HVAC PRODUCTS
INDUSTRIAL PRODUCTS

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HVAC PRODUCTS

INDUSTRIAL PRODUCTS

TANPERA is a dynamic company that has been in business for 23 years between heat transfer, thermal storage and heat - energy systems.

TANPERA aims to reflect its dynamism in its sector activities with a new service concept, starting with the slogan “makes the change happen”.

We believe that this service concept provides unique energy for the TANPERA, air conditioning, energy, and industrial sectors.

In TANPERA’s product range, there are too many products that have high efficiency operating in a wide temperature and pressure range suitable for many different fluids and processes than can be listed as follows: Plate / Shell Tube / Finned Tube Heat Exchanger, Economizer / Recuperator, Domestic Hot Water Storage Tank, Enamel Coated Storage Water Heater with Fixed Coil, Electric Boiler, Buffer Tank, Hydraulic Balance Tank, Expansion Tank, Pumped Controlled Expansion System, Waste Heat Recovery System, Vacuum Degasser, Automatic Water Supply System, Package Heating and Domestic Hot Water Production System.

With the technology vision of Tanpera R&D Centre and the products it develops with its strong engineering infrastructure, Tanpera also offers unique solutions to the extraordinary and unique needs of its customers. Tanpera has strengthened its position in all sectors as the solution partner of many companies with its years of experience and field studies it has done with its experienced engineer staff, using today’s technological opportunities as best as possible, especially the applications in energy efficiency and the design and feasibility analyzes it has developed sectoral.

TANPERA has gained wide recognition in many countries for its extensive product programs and marketing activities.

TANPERA GmbH was founded in Germany in 2019 to facilitate products manufactured in Turkey to the European market.

The objective of TANPERA is to continue to “ makes the change happen” and to be “the best” in distributing our world-standard products and sales to keep high customer satisfaction at the forefront is the priority a wider market and sector.

HVAC PRODUCTS

Plate Heat Exchanger

TANPERA's expert engineers ensure the long and healthy operation of plate heat exchangers with designs that are suitable for the conditions of each application.

Plate heat exchangers consist of plates, gaskets, front pressure plate, rear pressure plate, fixing bolts, upper support bar, lower alignment bar, anchoring brackets, and rubber/metal clamps. While plate materials consist of materials such as AISI 304, AISI 316, Titanium, SMO, 904L, and Hastelloy, gasket material is produced from materials such as NBR, EPDM, VITON, and Teflon.

Body components are used to hold the selected plate and gasket materials together for specific applications. Heat exchanger bodies can have different thicknesses depending on the plate sizes as a result of pressure vessel calculations. Body materials are produced from carbon steel materials such as P355GH, P265GH, P235GH, and St-37. Upper support and lower alignment bars, which carry gasketed plates and ensure rigid alignment, are also made of carbon steel materials. Fixing bolts, which hold gasketed plates, bodies, suspension, and alignment bars together, require special alloyed carbon steel bolt sets with high-quality materials.

Bodies must be electrostatically powder coated to protect them from corrosion in the working environment. Other carbon steel materials should be coated with hot-dip or electro-galvanizing methods. All heat exchangers produced by TANPERA are designed with precision to meet the different operational conditions required by each sector and ensure long-term operational life.

Brazed Plate Heat Exchanger

In TANPERA Brazed Plate Heat Exchangers, thin copper plates are placed between each plate gap. These copper plates are melted at high temperatures in vacuum furnaces and settle along the welding channels between the heat exchanger plates.

This provides a direction to the fluid flow within the heat exchanger and ensures tightness. TANPERA Brazed Plate Heat Exchangers are widely used as pressure breakers in high-rise buildings and in HVAC applications such as entrance stations of apartment buildings.

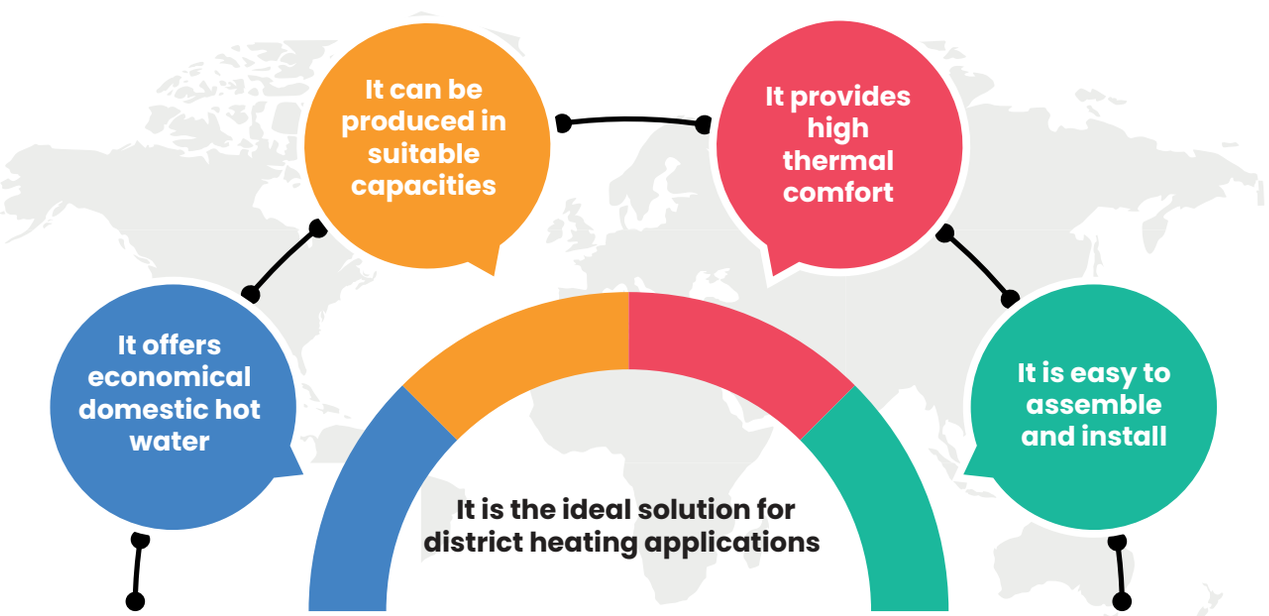
TANPERA TERMOBOX.. Series Building Heating Sub-Station

It is a package system that provides heating and domestic hot water preparation in buildings by using the energy of high temperature heating water coming from the district heating network.

TANPERA Termobox.. Series Building Heating Sub-Stations are designed so as to prevent mixing of water from the district heating network with the building heating system and the tap water network. It can be designed for various capacities by using gasketed type plate heat exchangers. The design of the system is such that it provides easy maintenance and service. This package system, which contains many installation devices and fixtures (pumps, automatic air dischargers, safety valves, expansion tanks, shut-off valves etc.) takes up very little space thanks to its compact structure. With its high-precisionsensors, it precisely measures temperatures and provides the highest level of thermal comfort.

It is a technological device that can send operation data to the building automation system via RS485 (MODBUS), RS232(MBUS) protocols, thanks to the control panel specially developed and designed by TANPERA R&D Center for district heating substations. With three different operating modes and programmable operating periods, it provides heating according to actual demand.

With the “heat curve” feature in its structure, the system automatically adjusts the water temperatures according to the outside air temperature with special type electric actuators and pressure-independent balancing valves, protects the system against high temperature and pressure by quickly isolating the central heating network from the system in case of power cuts and malfunctions. It can measure consumption data with MID-certified calorimeters and water meters.



TANPERA Enamel Coated Storage Water Heater with Fixed Coil

Due to its compact design, which enables the heating and storage of domestic hot water in the same structure, it can be easily placed and installed. It is a product that can offer wide usage opportunities to the designer and investor due to the fact that it allows the simultaneous use of different primary energy sources such as boiler, sun, heat pump and electricity.

It is produced in various storage and heating capacities to meet the user's needs.

With a storage capacity from 100 to 3000 liters, it is offered to our customers in various sizes.

While the heating fluid from primary heat sources such as boiler, heat pump, solar energy passes through the spiral coil, the mains water passes through the inside of the tank and the outer surface of the coil. In this way, without mixing the two fluids, the mains water is heated rapidly with the energy of the fluid in the primary circuit and the domestic hot water is produced and stored in the tank.

