

TA

Domestic hot water storage tank

USER AND MAINTENANCE MANUAL



Domestic Hot Water storage tanks

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Bespoke solutions



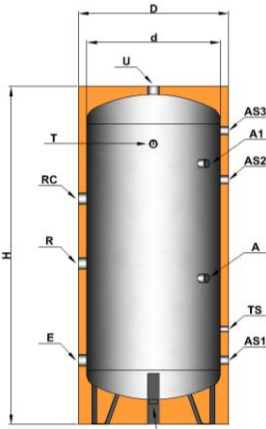
Cylinder material	<ul style="list-style-type: none"> TA-S / TA-C → Mild carbon steel TA-X → Stainless steel 316
Inside coating	<ul style="list-style-type: none"> TA-S / TA-C → CERAMFLON enamel TA-X → Pickling and passivation
Outside coating	<ul style="list-style-type: none"> TA-S / TA-C → Anti rust primer TA-X → Pickling and passivation

Characteristics	STANDARD SUPPLY	UPON REQUEST
Capacity	200 ÷ 5000 litre	> 5000 litre
Version	Vertical	Horizontal Vertical low / extra low
Connections	Threaded type	Flanged type
Insulation	PLF 50 mm (λ 37 mW/Mk)	<ul style="list-style-type: none"> PLF 75 / 100 / 120 mm Hard foam PU
Cladding	Coloured PVC with zipper fastening	Aluminium
Anode	<ul style="list-style-type: none"> TA-S → magnesium with cap TA-C → electronic TA-X → none 	<ul style="list-style-type: none"> TA-S → electronic / magnesium + tester TA-X → electronic
Accessories	<ul style="list-style-type: none"> Thermometer Inspection opening (TA-C) 	Immersion electric heaters

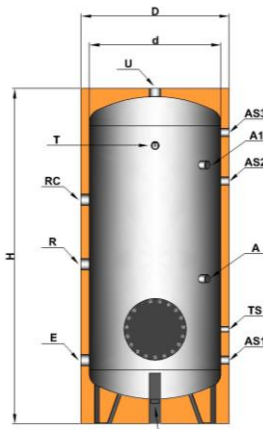
CYLINDER STANDARD WORKING CONDITIONS ⁽¹⁾			
Model	Max Temperature	Max pressure	
TA-S / TA-C	95°C	≤ 1000 l	8 bar
		≥ 1500 l	6 bar
TA-X	99°C	≤ 300 l	10 bar
		500 ÷ 2500 l	8 bar
		≥ 3000 l	6 bar

⁽¹⁾ Higher working pressure → Up to 10 bar
 Test pressure is = working pressure * 1,5 according to PED.

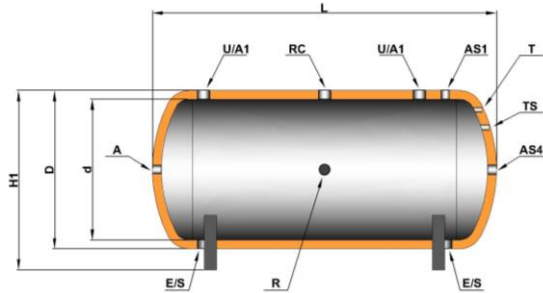
Dimensions



TA-S / TA-X
Vertical version



TA-C
Vertical version



TA-S / TA-C / TA-X
Horizontal version

Enamelled steel cylinders TA-S / TA-C					
Capacity	Dimensions (±5%)				
	D*	d	H*	L*	H1*
Litre	mm	mm	mm	mm	mm
200	550	450	1510	1410	720
300	650	550	1550	1460	820
500	750	650	1840	1760	920
800	900	800	1910	1840	1060
1000	900	800	2160	2090	1060
1500	1050	950	2470	2360	1220
2000	1200	1100	2530	2430	1360
2500	1300	1200	2600	2500	1510
3000	1350	1250	2800	2700	1550
4000	1500	1400	2880	2800	1700
5000	1700	1600	2970	2850	1890

Stainless steel cylinders TA-X					
Capacity	Dimensions (±5%)				
	D*	d	H*	L*	H1*
Litre	mm	mm	mm	mm	mm
200	550	450	1510	1390	720
300	650	550	1550	1440	820
500	750	650	1840	1740	920
800	900	800	1910	1840	1060
1000	900	800	2160	2090	1060
1500	1100	1000	2200	2100	1260
2000	1300	1200	2270	2200	1460
2500	1300	1200	2600	2500	1510
3000	1350	1250	2800	2700	1550
4000	1500	1400	2880	2800	1700
5000	1700	1600	2970	2850	1890

Connections

- A/A1 Anodes
- E Cold water feed
- U DHW return
- R Immersion electric heater
- RC Recirculation (secondary return)
- AS1 Spare fitting 200÷5000 litre
- AS2 Spare fitting 200÷800 litre
- AS3 Spare fitting 1000÷5000 litre
- AS4 Spare fitting 200÷5000 litre
- S Drain
- T Thermometer
- TS Sensor

* Subject to change depending on the insulation thickness.

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Dimensions		Capacity (litres)										
Id	u.m.	200	300	500	800	1000	1500	2000	2500	3000	4000	5000
E - E/S	inch	1"½	1"½	1"½	2"	2"	2"½	2"½	3"	3"	3"	3"
U - U/A1	inch	1"½	1"½	1"½	2"	2"	2"½	2"½	3"	3"	3"	3"
RC	inch	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
R	inch	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"
A	inch	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼
A1	inch	-	-	-	-	-	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼
T	inch	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"
TS	inch	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
AS1	inch	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼
AS2	inch	1"¼	1"¼	1"¼	1"¼	-	-	-	-	-	-	-
AS3	inch	-	-	-	-	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼
AS4	inch	1"½	1"½	1"½	1"½	1"½	1"½	1"½	1"½	1"½	1"½	1"½
S	inch	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼	1"¼
Empty weight ^(*)	kg	40	50	85	110	125	190	230	280	350	410	480

^(*) Indicative value, valid only for transportation and handling purposes

Treatments for corrosion protection

Corrosion is a spontaneous electrochemical process that causes destructive alteration of metallic materials by degrading their physical and chemical properties.

The electrical potential difference between metals or between different micro-areas of the same metal (due to changes in chemical composition), the presence of impurities such as sulfur or phosphorus, the internal or external voltages due, for example, to stray currents coming from electricity grid or railway, are the major causes of corrosion of metallic materials.

In structures composed of multiple metals in contact each other or immersed in a liquid, a system comparable to the Volta pile is created, in which the metal having a lower value of reduction potential is corroded.

Other elements that cause corrosion and oxidation are water, acids coming from the environment, alkaline or saline solutions and gases.

CERAMFLON ENAMELLING

The anti-corrosion treatment "CERAMFLON" is an innovative system of steel protection introduced by recent developments in resins.

The treatment has the following characteristics:

- The enamel used is inert and not subject to corrosion due to its high resistance to aging
- It is waterproof and impermeable to moisture and steam
- It has virtually no moisture absorption and the thermal stability is maintained at both high and low temperatures, so that excursions from -5 ° C to +95 ° C are well supported by this enamel, even with frequent cycles of maximum stress
- High impact resistance and very low friction coefficient allow to prevent dangerous phenomena of adhesions, which are due, for the most cases, to calcareous deposits
- Low dielectric constant, which remains constant despite changes in operating temperatures

The treatment is processed in the following phases:

- Sandblasting and phosphating of internal surface of the tank
- Cleaning with demineralised water and drying
- Application of polymers and polymerization
- Application of resins
- Cooking in the oven at ~ 200 ° C for 20 minutes

METAL PICKLING

The hot water cylinders made of stainless steels are treated with pickling and passivation processes, after manufacturing and testing phases. Thanks to this treatment all the stainless steel tanks are suitable for contact with sanitary water.

Cathodic protection

Corrosion of a metal structure occurs mainly in areas where there is a passage of current (redox process) from the structure to the external medium (water or gas) causing a dissolution process of the structure itself.

Considering the importance of protecting the metal from corrosion, the systematic control of the anode and the immediate replacement in case of consumption is strictly recommended.

Cathodic protection using magnesium sacrificial anode (optional)

The use of magnesium sacrificial anodes is a simple and economic method to obtain cathodic protection.

The sacrificial anode creates a situation similar to the one occurring in electric batteries, in which the anode itself and the metal structure to be protected have the function of electrodes.

Since magnesium has a dissolution voltage much higher of other metals, corrosion will affect only the anode, which will slowly fade in favor of the metal structure to be protected.

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Cathodic protection using impressed current electronic anode (standard)

As an alternative to galvanic systems (combination of materials with different electrical potential) another protection method is available, consisting in imparting to the metal structure to be protected a direct current equal and opposite, obtaining this way the neutralization of voltages formed inside the tank.

Thanks to modern techniques, an innovative cathodic protection electronic system is available, by impressing direct current.

Main advantages are:

- active protection by impressing direct current from an external source
- excellent operational flexibility, for respond to different types of internal lining and to variable mass of water
- maintenance costs reduction due to the permanent protection of the system

Thermal insulations

HARD POLYURETHANE FOAM

Hard foam polyurethane injected

Insulation made of hard polyurethane 55mm thick with closed cells content higher than 93%. It's injected directly on the tank enclosed inside a cylinder mould. It's self-extinguishing according to ISO 3582 (class B2, DIN 4102), density of 40÷42 kg/m³, average conductivity of 0,019 W/mK at 45°C. CFC and HCFC free.

Removable hard foam polyurethane semi-shells

Insulation made of hard polyurethane 55mm thick with closed cells content higher than 93%. It's composed of two removable semi-shells. It's self-extinguishing according to ISO 3582 (class B2, DIN 4102), density of 40÷42 kg/m³, average conductivity of 0,019 W/mK at 45°C. CFC and HCFC free.

Thickness	Density	Thermal conductivity coefficient at 45°C
55mm	40÷42 kg/m ³	$\lambda = 0,019 \text{ W/mK}$

PLF – POLYESTHER FIBER

Polyester fiber

Insulation made of soft polyester fiber 50mm foam, density of 20 kg/m³, average conductivity of 0,037 W/mK at 45°C. CFC and HCFC free. According to DPR 412/93, implementation of Italian Law 10/91.

Thickness	Density	Thermal conductivity coefficient at 45°C
50mm	20 kg/m ³	$\lambda = 0,037 \text{ W/mK}$

External finishing is made of coloured PVC cover with zipper closing.

Compliance

“Pacetti” hot water cylinders for storage and production of Domestic Hot Water of for heating systems are made with automatic welding processes, using DD11 pickled carbon steels or 316L stainless steel.

All manufacturing processes are guaranteed by the Quality Management System of the Company, certified to ISO 9001:2008.

The products, in all versions, are subjected to hydraulic tests at a pressure equal to 1.5 times the maximum working pressure.

All “Pacetti” products are designed, manufactured and tested according to an accurate engineering practice (Law 46 of 05/03/1990 – material constructed in a workmanlike manner) and comply with the following standards:

- **European Pressure Equipment Directive 97/23/CE – Par.3.3** (pressure vessels) for which the tanks enclosed in this catalogue must be considered exempt from CE mark.
- **Ecodesign requirements for energy-related products – Directive 2009/125/EC**
- **D.M. 174/04 or EC 1935/04 Regulation** (on materials intended for food contact)
- **D.P.R. 412/93** implementation of Italian Law 10/91

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1. WARNINGS

This instruction manual is an essential part of the product and must be given to the final user.

Carefully read the suggestions contained in this manual, as they provide important information about installation, use and maintenance of the product. Keep this manual for future reference.

The installation must be made in accordance with current regulations, according to the manufacturer's instructions and must be carried out by qualified personnel only, in order to keep warranty valid.

A wrong installation can cause damages to people, animals and things.

The manufacturer will not be responsible for any damage caused by a wrong installation.

This cylinder is designed to store domestic hot water, therefore it must be connected to the heating system, the water mains and the domestic hot water distribution network.

The use of the product for purposes other than those specified in this manual is forbidden.

The manufacturer will not be responsible for any damage caused by misuse, incorrect or unreasonable use.

The packaging must be disposed according to local regulations.

To clean the exterior of the cylinder, use a cloth dampened with a proper cleaner.

The use of abrasive or solvents is not recommended.

Disconnect the unit from any power source before carrying out any assistance or maintenance operation.

In case of malfunction should shut off the unit and ask for the intervention of the installer.

2. INSTALLATION

THIS OPERATION MUST BE MADE SOLELY BY QUALIFIED PERSONNEL, PENALTY THE LOSS OF WARRANTY.

2.1. FIRST CHECK

This cylinder has been designed, manufactured and tested for the storage of domestic hot water within the limits of temperature and pressure indicated in the chapter "technical data" and on the id label applied on the product itself. Any use beyond the allowed limits should be considered dangerous and not suitable.

2.2. PLACEMENT

- install the cylinder sheltered from the weather
- install the cylinder as close as possible to the primary heat source
- install the cylinder on a flat surface of suitable strength, able to support the weight of the product once filled with water
- check that there is enough space around the tank in order to perform future maintenance
- verify that the room where the tank is located has openings of a size to allow the free passage of the cylinder, in case it's necessary to bring it out, in order to avoid any demolition.

2.3. START

- The connection diagram shown in this document is purely indicative and not binding. it's up to the designer of the system to choose the best connection scheme for the required application, in accordance either with the applicable regulations and with the limits imposed by the data declared by the manufacturer.
- The connection to the water mains must be done through a safety hydraulic kit including:
 - 1 shut-off valve
 - 1 check valve
 - 1 safety valve
 - 1 stop device of water supplyall the above accessories are necessary to make the tank installation safe from dangers
- provide the system of an expansion vessel including a relief valve (of counterweight or spring type) having a diameter not less than $\sqrt{V/5mm}$ where V is the volume in litres of the cylinder, with a minimum of 15mm. The valve must be set at a pressure not exceeding the maximum working pressure of the tank
- make sure that the volume and the pre-charge pressure of the expansion vessel of the secondary circuit are suitable for the installation
- if the sanitary water system exceeds the maximum pressure allowed for the cylinder, install a pressure reducer as far away as possible from the storage tank
- in case the calcium value of the water coming from mains is too high, install a properly sized softener (before the storage tank)
- in case impurities are contained in the water coming from mains, install a suitable filter
- make sure that the pumps have enough flow and head and work correctly
- make sure that the thermometer and thermostat probes are positioned correctly
- always perform the grounding of the tank
- in case the users are many, located far from the unit, and require discontinuous supply of water, the installation of a recirculation pump is suggested, in order to keep constant the temperature of the domestic hot water. This way it's possible to avoid long waits and waste of cold water
- the insulation of the connecting pipes is always recommended in order to avoid unnecessary heat loss

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2.4. OPERATION

- the operation must be performed by qualified
- open a tap to let the air out while filling the cylinder with cold water from mains
- adjust the temperature of the domestic hot water by means of the regulation thermostat.
It is suggested to set the temperature between 50°C and 60°C.
The maximum working temperature must comply with the rules relevant to the reduction of energy consumption.
- frequently check that all the regulation and control devices work correctly

3. MAINTENANCE

Some days after the first start, check the tightening of the inspection flange bolts. It can be easily accessed by removing the plastic cap.
Always disconnect the power supply before carrying out any operation on the unit

3.1. CATHODIC PROTECTION

- **MAGNESIUM ANODE**
Frequently check the anode status; its consumption is strictly connected to the water quality.
The magnesium anode must be checked at least every 6 months and must be replaced immediately in case of need, with an original spare part.
The missing check and replacement of the anode will invalidate the warranty.
In order to replace the anode follow the below steps:
 1. Turn off the pumps
 2. Switch off the power
 3. Close the cold water supply
 4. Discharge the pressure from the system by opening the hot tap water
 5. Let out the water of the tank from the drain connection
 6. Replace the magnesium anode with a new one, if necessary
 7. Close the drain connection
 8. Close the hot tap water
 9. Open the cold water supply
 10. Switch on the power
 11. Turn on the pumps
 12. Check that everything works correctly and there's no water loss
- **ELECTRONIC ANODE**
This device is not subject to wear. It must be connected to the main power from which it absorbs only 3 W.
The titanium anode immersed in the tank is electrically fed by the device but is not consumed.
Be sure the power is correctly and constantly connected. Short power interruptions are not dangerous and don't cause any damage.
Long power interruptions (days or weeks) compromise the correct working of the electronic anode.

3.2. EXPANSION VESSEL

- frequently 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

3.3. CLEANING

- To clean the exterior of the cylinder, use a cloth dampened with a proper cleaner
- The use of abrasive, solvents, gasoline or alcohol is not recommended

4. DEFECTS AND FAILURES

PROBLEM	CAUSE	SOLUTION
Excessive pressure inside the tank	<ul style="list-style-type: none"> • lack of the expansion vessel • the air cushion pressure of the expansion vessel is not enough 	If the pressure increases during the heating step, verify that the system is equipped with an expansion vessel. If the expansion vessel is present, check that the pre-charge pressure is set correctly (it must be restored to the initial value, slightly less than the one of the pressure reducer)
Water loss from inspection hole	<ul style="list-style-type: none"> • the bolts are not tightened correctly • the gasket is damaged 	Tighten the bolts Replace the gasket
No start of primary circuit pump	The probe is missing or malfunctioning	Check that the probe is properly inserted and working correctly
	The thermostat is not working	Replace the thermostat

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5. **FINAL DISPOSAL**

At the end of its life cycle, this product must not be treated as household waste.
the metallic components should be sold to operators authorized to the collection of materials for recycling.
the non-metallic components should be transferred to operators authorized to their disposal.

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