

MOUNTING INSTRUCTIONS

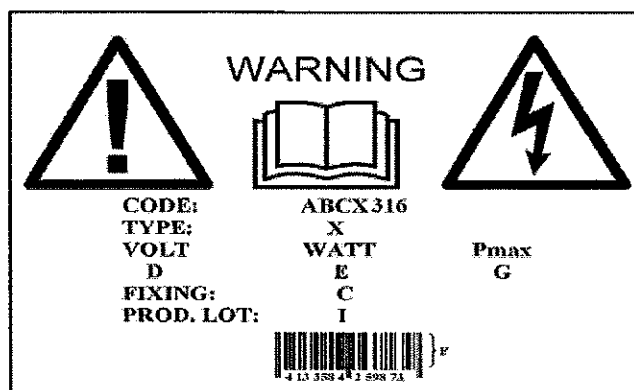
Sigmar marine water heaters are built with materials that withstand the rigors of the marine environment. Being an electrical appliance install water heater in a ventilated location where it will not be subjected to humidity and external water spray.

The distance between the engine and tubes should be as short as possible. Locate the water heater in an accessible position so that the water connections, pressure relief/non return valve and electrical heating element (30 cm long) remain accessible. Install the water heater in a ventilated location in order to prevent condensation which might be mistaken for water loss.

The water heater should be firmly secured with mounting brackets to a solid structure using bolts, nuts and lock washers. Bear in mind that the total weight of the water heater is its weight plus the weight in kilograms equal to its capacity in liters. Please consult risk analysis table inside this instructions booklet which also explains meaning of various warning symbols. Literature on qualification tests (procedure IO 105M) are supplied by manufacturer on request.



Before mounting, first check the information on the yellow sticker (see below) on the outside of black plastic cap covering electric parts (see below). This information is essential for the correct installation and maintenance of the water heater.



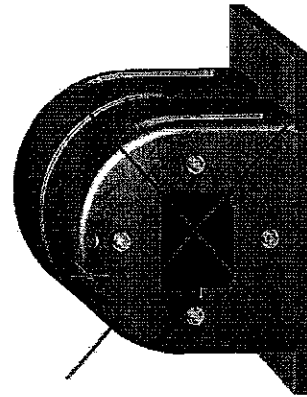
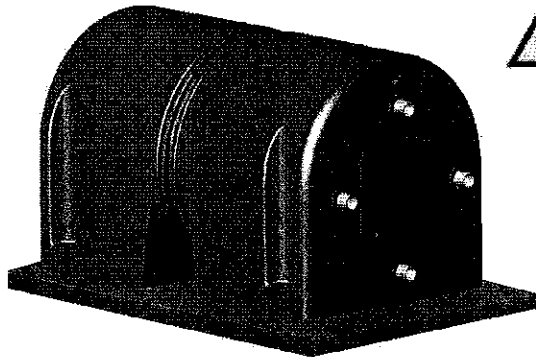
- A. **Water heater part number (type of water heater)**
 - B Insulated water heater with coil
 - BN Insulated water heater without coil
- B. **Water heater's theoretical capacity (indicative)**
- C. **Water heater part number (type of installation):**
 - U Universal horizontal deck (to the floor) / vertical models
 - H Horizontal deck (to the floor) model
 - HP Horizontal bulkhead model
- X. **Description of water heater model (L.T. = liters GL = gallons)**
 - C Compact model
 - I Compact Inox model
 - 316 Material with which inside tank is built: AISI 316 stainless steel
 - D Feed voltage of electric heating element (Voltage)
 - E Electrical input of heating element (Watts)
 - F Bar code Ean standard (if prescribed)
 - G Maximum working pressure in Psi (safety valve setting)
 - I Production batch (date: dd/mm/yy + homogenous production batch)

In order to best install your water heater, it is necessary that you identify the particular model (see point C above). When mounting the water heater the correct position is fundamental for its correct function.

