Expansion Tanks
User Manual

Tanpera®

Project	:
Customer	:
Heat Exchanger Type	:
Serial No	:
Year	:

The information in this document is based on the most up-to-date information and production materials available at the time of preparation for publication. Therefore, due to the rapid developments in this field, we accept no responsibility for changes in technical specifications that may affect the content of this document.

Copyright

Contents

1. What Is an Expansion Tank? — 3

2. Operating Principle — 4

3. Liability and Warranty Terms — 4
3.1. Situations Outside the Scope of Warranty — 5
3.2. Warranty Period — 5

4. Warnings and Safety — 5-6

5. Scope of Delivery — 7

6. Product Appearance / Product Components — 8

7. Technical Specifications — 9

8. Product Label — 10

9. Product Notation and Descriptions — 11

10. Table of Product Model Names and Technical Data — 11

11. Installation and Connections — 12
11.1. Preliminary Preparations — 12
11.2. Hydraulic Installation and Connections — 13
11.3. Post-Installation Checks — 15

12. Commissioning — 16
12.1. Preliminary Checks for Commissioning — 16
12.2. Setting the Pre-charge Gas Pressure and Initial Operation — 16

13. After-Sales Services — 17
13.1. Service Scope and General Information — 17
13.2. Authorized Service and Maintenance Services — 18
13.3. Spare Parts Supply — 18

14. Cleaning and Maintenance — 18-19

15. Possible Problems and Solutions — 21

1. What Is an Expansion Tank?

They are used to ensure the safety and efficiency of closed-circuit heating and cooling systems. Their main task is to balance the pressure fluctuations that occur as a result of the water in the system expanding (volume increase) or contracting (volume decrease) with temperature changes. Thanks to its internal membrane structure, it keeps the pressure within the desired range by temporarily storing excess water volume or by forcing the lost water back into the system. In this way, it protects the installation, the boiler, and the pumps, and prevents water loss and energy waste.

Pressure Balancing: It keeps the system pressure constant within a specified range during heating and cooling cycles. Installation Protection: It extends the system's service life by preventing the damage that high pressure would cause to the boiler, pump, pipes, and fittings.

Membrane Structure: The durable membrane separating the installation water from the air provides long-lasting and efficient operation.

Corrosion Prevention: By keeping the system closed, it prevents oxygen ingress and therefore helps reduce rusting.

General Features

- It is suitable for use as an expansion and contraction tank in closed heating and cooling systems to balance the increase and decrease in the volume of water caused by temperature changes.
- In booster pumps, it is suitable for use as a pressure-storage and shock-absorbing tank, with the aim of reducing energy consumption and increasing comfort of use by reducing the number of system switching cycles, and damping shocks and pressure fluctuations in the system.
- It is offered to our customers in various capacities from 24 liters to 5000 liters.
- It is manufactured as standard at operating pressures of 10 bar and 16 bar.
- It is suitable for use at water temperatures between -10°C and +90°C.
- It has a replaceable-type membrane made of hygienic EPDM material that does not impart odor to the water.
- It is ready to be installed in the system with a ready-made connection pipe dimensioned to suit the tank volume and fitted with a drain plug.
- **To monitor the gas pressure inside, tanks larger than 100 liters have a pressure gauge protected against impacts.**
- Before delivery to the customer, it is tested under a pressure of 1.3 times the operating pressure.

2. Operating Principle

The operating principle of the expansion tank is based on continuously balancing the volumetric changes of water by means of a flexible membrane and a compressible gas cushion (air).

Inside the tank there is a membrane that separates the system water from the pressurized gas. When the water in the system heats up, it expands, and this increasing volume fills the tank and pushes the membrane toward the gas cushion; the gas compresses and absorbs this pressure increase. When the system cools down, the water contracts; this time the compressed gas cushion in the tank expands, pushes the membrane in the opposite direction, and forces the stored water back into the system.
This continuous, two-way "breathing" movement protects the installation pressure against both dangerous rises and drops that would create a vacuum, ensuring that the system always operates within a stable and safe pressure range.

3. Liability and Warranty Terms

To avoid bearing the costs of repair and product replacement, we recommend that installation and maintenance work be carried out by suitably trained persons. For the cleaning and maintenance of your products, fault repair, and the supply of spare parts such as the membrane, you can contact the TANPERA After-Sales Services Unit (www.tanpera.com.tr). All products sold by TANPERA are under the warranty of TANPERA A.Ş. for a period of 24 months from the invoice date, within the "Warranty Conditions" stated below.

