratory test.
  - 19) Whenever the customer, for his own requirements, would need an insurance policy on the product to cover what is not included in the above items, this will be charged to the customer at his expenses. In this case **System** will undertake to provide the possible technical data required by the insurance company.
  - 20) The terms and conditions herein cancel and replace all preceding warranty terms and conditions.

## 14 Warranty

SYSTEM ROSATI

- 1) **Whereas:**  
All products manufactured by **System** are defined by and classified as: COMPONENTS, ELECTROMAGNETS AND GENERAL DRIVES, ELECTRIC PISTONS AND HEATER.
- 2) In agreement with the dealer and subsequently with the final consumer, **System** sets forth the following terms and conditions whereby it is stated that.
- 3) **System** is **ISO 9001:2000** certified and warrants that the final finished products are free from defects in material and workmanship and are in good working order at the time of delivery and that all products have been subjected to strict testing (*RA 400 - RA 1200 and RA 3000 heaters: not including heating test*) in compliance with quality manufacturing procedures, before shipment.
- 4) **System** products are qualified components and are to be used exclusively as part of machinery in general and their performance and reliability will depend on:  
**A- choosing the right product**  
**B- quality installation and application of the product**  
**C- correct use and maintenance of the product**
- 5) Whensoever points A, B and C of Paragraph 4 are the responsibility of the dealer and/or end user, any defect and its consequences will be the responsibility of the dealer and/or customer, excluding manufacturer defects which may occur after installation.
- 6) **System** may be held liable in specific regard to points A,B,C of paragraph 4 whensoever the company receives in advance a written specification report sent by the dealer and/or customer, the **System** technical support agents carry out the installation and testing of the product and issue certification that the product has passed quality control.  
Instructions given by **System** technical support agents based on their knowledge of applications, as well as their presence to perform installation and testing, does not tacitly imply or constitute certification. Only certification issued by **System** will be recognized as the only valid certification.  
In the event that **System** assumes responsibility, they will offer an insurance policy to the dealer and/or customer the cost of which will be added to the original sales offer.
- 7) All expenses pertaining to paragraph 6 will be acknowledged at the time that the offer is made and will be paid by the dealer and/or customer.
- 8) The **System** warranty is for a **2 YEAR** period starting from the manufacture date. The warranty is applicable to the product starting on the delivery date of the product to the dealer and/or customer if the delivery is made directly to the customer.  
The manufacture date, which is the sole starting date for the period of the warranty, is indicated directly on the product. If the information bearing the manufacture date is missing or illegible, the terms and conditions of the warranty shall not be applicable to the defective or presumed defective product.  
For products which have remained in dealer and/or customer stock for long periods of time, checked and tested for performance and integrity, to receive a 2 year period warranty starting from physical receipt by the dealer and/or customer, the dealer/customer must be able to provide a written notification to the manufacturer. The new information, containing the new delivery and/or installation date, is to be attached to the product without removing or rendering

## 1 Declaration of conformity

SYSTEM ROSATI

### The Unit

- **Type** - Water heater for industrial use and/or for use with endothermic engines.  
- The heater is classified as a component and is unable to operate independently. Choosing the right product for the right use, correctly installing the product and accurately following the safety regulations are all the liability of the customer/installer. See Warranty Agreement terms and conditions.
- **Company name** - System di Rosati s.r.l.  
60030-Monsano-AN-ITALIA-Tel. ++39 0731/605631  
Fax ++39 0731/605641  
<http://www.systemrosati.com> E-mail:info@systemrosati.com
- **Model** - **RA 400 - RA 1200 and RA 3000**

