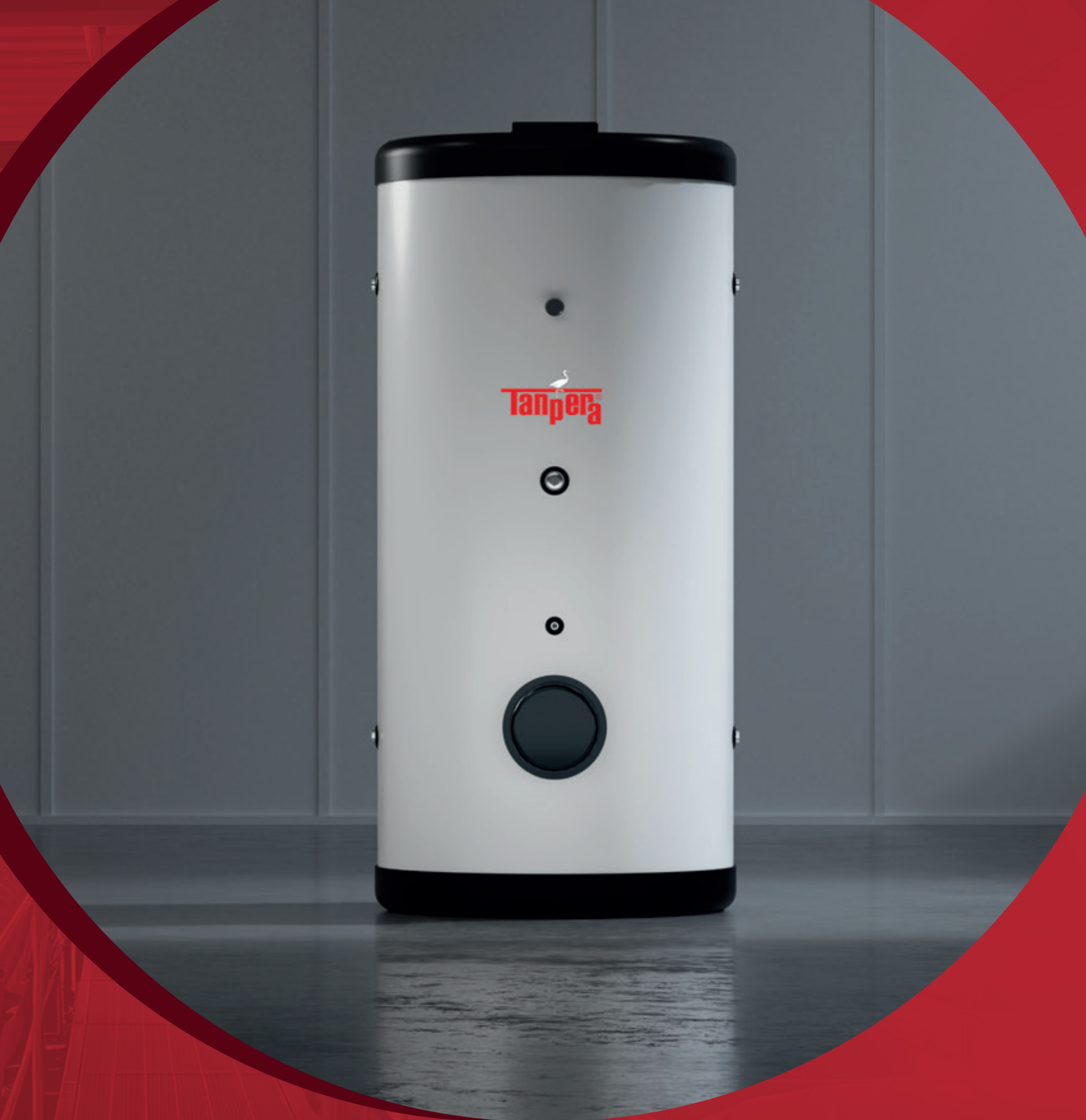