- The warranty covers material, workmanship, and manufacturing defects of the products.
- The decision as to whether a fault occurring in a product within the warranty period falls within the scope of the warranty is made by our company's After-Sales Services Department after the necessary technical inspection has been carried out.
- No fee is charged under the name of spare parts, labor, transport, or travel, or under any other name, for any operation carried out within the scope of the warranty.
- All authority and responsibility regarding the method to be applied for repairing the fault covered by the warranty and the determination of the parts to be replaced belong to our After-Sales Services Department.
- The fault repair can be carried out at the location of the product, at our company's central technical service, or at a service organization authorized by us. Our After-Sales Services Department is authorized to decide on this matter.
- If, within the warranty period of the product and in accordance with the warranty conditions, the same fault recurs, or if the time to repair the fault exceeds 30 calendar days, the customer has the right to request that the product be replaced with a new one.
- If a fault occurring in the product within the warranty period falls outside the scope of the warranty due to the reasons defined below as user error, the cost of the spare parts used for fault repair and the service fee are invoiced to the customer.

3.1. Situations Outside the Scope of Warranty

- Products that have suffered external physical damage during transport, storage, etc.
- Products that have been previously tampered with by persons and organizations not authorized by TANPERA.
- Products that, although requiring commissioning, have not been commissioned by our After-Sales Services Department or a service organization authorized by us.
- Products containing spare parts of unknown origin and that are not original.
- Products that have failed due to chemical agents and other unsuitable environmental conditions.
- Products damaged due to factors such as fire, flooding, freezing, etc.
- Products exposed to pressure or temperature conditions outside the operating pressure and temperature limit values stated on the label.
- Products that have failed due to the physical and chemical properties of the fluid because an incorrect fluid other than the design fluid was used.
- Products damaged due to fluid contamination (solid particles such as rust, welding burr, organic matter, etc.) or hardness (limescale).
- Products damaged by being exposed to water hammer caused by the fluid.
- Products not protected against pressure shocks by a safety valve of the qualities specified in the installation and operating manual and in working order.
- Damage occurring in products used in spaces at temperatures below +5°C or above +50°C, in excessively humid environments, in excessively corrosive environments, and in outdoor conditions is outside the scope of the warranty.

3.2. Warranty Period

- The warranty is valid for 2 years from the invoice date.
- For commissioning and annual maintenance operations, please contact the Tanpera Service Center.

4. Warnings and Safety

All potential personnel injury risks are indicated with the safety caution symbol.

The following causes may result in physical harm to personnel;

- Burns resulting from contact with the unit or another part of the installation;
- Burns and injuries resulting from the uncontrolled spurting of pressurized fluid;
- Burns and injuries resulting from the tank exploding;
- Contact with the sharp edges of the tank.

WARNING

Your unit may be damaged for the following reasons.

- Externally applied physical loads and forces;
- Corrosion;
- Chemical interaction;
- Wear;
- Material fatigue;
- Water hammer;
- Thermal and/or mechanical shock;
- Freezing;
- Incorrect handling/lifting.

Warning: The expansion tank must be continuously checked from the outside. Tanks that are damaged, have lost their structural integrity, or have corroded pose a risk of explosion and create a danger of serious damage and personnel injury/death. In such a case, the system must absolutely be stopped, all electrical devices in the system must be switched off, the tank pressure must be released, and the tank must be removed from the system and replaced with a new one.

- The chemical and physical nature of the fluid to be used in the unit must comply with the Group 2 fluids defined in Article 16 of the Pressure Equipment Directive (2014/68/EU), published in Official Gazette No. 30349 dated 03.03.2018. The vapor pressure of the fluid at its maximum operating temperature must not exceed "atmospheric pressure + 0.5 bar".
- The physical and chemical properties of the water in the system are very important for the service life of the product and trouble-free operation. Therefore, before the tank is commissioned, the system water must be checked for corrosive substances such as chlorine, acid, dissolved salts and oxygen, as well as solid particles such as clay, sand and welding residue and other contaminants, and must be filtered and/or treated if necessary.
- If the product (while filled with water or a water-based fluid) is exposed to sub-zero temperatures before being commissioned, it may be damaged by freezing.
- If there is a risk of freezing, the fluid inside the unit must be completely drained.
- Sudden pressure and temperature changes must be prevented by means of precautions taken in the installation.
- Even after the installation has been taken out of service, some parts may still be hot! Therefore, wait for it to cool down before working on it.
- If welding is to be carried out near the product, the tank must never be used for grounding. Electrical current can cause serious damage to the product. If you must weld on the installation, disconnect the connections and isolate your unit from the system.

Safety Caution Notice: The following rules must always be observed during the installation/operation/maintenance of the expansion tank;

- Comply with all local laws and regulations regarding occupational health and safety.
- Before starting any work on the unit, make sure it is not under pressure and has been cooled below 40°C.
- In all applications, make sure that all laws and regulations regarding the protection of people and the environment are observed.

Apart from those listed above, faults and damage occurring in expansion tanks used with unsuitable fluids are outside the scope of the warranty.