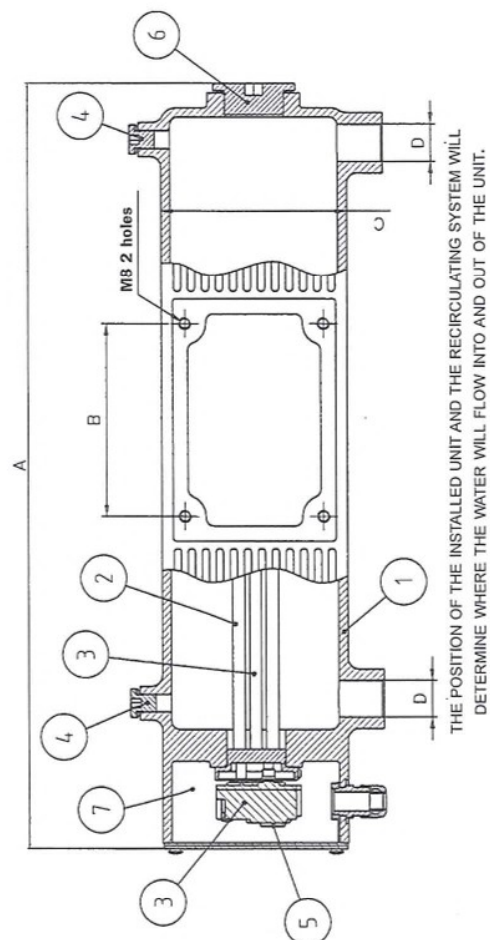
Certified under international regulations and provisions  
CEI - 61.50 - CENELEC EN 60 - 335 - 1  
ex CEI - 61.1 - CENELEC EN HD - 251.S2  
Class 1 electric equipment safety IEC 335 - 2 - 21

Complies with CE regulations

# 1 Declaration of conformity

SYSTEM-ROSATI

Model RA 1200 - RA 3000



Tolerances on the dimensions  $\pm 3\text{mm}$

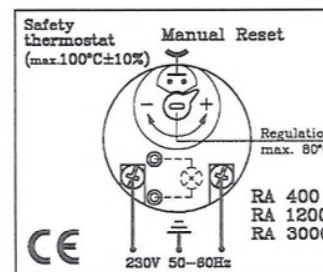
MODEL	A	B	C	D
RA 1200	438	70	92	G 1/2
RA 3000	512	129	120	G 3/4

- 1 - Heating tank
- 2 - Heating resistor
- 3 - Adjustable main thermostat
- 4 - Air release plug
- 5 - Manually operated safety thermostat
- 6 - Sealing plug
- 6 - Junction box

# 13 Wiring diagram

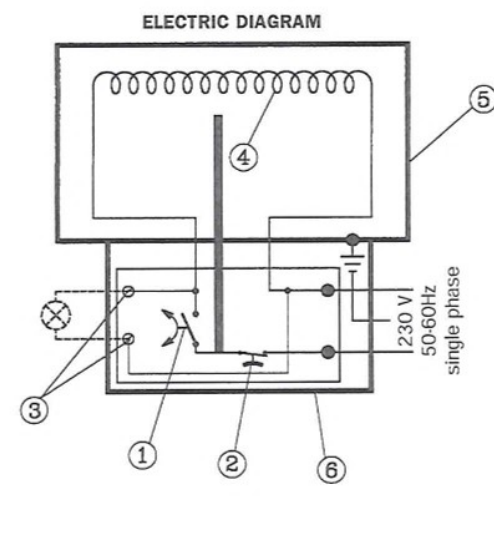
SYSTEM-ROSATI

Model RA 400 - RA 1200 - RA 3000



Provide with safety devices

The same diagram is located inside the junction box



- 1 - Adjustable main thermostat max 80°C  $\pm 10\%$
- 2 - Manually operated safety thermostat 100°C  $\pm 10\%$
- 3 - Socket for ON light
- 4 - Heating resistor
- 5 - Heater tank
- 6 - Junction box



## 10 Maintenance and repair

SYSTEM-ROSATI

In addition to the normal checks outlined in chapters 6,7 and 9, the heater may require maintenance to the hydraulic and electric connections, on the cover seal of the junction box and on the wire through hole to prevent liquid from leaking in and causing a short circuit and/or oxidation (rust) on the contact points.

## 11 Spare parts and technical assistance

SYSTEM-ROSATI

- The product does not include spare parts of the thermostat resistance unit and the connections box because only the manufacturer can substitute them.

The manufacturer offers technical assistance to the customer upon request.