All the inner surfaces of the tank, produced using materials suitable for domestic hot water, are coated with double layer glass enamel (glass-lined) in accordance with DIN 4753-3 standard providing excellent corrosion resistance.

TANPERA Enamel Coated Storage Water Heater with Fixed Coil provides rapid heating and storage of domestic and process water. Housing complexes, apartments, detached houses, shopping malls, tourism and accommodation facilities, hospitals, military facilities, dormitories, social facilities, sports facilities, factories, etc. It offers perfect solutions to its users wherever hot water is needed.

TANPERA TSB-ES Series
Fixed Single-Coiled Enamel
Domestic Hot Water Calorifier

TANPERA TDB-ES Series
Fixed Double-Coiled Enamel
Domestic Hot Water Calorifier

TANPERA Storage Water Heater with Replaceable Coil

Due to its compact design, which enables the heating and storage of domestic hot water in the same structure, it can be easily placed and installed. It is a product that can offer wide usage opportunities to the designer and investor due to the fact that it allows the simultaneous use of different primary energy sources such as boiler, sun, heat pump and electricity.

It is produced in various storage and heating capacities to meet the user's needs.

With a storage capacity from 100 liters to 5000 liters, it is offered to our customers in various sizes.

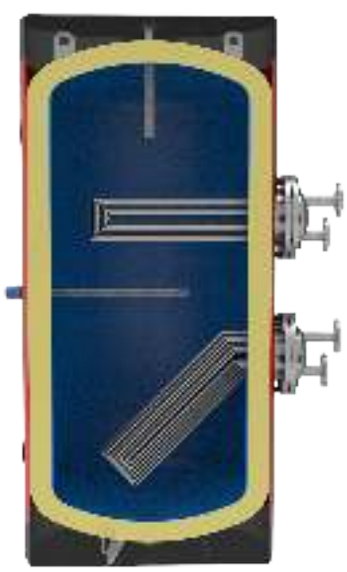
While the heating fluid from primary heat sources such as boiler, heat pump, solar energy passes through the tube coil, the mains water passes through the inside of the tank and the outer surface of the coil. In this way, without mixing the two fluids, the mains water is heated rapidly with the energy of the fluid in the primary circuit and the domestic hot water is produced and stored in the tank.

The tube coil mounted on the manhole flange on the body of the tank and having the required heating capacity can be removed, cleaned and replaced when needed. Through this manhole on the body, it is also possible to reach inside of the tank when necessary. The replaceable coil can be manufactured from stainless steel or copper material in accordance with the requirements of the user and the characteristics of the application.

Stainless Tank & Stainless Heating Coil Application: Water heaters made of complete stainless-steel material for the preparation of domestic hot water and for various process applications offer excellent corrosion resistance and hygienic use.

Enameled Tank & Stainless Heating Coil Application: The inner surfaces of the tank, produced using materials suitable for domestic hot water, are coated with double layer glass enamel (glass-lined) in accordance with DIN 4753-3 standard providing excellent corrosion resistance. It is possible to manufacture the replaceable coil from stainless-steel or copper material.

TANPERA TSB-ED1 Series
Single Extractable Stainless Steel Coil Enamel Coated Domestic Hot Water Vessel



TANPERA TDB-ED1 Series
Double Extractable Stainless Steel Coil Enamel Coated Domestic Hot Water Vessel

TANPERA TSB-P1D1 Series
Single Extractable Stainless Steel Coil Stainless Steel Domestic Hot Water Vessel

TANPERA TDB-P1D1 Series
Double Extractable Stainless Steel Coil Stainless Steel Domestic Hot Water Vessel

TANPERA PRO.. Series Domestic Hot Water Storage Tanks

It is specially designed for the storage of domestic hot water. Together with TANPERA plate heat exchangers, it forms an efficient and economical "Domestic Hot Water Production and Storage System". If desired, a connection port is available through which an electric heater can be installed.

It is offered to our customers in various capacities from 100 to 5000 liters.

The inner surface of the storage tank, which is produced in the required capacities and from materials suitable for the preparation of domestic hot water, is covered with double layer glass enamel (glass-lined) in accordance with DIN 4753-3 standard and provides excellent corrosion resistance. To minimize energy loss, it is perfectly insulated.

TANPERA PROWATT.. Series Electric Storage Water Heater

It is a system that heats domestic or process water quickly and effectively with electric heating coil, stores it in the tank and offers it to the users when needed.

It is offered to our customers in various capacities from 100 liters to 5000 liters. The electric storage water heater is delivered with stainless-steel electric heating coils.

At the specially designed control panel with Turkish/English menu LCD display, there are features of communication with the Building Automation System, co-aging for each electric heating coil and programming with a real time clock. The panel an has also electric leakage circuit braeker function, an operating data display and record function, automatic testing, and a legionella protection function.

All inner surfaces of the tank, produced using materials suitable for domestic hot water, are coated with double layer glass enamel (glass-lined) in accordance with DIN 4753-3 standard providing excellent corrosion resistance.

To minimize energy loss, it is perfectly insulated.

TANPERA BF.. Series Buffer Tanks

In all chilled water applications, in case additional water volume is needed, BF.. The series buffer tank is a specially designed and manufactured tank to increase the water volume of the system. In the tank, there are a certain number of baffle plates suitable for the tank volume to prevent temperature stratification and to ensure a homogeneous heat distribution. In this way, the air in the water can be easily separated and discharged out from the top of the tank. The outer surface of the tank is protected against corrosion by double layers of antirust, and the tank is perfectly insulated to minimize energy loss.

With flanged connection ports sized in accordance with the tank volume, it is ready to be installed in the system. It has also connection ports for air vent and drain valve installation.

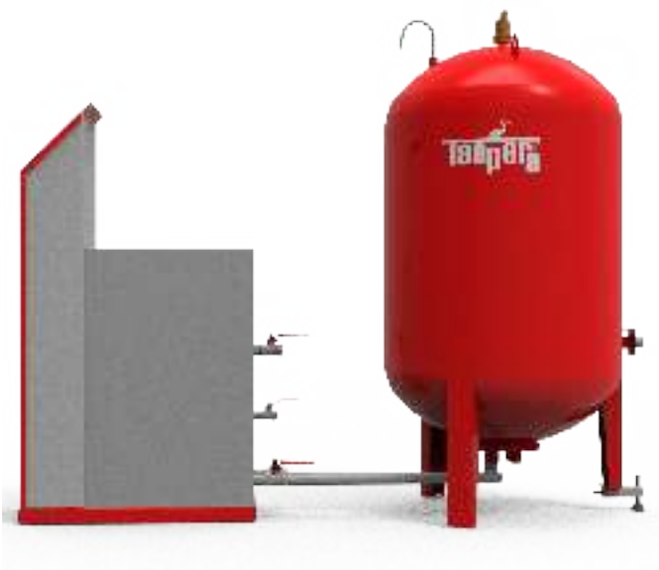
TANPERA TGT.. Series Expansion Tanks

In closed heating and cooling systems, expansion tank is used to compensate for the increase and decrease in the volume of water due to temperature changes.

TGT.. Series Expansion Tank is offered to our customers in various capacities from 24 liters to 5000 liters. It is produced in 10 bar and 16 bar operating pressure as standard. It has a replaceable bladder made of hygienic EPDM material that does not smell in water.

TANPERA TPG.. Series Pumped Controlled Expansion System

TANPERA Pumped Controlled Expansion System is a technology device that absorbs expansions from heating and cooling systems to maintain the pressure of installation. When heating the installation water, it controls the amount of expansion in the tank and eliminates pressure increases that may occur during heating. The pumped controlled expansion system ensures that decreasing volume of the installment water, which shrinks during the cooling of the water, is sent back to the plumbing with the help of the pump in, the pumped controlled expansion system thus preventing the installment pressure from decreasing.



Areas of Usage

It is used in heating and cooling systems to balance the changing volume of water due to change of temperature in all buildings and industrial facilities such as living centers, factories and industrial facilities, shopping malls, sports facilities, dormitories and boarding schools, social facilities and facilities, tourism and accommodation facilities, estates and apartments, military facilities, hospitals.

TANPERA Pumped Controlled Expansion Systems are produced in 2 different models and serviced to our customers.

TANPERA TPG-S (TPG - Standard) Series Pumped Controlled Expansion System;

TANPERA Standard Pumped Controlled Expansion System has 3 different operating modes. The 2.8-inch LCD touch screen makes switching modes easy.