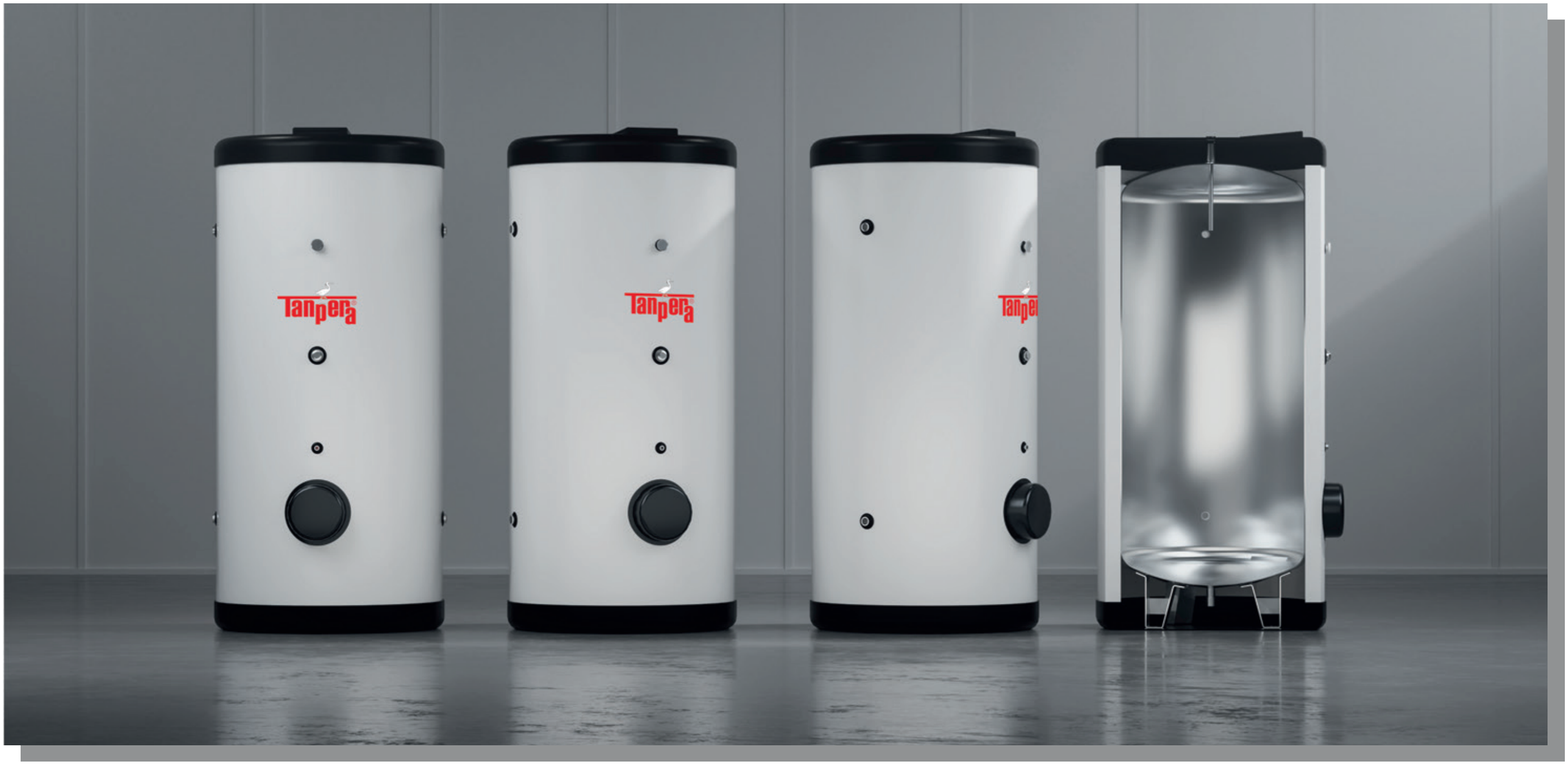