## 12 Liability

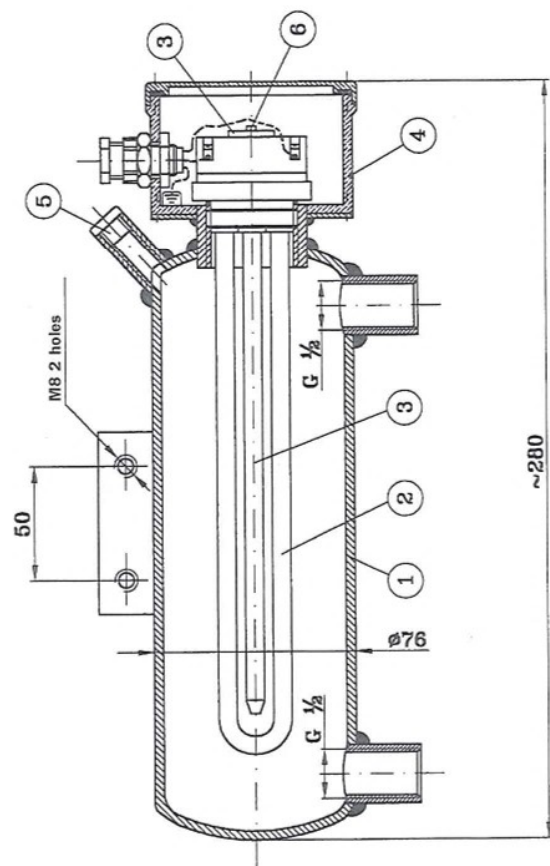
SYSTEM-ROSATI

The manufacturer guarantees that the heater has been built using quality workmanship and materials which conform to the quality standards. The heater is classified as a component and is unable to operate independently. Choosing the right product for the right use, correctly installing the product and accurately following the safety regulations are all the liability of the customer/installer. Considering the heaters as components, devoid of autonomous functioning the manufacturer turns the responsibility of mal-functioning to the customer.

## 1 Declaration of conformity

SYSTEM-ROSATI

### Model RA 400



Tolerances on the dimensions  $\pm 3\text{mm}$

- 1 - Heating tank
- 2 - Heating resistor
- 3 - Adjustable main thermostat
- 4 - Junction box
- 5 - Air release plug
- 6 - Manually operated safety thermostat

**2 Technical specifications****SYSTEM-ROSATI****Model RA 400**

Rated absorbed power	400 W
Power supply	230V 50-60Hz single phase
Absorbed current	1,75 A
Insulation class	Class 1
Dielectric strength	1500 V/3"
Protection class	IP 65
Duty	ED-100%
Maximum temperature may be regulated manually	80°C ±10%
Main thermostat on-off cycles	minimum no. 25.000
<b>The number of cycles depends on the installation and on the atmospheric conditions</b>	
Dimensions (see attached diagram)	page 5
Wiring diagram (see attached diagram)	page 13
Safety thermostat setting	100°C ±10%
Nominal testing pressure of the tank	6 bar
Total weight	2 Kg

**Model RA 1200**

Rated absorbed power	1200 W
Power supply	230V 50-60Hz single phase
Absorbed current	5,2 A
Insulation class	Class 1
Dielectric strength	1500 V/3"
Protection class	IP 65
Duty	ED-100%
Maximum temperature may be regulated manually	80°C ±10%
Main thermostat on-off cycles	minimum no. 25.000
<b>The number of cycles depends on the installation and on the atmospheric conditions</b>	
Dimensions (see attached diagram)	page 4
Wiring diagram (see attached diagram)	page 13
Safety thermostat setting	100°C ±10%
Nominal testing pressure of the tank	6 bar
Total weight	3.2 Kg

**Model RA 3000**

Rated absorbed power	3000 W
Power supply	230V 50-60Hz single phase
Absorbed current	13 A
Insulation class	Class 1
Dielectric strength	1500 V/3"
Protection class	IP 65
Duty	ED-100%
Maximum temperature may be regulated manually	80°C ±10%
Main thermostat on-off cycles	minimum no. 25.000
<b>The number of cycles depends on the installation and on the atmospheric conditions</b>	
Dimensions (see attached diagram)	page 4
Wiring diagram (see attached diagram)	page 13
Safety thermostat setting	100°C ±10%
Nominal testing pressure of the tank	6 bar
Total weight	6 Kg

**9 Operating instructions****SYSTEM-ROSATI**

The heater may be kept constantly running. Periodically check:

- the level of liquid or water
- the presence of air in the circuit or apply the automatic draining function
- the temperature of the liquid in different points of the equipment to be heated

Checking the temperature of the liquid in along different points of the equipment to be heated will determine if there are any "cold spots" in the circuit which indicate that "hot water" is not circulating due to air in the system or that water is not flowing freely. In this case, follow the instructions in chapters 6 and 7. If the circuit is completely cold, there could be:

- 9.1 - No power supply to the unit
- 9.2 - Heating element or thermostat failure
- 9.3 - Safety thermostat has not been activated
- 9.4 - Hot water is unable to circulate freely

- In the first case (9.1), use a tester to make sure the voltage is reaching the connection to the heating element. If the power is not reaching the element, make sure the wiring system is connected to the main power switch. If it is not connected DO NOT RECONNECT IT. Disconnect the wire connection from the heating element and check to see that the element has not short circuited or is grounded with the tank. In either case, the heating element/thermostat are malfunctioning and the unit must be returned to the manufacturer. Check that the main power switch is providing the necessary amount of power, taking into consideration also the electric peaks when the thermostat is turned on and off. Afterwards, reconnect the wiring and start the heating element again. Be sure that the heating continues regularly.

- In the second case (9.2), return the unit to the manufacturer.

- In the third case (9.3) if the safety thermostat has not been activated, check the cycles of the heating element, the temperature of the water and the heater. By manually reactivating the safety thermostat, the heating cycle will start again. If the main thermostat switches on automatically and runs regularly, the temperature will register at the set temperature and no higher than 80°C ± 10% on the heater. If the temperature registers higher than 80°C ± 10%, the thermostat is malfunctioning and when the temperature reaches 100°C ± 10%, the safety thermostat will switch on. In any case, if the safety thermostat switches on automatically, the heater is not working properly and must be returned to the manufacturer and replaced.

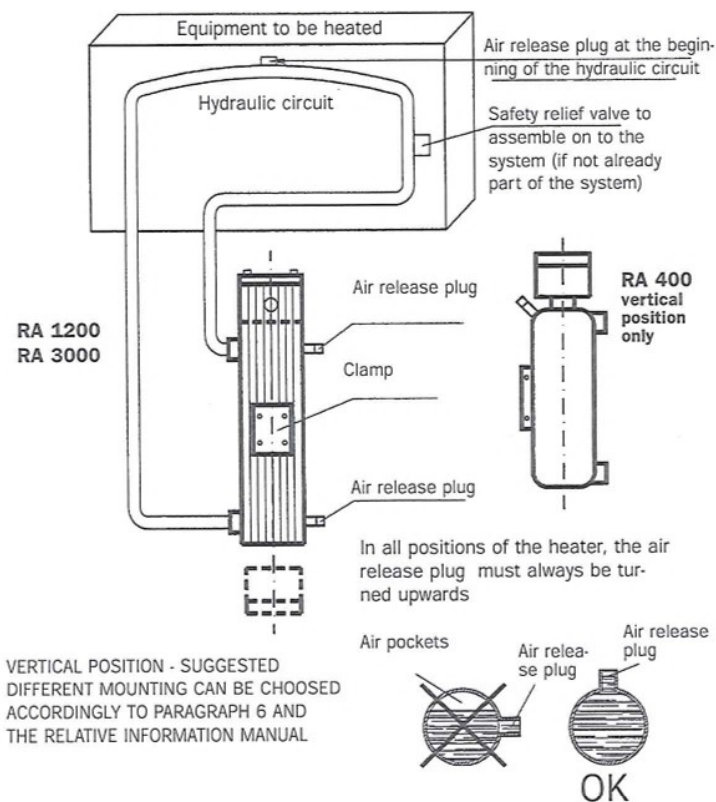
- In the fourth case (9.4) if the hot water is unable to circulate freely due to blockage, use a recycling pump as outlined in chapter 6.



## 8 Hydraulic connection diagram

SYSTEM-ROSATI

### Model RA 400 - RA 1200 - RA 3000



## 3 Safety instructions

SYSTEM-ROSATI

- The heater hydraulic system must be installed by a qualified personnel.
- Carefully read all instructions and information in the user manual before operating the heater.
- Follow all applicable safety instructions of the country where the unit is installed.
- General instructions:
  - All electrical work on the unit must be done by qualified personnel as follows:
    - 3.1 Disconnect the power supply from the main power switch.
    - 3.2 Make sure that the power supply cannot accidentally be reconnected
    - 3.3 Use a tester to be certain that no voltage is being passed to the part to be worked on.
    - 3.4 Check the ground wire.