Operating Modes

MANUAL MODE
Allows the user to individually open the equipment (solenoid valve, motorized valve, and pump) according to their needs.

AUTO MODE
Enables automatic pressure intake and pressurization according to the set operating pressure.

STOP MODE
Safely shuts down all equipment on the device and puts it in standby mode.

TANPERA TPG-P (TPG - Professional) Series Pumped Controlled Expansion System;

The state, management and monitoring of the system is ensured by the specially designed electronic control system, the software of which has been developed by the TANPERA R&D Centre. The high resolution 7" LCD touch screen offers userfriendliness. The LCD interface provides 4 operating modes, thus can be controlled operating pressure and other parameters. Many technological advances, such as membrane leak detection, external power units, remote access systems, greatly facilitate the use of mechanical installation systems.

Saving on Area

TANPERA Pumped Controlled Expansion Systems have an average expansion capacity of five times higher than conventional membrane expansion tanks, so they can be used in smaller areas and save space.

Low Maintenance Cost

Maintenance operations such as air and nitrogen gas boost required in conventional expansion tanks are not required in the pumped controlled expansion systems, because the outer surface of the membrane inside the tank is open to the atmosphere and unpressurized in the pumped controlled expansion systems. In consequence, maintenance and operating costs are lower.

Energy-Saving

TANPERA Pumped Controlled Expansions improve heat transfer and thus allows pumps to work with less pump head and save energy for the operation. The equipment in the installation system (pipes, fittings, valves, heater equipments and pumps) is protected from corrosion by the air inlet and the oxygen reduction in the air, significantly reduces the maintenance operations and renewal of the installation equipments, prolongs the life of the system proportionally and provides savings in operating costs.

Controlled Operation

Controlled operation allows installation pressures (-/+)to be maintained at 0.1 bar accuracy. The maintaining of constant pressure significantly reduces the air intake of the installation, reducing the air entering the installation brings benefits.

Opportunity of Automatisation

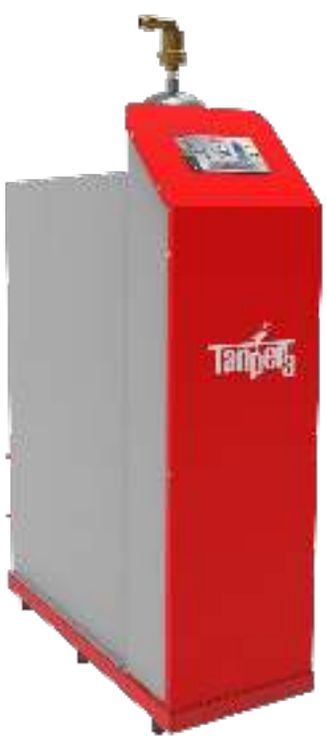
With LCD screens and error reporting features, the cause of errors can be easily detected and resolved. The system is operated smoothly and safely.

TANPERA TOSB.. Series Automatic Water Supply System

With the its pressure sensor, the pressure of the installation is constantly controlled, and when occur a pressure loss, back the required volume of water to the installation with the solenoid valve to balance volume of water. To ensure that the water of the heating and cooling systems does not mix with the mains water, the BA type backflow preventor valves are used which is certified to EN 12729 in accordance with European standards.

Due to the automation panel, the software of which was developed by the TANPERA R&D Centre, the operating values can send information to the building automation center via RS485 protocols (MODBUS). Dry contact signal outputs are also available. The automatic water supply system includes a flow meter (signal output flowmeter) to measure the volume of water fed to the installation and to determine the volume of loss and leakage.

TANPERA TVD.. Serisi Vacuum Degasser



TANPERA Vacuum Degasser is a package type technological device that ensures to remove dissolved gases in water that may damage the installation in heating, cooling and industrial processes with the principle of gas separation under vacuum. Dissolved air by diffusion into the installation water causes corrosion in pipes and fittings, significantly reduces energy efficiency and installation health, and causes malfunctions in many moving parts. The amount of water taken from the heating or cooling system is transferred into an especially designed tube. The fluid containing undesirable gases in the tube reach to the boiling point by being reduced to negative pressures by the centrifugal pump with vacuum capability, and the gases are separated from the boiling water under vacuum and rise to the top of the tube. Separated gases are released to the atmosphere with the help of a special type of air vent used on the tube. The gas separation process is repeated at certain periods.

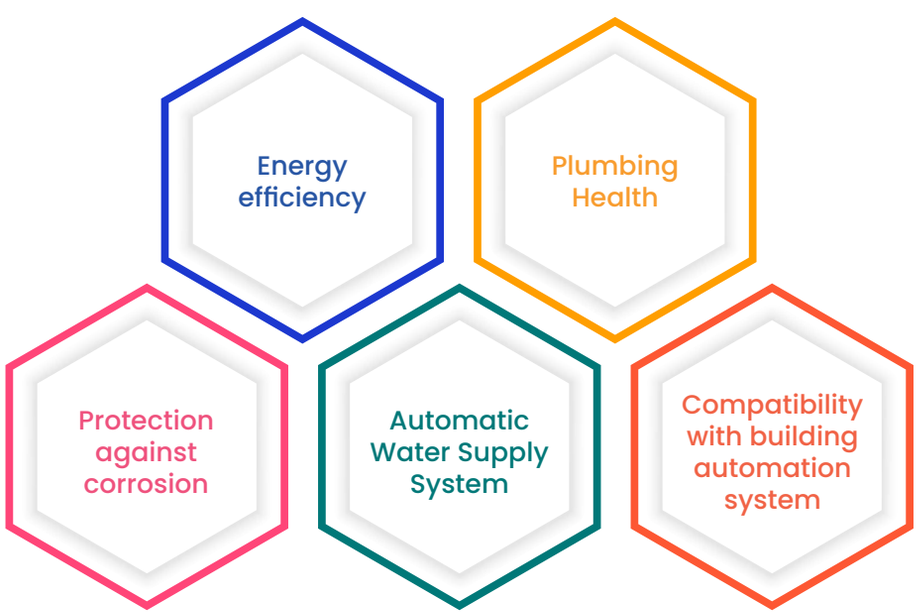
With the TANPERA Vacuum Degasser, the dissolved air in the installation is separated from the water, the formation of corrosion is prevented and the safety of the installation is kept at the highest point.

TVD-S (TVD-Standard) Series Vacuum Degasser;
TANPERA Standard Vacuum Degasser separates the dissolved gases in the installation water. The operating range can be programmed via the control unit when required or in certain time periods.

TVD-P (TVD-Professional) Series Vacuum Degasser;
The status, management and monitoring of the system is provided by the especially designed electronic control system, the software of which has been developed by the TANPERA R&D Centre. The high resolution 7" LCD touch screen offers userfriendliness. The LCD interface provides 4 operating modes, and thus can be controlled operating pressure and other parameters. With its automatic water supply system, it supplies the decreased amount of water in the installation by separating it from the dissolved gases. The system can give output signals suitable for the building management system upon request.