To ensure that it functions correctly, mount water heater as follows:

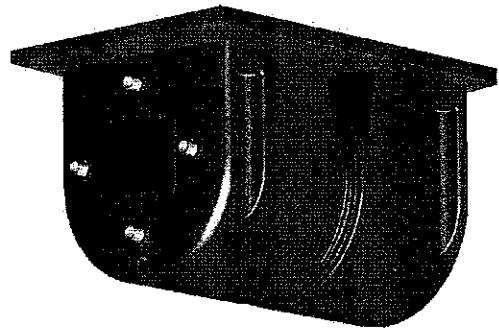
Horizontal deck (floor) installation:

the water heater must be firmly secured to a deck (models identified with part number ABHX316 o ABUX316).



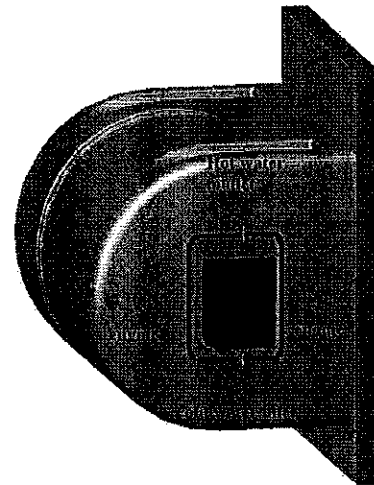
To deckhead (ceiling):

Water heater can be mounted horizontally to a deckhead (ceiling) as long as the entry and exit water connections are inverted. This type of installation is not advisable because the thermal advantage of the tank's disaxial position is lost and could provoke problems during installation and subsequent maintenance of water heater because entry and exit water connections have to be inverted. Moreover the weight of the water heater full of water during vertical accelerations when navigating, in particular with motor yachts, could cause fatigue stress on support and fixing screws.



To bulkhead (wall):

The water heater must be firmly secured to a bulkhead that is vertical in respect to the deck (models identified by part number ABHPX316). These water heaters can be mounted only horizontally to a bulkhead (wall) and not to a deck (floor). The cold water entry must always be the lower connection defined by boat builder according to whether the water heater is to be mounted to the right or to the left.



USE OF OPTIONAL SPECIAL STAINLESS STEEL FASTENING BRACKETS

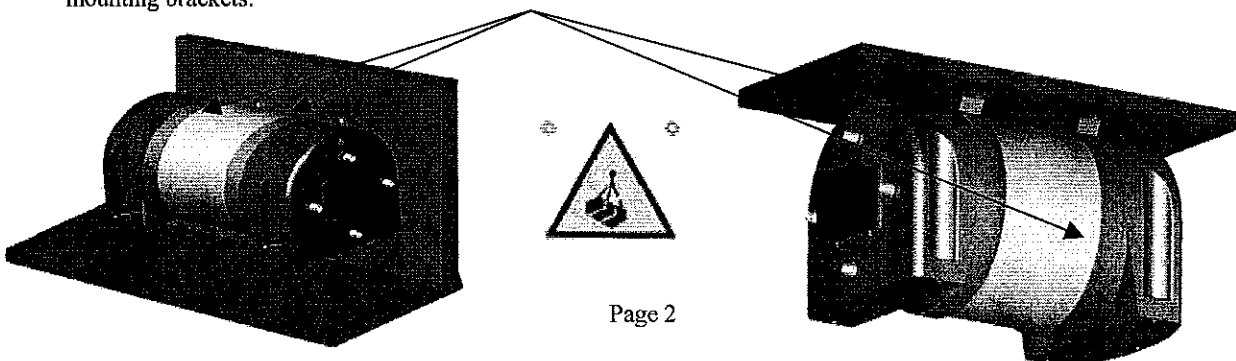
Special stainless steel fastening mounting brackets, available as an optional accessory, can be used.

Part Number 15.125 for water heater models up to 297 mm in height.