5. Scope of Delivery

The scope of delivery is described in the shipping document. Immediately after receiving the product, carry out the necessary checks for material,

Transport

- Depending on their size, the products are shipped either in cardboard packaging or placed vertically or horizontally on a pallet according to their dimensions.
- During transport, the products must be handled so that they cannot tip over, be crushed, or get wet. Care must be taken when unloading the products from the vehicle; they must be handled so they cannot fall or tip over, and, when necessary, moved to the storage or installation area using handling equipment (forklift).
- Depending on its size, the expansion tank has a lifting ring or lifting eyebolts. The tank can be lifted and carried using this lifting ring or eyebolts. In this case, attach the lifting ropes to the ring/eyebolts as shown in the photographs.

Storage

- The products must be stored in a dry and well-ventilated environment.
- Precautions must be taken against the products tipping over due to a possible earthquake or other causes.
- The products must be stored so that no load is placed on them and no object can fall onto them.
- If the unit must be stored for a long time without being installed, it must be kept on its pallet with its bubble-wrap packaging unopened, in an enclosed place that is never exposed to outdoor weather conditions.
- If the unit is to be taken out of service for a long period, precautions against freezing must be taken and the water inside must be drained.

6. Product Components

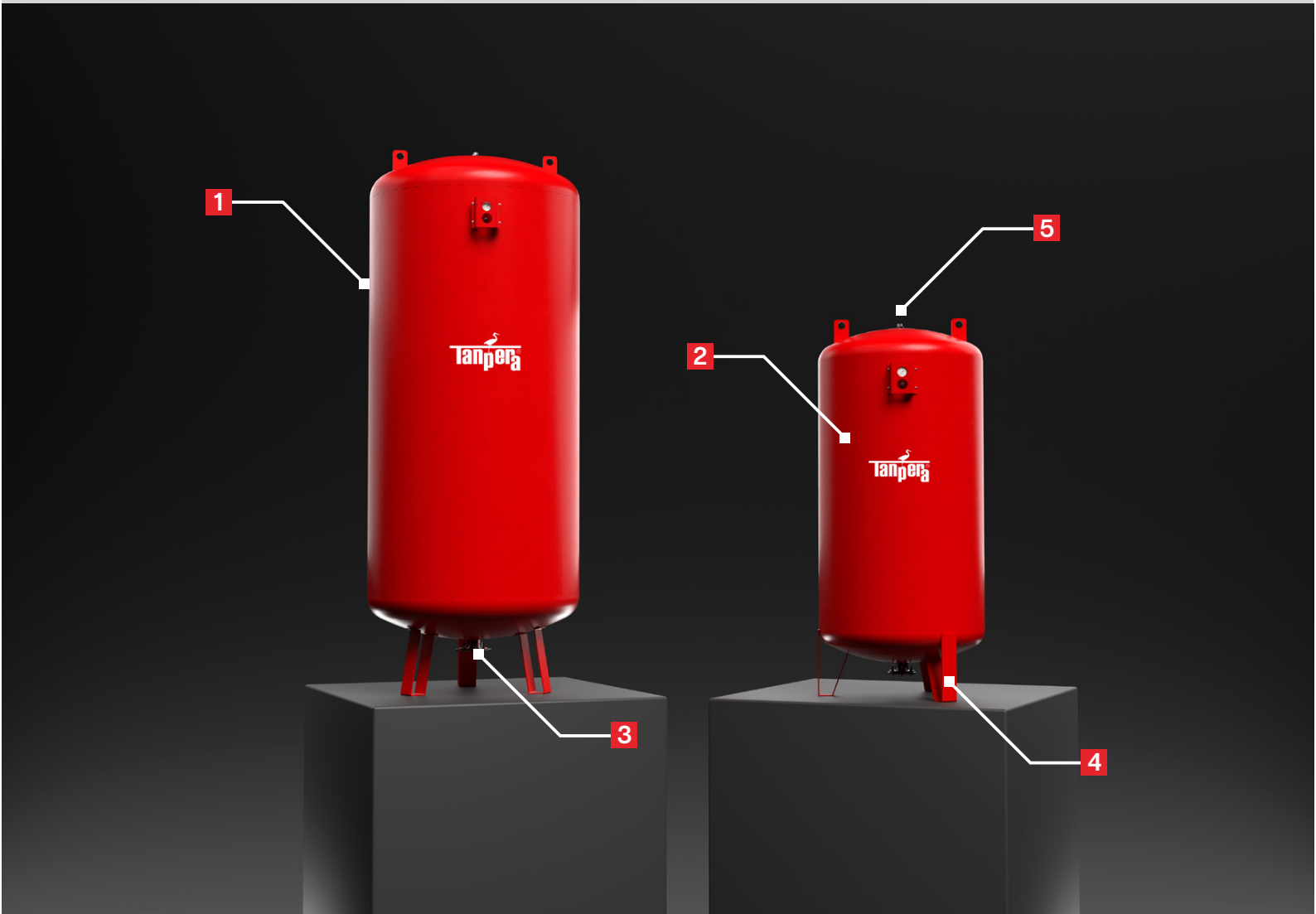
1 Tank Body
The outer shell of the tank, manufactured from high-quality carbon steel. It is designed to withstand the maximum operating pressure of the system, and its outer surface is coated with corrosion-resistant electrostatic powder paint.