TANPERA TVD-S Series
Vacuum Degasser

TANPERA TVD-P Series
Vacuum Degasser



INDUSTRIAL PRODUCTS

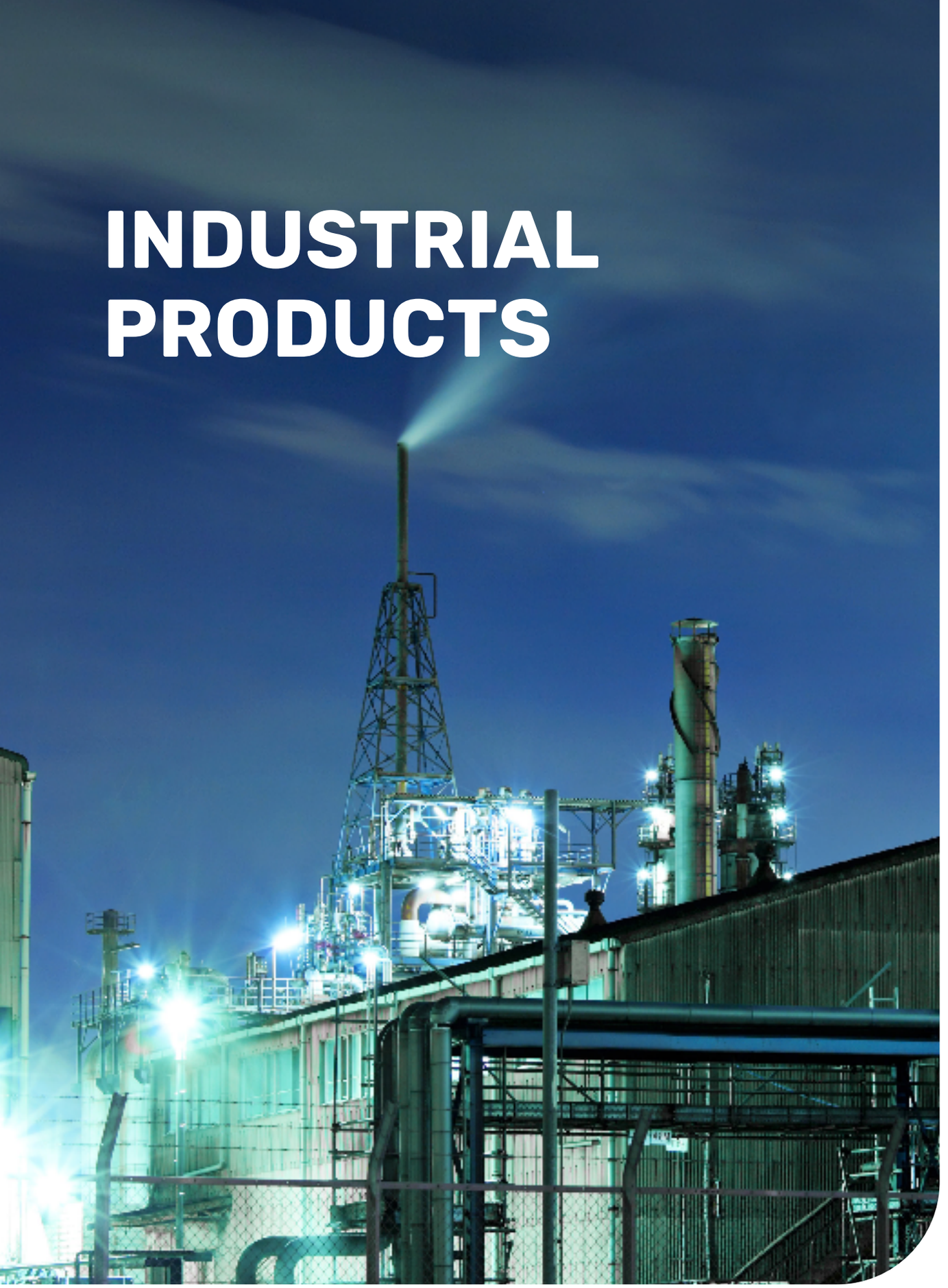
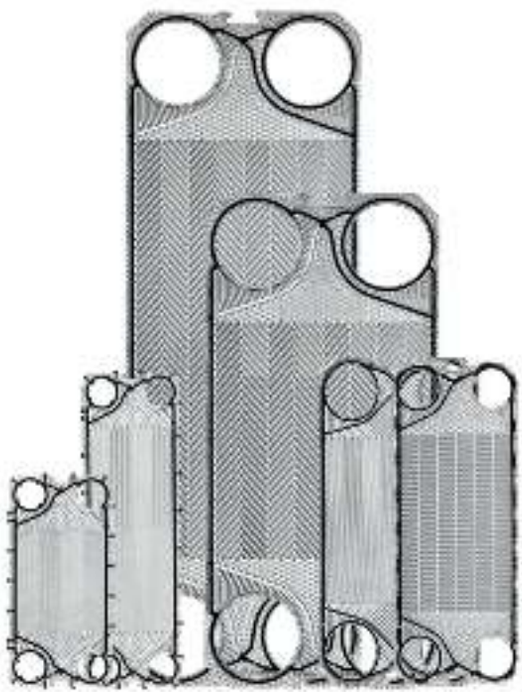


Plate Heat Exchanger



TANPERA Plate Heat Exchangers (PHEs) are one of the most commonly used devices for heat transfer in industrial applications. Plate heat exchangers are used in many different sectors such as chemical processes, food processing, pharmaceutical manufacturing, petrochemicals, and energy production.

With the expert designs of TANPERA's engineers to suit the conditions of each application, plate heat exchangers can be operated for long and healthy periods.

Plate heat exchangers are designed according to the type of fluid, inlet and outlet temperatures, flow rate, and allowed maximum pressure drop values. As a result of the design, a product is produced with a certain surface area, connection diameter, and dimensions. A heat transfer coefficient is determined for the designed product based on all the design conditions. The unit of this heat transfer coefficient is W / m².°C, which represents the amount of heat transferred per 1°C temperature difference over 1 m² surface area.

TANPERA plate heat exchangers consist of body plate gaskets and suspension systems. Plates are made of materials such as AISI 316, AISI 304, Titanium, 904L, and SMO. Gaskets are made from materials such as NBR, EPDM, VITON, TEFLON, and HYNBR.

Another important part of plate heat exchangers, as important as the plates and gaskets, is the body system. The body system consists of front pressing plate, back pressing plate, upper suspension rod, lower alignment rod, support foot, and stud sets. The materials for pressing plates are selected according to the needs of the project, such as St-37, St-52 P355GH, P265 GH, and AISI 304 stainless.

In plate heat exchangers that operate in places where external corrosion is high, the upper suspension rod, lower suspension rod, foot, and stud sets are coated with hot-dip galvanized coating to provide surface protection with zinc-containing primer.

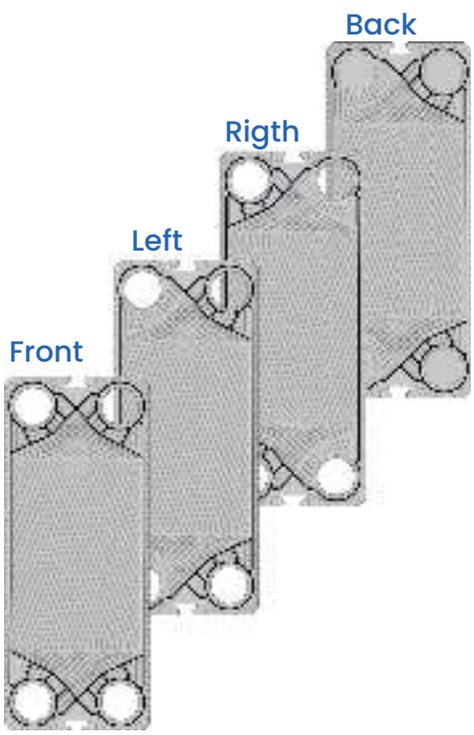
TANPERA designed and manufactured the world's largest gasketed plate heat exchanger that can provide heat transfer at a flow rate of 7200 m3/h with its experienced technical team.

Lehimli Plakalı Eşanjör

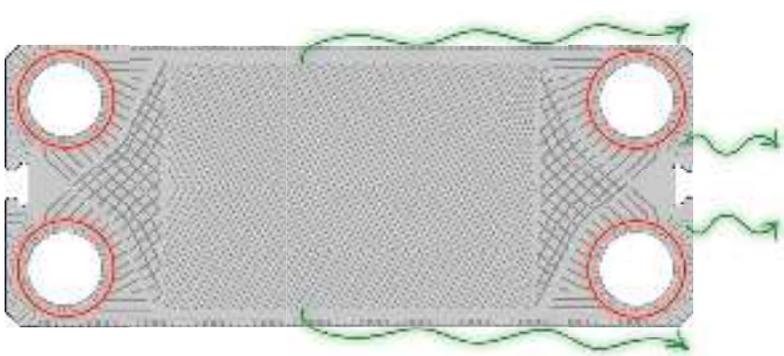
In TANPERA Brazed Plate Heat Exchangers, thin copper plates are placed between each plate gap. These copper plates are melted at high temperatures in vacuum furnaces and placed along the welding channels between the heat exchanger plates. This provides direction to the fluid flow inside the exchanger and ensures tightness.

Brazed heat exchangers are also used in applications where gasket strength is limited. TANPERA Brazed Plate Heat Exchangers are widely used as condensers and evaporators in cooling units, for oil cooling in hydraulic machines, for pasteurization in the food industry, and for producing hot water from steam.