## 4 Storage and handing

SYSTEM-ROSATI

- Handle the heater carefully during loading and unloading, unpacking and during installation. Improper handling of the unit can damage the electrical components. Broken or damaged electrical components may cause short circuits during the alimentionation, dangerous to the machine operator. Total or partial breakage of the electrical components, including the connectors, can cause the unit to short circuit when reconnecting the power supply. Carefully check the condition of the heater before installation. Do not install the heater if there is any sign of defect or damage to the electrical components or any other part of the unit and immediately return the unit to the manufacturer.
- Store the unit in a dry place.

## 5 Construction and operation of the unit

SYSTEM-ROSATI

The heater contains:

- Electronically welded steel tank
- Electrical heating resistor
- Adjustable main thermostat
- Manually operated safety thermostat (a part of the main thermostat)
- Electrical connections
- Junction box

## 5 Construction and operation of the unit SYSTEM-ROSATI

### Operation

After the unit has been properly installed, turn on the power supply. The heating element will heat the water in the tank and the water will begin to circulate by force and/or naturally and heat the rest of the water. When the water has reached the set temperature, the thermostat will cause the heating element to automatically switch off. When the temperature of the water drops below the set temperature, the heating cycle will start up again automatically and continue until the water reaches the set temperature again. The time and amount of electricity necessary for the heating element to reach the desired temperature are proportional to the amount of water to be heated, the room temperature, and how much heat is dissipated through the metallic mass.

## 6 Installation SYSTEM-ROSATI

Installation must be done by a qualified personnel. The heater has no autonomous functions. The main components include a heating element and a bulb thermometer, both found lengthwise inside the metal tube of the heater. These components must be kept completely submerged in the water at all times. The set temperature of the water must be kept constant along the length of the tube. Inconstant water temperature will create areas that are very hot and very cold which causes the thermostat and the heating element to work inefficiently. For the unit to operate efficiently, the following factors must be taken into careful consideration:

- A - The quantity of liquid to be heated
- B - The size of the mass to be heated
- C - Different volumes of the liquid inside the mass to be heated
- D - The route of the liquid inside the mass to be heated (connections between the volumes of liquid)
- E - The position of the heater based on points A,B,C and D
- F - Perfect circulation of the liquid

The installer must also carefully consider and choose:

- the right heater
- the right position to install the unit
- the circulation pattern of the liquid (**forced with a recycling system and/or natural**)

The installer must also:

- evaluate the circulation pattern inside the mass to be heated; in the case of endothermic engines, the installer must request written documentation from the manufacturer and advice on how to remove possible thermostat blockage or other problems or by-pass the obstruction.
- avoid keeping the temperature of the water too high. Excessively high temperatures cause natural evaporation which lowers the level of the water and can cause damage. If the water temperature must be kept high, check the water level frequently and release air trapped inside the mass.
- make sure there is no damage on the thermostat contacts which can be caused by condensation formed in very humid atmosphere. When this occurs, the heater heats up and cools down frequently and does not work continuously.

## 6 Installation SYSTEM-ROSATI

- assemble anti-vibration devices to the fixation and flexible tubes to the heater, so that dangerous vibrations can be avoided
- not allow the heater go long periods without running. Prolonged periods of disuse can cause the thermostat contact to function improperly
- use water or liquids that are calcium-free to obtain the best performance from the heater. Calcium deposits can form on the heating element and thermostat causing them to work improperly
- follow the electric connections according to the diagram on page 13, exactly place the grounding wire and the necessary safety devices
- install a safety relief valve into the hydraulic circuit as a safety precaution (if there is not already one installed)
- apply the automatic air bleeding function in order to avoid inadequate checks for the presence of air in the circuit
- avoid shocks - avoid conical fittings

## 7 Starting the unit SYSTEM-ROSATI

After having correctly installed and connected the heater, turn on the power supply. In a few minutes, hot water should be flowing throughout the entire mass to be heated. If not, release trapped air and refill with water.

All trapped air must be released for the heater to work properly.

Air pockets can form and be trapped in the heater, causing the heating resistor to burn out.

Continually check the water level and make sure there is no trapped air or apply the automatic draining function

The user or installer must set the temperature so the water or liquid in the heater does not exceed  $80^{\circ}\text{C} \pm 10\%$  as according to safety instructions. Do not set the thermostat at the highest temperature. High temperatures will cause overheating in areas of the heater or the circuit and result in evaporation which dangerously lowers the liquid level. Follow the diagram below to correctly regulate the thermostat and ensure it is working properly:

