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SCAMBIATORI - BOLLITORI - SERBATOI

Installation, Operation and Maintenance Manual

BUFFER TANKS FOR HEATING AND CHILLED WATER STORAGE

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1. GENERAL INFORMATION

This manual is an important guide for ensuring the safe and reliable functioning of the product. It covers handling, installation, operation, maintenance and disposal procedures for water storage tanks manufactured by Pacetti Srl. Some storage tanks are built to meet customer specifications. Instructions may not be specific to every system.

Read and understand this manual before installing, operating or servicing the unit. Failure to follow these instructions and safety messages contained herein could result in damage to the product or serious personal injury. Pacetti Srl cannot be held responsible or liable for damages resulting from incorrect installation, use and maintenance.

The unit must only be worked on by suitably qualified and trained personnel in accordance with all applicable national and local regulations.

This manual must remain with the unit.

2. APPROVALS

All water storage tanks supplied by Pacetti have been designed and manufactured in accordance with Article 4.3 of the European Pressure Equipment Directive - PED 2014/68/EU (SEP - Sound Engineering Practice). When the working pressure of the equipment is below or equal to the limits set out in this Directive, it must not be CE marked.

In order to reduce environmental impact and achieve energy savings, all water storage tanks supplied by Pacetti comply, where applicable, with European Directive 2009/125/EC (Reg. 812/2013 & 814/2013). This Directive establishes the design and manufacturing requirements for Energy-related Product (ErP).

All water storage tanks supplied by Pacetti are designed, manufactured and tested according to the appropriate quality control procedures.

A Declaration of Conformity is supplied with each unit, with reference to the relevant serial number.

It is the responsibility of the designer and/or installer to ensure that this unit is installed and operated safely, in accordance with the instructions supplied within this manual and any additional statutory regulations and provisions in force in the country of installation, in order to prevent accidents and protect the environment.

3. HEALTH AND SAFETY NOTICES

The proper installation, use and servicing of this storage tank is extremely important to your safety and the safety of others.

Many safety-related messages and instructions have been provided in this manual to warm you and others of a potential injury hazard. Read and obey all safety messages and instructions through this manual. It is very important that the meaning of each safety message is understood by you and by others who install, use or service this storage tank.

	STOP Indicates that an action must not be taken or must be stopped.
	WARNING Indicates a potentially hazardous situation which, if not avoided, could result in injury or property damage.
	TIPS & ADVICE Indicates special instructions on installation, operation or maintenance that make the work easier but are not related to personal injury or property damage.

4. PRODUCT INTRODUCTION

4.1. IDENTIFICATION

All water storage tanks supplied by Pacetti are provided with a nameplate where at least the following details are specified:

- Model / Part number
- Capacity in Litre
- Serial number
- Year of manufacture
- Max. working pressure in bar
- Test pressure in bar
- Max. working temperature in DegC
- Design code / Applicable Standard

4.2. DESCRIPTION

This buffer tank must only be used in closed loop circuit. It is designed for the purpose of storing heating and/or chilled water and is not designed for use with potable water.

Any use in application other than this may cause injury, damage or shorten the life of the product.

This buffer tank is designed and built for the working conditions provided by the customer and shown on the name plate.

Pacetti cannot be held responsible for any damage as a result of any operation deviating from the original design conditions.

All storage tanks supplied by Pacetti come insulated and can be installed indoor or outdoor, depending on the type of cladding selected:

- PVC cladding insulation is suitable for indoor installation
- Aluminium cladding insulation is suitable for indoor or outdoor installation

The buffer tank can be manufactured from Stainless Steel 316L or carbon steel.

The standard range offers capacities between 200 litres and 5000 litres, in vertical or horizontal orientation, rated between 6 bar and 10 bar.

In addition to the standard range, Pacetti offers a wide range of customised solutions.

4.3. TECHNICAL DATA

Technical data for the standard range is available in the relevant brochure on the website www.pacetti.it
In the case of non-standard tanks, please refer to the approved offer and drawing.

5. HANDLING INSTRUCTIONS

The following handling and installation instructions are intended to help customers handle tanks properly and efficiently.
These instructions are to be intended as recommendations only. They do not relieve the purchaser from full responsibility for proper inspection, handling and installation. Improper handling or installation, which results in damage or tank failure, is the sole responsibility of the purchaser. Failure by the customer to comply with the handling or installation instructions will void the tank warranty. Unknown situations or conditions are also the burden of the purchaser.

5.1. IDENTIFICATION OF THE UNIT

The nameplate provides information on manufacturer, year of manufacture, part number, serial number and technical data. The nameplate is located on the tank or the tank insulation.

5.2. UNLOADING THE UNIT

All storage tanks supplied by Pacetti are designed to withstand normal handling. Each buffer tank is properly packed at the factory. The packaging is designed to provide protection for the unit during transportation, and to ensure safe handling. The unit can be unloaded using a crane, forklift, or hand truck.

Use lifting lugs where fitted. Sometimes it may be necessary to remove the top cover, whether it is a PVC cap or a black plastic or aluminium lid, to expose the lugs welded to the top dome of the cylinder. Do not lift a vessel using the insulation where fitted. Straps may crush or damage the insulation casing. Due to the insulation casing material thickness, care should be taken when moving and handling the vessel not to damage the insulation. Do not lift the vessel using chains directly in contact with the shell. Do not allow operatives to stand on the vessel.

On receipt of the product it should be carefully examined to assure the tank is as ordered and that no visible parts have been damaged during transport. If any visible parts have been damaged, contact Pacetti offices immediately to receive instructions on how to proceed.

5.3. INSPECTING THE PRODUCT UPON RECEIPT

At the time of delivery, the customer shall be responsible for inspecting the tank for damage during transit. If damage has occurred, it should be noted on the delivery receipt prior to signing acceptance, whether it be a Pacetti truck or common carrier. In the case of a common carrier, claim should be immediately filed by the customer with the delivering carrier. If the delivery is made by a Pacetti truck, the factory should be immediately contacted prior to unloading or acceptance.

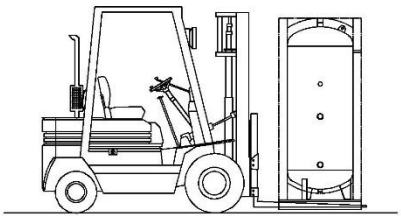
The customer accepts all future responsibility for a damaged tank if the procedures set forth are not followed. Minor damage can sometimes be repaired at the delivery site.

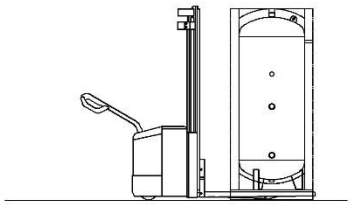
5.4. UNPACKING, LIFTING & HANDLING

Note the following handling precautions.

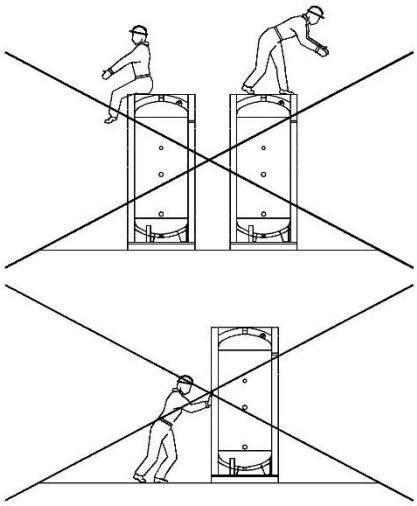
1. NEVER roll or slide a tank. Lift the tank using a crane or other approved method.
2. Operators of hoist equipment should always follow proper rigging procedures.
3. NEVER allow tank to swing out of control.
4. Do not drop or allow hard impact from tools.
5. NEVER use cables or chains around tank.
6. Use designated lifting lugs to lift the unit.
7. If tanks are being stored prior to installation, be sure to lay on padded surface and tie down securely.

5.4.1. HANDLING INSTRUCTIONS FOR VERTICAL PACKAGED UNITS



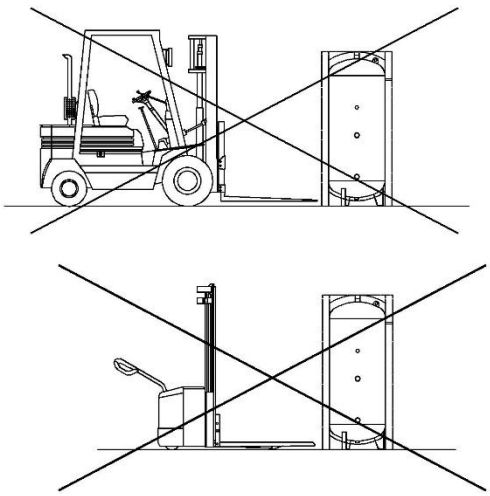


Unloading operations may only be carried out by highly qualified personnel.
As first ensure size of lifting equipment, chains, and hooks, are capable of handling the weight of the tank.
Tanks are palletized to facilitate handling by forklift. To move tank, pull on the bottom of the skid. DO NOT PULL ON THE TANK.
The tank is to be unpackaged and the pallet removed only once the unit is on the final installation place.
To take the unit off the pallet, remove plastic film (DO NOT CUT!) and the strap and/or the fixing screws, paying attention not to damage the external finish of the product or other accessories installed. Take care when removing the straps from the palletised storage cylinder as they may be under tension. DO NOT INSTALL THE TANK ON THE PALLET SUPPLIED, IT IS NOT SUITABLE TO SUPPORT THE WEIGHT OF THE TANK WHEN FULLY LOADED.

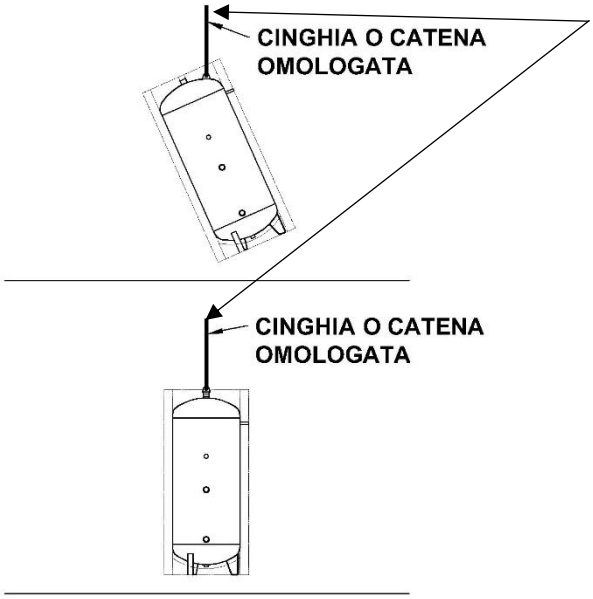


Do not climb, lean or place any weight on top of the products, as this may irreparably damage the product or the installed accessories.

Do not pull or push the tank, always use lifting tools to move it.



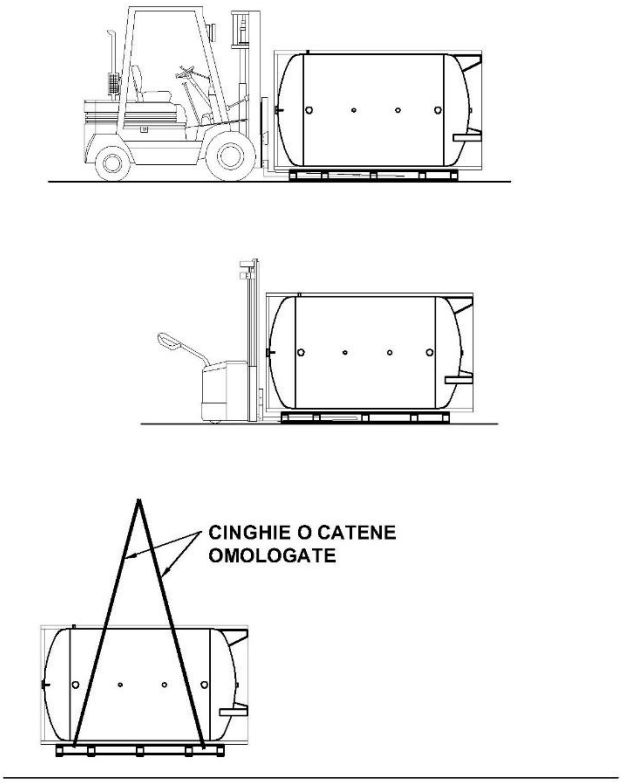
The pallet and the protective films of the packaging must only be removed after the unit has been placed in its final position.
NEVER move or lift the product without the pallet below.



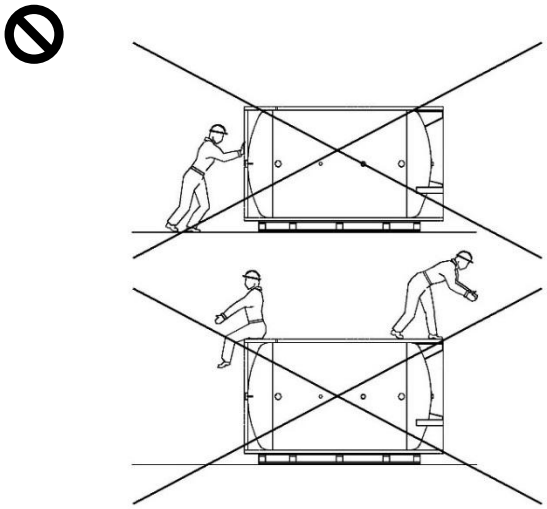
USE ONLY APPROVED CABLE OR CHAIN

To remove the pallet or strapping, lift the product using the hook welded to the top of the tank, if provided for in the approved drawing. If it is not visible, remove the top cover and squeeze the insulation foam to release the hook.
If the hook is not provided get a certified threaded lifting eyebolt of the same diameter as the upper connection and screw it to the top fitting.
Should this connection be occupied by the magnesium anode, remove it temporarily to allow the tank lifting.

5.4.2. HANDLING INSTRUCTIONS FOR HORIZONTAL PACKAGED UNITS

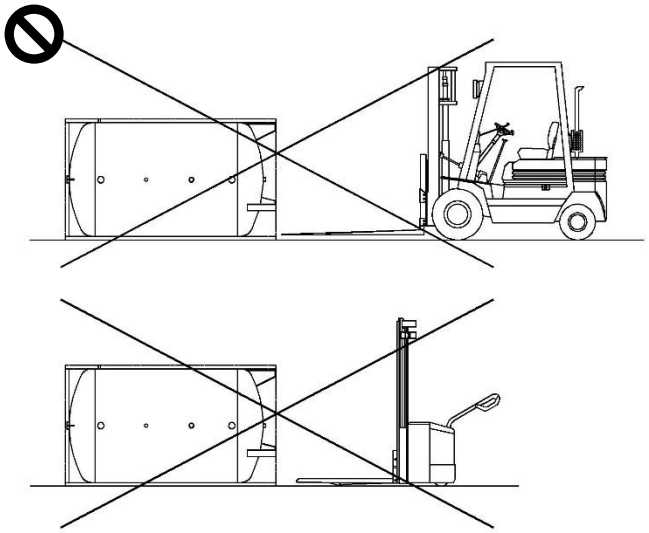


Unloading operations may only be carried out by highly qualified personnel.
As first ensure size of lifting equipment, chains, and hooks, are capable of handling the weight of the tank.
Tanks are palletized to facilitate handling by forklift. To move tank, pull on the bottom of the skid. DO NOT PULL ON THE TANK.
The tank is to be unpackaged and the pallet removed only once the unit is on the final installation place.
To take the unit off the pallet, remove plastic film (DO NOT CUT!) and the strap and/or the fixing screws, paying attention not to damage the external finish of the product or other accessories installed.



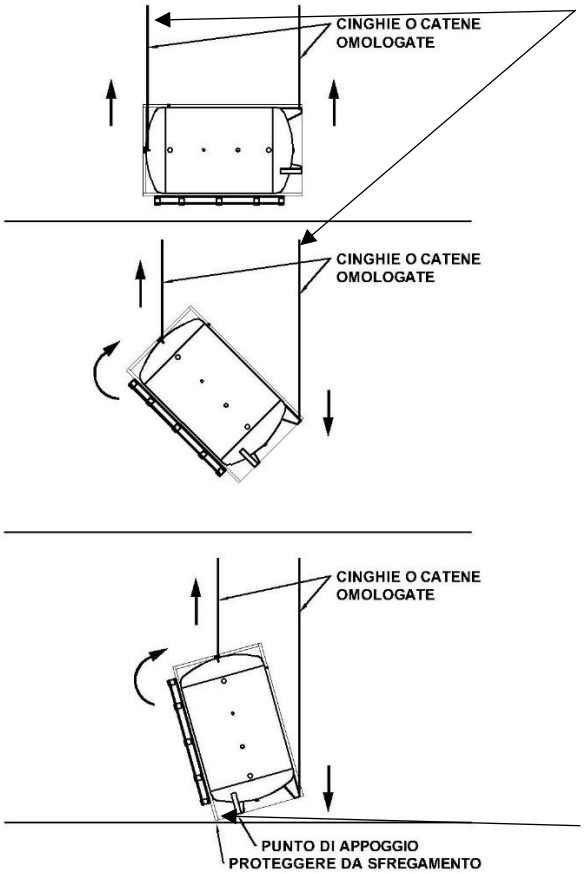
Do not pull or push the tank, always use lifting tools to move it.

Do not climb, lean or place any weight on top of the products, as this may irreparably damage the product or the installed accessories.



The pallet and the protective films of the packaging must only be removed after the unit has been placed in its final position.
NEVER move or lift the product without the pallet below.

5.4.3. UPRIGHTING INSTRUCTIONS FOR HORIZONTAL PACKAGED UNITS



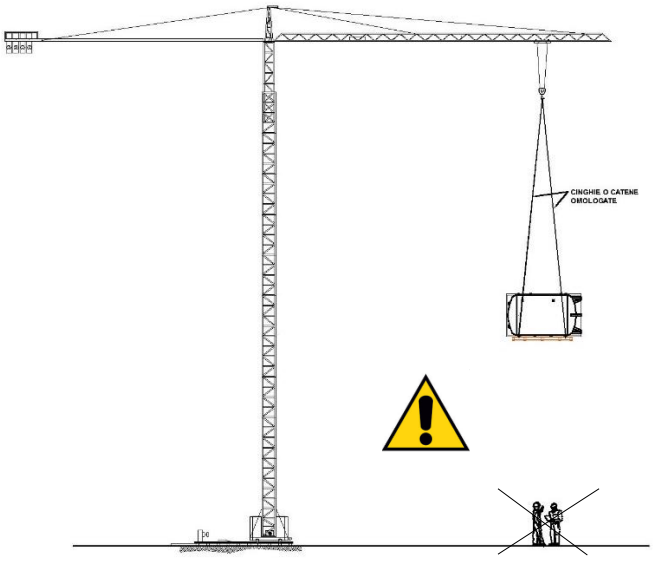
USE ONLY APPROVED CABLE OR CHAIN

To carry out the operation described above, refer to the "MULTIPLE-CRANE LIFTING" section.
The up righting of horizontal packaged units must be carried out by qualified personnel.
With the aid of two lifting devices, lift the product to a height sufficient to prevent it from hitting the ground during the operation.
At the same time, lower the product from the bottom side, raising and approaching from the top.

- DO NOT PIVOT tank on legs.
- Lift the entire tank.
- Rotate to a vertical position.
- Set straight down on all legs.

When the insulation is covering the legs, proper care should be taken to protect the pivot point by means of excessive padding.

PIVOT POINT



In case of crane handling, lift the tank VERTICALLY using the hooking system described in the "Handling instructions for vertical packed units".
If the tank is packed HORIZONTAL, anchor the lifting cables to the wooden pallet supplied without removing it and use suitably long straps to avoid damaging the external finish of the product.
Make sure that the tank is perfectly balanced during handling and that it is not subject to oscillations that could damage the pallet and cause falls or damage to the product itself. It is recommended to use an additional safety hook anchored to the welded hooks or to the legs of the tank to avoid accidental falls.
<u>Do not stand under suspended loads.</u>
Always observe the safety regulations in force.

Once positioned on site remove the packaging and the screws with which the tank is screwed to the pallet.

Risk of injury due to bruising or crushing caused by tipping over of the unit.
Ensure sufficient stability of the cylinder.

Risk of injury due to heavy weight. The tanks are heavy.
Use suitable lifting equipment to avoid the risk of physical injury and accidents.

6. STORING

This buffer vessel must be stored in a covered, dry and ventilate place, protected from rain and sun. Before siting and commissioning, whether the unit is suitable for outdoor installation or not, it must be stored in a cool place away from direct sunlight or areas where heat can be transferred to parts inside packaging. It must also be adequately protected against adverse weather.

Upon receipt, promptly remove the plastic film wrapping it to prevent moisture from forming between the insulation and the packaging.

If the tank is supplied with aluminium cladding and the plastic package is not removed promptly, the cladding may be damaged or stained. This would only be a cosmetic problem for which Pacetti will not, however, be responsible.

Used tanks must be emptied of water before storing.

7. SITING

All packaging materials must be removed from the storage tank prior to its installation.

Place the tank on its legs in vertical or horizontal position depending on its arrangement, and ensure it lays on a solid and level floor or foundation.

Foundations or plinths must be firm and level to prevent settling, pipe strain or distortion of the shell. Unless specifically ordered differently, the vessel must be installed in a level position.

Prior to positioning, the bearing capacity of the foundation must be carefully checked; it must be suitable to support the weight of the tank and its contents.

The cylinder should be anchored to the floor, following applicable architectural/local code requirements or accepted standards for the specific installation site. During the fixing down of the unit, the legs should not be welded to a base plate or structure and should always be fixed down using bolts. Use bolts, washers and nuts that are suitable for the surface of the floor or base frame. Use all bolt holes in the legs when securing the tank.

The buffer tank should be installed as close as possible to the power source, if any.

Clearance must be allowed for servicing and repairing of the tank.

The nameplate must be always accessible.

It is recommended to consider that the entire unit may have to be removed from installation later for servicing. For indoor installations, do not build walls around the tank once it has been installed and provide a door opening of sufficient size to allow the tank to pass through without having to dismantling anything.

Where damage to property can occur in the event of the storage tank leaking, it must be installed in a safe tray or the area be suitably bunded. In any case, it is recommended to install the tank near a sump or drain.

8. INSTALLATION

All plumbing works must be carried out:

- by a fully qualified person, properly trained in such products
- in accordance with the installation instructions
- in compliance with European Standards and all local codes and regulatory authority regulations.

Do not operate the cylinder at pressures or temperatures exceeding those specified on the nameplate of the vessel marking.

Make sure the cylinder is not subjected to vacuum or partial vacuum; the installation of an anti-vacuum valve is highly recommended.

Fit a properly sized expansion vessel on the cold feed line to prevent the tank being damaged by water hammer.

The buffer tank should be earthed to avoid free currents from causing damages.

Filters should always be provided to prevent any impurities in the water from circulating in the system

Plugs may be fitted to connections to protect them in transit. These must be removed prior to use. If a connection is not required, seal it appropriately. Before making any connections of water inlet or outlet to the unit, assure that all piping is clean and free from foreign material or scale. Any foreign material or scale entering the unit can adversely affect operation and performance.

Fitting locations on the cylinder may vary by product; refer to the technical brochure relevant to the selected model or the drawing in case of bespoke design.

Pipework connected to the vessel must be adequately supported to prevent any loads being transmitted to the vessel.

Use thread sealing tape or approved thread sealant on all fittings. The type of sealer should be determined by referring to local codes, accepted practices, or the requirements of the installing contractor.

It is recommended to install an isolating valve on piping connections to isolate the tank for servicing.

Fit isolation valves prior to the vessel connections to facilitate servicing – not to the air vent connection -

Provide for thermal expansion with bends and expansion joints.

For flanged connections, tighten bolts in a diametrically opposite sequence to load the flanges evenly onto the gasket (see 6.3.1).

Safety valves should have their discharge pipes away to a safe disposal point, preferably via an air-break and tundish so that the discharge unrestricted and easily visible.

It is the responsibility of the installer to equip the buffer tank with all safety accessories required by European standard and/or local regulations.

The full pipework should be insulated to reduce pipe heat losses or provide adequate freeze protection.

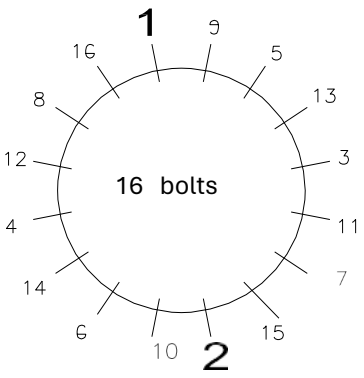
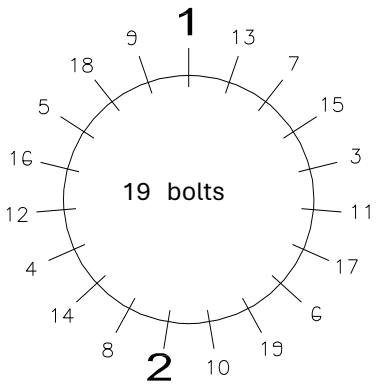
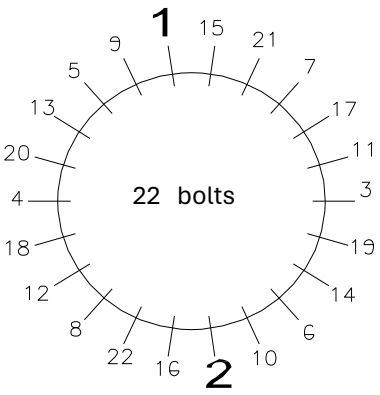
If the buffer tank is to be equipped with immersion electric heaters, their installation should be carried out by qualified person. It is responsibility of the purchaser to ensure that any relevant local codes are complied with. See section 8.3 for more details.

8.1. MANHOLE GASKETS ASSEMBLING INSTRUCTIONS

Some buffer tanks can be supplied with a manhole to allow inspection of the inside of the cylinder during routine maintenance. The diameter of such manhole may vary by product.

- Place the gasket on the flange edge ensuring it is thoroughly cleaned, mostly if you are replacing an old gasket.
- Place the cover on the flange taking care to align and centre the holes of flange, gasket and cover.
- Using a torque wrench, start tightening the screws following the below sequence and ensuring that tightening is uniform on all screws. Tightening torques differ depending on the type of rubber the gaskets are made of:
    - **EPDM** → torque setting of **70 ± 5 Nm**
    - **Graphite** → torque setting of **100 ± 5 Nm**

The following tightening sequence must be carefully followed to avoid leaks or issues.

MANHOLE GASKETS TIGHTENING SEQUENCE		
Manhole external diameter **300 mm** **16 bolts**	Manhole external diameter **380 mm** **19 bolts**	Manhole external diameter **430 mm** **22 bolts**
		

- Fill the tank and bring it to the design operating conditions (pressure and temperature). Check that there are no leaks; if there are, repeat the above operations, taking care to clean the gasket housing carefully. Once the desired tightness has been achieved, check it over time and inspect the tank periodically.

Leakage may occur at any time during the operation of the tank, but more frequently in the case of use at high temperatures or in the case of non-uniform feed, as the ageing of the material is considerably accelerated in the latter working conditions. In the case of small leaks, it may be possible to try tightening the bolts with a torque 5 Nm higher than previously used; if this does not solve the problem, the gasket must be replaced.

⚠ *Over tightening can result in cutting the gasket and allowing a water leak to occur.*

8.2. DRAIN CONNECTIONS ARRANGEMENT ON VESSELS WITH HARD FOAM PU INJECTED

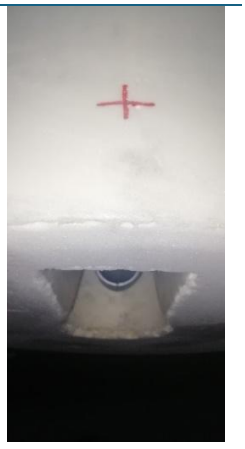
1 –Open the zip of the PVC cladding for at least 30cm from the floor.
If the insulation is provided with aluminium cladding, go directly to the next step.

2 - Place the tank horizontally, taking care not to damage the external cladding.
Rotate the tank until the dig is perpendicular to the ground, facing upwards.

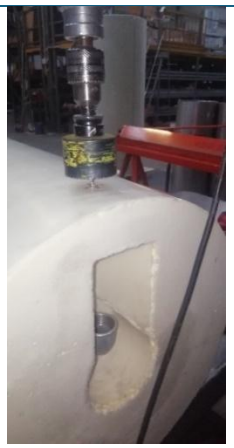
3 - Screw on an M/F threaded elbow by hand.
Apply an anaerobic sealant to the male thread to ensure hydraulic tightness.

4 - Measure the distance between the centre of the elbow fitting and the bottom of the tank using a spirit level.

5 - Measure the same distance as in the previous step on the outside of the tank, corresponding to the dig.
Mark this with a felt-tip pen as this is the position where you will drill a hole through the PU insulation.
If the cladding is aluminium, mark the position to be drilled directly on the aluminium sheet.

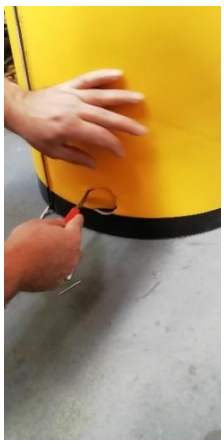


6 - Drill a hole in the polyurethane foam, starting from the felt-tip mark, inwards.
Use a hole saw with a diameter of 60÷70 mm.
If the insulation foam is too thick for the hole saw machine, proceed step by step, removing the waste material from the previous drilling at each stop.



7 - At the end, the hole should be perfectly aligned with the drain pipe.

8 - Reposition the PVC cover in its previous arrangement. Close the zip. Use a cutter to make a round hole corresponding to the hole just drilled in the insulation.
If the cladding is aluminium, carefully remove the burrs from the cut to avoid any inconvenience.



9 - Screw a male pipe onto the elbow after applying an anaerobic sealant suitable to ensure hydraulic tightness.
Wait for the times recommended by the sealant manufacturer before filling the tank.

8.3. IMMERSION ELECTRIC HEATERS WIRING INSTRUCTIONS

The electric heater has been designed and manufactured to operate in clean water. The correct functioning of the electric heater is not guaranteed if the water contains additives or acids.

In the case of particularly hard water, the limestone may deposit on the electric heater pipes, causing malfunction and overheating, resulting in reduced life or breakdown.

⚠ Frequently check that the electric heater doesn't run dry.

It's important to use the thermostat supplied with the electric heater, as this will place the temperature sensor in the best position for the heater to work properly. Do not use other types of thermostats.

In order to extend the life of the product, it is advisable to check its condition on a monthly basis and, if limescale deposits are found, to clean it with a normal anti-limescale liquid.

For correct wiring, refer to the diagram supplied with the element. Failure to wire the element correctly will invalidate the warranty.

9. COMMISSIONING

It is recommended that the tank be flushed before startup in order to clear the vessel of loose particles and material from the installation process.

At this stage it is assumed that any safety device and pressure reducing valve is already commissioned and set to the correct pressure.

Close the drain valve. Check that the drain pipework is properly screwed (in case of PU insulation see section 8.2 for specific instructions).

Start filling the tank slowly ensuring that all valves and accessories are operational.

Ensure adequate venting for air removal during filling and operation.

Check that all gaskets are effective when the unit is operating as some bolts may need to be further tightened after the tank has been first filled or from time to time (see section 8.1 for specific instructions).

Temperature sensors and pressure gauges must be carefully checked before commissioning.

No chemicals or fluids other than water, such as corrosion inhibitors or similar, should be used without first checking their compatibility with the material of construction of the tank, pipework and any other ancillary equipment in the system.

Risk of scalding in hot water buffer vessels. To avoid scalding of the skin and eyes caused by escaping hot water wear personal protective equipment.

To avoid any water hammer, open the valves gradually; sudden accelerations of fluid could cause increases in pressure many times greater than the working pressure, causing irreparable damage to the tank.

10. MAINTENANCE

Always disconnect the power supply before carrying out any maintenance of the unit.

The buffer vessels supplied by Pacetti are designed to operate efficiently with a regular maintenance programme to ensure continued high efficiency and trouble-free operation.

The first inspection should be within the first six months of operation. Once the tendency to accumulate sediment has been established, the inspection program can be modified to suit the water conditions. Typical inspection programs flush the tank at six-month intervals and clean the tank in yearly intervals.

EXPANSION VESSEL.
Regular inspection and maintenance of the expansion vessel is mandatory.

Annually check the pre-charge pressure of the expansion vessel; the same value established during the system installation must be always maintained. Restore the air cushion to the initial value in order to ensure an efficient protection of the installation from overpressure/water hammer.

10.1. FLUSHING AND CLEANING THE BUFFER VESSEL

The mineral accumulation in a tank will be in a soft sediment form that can be removed by a regular cleaning of the lower portion of the tank. Many tanks will have a hand hole or a larger manway to allow access to the interior of the tank for complete removal of accumulated sediment. If the vessel comes already insulated, an opening is provided in the exterior jacket to access the manway or hand hole. The opening will be in the bottom portion of a vertical tank and on the end of a horizontal tank.

> ⚠ ***It is imperative that the anti-vacuum valve is checked to be operational before starting to drain down to avoid any vacuuming within the vessel which would cause catastrophic failure of the shell.***

To flush the tank, follow these steps:

- Turn off electrical power to any circulating pump or other tank accessories.
- Close all isolation valves (except drain)
- Close the valve on the water outlet
- Reduce the residual cylinder pressure by manually operating the safety valve

> ⚠ *Risk of scalding if hot water is stored in the buffer vessel.*
> *Some hot water will come out when the safety valve is actuated. It is recommended to wait until the system has cooled down before proceeding.*

- Ensure that the drain located on the bottom of the tank is routed to a floor drain with adequate capacity to allow the tank to be flushed.
- Open the drain valve and allow the incoming water to flush out any soft sediments that may have formed on the bottom of the tank.

> ⚠ *Risk of scalding if hot water is stored in the buffer vessel.*
> *Use extreme caution, as the water exiting the tank drain may be hot if the system has not been cooled down beforehand.*

- Allow the drain to run until the cylinder is completely empty.
- If the tank is fitted with an inspection port, open the cover plate to check the inside of the tank; if there is still sediment in the lower part of the tank, remove it by hand with a mop or a hand tool. Use a flashlight to observe the sediment collected in the tank, if any.

> 💡 *A new manhole gasket should be acquired before beginning this procedure.*

- Use a water hose to flush the remaining sediment from the interior surfaces of the tank and ensure that all debris is removed. Scale or sediment allowed to reach other parts of the system can foul them. Ensure that the tank interior is clean before refilling the vessel.
- Install a new gasket on the manhole to prevent any possible leak.
- Before recommissioning rinse the tank thoroughly with water.

10.2. REMOVAL FROM SERVICE

The tank may be permanently or temporarily removed from service for maintenance or repair. Before proceeding, disconnect it from the system and drain it following the steps above.

> ⚠ *All fluids must be drained when the unit is out of operation to prevent issues.*

Follow the same handling instructions given at the beginning of this document.

11. DISPOSING OF THE PRODUCT

This product or parts of it must be disposed of in an environmentally sound manner in accordance with local regulations.

Where possible, remove the insulation and dispose of the insulation and the steel base tank separately. Some types of insulation may be suitable for recycling if the local waste management authority has the proper facilities to do so, while steel should always be easy to recycle.

12. WARRANTY

GENERAL CONDITIONS OF WARRANTY
rev. 0-2021

These warranty conditions may not be modified by any other oral or written agreement.

1. WARRANTY PERIOD The standard sales warranty covering Pacetti S.r.l. products is valid from the date of delivery of the goods, for a period that varies according to the model of the product purchased. If the goods are not collected, once a period of one month has elapsed since the date of notification of readiness for shipment, Pacetti S.r.l. shall issue a sales invoice and the initial warranty period will commence on that date.
2. COMPLIANCE WITH TERMS AND CONDITIONS Pacetti S.r.l. warrants its products provided that all the operating conditions described in the installation, use and maintenance manual are met and the technical specifications indicated by Pacetti S.r.l. are complied with. In addition, proper routine and special servicing operations must be carried out, as envisaged and described in the documentation provided and the customer must also comply with these general warranty conditions. The products must be installed and serviced exclusively by skilled, qualified staff, failing which the warrant shall no longer be valid.
3. LENGTH OF WARRANTY PERIOD

Years	Product type
8	Tanks, water heaters, storage tanks in stainless steel AISI 316L
5	Indirect water heaters in GLASS-LINED steel
3	Gasketed plate heat exchangers
2-5	**Extendable to 5 years upon request solely in the case of installation in plants for which the tax allowance is envisaged (*)** • Tanks, water heaters, storage tanks in CERAMFLON enamel-coated steel • Tanks, water heaters, storage tanks for technical water in untreated or galvanized carbon steel
2	• Tanks, water heaters, storage tanks in galvanized carbon steel for DHW • Dirt separator filters, excluding accessories and spare parts • Brazed plate heat exchangers • All the remaining products, purchased directly by the final consumer, in accordance with the provisions contained in Italian Legislative Decree no. 24 dated 2 February 2002 – Implementation of Directive 1999/44/EC
1	• Electric immersion heaters and electrical equipment in general • Circulators • Cartridges and spare parts for dirt separator filters

(*) See Italian Legislative Decree no. 63/13, as converted to Italian Law no. 90/13 and Italian Presidential Decree no. 917/86, art. 16-bis; Italian Law no. 449/97

4. EXTENSION OF WARRANTY PERIOD: The warranty extension service provides for the extension of the standard sales warranty covering the product from 2 to 5 years. The warranty may only be extended if the following documents are submitted: copy of any energy certification or qualification obtained, together with the online delivery receipt, valid to all effects and purposes as proof of transmission of the documents to accompany an application for the tax allowance.

5. ASSEMBLED PRODUCTS: In the case of assembled products, that is, made up of individual products, but sold as a whole, (e.g. semi-instantaneous water heaters, separator units for fireplaces, etc.) the warranty differs for each individual component and each is therefore covered by its own warranty.
6. SCOPE OF WARRANTY: Pacetti S.r.l. warrants the quality of the materials used and that its products are constructed in a workmanlike manner. The warranty provides for the repair or total replacement of the product, if it is found to be defective or malfunctioning, Pacetti S.r.l.'s prior decision on the matter being final. Following repairs/ replacement, the new product supplied shall be covered by a warranty valid for the residual term of that applying to the replaced/repaired product. It is pointed out that the cost of replacing products is borne by the customer. If Pacetti S.r.l. is not responsible for the defect complained of, all the expenses stemming from the inspection of the returned goods and any transportation costs shall be fully charged to the customer.
7. EXCLUSIONS FROM WARRANTIES: Expendable materials and parts subject to wear are not covered by the warranty. During the warranty period products which are unfit or malfunctioning will not be replaced or repaired if their condition is the result of problems caused by the following: incorrect or inappropriate design of the plant in which the product is installed; incorrect or inappropriate installation; products were ordered that are not fit for the intended purpose; installation in locations and/or environments whose characteristics are not compatible with the materials with which the products were constructed; lack of care, lack of skill, negligence or wilful misconduct on the part of the designer of the plant and/or the installation/servicing technician of the plant and/or the product, and/or the user; inadequate or improper servicing. The warranty does not cover the cost of demolition work and/or works carried out in order to transfer the product, whether incoming or outgoing, if caused by errors or shortcomings in its design or failure to follow the instructions given by Pacetti S.r.l.. Pacetti S.r.l. shall not therefore be obliged to reimburse related repair or replacement expenses, or to compensate for any direct or consequential damage of any kind and on any ground incurred as a result thereof. Pacetti S.r.l. shall not be held liable for any damage to the products resulting from fire, explosion, uprising or revolt, industrial strike, declared or undeclared war, flood, earthquake, natural disaster and/or other events.
8. TERMINATION: The warranty shall terminate: whenever unauthorised modifications are made to the materials; when, repairs are carried out during the warranty period by staff without prior authorisation from Pacetti S.r.l.; when the instructions given in the use and maintenance manual provided have not been followed.
9. SHIPMENT OF PRODUCTS UNDER WARRANTY: Products under warranty considered to be defective shall be consigned, following authorisation in writing by Pacetti S.r.l., carriage paid. The product replacements shall be sent carriage forward.
10. COMPLAINTS: any complaints must be submitted to Pacetti in writing, accompanied by a full report with photographic evidence of the relevant damage, sent within the time limits envisaged by the law, together with the model and serial number of the products under warranty. Returned goods shall not be accepted without prior written authorisation from Pacetti S.r.l. and, in any event, must be sent to the head office of Pacetti S.r.l. carriage paid.
11. RETURNING DEFECTIVE OR MALFUNCTIONING PRODUCT: If products found to have construction defects are replaced, Pacetti S.r.l. may demand that the defective products be returned, over which it shall regain ownership.
12. DELAYS: Pacetti S.r.l. shall not be held liable for any damage caused as a result of a delay in the execution of any operations to replace or repair the product covered by warranty.
13. DAMAGE OR INJURY TO THIRD PARTIES: The company shall not be held liable for any damage or injury to third parties caused by the product covered by warranty.
14. PRODUCT TYPES: according to the product type, the following specifications shall apply:
    - *14.1. TANKS / WATER HEATERS / DIRT SEPARATOR FILTERS / HYDRONIC KITS*: The warranty covers only construction defects and is subject to the following conditions:
        a. the product was not damaged during transportation and/or handling and/or installation;
        b. installation standards have been met in a workmanlike manner. The product must be installed by qualified staff, in keeping with the instructions given and regulations laid down in the technical documents provided, and in compliance with legislative provisions and specific technical standards;
        c. the product has not been tampered with, nor has any repair work been carried out without authorisation from Pacetti S.r.l.;
        d. the temperatures and maximum working pressure readings, that is, peak and not continuous readings, indicated on the identification label affixed to the product, and in the Pacetti S.r.l. technical/commercial documentation, are respected;
        e. the tank/water heater has not undergone a drop in pressure and/or water hammer;
        f. the electric and/or hydraulic mains supply is not defective and is in good working order;
        g. the tank/water heater is fitted, when envisaged, with a protective cathodic anode. This accessory is supplied with the water heaters to protect them against galvanic current. The device in question must be checked periodically and replaced immediately when wear exceeds 70% of the original state. Electronic anodes must be checked regularly to ensure that they are in good working order and properly connected;
        h. unauthorised fluids or aggressive chemical substances have not been used. In particular, chlorine dioxide or similar substances must not be used in tanks constructed in treated steel;
        i. the drinkable feed water requisites conform to Italian Legislative Decree no. 31/01, implementing EU Directive 98/83/EC.
        j. the tank/water heater must be earthed;
        k. when envisaged, a safety valve conforming to EU Directive 2014/68/EU, implemented by Italian Legislative Decree no. 26/2016, has been installed and is regularly checked;
        l. an expansion tank must be fitted, of a size compatible with the capacity and temperature of the plant, and conforming to EC Directive 2014/68/EU, implemented by Italian Legislative Decree no. 26/2016. The expansion tank must be fitted in the immediate vicinity of the tank and the cold water feed point, and must be checked periodically

to ensure that it is in good working order. No shut-off mechanisms must be fitted that could impair the operation of the expansion tank;

m. the accessories fitted are the originals supplied by Pacetti S.r.l.;
n. the product was stored under ideal conditions and protected against adverse weather before being installed, and, if the product is not fit for external use, also when being installed, the directions given on the packaging must be followed.

14.2. PLATE HEAT EXCHANGERS / HEAT EXCHANGER UNITS: The warranty covers only construction defects and is subject to the following conditions:

a. the product was not damaged during transportation and/or handling and/or installation;
b. installation standards have been met in a workmanlike manner. The product must be installed by qualified staff, in keeping with the instructions given and regulations laid down in the technical documents provided, and in compliance with legislative provisions and specific technical standards;
c. the servicing operations specified in the aforementioned manual are carried out;
d. the product has not been tampered with, nor has any repair work been carried out without authorisation from Pacetti S.r.l.;
e. no repair work has been carried out without authorisation from Pacetti S.r.l.;
f. the temperatures and maximum working pressure readings indicated on the identification label affixed to the product, and in the Pacetti S.r.l. technical/commercial documentation, are respected;
g. the fluid used are compatible with the materials with which the exchangers were fabricated;
h. safety mechanisms must be fitted conforming to EU Directive 2014/68/EU, implemented by Italian Legislative Decree no. 26/2016, and must be periodically checked;
i. the accessories fitted are the originals supplied by Pacetti S.r.l.;
j. the product was stored under ideal conditions and protected against adverse weather before being installed, and, if the product is not fit for external use, also when being installed, the directions given on the packaging must be followed;
k. the rubber gaskets have been adequately protected against wear and suitable measures are taken to ensure that they are stored correctly, protected from heat, damp and light.

14.3. ELECTRIC EQUIPMENT: The warranty covers only construction defects and is subject to the following conditions:

a. the products must be installed and serviced exclusively by skilled, qualified staff, failing which the warrant shall no longer be valid;
b. the indications given in the use and maintenance manual, supplied with the product, must be followed;
c. electrical components must be adequately protected against damage or malfunctioning, and suitable measures must be taken to ensure that they are correctly stored and/or kept and/or used, protected from heat, damp and light.