Double Wall Plate Heat Exchanger



TANPERA Double Wall Plate Heat Exchangers are preferred in applications where mixing of two fluids is not desirable. TANPERA Double Wall Plate Heat Exchangers are formed by placing pairs adjacent to each other and functioning as a single plate. Since there is space between the two plates, when possible plate fractures occur, liquids are guaranteed to leak outside the environment, rather than mixing with other fluids. TANPERA Double-Wall Heat Exchangers are particularly preferred in chemistry, pharmaceuticals, food, where the mixing of fluids involves a high risk.



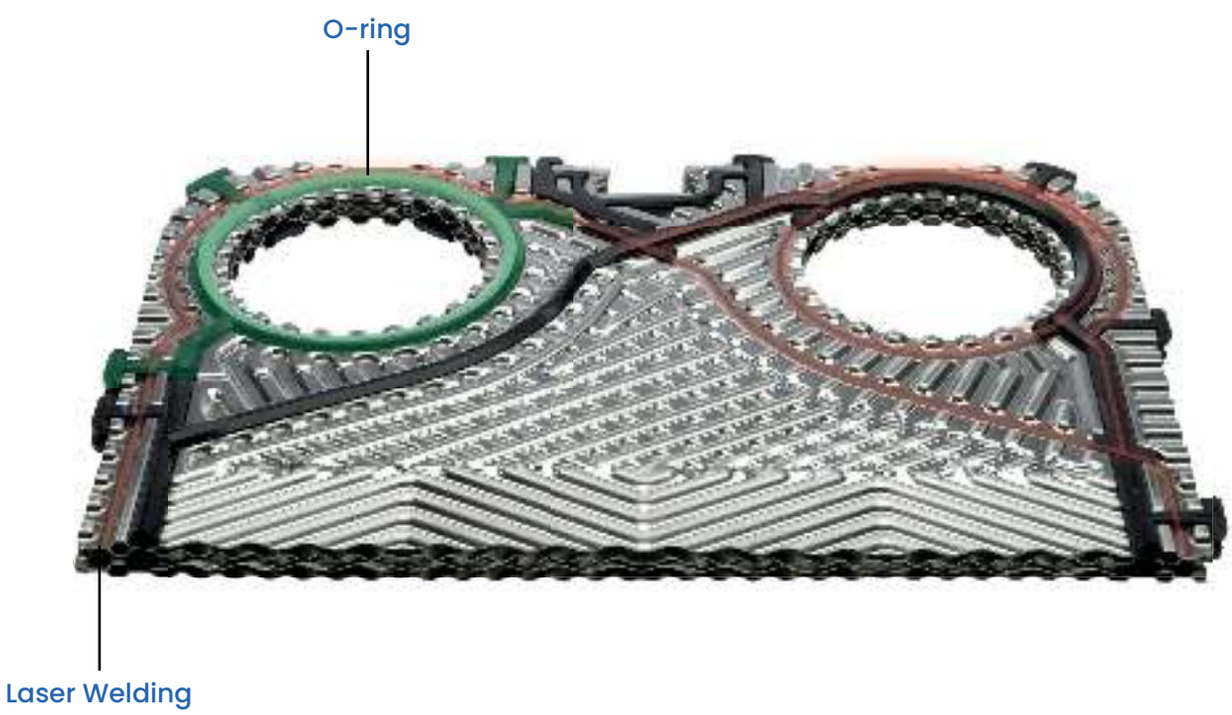
Semi-Welded Plate Heat Exchanger

TANPERA Semi-Welded Plate Heat Exchangers are preferred for applications in which two fluids require different types of gaskets. For each fluid requires different gaskets in steam, oil, ammonia gas, and water applications. Viton Gaskets are used to heat water with high-pressure steam. Teflon gaskets are used for the cooling and heating of chemical liquids where conventional gasket strength is not suitable. In such industrial applications, viton and teflon gaskets are only used on mandatory circuits, so low-cost gaskets can also be used on other circuits. Thus, the initial investment costs of the use of semi-welded heat exchangers for industrial applications are reduced to a reasonable level.

Semi-welded heat exchangers are used as evaporator, condenser and desuperheater in the refrigeration industry. In particular in food storage facilities where there is a need for high-capacity cooling, semi-welded heat exchangers take up less space than shell-tube heat exchangers and provide a close approximation of temperature with their high heat transfer capability.

In particular, in the cooling industry, energy recovery is achieved by applying desuperheaters. The refrigerating gas from the compressor is in the super-heating phase, first entering the condensing saturated phase, and then condensing.

In applications of desuperheating, the semi-welded heat exchanger provides heat recovery during the transition from superheating to saturated.

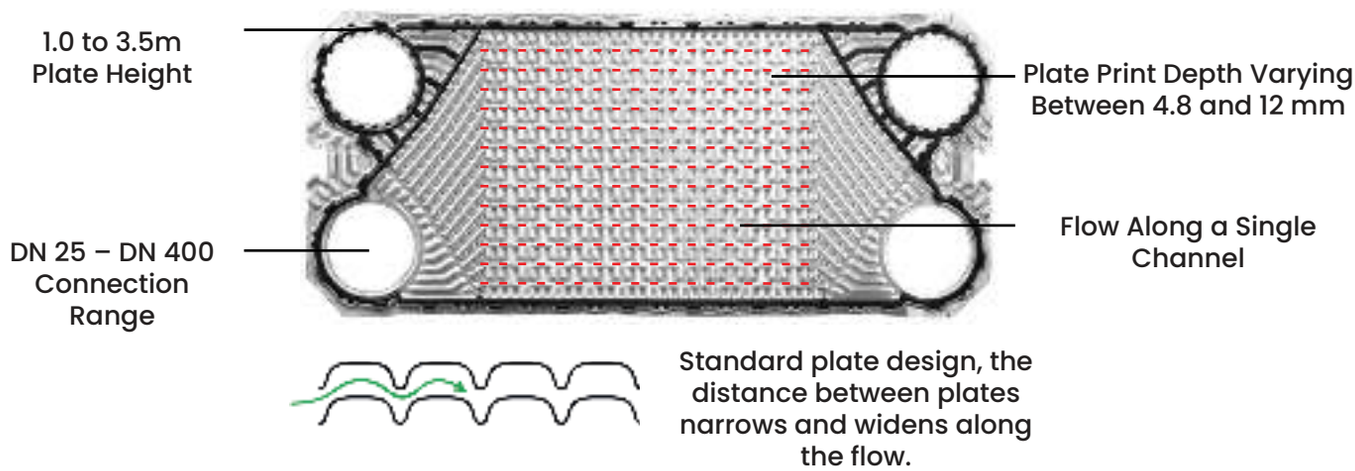


Free Flow Plate Heat Exchanger

TANPERA Free Flow Plate Heat Exchangers are gasketed plate heat exchangers with a plate-channel structure specially designed to provide heat transfer for high viscosity liquid that contains undissolved solids. TANPERA free flow plate heat exchangers are characterized by a wide range of products with a diameter of DN 25 to DN400.

The main difference of wide-range plate heat exchangers from traditional fish bone plate heat exchangers is that the heat exchanger increases the resistance of the heat exchanger against fouling by ensuring that the fluid moves through a perpendicular channel from a fixed gap while heat transfer takes place.

These heat exchangers ensure that continuous operation of the system during production is ensured because of the long period of fouling in the sector where production takes place at a certain period, such as the sugar process.



Spiral Heat Exchanger

TANPERA Spiral Heat Exchangers are particularly suitable for foulants where the plate heat exchanger cannot be operated. TANPERA Spiral Heat Exchangers are a highly suitable solution for harsh conditions designed to provide heat transfer from foulants containing Sludge, Waste Water, Pulp, High Viscosity Hydrocarbons, Fiber and Solid particles.

The core of TANPERA Spiral Heat Exchanger consists of a concentric spiral plate coil placed in the shell. With these coils, an excellent heat recovery is achieved with two completely separated channels with countercurrent flow arrangement, which allows to obtain close temperature approximations between primary and secondary circuits.

The height of the channel passing through the fluids with foulant is 6 to 50 mm, allowing the solid particles to move freely into the channel.

Due to these structural features of TANPERA Spiral Heat Exchangers, it is ensured that the energy of fluids that contain energy in one circuit but cannot be reused are transferred to the other circuit at the maximum level.

Plate Condenser

TANPERA Plate Condensers are used to condense vapor phase fluids under vacuum or underpressure.

TANPERA Plate Condensers are formed by welding two plates to each other with laser welding. The large diameter of the connection on the laser welding side allows underpressure steam that comes to this point to enter the plate condenser with minor pressure loss.

Shell&Plate Heat Exchanger

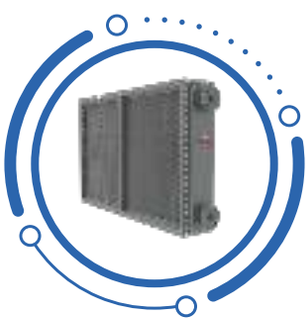
TANPERA Shell&Plate Heat Exchangers are produced by welding the plates to each other with laser welding. TANPERA Shell&Plate Heat Exchangers are designed for high pressure and/or high temperature applications.

It is widely used for applications such as the cooling of plastic presses used hot oil, the production of hot water for heating systems with hot oil boilers, and the production of hot water from high-pressure steam. Shell and plate heat exchanger, which is produced in the standard configuration, is designed to work smoothly in the 40 bar pressure and 400°C temperature range.

Finned Tube Heat Exchanger

TANPERA Finned Tube Heat Exchangers are devices that transfer heat between liquids that pass through the tube and gases that pass outside the fin. It consists of a large number of fins and tube bundles arranged in a certain order.

Finned tube heat exchangers contain a large number of fins since the outer fluids are usually gases (usually air). Since the outer fluid is gas, the value of the heat transfer coefficient is low, so more heat transfer area is required for the desired amount of heat transfer. Due to its unique structure and many fins, it increases the surface of heat transfer and ensures great heat transfer.



Rectangular Finned Tube
Heat Exchangers

Circular Finned Tube
Heat Exchangers

Bare Tube
Heat Exchangers

Double H Finned Tube
Heat Exchangers

Rectangular Finned Tube Heat Exchangers

Rectangular Finned Tube Heat Exchanger is composed of thin fins placed in parallel at a certain interval, and the tubes pass through a hole in these fins in a certain sequence.

Generally, the fluid passing between the fins (external fluid) is gas, and the fluid passing through tubes is liquid. Since the external fluid is gas, the heat transfer coefficient is low and more heat transfer area is needed for the desired amount of heat transfer. The fact that there are more fins increases the heat transfer area and ensures the maximum heat transfer.

Rectangular finned tube heat exchangers can be used in steam, heat recovery and other many industrial applications, especially in HVAC. Rectangular finned tube heat exchanger can be designed by TANPERA engineers in accordance with thermal capacity and pressure loss limits.

Rectangular finned tube heat exchangers can be produced in the following material options.

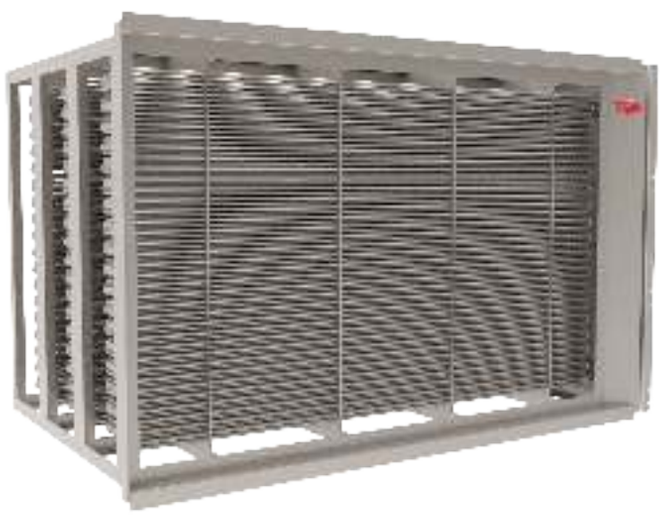
Circular Finned Tube Heat Exchangers

Circular Finned Tube Heat Exchangers are formed by coil fins at a specified interval on the suitable tube material to increase the surface of heat transfer. The following issues are determined during the design phase;

- Spiral fin type
- Tube and fin material
- Product application area
- Expected performance from the product
- Product service life

Circular Finned Tube Heat Exchangers can be used in various industrial processes and applications such as marine, paper and textile industries, oil cooling and heat recovery applications, motor and generator coolers, air heating and drying. Serpentine finned tube heat exchangers can be manufactured with the following material options.

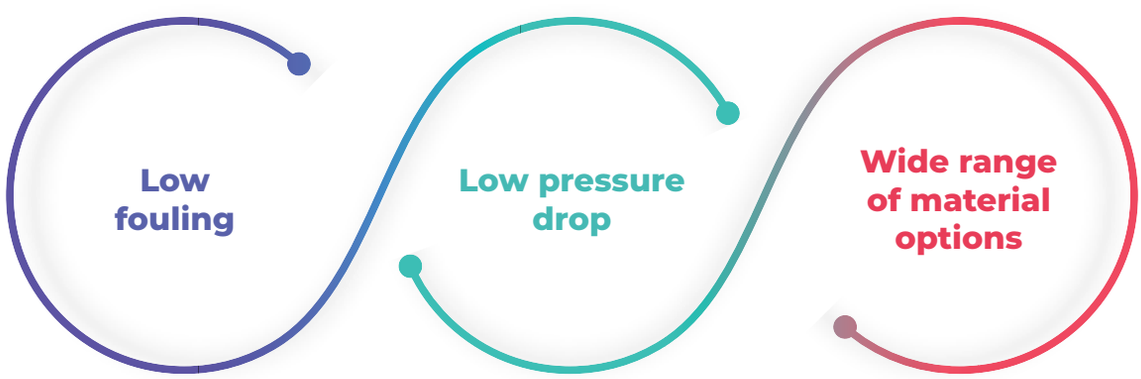
Bare Tube Heat Exchangers



Bare tube heat exchangers are preferred in situations where maximum air flow rates and minimum fouling and pressure losses are desired. Due to the flat structure of the outer surface of the pipes, it becomes diff cult to remove dust, sawdust, etc. dirty fluids to adhere to the surface. Bare tube heat exchangers are easy to clean and therefore increase the efficiency of heat transfer.

Bare tube heat exchangers are generally used for heating water with hot air, heating air with steam or heating oil with waste gas. Bare tube heat exchangers are preferred in thepaper and wood industry, brick-ceramic factories and many industrial heat recovery applications where dirty waste heat is present.

Materials of tubes, wall thicknesses and other details are calculated while heat transfer calculations are made by TANPERA engineers.



Double H Finned Tube Heat Exchangers

Yüksek frekans kaynaklı H tipi kanatlı borular hava akış hızının ve basıncının yüksek olduğu, kirlenme ve tıkanmaların oluşabileceği proseslerde sıklıkla tercih edilmektedir. Kanatlı yapısından dolayı çıplak borulu eşanjörlere göre daha kompakt ve hafif dizayn edilebilmektedir. Birbirine paralel düz kanat yapısı sayesinde kolay temizlik ve bakım olanağı sunmaktadır.

Yüksek frekans kaynaklı kanatlı borulu eşanjörler kirliliğin yoğun olduğu kâğıt ve ağaç endüstrisinde, tuğla-seramik fabrikalarında, tekstil fabrikalarında ve birçok tesiste atık ısı uygulamalarında kullanılmaktadır.