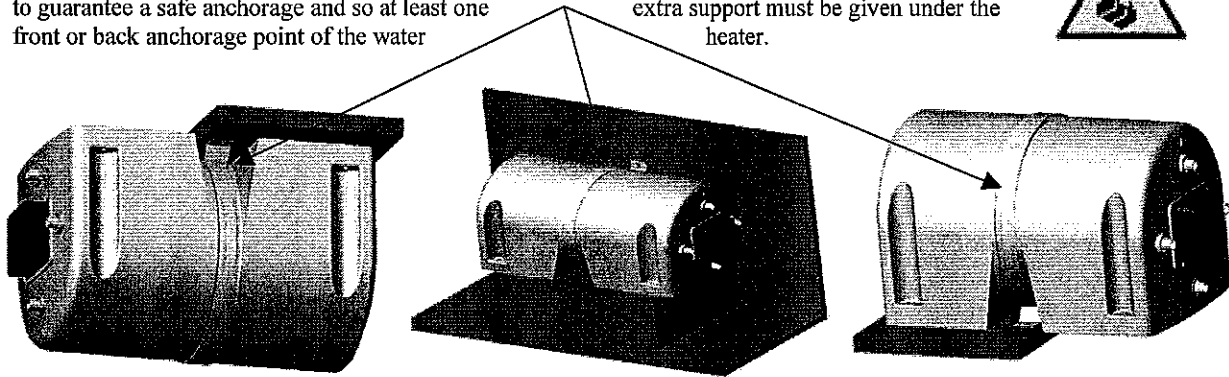
Part Number 15.126 for water heater models up to 358 mm in height.

Part Number 15.127 for water heater models up to 410 mm in height.

The Compact **Inox** series of water heaters can be mounted horizontally to a bulkhead (wall) using two fastening mounting brackets.

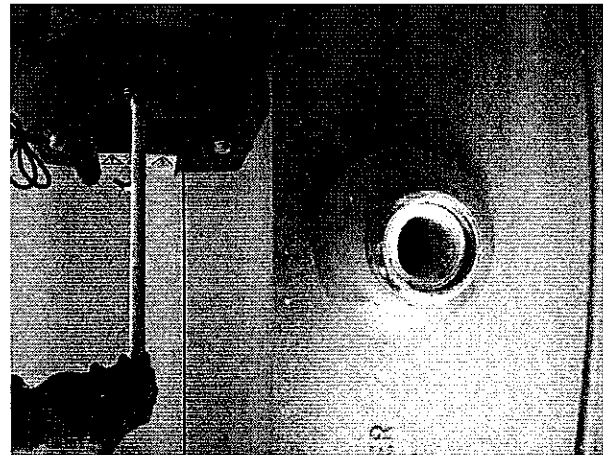


The Compact series of water heaters can be mounted horizontally to a bulkhead (wall) using **only one** fastening mounting bracket placed over the central “union” point of the two external plastic shells. On the larger Compact models (30 and 40-litre), the use of only one fastening bracket is not sufficient to guarantee a safe anchorage and so at least one extra support must be given under the front or back anchorage point of the water heater.

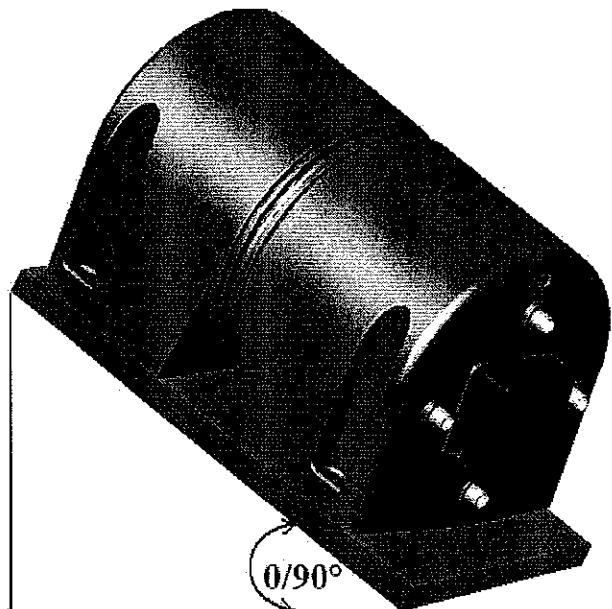


Vertical mount (models identified with part number ABUX316)

If the water heater is mounted vertically (see photos), ensure that the white plastic tube supplied with water heater inside packaging, is inserted inside the hot water exit connection identified by “Hot water outlet” writing. Ensure that the tube enters right inside and that the end of the tube does not overlap the hot water exit connection.



Water heater can be mounted in an inclined position. Maintaining the back part of the water heater at the top, the water heater can be mounted on a surface that is inclined from 0° (horizontal mount) to 90° (vertical mount).



After installation of the water heater, remove the PVC protection film (if any) of the water heater’s stainless steel external casing (only Compact Inox models).

FRESH WATER PLUMBING CONNECTION

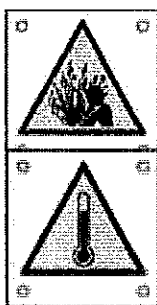
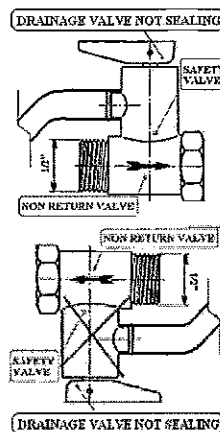
For a better understanding of these instructions, please refer to the "plumbing connection diagram" found at the back of the booklet.

First connect water system to the pressure relief/non return valve and then to the cold water inlet marked with a blue rubber washer (see plumbing connection diagram, points 2 and 6). With the 'U' (UNIVERSAL) models when water heater is mounted vertically with its tubes upwards, the entry pipes should be exchanged with the exit pipes and vice-versa.

Ensure that pressure relief valve is mounted correctly (that the arrow points towards the blue rubber washer). A gate valve, that cuts off the water heater from the rest of the hydraulic circuit during maintenance operations (see plumbing connection diagram, point 11), is recommended. Install the valve between the accumulator tank and the pressure relief valve.

The hot water inlet marked with a red rubber washer (see plumbing connection diagram, point 1) should be connected to the hot water taps with tubes or hoses that can withstand the circuit's temperature and pressure (max. 120° - 7 kg cm²).

An escape valve, useful for maintenance or drainage operations (see plumbing connection diagram, point 7) is recommended and should be mounted between the tube and pipe fitting connection.



When the water heater has been mounted, open hot water taps, start the fresh water pump and allow the water to run a few minutes (before making the electrical connection!) in order to expel all air from water heater and lines thus ensuring that the heating element is totally submerged, otherwise it will be damaged when power is turned on.

Ensure that all pipe fitting connections are watertight. Mount a small tube to the safety/non return valve and ensure that overflow runs into the bilge or other suitable space where hot water and steam will not cause any immediate risk to people on board or damage any other parts, particularly electric ones.

N.B: Ensure that the cold water inlet and hot water outlet pipework has been connected correctly (see plumbing connection diagram, points 1-2) and not the heat exchanger pipes marked with the engine symbol "ENGINE" (see plumbing connection diagram, points 3-4).

ELECTRICAL CONNECTION

Follow the norms and standards of the local authorities when carrying out electrical connections. Ensure that your AC voltage corresponds to that indicated on the electrical heating element (see point D above).



Ensure that a high-sensitivity differential cutout switch and an insulating transformer is mounted into the electrical system. Insert a bipolar switch (10AMP/220V or 15 AMP/110V) in an accessible location from where

the electric supply of the water heater's electric heating element can be controlled.

Protect electric line with a 10 AMP/220V or 15AMP/110V fuse. Use only pliant and not rigid cable, since vibrations might damage the latter. The cable should not be less than 2.5 mm in width. The electric cable's course should be protected from sea spray and dripping. The cable must not run in the bilge. Support it securely at frequent intervals. Protect it from the possibility of accidental contact with mobile parts.

With water heaters equipped with a cable and shuko plug, connect plug to shuko socket. If electrical connection is preferred without the use of the cable and shuko plug, or if the water heater is not equipped with a cable and shuko plug, remove the black plastic cap covering the electrical parts by unscrewing the three screws and disconnect the cable if there is one.

Strip the insulation from the three wires to bare about 1 cm of the stranded wire. The two power supply wires (generally blue/brown) should be fastened to the thermometer's contact points marked by numbers 1 and 2.

Connect the earth wire (yellow or green) to the screw nut contact on the water heater tank marked with the earth symbol.

Adjust the thermostat setting by turning the dial clockwise with a screwdriver blade until the arrow points to the desired temperature setting (our production sets it to 60°C).

Sigmar Marine thermostats are equipped with a high temperature cutout safety switch, which is an electro-mechanical device that opens



PROBLEMS AND SOLUTIONS

IMPORTANT: BEFORE REMOVING THE BLACK PLASTIC CAP PROTECTING ELECTRIC PARTS, BE SURE TO TURN OFF ELECTRIC CURRENT TO WATER HEATER.



I. WHEN THE ENGINE DOES NOT HEAT THE WATER:

- A. Ensure that there are no air locks inside the entry pipe to the water heater's coil. If any, unloosen escape valve (if mounted see plumbing connection diagram, point 5) or heat exchanger's pipe fitting (marked with red rubber washer see plumbing connection diagram, point 4) and let out any air.
- B. Check that temperature of the coolant inside the water heater coil is over 50°C and that it circulates properly.
- C. Control that hot water taps are watertight.

II. WHEN ELECTRIC HEATING ELEMENT DOES NOT HEAT WATER:

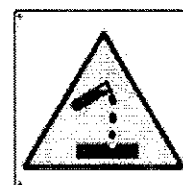
- A. Check the electric supply (that you are receiving power) and that the AC supply voltage corresponds to that indicated on the electric heating element.
- B. Check that the thermostat is working correctly (that it switches on /off).
- C. Check whether the thermostat's high temperature cut-out safety has been inserted (see electrical connection instructions above). If the pin of the cut-out safety device has been released, restore contact by pushing the pin back to its original position, which is a few millimeters below the surface, with a pointed instrument. If the water heater overheats excessively and the cut-out safety device is activated again within only a few hours of operation (temperature cut-out = 120°C), check the thermostat and electric heating element and if faulty, substitute.
- D. With a tester check that the electric heating element is not damaged and that the ohmic value is correct ($A=W/V$ $\Omega=V/A$ e.g. a 220 V 800 W heating element = $800/220=3.6$ A $220/3.6=61$ Ω). Remove electric heating element, check whether there are any calcium deposits, and if any, remove.
- E. Check that hot water taps are watertight.

III. IF HOT WATER COMES OUT OF THE COLD WATER TAPS:

- A. Ensure that non-return valve is not obstructed and that it does not permit hot water to return to the accumulator tank.
- B. Control that water heater has been connected correctly.
- C. Should water boil despite the high temperature cut-out safety immediately cut out the power supply, carefully open hot water taps to let out any excess pressure and change the thermostat.

IV. IF THERE IS ANY WATER LOSS:

- A. Ensure that the water heater is situated in a well ventilated location, otherwise any condensation that might occur could be mistaken for water loss.
- B. Check that the pipe fittings are water tight.
- C. If the water loss persists, the water heater should be changed. If the installation is over five years old, check zinc anodes; the water heater has probably been damaged by electrolytic currents that break down the inoxidizable alloys and corrode the structure of all metallic parts on board.



V. IF COOLANT COMES OUT OF THE FRESH WATER TAPS AND VICEVERSA:

- A. heater- then proceed as per point IV C.

VI. IF THE PRESSURE RELIEF VALVE RELEASES WATER:

- A. Ensure that pressure relief/non-return valve tube or pipe fittings do not leak.
- B. In normal operation of the water heater, there should not be any problem. The pressure relief valve normally leaks when it compensates for any pressure increase inside the water heater. The installation of a suitable expansion tank will completely eliminate this inconvenience.
- C. If the water loss is larger and continual, check whether there is any foreign matter lodged in the valve seat of the pressure relief valve. If dripping continues, replace the valve.

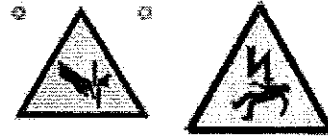
VII. IF THE CURRENT LIMIT-SWITCH OR CUTOFF DIFFERENTIAL SWITCH INTERVENE DURING THE ELECTRIC OPERATION OF THE WATER HEATER:

- A. Check the electric line and thermostat connections.
- B. Check whether there are any current leakages to earth from the electric heating element. If there are, change the heating element as indicated in point 2 under 'Maintenance'.

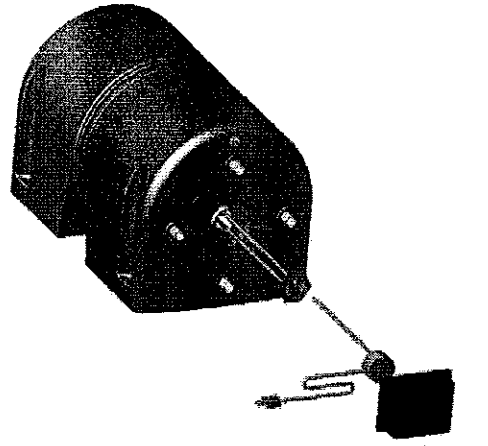
NB: To check whether there are any current leakages to earth, disconnect electric wires and remove the thermostat as indicated in point 1 under 'Maintenance'. With an ohmmeter check that the resistance, between earth (water heater tank) and the element head, is infinite (no contact between the two). If it is not infinite, replace electric heating element.

MAINTENANCE

IMPORTANT: BEFORE REMOVING THE BLACK PLASTIC CAP COVERING THE ELECTRICAL PARTS, BE SURE TO TURN OFF THE WATER HEATER'S ELECTRICAL POWER SUPPLY.



Periodically check electric connections and check that all the pipe fittings are watertight. Replace any corroded or damaged nut/bolt and screw fastenings. Empty the water heater every time the temperature in its location goes below zero °C. The water heater might be irreparably damaged if water inside it freezes. For any ordinary maintenance follow the instructions manual, but the assistance of qualified personnel is advisable for any special maintenance. Nearly all SIGMAR MARINE water heaters are heat insulated with auto-extinguishable cellular polyurethane; since this material produces small quantities of toxic gas at temperatures that exceed 500°C, any work that produces high temperatures (welding, scoring, drilling, etc.) must not be executed in closed confined areas.



I. TO REPLACE THERMOSTAT:

- A. Remove plastic cap by unscrewing the three screws.
- B. plug, disconnect plug and unscrew electric contact screws. Ensure that any exposed wires are protected.
- C. Place a screw driver between thermostat and electric heating element to prize up the thermostat.
- D. To remount the thermostat, follow the instructions the opposite way round, taking particular care that the thermostat contacts are correctly connected to the elements' Fast-On contacts.

II. TO REPLACE ELECTRIC HEATING ELEMENT:

- A. Proceed as in points 1/A/B/C
- B. Unscrew electric heating element with a 56mm or 60 mm socket spanner or similar tool. If difficult to unscrew, heat nipple between electric heating element and water heater.
- C. Before replacing element, seal threading with Loctite 572, hemp or Teflon.

III. TO EMPTY THE WATER HEATER:

- A. Ensure that the power supply is disconnected so that the water heater cannot be accidentally switched on when empty.
- B. Cut off the water supply to the water heater.
- C. Open the safety/non return valve by lifting the valve lever (ensure that water outlet is directed towards the bilge).
- D. Loosen the pressure relief valve, if mounted, or exit hot water pipe fitting (red rubber washer, see plumbing connection diagram point 1) until the water heater begins to empty.

SIGMAR MARINE srl reserves the right to modify the above without prior notice.