2 Replaceable Membrane
This component, the "heart" of the tank, is a bag (balloon) shape made of flexible, high-strength EPDM material. The system water fills the inside of this balloon and never contacts the metal body of the tank. This design completely prevents corrosion and allows the membrane to be easily replaced when necessary.

3 System Connection Elements
The point at which the expansion tank is connected to the installation and where water enters and exits. Depending on the volume, it may be a threaded socket or a flanged connection.

4 Mounting Feet
Feet are provided to secure the tanks to the floor, or a mounting bracket is provided for hanging small tanks on the wall.

5 Gas Filling Valve
Used to measure or adjust the pressure of the gas compartment



7. Technical Specifications

For the correct and proper operation of the system, the capacity and design pressure of the expansion tank must be determined/engineered by a qualified technical expert in this field.

The TANPERA expansion tank is manufactured in accordance with the Pressure Equipment Directive (2014/68/EU), published in Official Gazette No. 30349 dated 03.03.2018.

- Wide Tank Volume Range / Capacity: 24 - 5000 Liters
- Operating Pressure: 10 bar / 16 bar (8 bar only for the 50 and 24 liter tanks)
- The maximum operating pressure is 16 bar. Expansion tanks with a 25 bar operating pressure can also be supplied on special request.
- Suitable for water temperatures between -10°C and +100°C.
- Gas charge: 4 bar dry air (1.5 bar only for the 50 and 24 liter tanks). On special request, the tank can also be supplied charged with nitrogen gas.
- Body Material: Manufactured from S235JR (ST37) steel. On special request, the tank can also be supplied in stainless steel.
- A replaceable EPDM membrane is used. On special request, the tank can also be supplied with a "butyl" membrane.
- Electrostatic powder coating is applied for corrosion protection.
- The tanks are floor-mounted.

8. Product Label

Every TANPERA-branded expansion tank has a name label on it. The following details are stated on this label;

TANPERA TEKNOLOJİ VE END. ÜRÜN.SAN. VE TİC. A.Ş.

EXPANSION TANKS

Model	**TGT500/10**
Hacim Volume	**500 Litre**
Şarj Edilen Gaz Charged Gas	**Kuru Hava**
Değiştirilen Ön Gaz Basıncı Adjusted Front Gas Pressure	**16 Bar**
Maks. İşletme Sıcaklığı Max. Operating Temperature	**2200mm**
Maks. İşletme Basıncı Max. Operating Pressure	**4050mm**
Tank Malzemesi Tank Material	**4200 Kg**
Membran Cinsi Membrane Type	**TB9777/2026**
Bağlantı Çapı / Çap Connection Diameter / Diameter	**4200 Kg**
Yükseklik / Ağırlık Height / Weight	**TB9777/2026**

Şeyhli Mh. Ankara Cd. No: 380/C, Pendik, İstanbul, Turkey
info@tanpera.com.tr / +90 850 308 01 14

9 Product Notation and Descriptions

TANPERA-TGT 1000/10

- Nominal Operating Pressure (Bar)
- Nominal Capacity (Liters)
- Expansion Tank Type Code

10. Table of Product Model Names and Technical Data

Unit Type	Capacity (liters)	ØD (mm)	H (mm)	Connection Port	Empty Weight (kg)
TGT-24/8-spherical	24	360	330	1"	6
TGT-24/8	24	280	465	1"	6
TGT-50/8-horizontal	50	380	590	1"	12
TGT-50/8	50	380	750	1"	12
TGT-100/10	100	460	970	1"	20
TGT-200/10	200	590	1120	1 1/4"	40
TGT-300/10	300	640	1230	1 1/4"	45
TGT-500/10	500	750	1500	1 1/4"	70
TGT-750/10	750	750	1900	2"	120
TGT-900/10	900	800	1950	2"	140
TGT-1000/10	1000	800	2180	2 1/2"	160
TGT-1250/10	1250	800	2400	2 1/2"	200
TGT-1500/10	1500	960	2400	2 1/2"	260
TGT-2000/10	2000	1100	2520	2 1/2"	400
TGT-2500/10	2500	1100	2800	2 1/2"	420
TGT-3000/10	3000	1200	2800	3"	450
TGT-4000/10	4000	1450	3180	3"	750
TGT-5000/10	5000	1450	3720	3"	880
TGT-100/16	100	460	970	1"	50
TGT-200/16	200	590	1120	1 1/4"	55
TGT-300/16	300	640	1230	1 1/4"	65
TGT-500/16	500	750	1500	1 1/4"	95
TGT-750/16	750	800	1900	2"	220
TGT-900/16	900	800	1950	2"	240
TGT-1000/16	1000	800	2180	2 1/2"	260
TGT-1250/16	1250	800	2400	2 1/2"	350
TGT-1500/16	1500	960	2400	2 1/2"	400
TGT-2000/16	2000	1100	2520	2 1/2"	530
TGT-2500/16	2500	1100	2800	2 1/2"	640
TGT-3000/16	3000	1200	2800	3"	770
TGT-4000/16	4000	1450	3180	3"	1000
TGT-5000/16	5000	1450	3720	3"	1200

11. Installation and Connections
11.1. Preliminary Preparations

- The installation of the expansion tank must only be carried out by authorized service personnel or staff with the relevant technical qualifications.

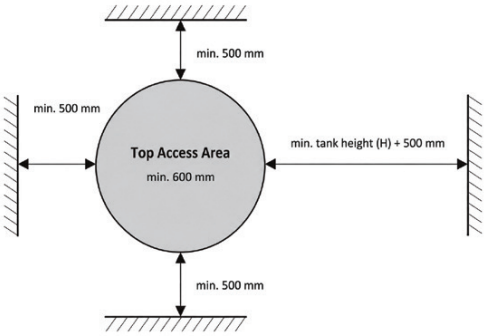
- The unit must be visually inspected for any damage that may have occurred during transport.

- The installation area must be a location that has no risk of freezing, has suitable humidity, is well ventilated, and provides easy access to the unit's control panel.

- The surface on which the unit is placed must be capable of safely bearing the fully filled weight of the expansion tank and must always be leveled. If the location is level and protected against flooding, the unit may be installed without any base. However, to protect the unit from environmental effects, it is recommended to place it on a base of at least 10 cm in height and of suitable quality. This base may be of concrete or steel construction. Especially in areas at risk of earthquakes, the tank must be fixed to the floor using the mounting holes in the tank feet.

- The area where the unit is installed must always have precautions against flooding. For this, the floor must have a suitable drainage system (drain, grating, sump pit and pump, etc.) capable of discharging water. In locations where such a precaution is not taken, TANPERA is not responsible for damage that water leaks from the unit or the connected installation may cause to other areas.
- When the unit needs to be replaced or repaired/modified for any reason, suitable passage and exit clearances and handling facilities must also be provided so that the old unit can be removed and a new one installed in the same place.

- When positioning the product, it is very important to leave sufficient clearance around it for access and service. The air vent, pressure gauge, and name label on the tank must be visible and accessible. After installation, sufficient working space must be available to work on the product for troubleshooting or to remove/install any connection or equipment. Since in some cases the tank must be laid down on the floor to replace the membrane, it is strongly recommended that there be suitable space at the installation site for this, and that a ring capable of bearing the tank's weight be installed on the ceiling for attaching a hoist. Otherwise, the necessary service cannot be provided.



11.2 Hydraulic Installation and Connections

Tanpera expansion tanks are supplied with threaded connection ports.

When connecting the unit to the installation, make sure that no stress or strain is created on either the tank or the piping system.

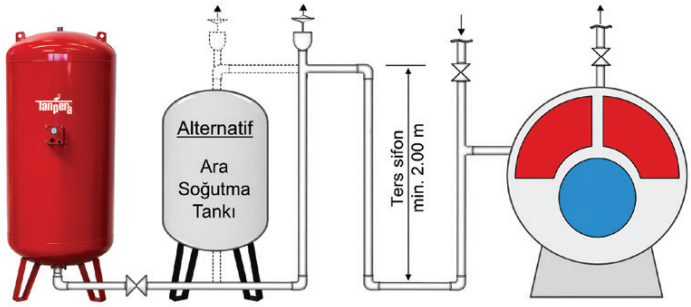
- Pipe connections must be made in accordance with an approved installation project.
- During installation, at least one safety valve of suitable diameter and opening pressure must be used in the system. The opening pressure of the safety valve must be at most 10% below the design pressure of the tank and the system. Safety valves can be supplied by our company.

The outlet of the safety valve must never be blocked; the outlet connection must be installed as short as possible and sloping downward. The valve's discharge line must be directed to the drain in such a way that any water flow can easily be seen from the outside.

- Tanks with feet must always be mounted on their feet. Tanks without feet can be connected directly to the installation pipe. In this case, the tank must always be mounted in a vertical position.
- The tank's connection line to the system must be at least the diameter of the tank connection port.
- During operation, it is very important to prevent this line from becoming blocked and to prevent foreign matter/air from entering the tank. For this reason, a connection made from a horizontal line or a manifold must be made from the side of the pipe, not from the bottom or top. In cases where it is unavoidable to connect from the bottom of the pipe, a dirt-collection pocket with a drain valve must be installed immediately after the connection point to prevent dirt from entering the line.
- There must be a drain cock/plug on the tank side of the connection line.
- Before the tank is connected to the installation, the entire system must be thoroughly flushed and cleaned. If there is more than one tank in the system, it is recommended that the tanks be at the same level as far as possible and connected to the system via a common manifold, so that they all see the same system pressure and operate in a balanced way.
- The tank must always be properly grounded against galvanic corrosion.