Tanpera®

ACCUMULATION TANK

HIGH CAPACITY, UNINTERRUPTED PERFORMANCE!



What is an Accumulation Tank?

A hot water accumulation tank is a pressurized tank that heats cold utility water from the network using the energy it receives from an external heat source, and stores this hot water in an insulated body, ready for use and at the desired temperature.

Its primary function is to manage the time and capacity difference between the heat generation capacity and the instantaneous hot water consumption demand.

What is the Working Principle?

Hot water accumulation tanks operate using an indirect heating method. Their basic working principle is based on heat transfer and thermal storage.

Heating: The external heat source (boiler, etc.) and the network water enter the plate heat exchanger. Heat transfer occurs instantly without the two waters mixing.

Hygienic Storage: The clean hot water heated in the heat exchanger is sent to the accumulation tank for storage.

Heat Insulation: The tank's excellent insulation maintains the water temperature for a long time.

Smart Support: If the temperature falls below the set degree, the integrated electric resistance automatically activates and brings the water to the desired temperature.

Usage: Thus, hot and clean water is continuously ready for use at the desired temperature.

ACCUMULATION TANK

Advantages

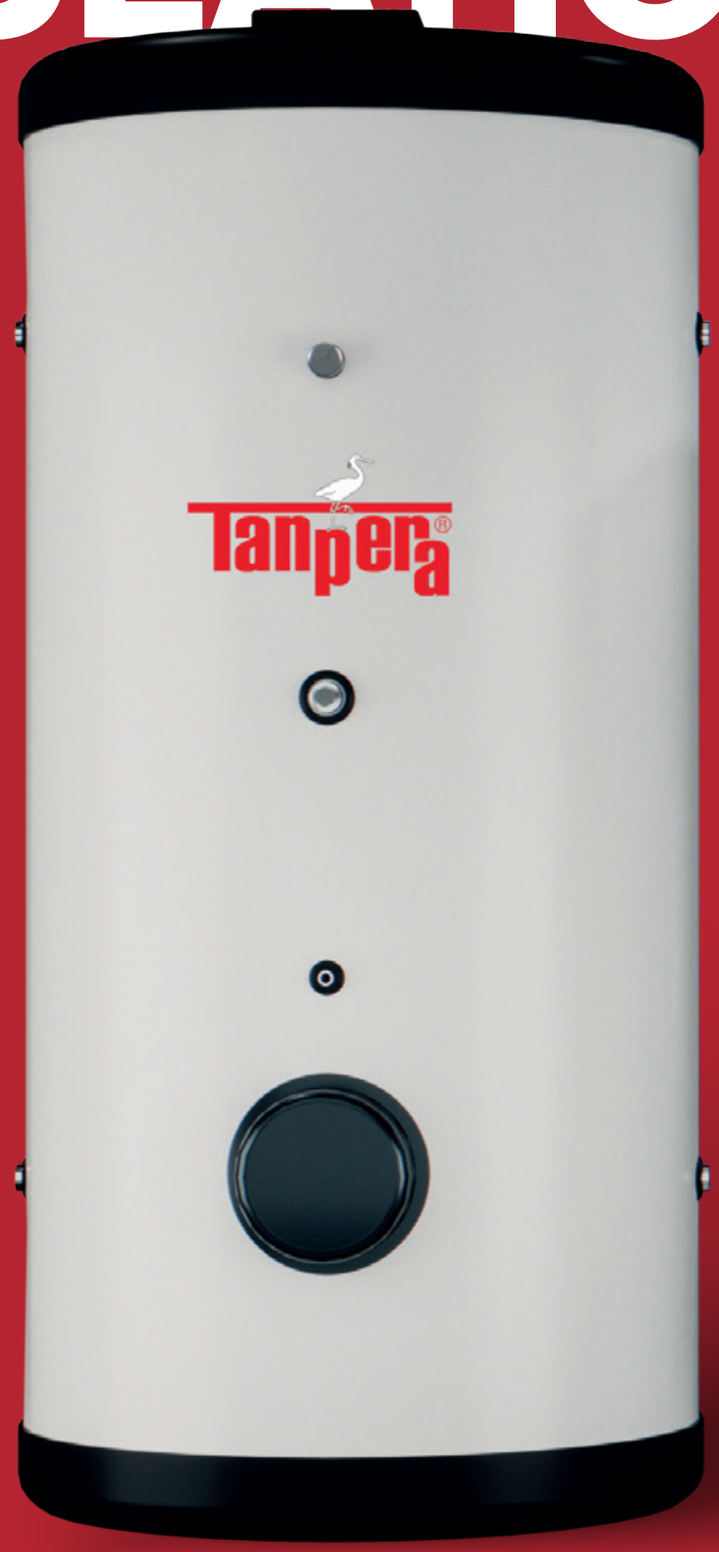
- **Uninterrupted Hot Water Comfort**
  This is its primary advantage. A heating system can heat water instantaneously, but when a large amount of water is used in multiple locations simultaneously, it may be insufficient on its own. The accumulation tank holds a volume of preheated and stored hot water. When instantaneous demand occurs, the system draws from this reserve. This allows multiple points to be supplied comfortably without a drop in water flow or temperature.

- **Energy Efficiency and System Protection**
  If there were no hot water accumulation tank in the system, the main heating system would have to activate with every small faucet opening and closing. This constant "start-stop" operation shortens the equipment's lifespan and is the least efficient mode of operation. The accumulation tank meets these small demands from its own storage, preventing the main heater from activating unnecessarily. The system only engages when the water in the tank actually cools down, operating for longer periods and in a more efficient regime.

- **Integrated Electric Heater**
  It ensures that your system never runs "without hot water." If your main heat source (boiler, etc.) fails for any reason, undergoes maintenance, or is completely turned off (as in summer months), the electric resistance inside the tank can heat the water independently. During peak demands, if the external heat exchanger cannot heat the water quickly enough, the resistance activates to bring the water temperature to the desired level.

- **Enamel Coating**
  The enamel coating, with its smooth (glass-like) structure, prevents rust, limescale buildup, and most importantly, the growth of dangerous bacteria such as Legionella. It keeps the water hygienic. Water corrodes metal (especially hot water). Enamel prevents the water from contacting the steel body of the tank, protecting it from rust and greatly extending its service life.

- **High Heat Insulation**
  Thanks to high heat insulation, it preserves the stored thermal energy for a long time. It is less affected by day-night temperature differences and minimizes heat losses.



Technical Specifications

Accumulation tanks, providing high-efficiency storage for every need and every heating system;

- They work fully compatible with condensing devices, boilers, heat pumps, and solar energy.
- High domestic hot water comfort in the range of 100–5000 L
- Maximum Operating Pressure (Tank): 10 Bar
- Maximum Operating Temperature (Tank): 95°C
- Construction: S235JR Steel
- Minimum limescale formation thanks to its smooth surface. Hygienic hot water protection and optimal corrosion resistance are ensured by its high-quality enamel coating, compliant with DIN 4753-3.
- Magnesium Anode Protection

Installation-friendly and largely maintenance-free design;

- With sensor sleeve (1/2") and thermometer
- Re-circulation Connection Capability
- High Heat Insulation
- 100–1000 L: 50mm, 42 kg/m^3 Rigid Polyurethane Insulation
- 1500–5000 L: 80mm, 18 kg/m^3 Open-Cell Soft Polyurethane Insulation

Outer Jacket Coating:

- 100–1000 L: Termowen Coating
  1500–5000 L: Vinyl Jacket (Vinleks)
- Designed according to TS EN 13445-3 standards.

Applications of Accumulation Tanks

The purpose of using these tanks is to store the hot water produced by the heating device (boiler, heat pump, etc.) to meet "peak" demands, such as when multiple faucets or showers are used simultaneously.

Residences and Individual Use

Detached Houses and Villas
For cooling needs in production processes, factory environments, and other industrial facilities.

Centralized System Apartments
Used in systems where heating is centralized but hot water is produced per apartment (or centrally), to meet the hot water needs of the apartments.

Food & Beverage Service Sector

Restaurants and Large Kitchens
They are used to provide the high-temperature water required by industrial dishwashers and the abundant hot water needed for general kitchen cleaning.

Hair Salons and Beauty Salons
They require uninterrupted hot water for continuous hair washing and similar services.

Commercial and Collective Use Areas

Hotels and Tourist Facilities
They must meet the need for hundreds of guests to take showers simultaneously, especially during morning and evening hours.

Hospitals
They require continuous and high-temperature water for hygiene, especially for Legionella control.

Industrial Facilities

Food Processing Facilities
They require large amounts of hot water at specific temperatures for cleaning production lines and for the process itself (boiling, pasteurization).

Factories
They are used in employee shower areas or in production processes (e.g., washing after dyeing in textiles).

Gyms and SPA Centers
They are places where shower areas are heavily used and large amounts of hot water are required.

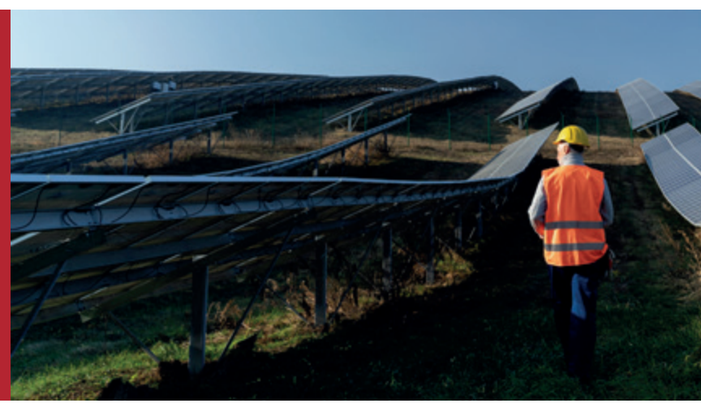
Dormitories and Military Facilities
They are used in communal living areas to meet the hot water demand that accumulates during specific time periods.

Schools and Universities
They are especially needed in boarding campuses and sports facilities.

Energy Systems Integration

Solar Energy Systems
They store the heat collected during sunlight hours to be used when there is no sun (e.g., in the evening or morning).

Heat Pump Systems
Heat pumps usually heat water at a lower temperature and more slowly. The accumulation tank collects this slow production, creating a reservoir to meet instantaneous high demand.



What are the Components of the Product?

Body
It is the main structure of the tank. This part, which must be pressure-resistant, is made of carbon steel.

Insulation
It is the most important element that ensures the water temperature inside the tank is maintained. Depending on its capacity, rigid or soft polyurethane is used.

Magnesium Anode Rod:
It is the component that protects the tank against the corrosive effects of water. It must be replaced at regular intervals.

Connection Sleeves
These are the parts where the tank is connected to the relevant plumbing. A space for the resistance can be left upon request.

Cleaning and Access Cover
Maintenance operations, such as cleaning the tank and removing sediment, are carried out by opening these covers.

Outer Jacket
The outermost layer that covers the insulation material, gives the tank an aesthetic appearance, and protects it from external impacts. Usually, a "vinleks" (synthetic leather) jacket is used.

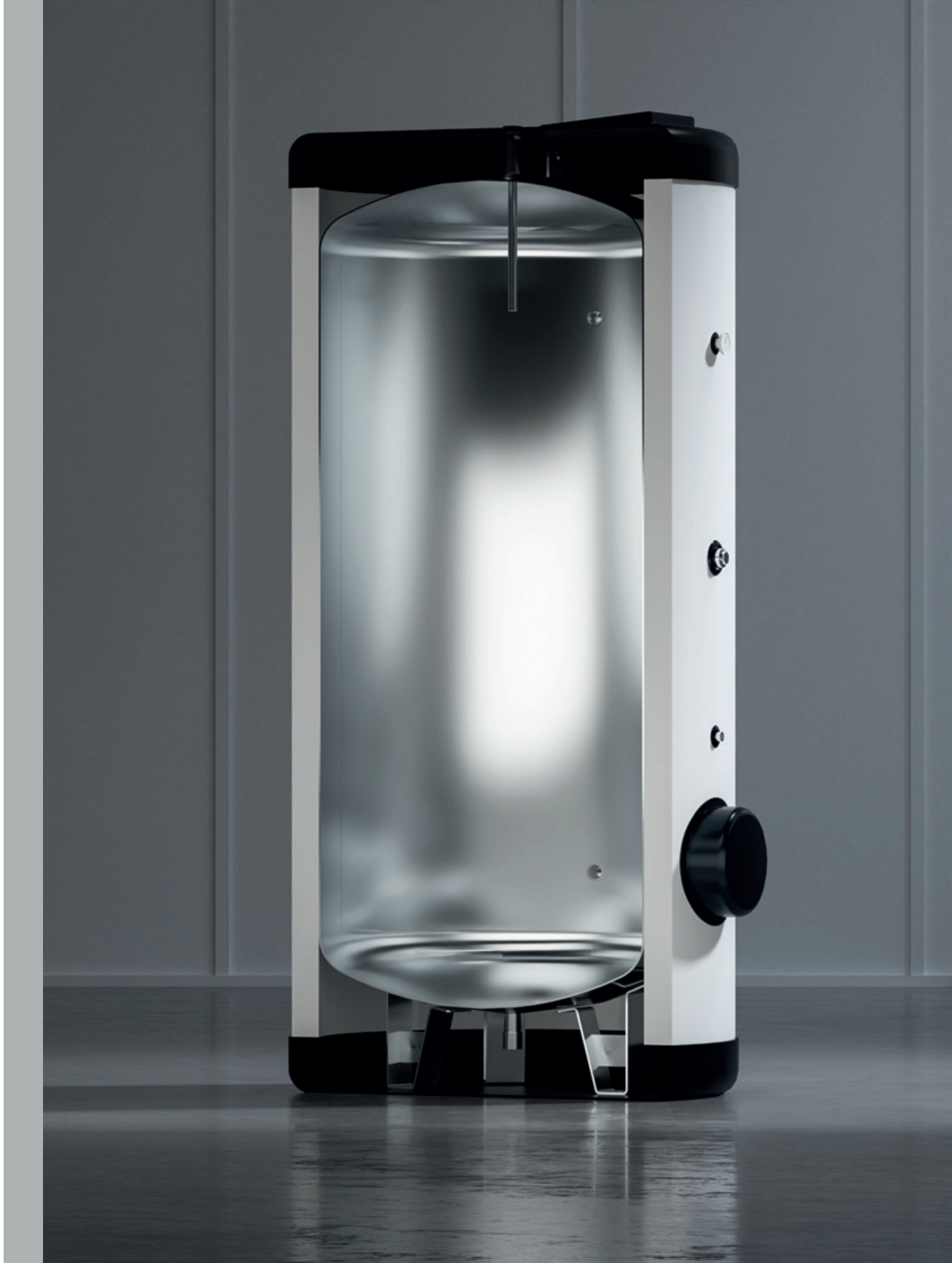
Thermometer
It allows the water temperature inside the tank to be viewed from the outside.

Sensor Sleeve
It is a closed tube immersed in the water, where the temperature sensor (probe) is installed for the automation of the heating system.

Product Notation and Descriptions

TANPERA-PRO 1000/10 - EV

- Position; V: Vertical
- Coating Type; E: Enamel
- Nominal Operating Pressure (Bar)
- Total Storage Capacity (Liters)
- Hot Water Accumulation Tank Type Code



Capacity and Main Dimensions

Accumulation Tank		PRO 100	PRO 200	PRO 350	PRO 500	PRO 800	PRO 1000	PRO 1500	PRO 2000	PRO 2500	PRO 3000	PRO 4000	PRO 5000
Volume	V (L)	100	200	350	500	800	1000	1500	2000	2500	3000	4000	5000
Diameter	D (mm)	486	586	756	756	910	1010	1120	1260	1460	1460	1660	1660
Height	H (mm)	1100	1300	1320	1770	2150	2180	2470	2500	2350	2750	2480	2980
Water Inlet / Outlet	N1 (inch)	3/4 "	3/4 "	1 "	1 "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ½ "	1 ½ "	2 "	2 "
Circulation Connection	N2 (inch)	3/4 "	3/4 "	1 "	1 "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ½ "	1 ½ "	2 "	2 "
Additional Electric Heater	N3 (inch)	1 ½ "	1 ½ "	1 ½ "	1 ½ "	2 "	2 "	2 "	2 "	2 "	2 "	2 "	2 "
Thermometer	N4 (inch)	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "	1/2 "
Magnesium Anode	N5 (inch)	1 ¼"	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "
Cleaning Flange	N6	4 "	4 "	4 "	4 "	5 "	5 "	5 "	5 "	5 "	5 "	5 "	5 "
Drain	N7	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "	1 ¼ "
Empty Weight	W (kg)	62	82	108	143	235	302	350	470	540	640	950	1100

Design Recommendations / Capacity Selection Guide

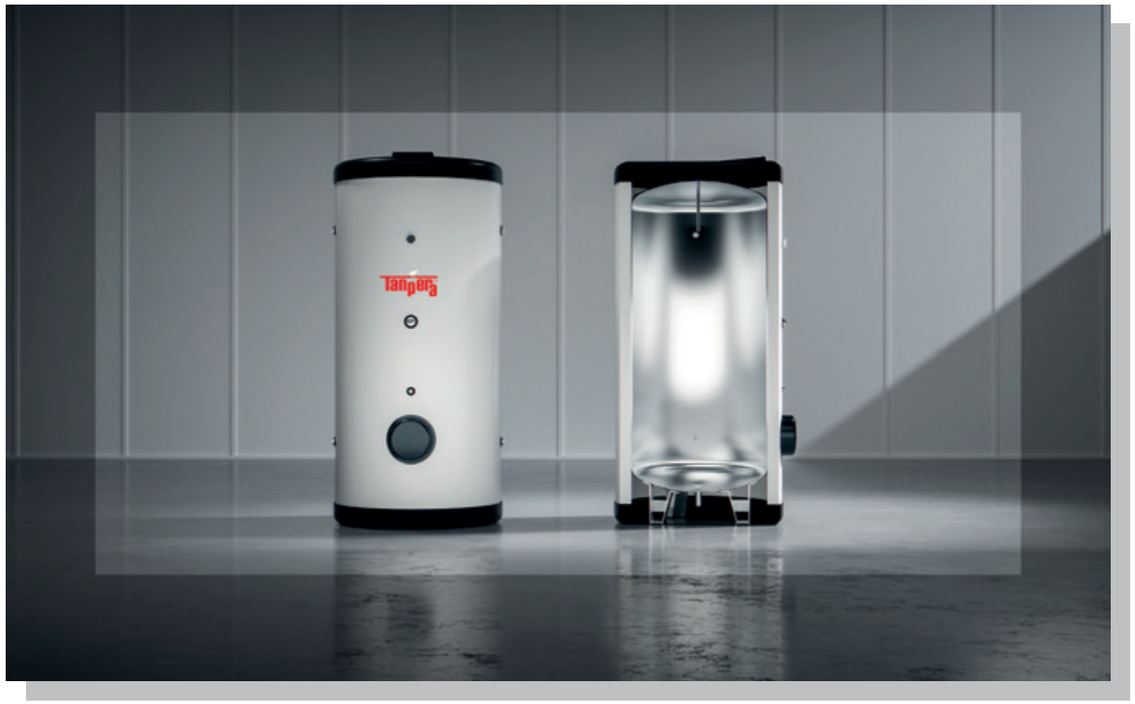
The pressurized hot water, heated in the heat exchanger and stored in the accumulation tank, is delivered to the points of use through distribution pipes when needed. The hot water demand of each point of use varies in temperature and flow rate according to its characteristics, and may also be constant, variable, or intermittent throughout the day. The combination of the specific demand characteristics of the points of use forms the daily hot water demand profile of the building or facility. This unique profile is determined by cultural and demographic factors, personal preferences, or different process applications. On the next page, a schematic representation of such a hot water demand profile is provided.

In order to accurately determine the volume of hot water that needs to be stored by the accumulation tank(s) along with the heat exchanger capacity, the expected demand profile in the system must first be realistically defined—that is, the magnitude and duration of the peak hot water demand as well as the total daily hot water consumption. Various sources propose different methods for these calculations, and the most suitable one for the specific application can be selected.

In many systems, excluding process applications, peak hot water demand is usually caused by the use of showers. For example, in hotels, there is a peak demand lasting 2–4 hours during the day due to shower usage. In places such as barracks, dormitories, factories, and gyms, all showers may be used simultaneously within a certain period. In such locations, the peak demand can be calculated by determining the total number of showers and the flow rate per shower, and then estimating the duration during which these showers will be used simultaneously. The flow rate per shower depends on the type and size of the showerhead and the water pressure. For standard-sized showerheads at 2 bar pressure, this flow rate can be considered 500–600 L/h.

Once the data regarding peak demand has been determined, it should be decided how much of it will be met instantaneously by the heat exchanger, and the required storage volume for the remaining demand must be calculated. In doing so, the facility's demand profile, the capacity of the primary heat source allocated for the heat exchanger, the space available for storage, as well as the total initial investment and operating costs must all be taken into account.

The capacities of the heat exchanger and the accumulation tank should be determined together in such a way that during peak demand, the stored hot water and the instantaneous heating capacity are sufficient to meet the need, and during low demand periods, the remaining capacity of the heat exchanger is adequate to fully replenish the accumulation tank with hot water for the next peak demand.



The temperature of the domestic hot water, except in special applications, should not exceed 60°C in order to minimize corrosion and energy losses. At temperatures above this, limescale in hard water increases significantly. Additionally, 60°C is a temperature at which many bacteria are killed or their growth is limited. When calculating capacity, the cold water temperature should be assumed to be no more than 10°C.

Considering the size and shape of the storage location, as well as the spaces within the building through which the tank must be transported, the required total storage capacity should be provided, if necessary, by dividing it into two or more tanks. When determining tank capacity, it should be taken into account that due to the thermosiphon effect, only 70% of the tank's total storage capacity can be filled with water at the desired temperature.

The flow rate of the tank charging pump should match the secondary circuit flow rate of the heat exchanger, and its head should be selected to overcome the pressure drops in this circuit. For this purpose, a semi-wet or dry-rotor type pump should be preferred.

To ensure better temperature stratification and make the most efficient use of the hot water volume inside the tank, horizontally positioned tanks should not be used except when absolutely necessary.

It is also recommended to install a safety valve, selected with an opening pressure suitable for the tank's operating pressure, and an expansion tank of appropriate capacity in the domestic water circuit. The minimum safety valve diameter required is indicated in the table below.

Appropriate safety measures must be implemented to eliminate the risk of users being scalded by hot water in the event of possible automation failures.

Accumulation Tank Volume (Liters)	Safety Valve Diameter
<800	3/4″
1000 - 3000	1″
>3000	1 1/4″

Example Calculation
In a production facility with 50 showers, it is planned that 300 employees take showers at an average water temperature of 45°C at the end of their shift. The instantaneous hot water production capacity in this scenario is 500,000 kcal/hour. Let's calculate the required accumulation tank capacity in this case.

Assuming that only 5 people use each shower within 1 hour and that each shower consumes approximately 500 L of water per hour;

Peak usage duration at the end of the shift;

300 people ÷ (50 showers × 5 people/(hour × shower)) = 1.2 hours

Required hourly flow rate of 45°C water:

50 showers × 500 Liters/hour = 25,000 Liters

Required hourly flow rate of water at °C:

25,000 Liters/hour × [(45–10)°C / (60–10)°C] = 17,500 Liters/hour

The amount of energy required to meet the hourly capacity:

Q = 17,500 Liters/hour × (60–10)°C = 875,000 kCal/hour

The amount of 60°C water produced during the peak demand period:

10,000 L/hour × 1.2 hours = 12,000 L/hour

Pik talep süresince gerekli 45°C sıcaklıktaki su miktarı

50 showers × 500 Liters/(hour × shower) × 1.2 hours = 30,000 Liters

Required hourly amount of 60°C water during peak demand

30,000 Liters/hour × [(45–10)°C ÷ (60–10)°C] = 21,000 Liters/hour

Amount of 60°C water produced hourly by the heat exchanger

500,000 kCal/hour × (60–10)°C = 10,000 Liters/hour

Hourly amount of 60°C water produced by the heat exchanger

10,000 Liters/hour × 1.2 hours = 12,000 Liters/hour

Amount of stored water to be used during peak demand

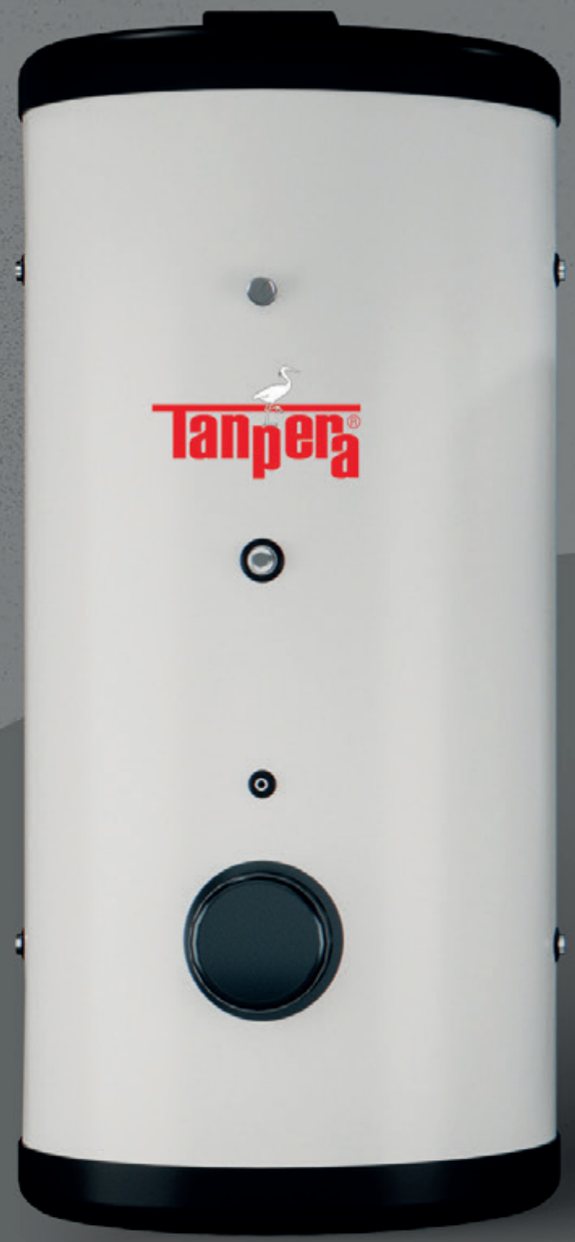
21,000 Liters – 12,000 Liters = 9,000 Liters

Required Accumulation Tank Capacity

9,000 Liters ÷ 0.7 = 12,857 Liters

Recommendations
For this capacity, at least 3 TANPERA-PRO 4000/10-E/V type tanks with 4,000 L storage capacity each should be selected.

Pro Series
Accumulation Tank



By effective heat transfer between the blood coming from the heart at 40°C and returning from the feet at 1°C, it can remain in cold water for a long time without freezing. Using these natural principles, we design our engineering marvel heat exchangers.

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