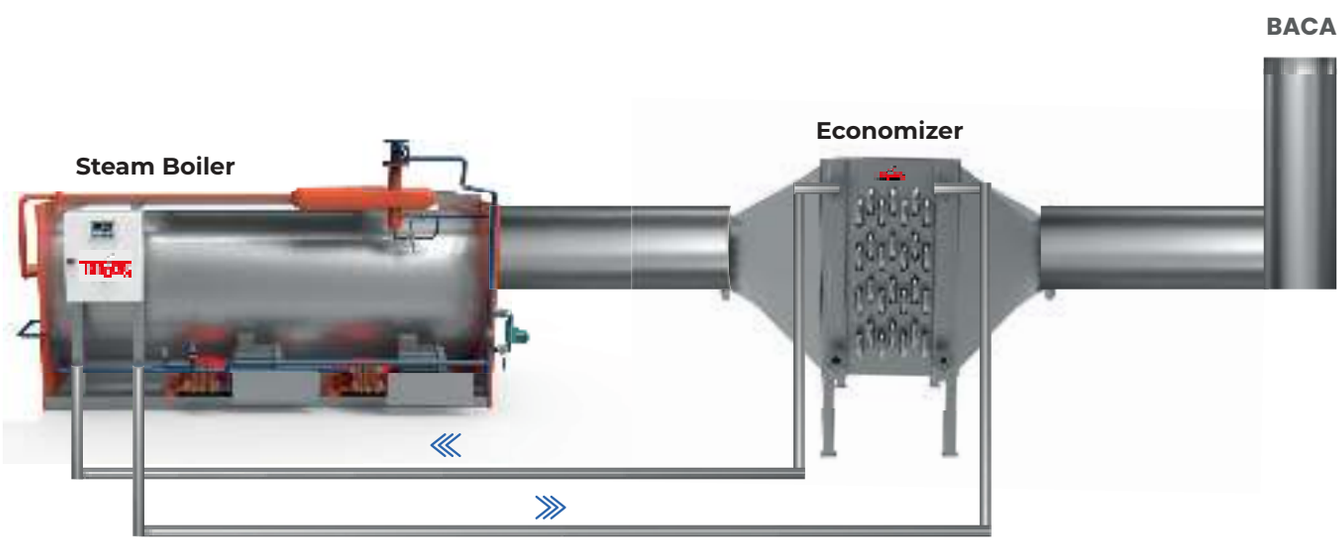
Economizer

With the economizer, heat, steam, or power generation facilities can recover some of the heat on the hot smoke gases coming out of the boilers or furnaces and going to the chimney, resulting in a boiler or plant efficiency increase of 3% to 15%. Depending on the increase in efficiency, fuel savings can be achieved.

The greater the difference between the smoke gas temperatures entering and exiting the economizer, the greater the efficiency increase. However, when the economizer gas outlet temperature drops below a certain temperature, acid gases that may cause corrosion will begin to condense. To prevent this, it should be kept in mind that temperatures of the waste gases cannot be reduced to a certain degree.

Gas temperatures can be reduced in natural gas-fueled boilers up to 50 - 60 °C in condensing systems. In this case, the economizer should be made of stainless steel.

It should be noted that every 20 ° C drop in the temperature of the flue gas provides a 1% increase in the efficiency of the boiler. The return on investment of economizer applications is between 1-3 years.



Recuperator

The recuperator is a heat recovery system that provides heat transfer from air to air. In other words, the equipment that allows the heat energy contained in the hot gas to pass to a cooler air is called a recuperator.

Steam air flow entering and exiting the recuperator are separated by a wall. As long as the temperature values of the two air flow streams differ from each other, the heat in the warmer air stream is transferred to the cooler air stream through the wall. Thus, heat in hot and polluted air is transferred to cold and clean air, and vice versa.

The recuperator investment pays off in a very short time, such as 3-12 months, depending on the capacity, working time and purpose of use.

Dry Cooler

Dry coolers are systems that cool process water with ambient air. Dry coolers can cool to 5 ° C above ambient temperature. However, in wet/adiabatic coolers, absorbed atmospheric air is brought into contact with water to increase the relative humidity. After the humidity is saturated in the air, the air temperature decreases. Thus, water cooling can be provided at lower temperatures.

Dry Coolers are preferable in areas where wet bulb temperatures are low, as they consume less water than open or hybrid cooling towers. Furthermore, dry coolers are not fouling because they operate in closed circuits with cooling water circuits. For this reason, the breakdown and maintenance costs are low.

The most important usage areas of dry coolers are free cooling application. By connecting in series with the chiller devices, it provides electricity savings by partially or completely taking the load of the group by working instead of the chiller unit in periods when the atmospheric temperature is low and/or working as the pre-cooling of the chiller unit.

Dry coolers can be produced as epoxy coated aluminum fins or uncoated aluminum fins, and they consist of copper tubes and fans passed between the fins.

In order to reduce dry cooler electricity consumption, EC fans are usually used instead of AC. Because of the EC fan, each fan driver can reduce engine rpm of the fan to 1rpm.

At low atmospheric temperatures, the fan rpm with drivers decreases, thereby reducing electricity consumption. In this way, by using EC fans in dry coolers, it provides up to 50% electricity savings compared to AC fans.

Dry coolers can be used in the plastics industry, thermal power plants, cogeneration systems, data center, pharmaceuticals, surface treatment and other many different industries and HVAC applications.

While heat transfer calculations are made by TANPERA engineers, tube materials, wall thicknesses and other details are calculated according to the condition of the process and area where it will be used.

Exhaust Gas (Waste Heat) Shell&Tube Exchanger

TANPERA Exhaust Gas (Waste Heat) Exchanger is used to recover heat from the gas discharged at high temperature from the exhausts of solid or gas fueled engines such as diesel, coal and biogas, or to obtain hot water.

Shell and Tube Heat Exchangers are the type of heat exchanger where the effects of fouling on the heat exchanger surfaces, where the waste gas passes are the least in exhaust gas applications and are more durable than other heat exchanger types. Therefore, it is preferred in this type of application over other heat exchangers.

In biogas plants, the waste gas temperature is 180°C, and in coal and natural gas boilers it is over 130°C. In these cases, all the surfaces that the gas comes into contact with can be produced from at least carbon steel quality, also from AISI 304 or AISI 316 quality stainless steel materials. In natural gas burning devices, if it is desired to be cooled to 130°C and below, all surfaces that the exhaust gas comes into contact with due to condensed water must be of AISI 316 quality.

Double Pipe Heat Exchanger

TANPERA TGB Series..Double Tube Heat Exchangers are used in applications where one of the fluids is foulant. Due to its structure, the double-pipe heat exchanger consists of two concentric pipes.

Double tube heat exchangers are commonly used to keep the temperature constant in the sedimentation pool. Another widespread area of its use is the application of thermal recovery of textile waste water. The foulant fluid passes through the inner tube, while the other fluid passes through the outer tube. When designing double pipe heat exchangers, the flow rate in the inner pipe, which is the foulant side, is crucial.

Dehumidication Shell&Tube Heat Exchanger

Especially in the biogas sector, the biogas produced contains about 30% humidity, o.r.,water vapour, depending on the temperature. Before entering gas engine, this humidity must be filtered from the biogas.

The simplest way to eliminate this humidity is to cool biogas. When biogas is cooled to approximately 10°C, the moisture content of the biogas decreases to approximately 1%. For this process, shell and tube heat exchangers are often preferred for their low pressure loss. In the case of biogas applications, biogas is transported by pipeline, while cooling water is transported by the shell side.

Steam Condenser Shell&Tube Heat Exchanger

Steam Condenser Shell&Tube Heat Exchangers are generally used for the following two purposes:

- Generating hot water with the energy of saturated or superheated steam.
- Condensing fluids in the vapor phase under vacuum or at saturation point with cold water.

Due to the limited use of gasketed plate type heat exchangers in hot water production applications from steam at high temperature or pressure, shell and tube heat exchangers are used extensively in these applications. The main advantage is that it can be used long-term without maintenance.

Steam Generator Shell&Tube Heat Exchanger

Steam Generator Shell&Tube Heat Exchangers produce steam from pure water by using energy sources such as polluted steam, hot oil or hot water. In this way, strelize steam is obtained, which is food grade.

In the production of sterile steam, since the produced steam comes into contact with the stainless material throughout the process, no fouling occurs during the process.

Tank Suction Shell&Tube Heat Exchanger

The tank suction shell&tube heat exchanger are generally used to heat liquid in tanks that are stored and can exist in solid or semi-solid form at low temperature.

At low temperatures, it is very difficult to transfer high viscosity and density liquids. In order to avoid this situation, the liquid absorbed from the tank is heated before the pumping station, reducing its density and viscosity.

U Tube & I Tube Shell&Tube Heat Exchanger

TANPERA shell and tube heat exchangers can be designed as U-tubes or I-tubes, depending on the process. Tube type, material, wall thickness and method of tube sheet joining to be used are determined by TANPERA engineers according to the temperatures of the fluids, the desired pressure losses and the type of fluid. The U-Tube heat exchanger is especially preferred in processes where the temperature difference is great and the cleaning of the heat exchanger is crucial.

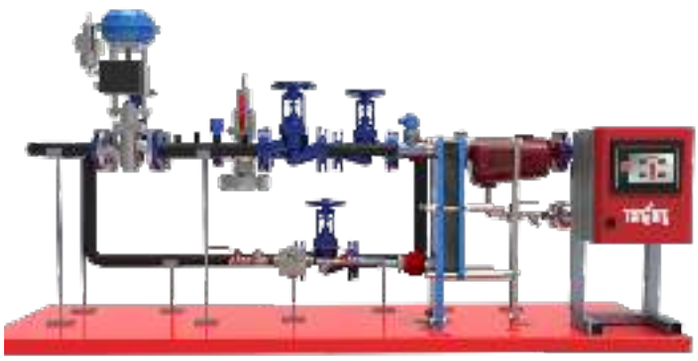
Shell and tube heat exchangers are used in many sectors such as textile, food, chemistry, petrochemistry, maritime, in many applications such as oil cooling-heating, water cooling-heating, compressor air cooling, and in many industrial facilities. Shell and tube heat exchangers can be produced from copper, carbon steel, stainless steel, titanium and many different materials.

Flash Steam System

In steam plants, flash steam emerges due to the loss of pressure at the high pressure and temperature condensate returning energy or during the blowdown of the surface in the boiler. This resulting steam is thrown out of the condensate tanks open to the atmosphere, thus causing loss of energy, water and chemicals. This loss can reach 3-20% of the amount of steam produced.

It is possible to prevent this loss with flash steam systems. The obtained flash steam can be used for degassing in dearator, preheating of feed water, condensate heating, cooling with absorption chiller, preheating the air or by re-pressurizing it to meet the need of plant steam.

TANPERA HEATBOX.. Series Hot Water Generation System



- Produces hot water at the desired temperature for heating and processes.
- It meets the needs of domestic or process water with its fast and instant response feature.
- It is designed to provide constant temperature water even at variable loads.
- They are package systems mounted on the platform and ready for installation.
- It can be easily commissioned by making electricity, water and steam connections.
- Less area is required for installation.
- Remote access and control can be possible according to the automation alternatives to be selected.
- Perfect design, preventing dirt and bacteria formation.

CONTROL PANEL :
Easy-to-use touch screen, has a visual screen where you can see all system values.

PLATE HEAT EXCHANGER:
It is one of the elements of the system that guarantees the design performance values. The specially designed heat exchanger has high efficiency and low pressure drop values. It is easy to maintain and the capacity can be changed due to its detachability.

TEMPERATURE CONTROL:
Electric or pneumatic actuators are used. Proportional control is recommended. Precise temperature control is achieved with PT 100 temperature sensors.

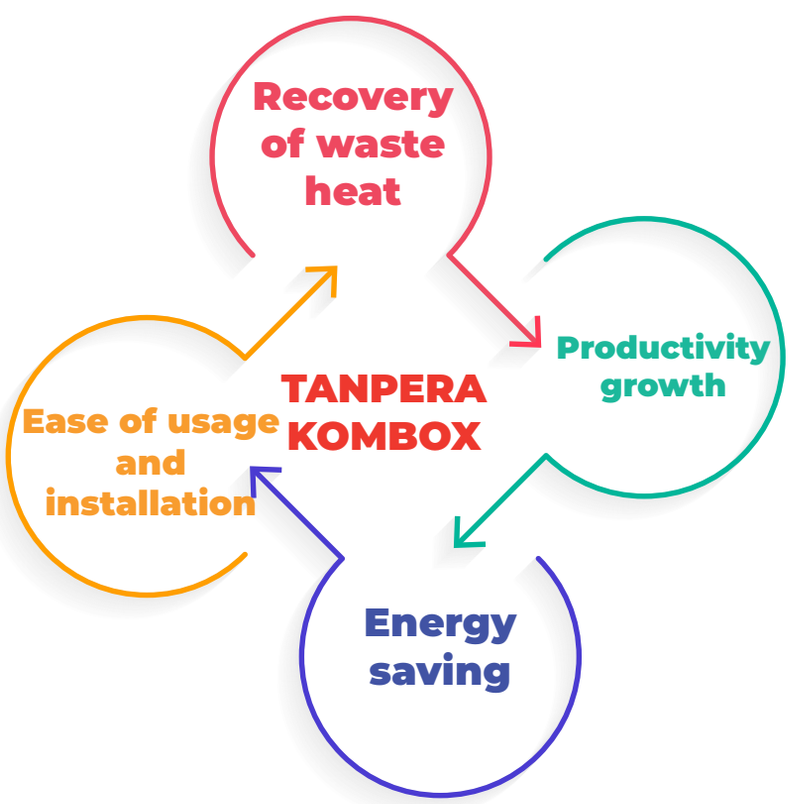
FLOW METER:
Optionally, with the addition of steam meter, instant and total steam consumption can be seen.

CONDENSE CONTROL:
With the combination of the steam trap or condensate pump, the condensate can be easily discharged under all operating conditions.

TANPERA KOMBOX.. Series Compressor Heat Recovery System

In almost all industrial plants, air compressors are used to produce compressed air. Compressed air has a crucial place for production in industrial facilities. While air compressor carry out this important function, they are very inefficient machines when compared to their electricity consumption and operating performance. In return for the useful operating, it throws 95% of the energy that consume into the atmosphere as waste heat. The waste heat is exhausted to the atmosphere by cooling the lubrication systems of the mechanical equipment used to compress and pressurize the air.

TANPERA Kombox Series Compressor Heat Recovery System is a packaging system specifically designed to use oil energy. In the compressor heat recovery system of the compressor, the heated oil in the screw group is delivered to the three-way thermostat valve. If the temperature is higher than the temperature set by the thermostatic valve, to the brazed plate heat exchanger in the compressor heat recovery system is directed. The heat in the oil is transferred to the water in the secondary circuit via of a brazed plate heat exchanger. In this way, approximately 90% of the consumed electrical energy is converted into useful energy when the compressor operates at full-load. Thus, compressor waste heat can be used to produce hot water for many different purposes, usually heating system or domestic hot water heating.



Water Tube Steam Generator

It is a boiler system which is very easy to operate, has no explosion risk and can produce dry steam whenever and as much as needed in high efficiency, all in a few minutes by controlling from a common automation system by putting together the new technology steam producers modularly designed to be used side by side.

It has a high efficiency and low NOx and CO2 values along with Class 3 burners that are used in the system. It also provides a great advantage for operations that demand environmentally friendly and low carbonization as well as high efficiency.

The temperatures of the chimney gas waste are very low because of the surface area that provides a high heat exchange.

Thanks to the chimney gas economizer that the system has as a standard, the modulating controlled combustion and feedwater system is synchronized and most of the energy is transferred from the chimney to the feed water. Thus, the total system efficiency reaches 95%.

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Advantages

•%95 Efficiency
•Small Boiler Rooms
•Economic and Easy Backup Possibility
•Faster Response in Peak Flow
•Low Commissioning Energy Loss
• Zero Explosion Risk
• Smart Fault Detection System
• Unattended Safe System
• No Blowdown Losses
• Dry and High Quality Steam
• New Technology Automation System
•No Classical Deaerator Requirement
•High Turndown Ability
•Feed Pump Cavitation Prevention System
•User Friendly, Easy Operation
•Easy to Change Steam Pressure
•Easy and Economic Steam Capacity Increase
•Protective Layer / Efficiency Loss Control System
• Sequential Operation
• Possibility of periodic maintenance agreement
• Low Operating Cost
• Environmentally Friendly, Low NOx and CO2
• Synchronous Modulating Control of the Whole System
• Optional Flash Steam Recovery System

No Commissioning Losses During The Start-Up
A conventional scotch type steam boiler that is not commissioned should be operated for about an hour, depending on its capacity, to produce steam at the desired pressure.

Until the boiler reaches full capacity, both energy and time loss may occur by spending extra energy. It takes a maximum five minutes to obtain steam at the desired steam pressure from zero with a small amount of water used in the water pipe cascade system.

Economical and Easy Backup Opportunity
Since it is a modular system consisting of lower capacity units, there is no need for full capacity backup.For example, for a facility requiring 12 t/h steam, when you make a backup in the conventional system boiler room, you need to buy 2 units of 12 t/h boilers. