

## 1 – DESCRIPTION AND USE

The expansion vessels which these instructions refer to have been designed and manufactured for the purpose of allowing the expansion of not potable water and the pressure control in closed hydraulic heating systems and in refrigerating systems; these vessels cannot be used for the production of sanitary / potable water. The vessels incorporate a flexible synthetic diaphragm to keep the system water or fluid from contacting the sealed in air cushion in the tank.

## 2 – TECHNICAL CHARACTERISTICS

The technical characteristics of the expansion vessel are written on the technical drawing and on the identifying label applied to each product; among them, the most important information are: product identification, vessel volume, maximum working pressure and temperature, pre-charge pressure, production year, serial number.



Any use at sustained or instantaneous pressure and temperatures exceeding the prescribed limits is **unsafe and can cause reduced vessel life, property damage, serious scalding and/or bodily injuries or result in death**. The vessel may be utilised in systems having a maximum working temperature as specified, providing all the means that ensure the temperature on the vessel is 70 °C at maximum (installation in the coldest part of the system, thermostatic control and so on). About the minimum temperature, the vessels may work, using proper antifreeze as ethylene glycol (with a percentage up to 40%), at a temperature not lower than -10 °C. Due to the toxicity of such substances, the vessels may not be used for the production and storage of sanitary / potable water. Moreover, all the proper means and precautions for avoiding dispersion in the environment and possible poisoning must be adopted; please, refer to local safety, occupational, health and environmental codes and standards.



Before the installation, it is mandatory to calculate and to choose the correct type of vessel according to the system design, specifications, instructions and operation requirements. Only qualified and licensed technicians may perform the calculation and the choice of the vessel according to local codes and standards and the rules contained in the present specification. Only qualified and licensed personnel may install, operate and service the vessel in accordance with system design, specifications and instructions, operation requirements and local thermal, plumbing, and electrical codes and standards. Moreover, all local safety, occupational, health, environmental applicable codes and standards must be followed. All instructions must be carefully read before installing, operating and servicing this expansion vessel. After the installation, these instructions must be kept for future reference.

## 3 – WARNINGS

- The system in which the expansion vessel is installed must have a pressure-limiting device (pressure relief valve).

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- The label is firmly applied to the vessel and must not be removed tampered or changed.
- If the label on the ZILMET vessel is missing or the technical characteristics on the ZILMET label are not readable, please do not install the expansion vessel: please contact directly ZILMET by phone at +39 0497664901 or by e-mail at [zilmet@zilmet.it](mailto:zilmet@zilmet.it)
- To prevent corrosion due to stray and galvanic currents, the boiler and the connected system must be grounded properly according to local electrical and plumbing codes and standards.
- Other possible causes for pin holing and corrosion phenomena have to be considered, for instance, water characteristics (included its temperature), presence of oxygen, melted salts, the use in the same system of devices made of different materials (e.g. carbon steel and stainless steel, carbon steel and copper). All of these factors have to be considered by the manufacturer of the complete system and by the personnel in charge for the installation and maintenance, taking into account also all the local plumbing, electrical and safety standards and regulations.  
**The use of corrosion inhibitors and system cleaning products is recommended.**

- Do not use this vessel with the following fluids:
  - a) chemicals, solvents, petroleum products, acids or bases different from the allowed additives, or any other substance that may be detrimental to the vessels itself (for example degreasers, mineral oil, vegetable oil, heptane, butyl glycol)
  - b) classified according to Table 1.1, part 1.1.2 Annex VI in Regulation (EC) N ° 1272/2008, in particular with fluids classified as explosive, extremely flammable, highly toxic, toxic and oxidising.
- Do not use this vessel with water containing sand, clay or other solid substances that may damage the vessel (particularly the internal coating) and / or clog its connection.
- Proper means must be provided for preventing the air from accumulating, during the working of the system, in the chamber of the vessel (water side) connected to the system.
- The vessel and the connected system must be protected against below freezing temperatures, for instance using proper antifreeze or installing the vessel in suitable areas.
- Do not use this expansion tank for any other purpose that it has been intended for.
- The expansion vessel, piping and connections may in time leak. Therefore it is necessary that the boiler in which the vessel is installed is placed in an area in which an adequate system to drain and discharge water from the safety valve is present (conveyed valve) so that any leakage will not damage the surrounding area and will not cause scalding injuries. Moreover it is not allowed to use an automatic water filling system. **The manufacturer shall not be responsible for any water damage to people and/or things and properties in connection with this expansion vessel.**
- The manufacturer of this vessel shall not be responsible for any possible damage to things and property and / or injuries to persons due to improper transport and/or handling of the tank itself.

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- It is forbidden to drill, open, heat with flames or tamper with the vessel in any way.
- Make sure that the system layout allows for future maintenance and provides sufficient working space around the system to allow for replacement of components whenever necessary.
- If vibration is likely to occur in the vicinity, proper means must be provided in order to insulate the expansion vessel from vibrations (e.g. installation on a resilient mount).
- The vessel disposal must be done only at selective waste collection authorised centres, according to the local codes and standards.

### 4 - GENERAL INSTRUCTIONS FOR INSTALLATION

- Make sure all the suitable and required lifting and transport means are used and all the precautions are adopted when positioning and installing this expansion tank.
- Install this vessel only inside the boiler.
- Depending on the model, the weight of the expansion vessel filled with water is supported by the boiler piping. Therefore, it is important that, where appropriate, the piping has suitable supports (strapping, hanger, brackets).
- Shut off the electric power and the water supply to the system. Make sure the system is cooled and not pressurised for avoiding scalding and / or serious bodily injuries.
- Before the installation, put again remove the plastic cap on the air valve of the vessel and check for the correct factory set pre-charge (with a tolerance of  $\pm 20\%$ ) with a controlled manometer; put again and tighten the plastic cap on the air valve.
- Install the vessel at the point specified by the instructions of the boiler's manufacturer, preferably in vertical position and with the connection in downward direction and on the runback piping.
- Adequate care must be adopted for avoiding water-hammering (e.g. a needle proportional valve must be used for filling the system).
- After the installation of the vessel and the re-start of the plant, check it for leakage and ensure the air is properly removed from the system. Check to make sure that the system pressure and temperature are within a safe operating range; if necessary, remove system fluid to bring the system pressure within safe limits and/or adjust the temperature control up to the desired ending temperature.
- Do not over-tighten the threaded connection (G 3/8" 25 +/- 2 Nm, G 1/2" 18 +/- 2 Nm, G 3/4" 25 +/- 2 Nm).

Please, note the above described installation is just a reference procedure and for this reason must be used taking into account the specifications and instructions of the boiler on which the vessel is installed, the system design, the operation requirements and the local codes and standards.

### 5 - MAINTENANCE

Please, note that only qualified and licensed personnel may perform service and maintenance.

- To perform maintenance and control, make sure the system is off, cooled and not pressurised, all the electric parts are not energised and the vessel is completely empty.
- In the case the expansion vessel has been correctly calculated and sized, it has to be verified at least once per year, checking that the pre-charge is within the value indicated on the label with a tolerance of  $\pm 20\%$  (at 20 °C), if not otherwise stated. In the case of under-sizing of the expansion vessel, the frequency of controls has to be increased accordingly.
- This expansion vessel includes components which undergo stresses; in the case such components should deteriorate in time, the vessel must be replaced.
- Use only ZILMET original spare parts.

**ZILMET shall not be responsible for any damage to things, property and / or injuries to persons due to not observing all the above instructions and, particularly, to improper calculation and choice, installation, operation and maintenance of the tank itself and / or the connected system.**