In Heating Systems;

Unless there is a requirement to the contrary, the expansion tank must be connected to the system at the point closest to the heat source (boiler, etc.). The operating regime of the system must be taken into account when positioning the tank. To extend the membrane life, the tank must be connected at the return point of the heat source, where the water is coolest.



To extend the membrane life, especially in systems operating at 80°C and above, the water volume inside the pipe connecting the tank to the system should be at least equal to the amount of water that will expand; if this is not possible (which is generally impossible in large systems), it is recommended to add an intermediate cooling tank of suitable capacity to the connection line, or at least to install an inverted siphon of suitable height (min. 2 m) on the connection pipe to prevent the hot water from reaching the membrane as far as possible.

- The line connecting the expansion tank to the system (the safety pipe) must be correctly sized (in accordance with TSE EN 12828) so that water velocity and pressure loss are minimal; if the diameter specified in the project is larger than the tank connection diameter, the diameter must be increased with a reducer immediately after the tank.
- The connection line must not be routed through areas where there is a risk of freezing.
- In order to work on the tank without draining the system, it is recommended to install a lockable shut-off valve on the connection line. Apart from this, there must be nothing on the line that restricts flow. There must also be a drain cock/plug on the tank side of the line. The lockable shut-off valve can be supplied by our company.

In All Closed-Circuit Systems;

It is very important to prevent air from entering and accumulating in the expansion tank. For this, there must be a suitable number and capacity of air separators/eliminators in the system, and the connection line should, if possible, be routed with a downward slope toward the tank. Automatic air vents and air separators can be supplied by our company.

To prevent the system pressure from dropping below atmospheric pressure and causing cavitation and air ingress, the tank must be on the suction side of the pump.
The system's water-filling/make-up connection must be made from another point in the system, not via the tank's connection line.

Care must be taken to ensure that the volumetric proportion of antifreeze or similar freeze-preventing additives in the water in the installation does not exceed 50%. If there is any doubt about the type and proportion of the additive to be used, our company must be consulted and approval obtained.

In Booster Pump Systems;

It is beneficial to connect the tank at the point closest to the discharge side of the pump and with a short pipe. There must absolutely be a shut-off valve and a drain cock/plug on the tank's connection line.

In Domestic Hot Water Systems;
The expansion tank must be installed on the cold water inlet line of the water heater (boiler, etc.). A pressure gauge must be fitted on the line before the expansion tank so that the mains pressure (or the pressure reducer outlet pressure, if any) can be read.

11.3 Post-Installation Checks

- All threaded and flanged connections on the connection line must be checked for leak-tightness. The tank's connection line to the system must be at least the diameter of the tank connection port.

- The pre-charge pressure of the expansion tank must match the system operating pressure.
  There must be a drain cock/plug on the tank side of the connection line.

- After installation, before the tank is filled with water, the pre-charge pressure must be measured with a pressure gauge.

- The factory outlet pressure stated on the manufacturer's label must be compared with the system requirements; if necessary, the pressure must be adjusted.

- It must be verified that the tank is in a stable position with no risk of falling, tipping over, or vibration.

- It must be checked that a minimum service clearance is left around the tank and that maintenance access is unobstructed.

- It must be confirmed that the installation area is suitable in terms of temperature, humidity, and conditions that could cause corrosion.

12. Commissioning

12.1. Checks for Commissioning

The following details are stated on the name plate found on the product.

- The commissioning of the expansion tank must only be carried out by personnel trained, qualified, and authorized in this field.
- Check the temperature and pressure values of the fluid in the system and make sure they are not higher than the maximum values stated on the name plate.
- Before the first start-up, check that the lockable valve on the tank connection line is closed and the drain is open, and that any water inside the tank has been completely drained.
- Make sure that any foreign matter that may be in the connection line has been thoroughly cleaned.

12.2. Setting the Pre-charge Gas Pressure and Initial Operation

Warning: Pressure adjustment must never be carried out on tanks that are externally damaged, have lost their structural integrity, or have corroded.

- As standard, the TANPERA expansion tank is shipped charged with dry air at 4 bar pressure.
- Apart from the initial commissioning and check, the tank pressure must never be tampered with, and the gas charge valve must not be meddled with.

When the tank is first commissioned, before it is filled with the water in the system, the pre-charge gas pressure inside the tank must be set as described below;

- Remove the plastic cap of the gas charge valve and measure the gas pressure present inside the tank. Since the gas charge valve is the same as a car tire valve, the pressure measurement can be carried out with a calibrated tire pressure gauge.

- If the current pressure is higher than the pressure to be set, press the pin in the center of the valve with a screwdriver or similar tool and discharge a sufficient amount of gas from the tank. While doing this, continuously check the pressure in the tank so as not to discharge more gas than necessary.

- If the current pressure is below the pressure to be set, set it to the required pressure by pumping dry, oil-free air at ambient temperature into the tank (using a suitable compressor or hand pump depending on the size of the tank). While doing this, continuously check the pressure in the tank so as not to charge more gas than necessary.

Warning: Flammable and explosive gas must never be used for gas charging. Otherwise, the resulting explosion and fire may create a danger of serious damage and personnel injury/death.

Warning: Exceeding the design pressure while charging the tank with gas can cause the tank to explode, creating a danger of serious damage and personnel injury/death.

- Tightly close the plastic cap of the gas charge valve.
- Write the pre-charge gas pressure that has been set in the space left blank on the tank's name label.
- If there is more than one expansion tank in the same system, the pre-charge gas pressure of all of them must be set to the same value.
- Slowly open the lockable valve on the line to allow the system water to enter. After the air in the line has been bled out, close the drain valve/plug.
- Lock the lockable valve in the open position. Especially in heating systems, if the shut-off valve on the line is left in the closed position, the tank is disabled and water is discharged from the safety valve during every expansion cycle. This causes serious water and energy loss.

The most suitable pre-charge gas pressure, in "bar", for expansion tanks in various systems can be determined as described below;

- Heating systems: The static height pressure of the system (static height in meters / 10.2) + ~0.3 bar. Whatever the calculated value, the pre-charge gas pressure must not be below 0.7 bar.
- Cooling systems: Equal to the static height pressure of the system (static height in meters / 10.2).
- Domestic hot water systems: Equal to the mains pressure or the upper booster pump pressure. Whatever the calculated value, the pre-charge gas pressure must not be above 5.5 bar. If necessary, a pressure reducer must be used before the tank for this.
- Booster pump systems: The pump cut-in (lower) pressure x 0.9 (in multi-pump systems, the cut-in pressure of the pressure switch controlling the highest pressure range).

13. After-Sales Services

13.1. Service Scope and General Information

Our company bases all processes, from the design to the production of our products, on high quality standards. The product you have purchased is under our company's warranty against manufacturing defects. For the efficient and long-lasting use of your product, the installation, commissioning, and maintenance instructions in this manual must be strictly followed.

13.2. Authorized Service and Maintenance Services

The periodic maintenance, repairs, and spare-part replacements of expansion tanks must be carried out only by service points authorized by our company. Interventions carried out by unauthorized persons may void the product's warranty and create safety risks.

Service Request: For any fault condition or maintenance request, please contact our technical support unit by phone or e-mail.

Periodic Maintenance: To maintain the performance of the product, it is recommended that operations such as checking the magnesium anode rod and cleaning the inside of the tank be carried out annually by authorized service.

13.3. Spare Parts Supply

In accordance with the Regulation on After-Sales Services of Industrial Goods, our company undertakes to keep in stock the spare parts necessary for this product to perform its functions throughout its service life (the period determined by the Ministry, generally 10 years) and to supply them for a fee when requested.

14. Cleaning and Maintenance

- To ensure that the unit continues to operate effectively, it must be continuously observed from the outside and must also undergo a general inspection and maintenance at least twice a year.
- Inspection and maintenance on the unit must be carried out only by authorized, trained, and suitably qualified persons.
- If you wish, you can have the periodic inspection and maintenance of your product carried out by TANPERA service.
- Maintenance operations must only be carried out on units that have been cooled below 40°C, depressurized, and taken out of service.
- The operations to be carried out during inspection and maintenance are described below:

General Inspection and Cleaning

- Depending on the ambient and operating conditions, the expansion tank may corrode over time and lose its structural integrity. Like all equipment operating under pressure, the expansion tank can in this condition lead to undesirable results such as explosion or rupture, causing serious damage and injury. To minimize this risk, the corrosion and damage status of the tank must be continuously checked from the outside.
- To reduce the risk of corrosion caused by external conditions, the tank must be kept clean. For this reason, it must be cleaned periodically from the outside using warm water and soap.
- When the tank is not used for a long time, bacteria harmful to health may grow inside it. For this reason, expansion tanks - especially in booster pump and domestic hot water systems - must always be drained and taken out of service before long idle periods, and must be disinfected in accordance with local regulations and rules before being put back into use. No substances, detergents, etc. that would harm the tank or health may be used in this process. Tanks found to be contaminated in this way must be replaced if they cannot be cleaned.

Checking the Pre-charge Gas Pressure

When the expansion tank is charged with air, it is inevitable that the air inside will permeate through the membrane into the water over time, causing the pressure to drop. In addition, gas may leak out through a faulty valve. Insufficient gas pressure in the tank means that the expansion in the system cannot be absorbed sufficiently, causing system water to be discharged from the safety valve during every heating cycle. The oxygen in the new water added to the system to make up for the lost water is also released when the water heats up, both increasing corrosion in the system and causing air to form in it. For this reason, periodically checking the gas charge inside the expansion tank and topping it up if insufficient is very important for the healthy operation of the system.

Warning: Pressure adjustment must never be carried out on tanks that are externally damaged, have lost their structural integrity, or have corroded.

- The pre-charge gas pressure check must always be carried out when the tank is not full of water and is isolated from the system.

To check the pre-charge gas pressure and top it up if necessary, carry out the following steps;

- Stop the operation of the system and take the heat source and all electrical devices out of service.
- Wait for the water in the system to cool down to ambient temperature (at most 40°C).
- Close the lockable valve on the tank connection line.
- Open the drain cock/plug and drain the water from the tank.
- Remove the plastic cap of the gas charge valve and measure the gas pressure present inside the tank.
- Since the gas charge valve is the same as a car tire valve, the pressure measurement can be carried out with a calibrated tire pressure gauge.
- If the current pressure is higher than the pressure to be set, press the pin in the center of the valve with a screwdriver or similar tool and discharge a sufficient amount of gas from the tank. While doing this, continuously check the pressure in the tank (comparing it with the "adjusted pre-charge gas pressure" written on the label) so as not to discharge more gas than necessary.
- If the current pressure has dropped 10% or more below the required pre-charge gas pressure, set it to the required pressure by pumping dry, oil-free air at ambient temperature into the tank (using a suitable compressor or hand pump depending on the size of the tank). While doing this, continuously check the pressure in the tank so as not to charge more gas than necessary.

Caution: Exceeding the design pressure while charging the tank with gas can cause the tank to explode, creating a danger of serious damage and personnel injury/death.

- Tightly close the plastic cap of the gas charge valve.
- Slowly open the lockable valve on the line to allow the system water to enter. After the air in the line has been bled out, close the drain valve/plug.
- Lock the lockable valve in the open position and restart the system.

Warning: Especially in heating systems, if the shut-off valve on the line is left in the closed position, the tank is disabled and water is discharged from the safety valve during every expansion cycle. This causes serious water and energy loss.

Within the scope of maintenance

- It must also be checked whether the safety valve is working properly. This check can be carried out by raising the water pressure in the system up to the safety valve opening pressure using a hand pump. Safety valves found to be faulty or not working properly must absolutely be replaced with new ones.

Caution: During the check, no personnel must ever be in front of the valve discharge line. The water may be very hot.

- It must also be checked that the devices, fittings, and accessories on the unit and the connected installation - such as valves, check valves, and thermometers - are intact and in working order; faulty ones must be repaired or replaced, and the screens of the strainers must be cleaned.

15. Possible Problems and Solutions

The table below lists the problems you may encounter with your TANPERA expansion tank, along with their possible causes and solutions.

Closed-circuit heating and cooling systems, domestic hot water systems;

Problem	Possible Cause	Possible Solution
Water is continuously discharged from the safety valve in the system	The expansion tank capacity is insufficient	Replace it with a tank of suitable capacity.
	The pre-charge gas pressure is not correct	Set the pre-charge gas pressure to the appropriate value.
	Water has filled the air chamber due to a hole in the membrane or a leak at the tank connection point. (Over time the air dissolves into *the water and diminishes, so the tank can no longer fully absorb the expansion and starts to fall short.)*	Check by pressing the pin in the center of the gas charge valve with a screwdriver or similar tool. If water comes from here: Stop the system completely and call authorized service (TANPERA).
	The tank is leaking gas	1. Check the gas charge valve using soapy foam or a similar method. If there is a leak, the valve is faulty; call service. 2. Check the outside of the tank using soapy foam or a similar method.
	The safety valve opening pressure has been selected incorrectly, or the valve is faulty	Replace the valve.

Booster pump (hydrophore) systems;

Problem	Possible Cause	Possible Solution
The booster pump cycles on too frequently	The expansion tank capacity is insufficient	Replace it with a tank of suitable capacity.
	The pre-charge gas pressure is not correct	Set the pre-charge gas pressure to the appropriate value.
	Water has filled the air chamber due to a hole in the membrane or a leak at the tank connection point. (Over time the air dissolves into *the water and diminishes, so the tank can no longer fully absorb the expansion and starts to fall short.)*	Check by pressing the pin in the center of the gas charge valve with a screwdriver or similar tool. If water comes from here: Stop the system completely and call the TANPERA authorized service.
	The tank is leaking gas	1. Check the gas charge valve using soapy foam or a similar method. If there is an air leak, the valve is faulty; call service. 2. Carefully check the outside of the tank using soapy foam or a similar method. If there is a hole in the tank, stop the system immediately, reduce the pressure and call service.

Tanpera A.Ş.

+90 850 308 01 14

info@tanpera.com.tr
www.tanpera.com.tr

Şeyhli Mh. Ankara Cd. No: 380/C
Pendik, İstanbul, Turkey

Tanpera GmbH

+49 1590 41388428

info@tanpera.de
www.tanpera.de

Hermann-Essig-Str. 36 71701
Schwieberdingen, Stutgart, Germany

Tanpera®

Experience the changes...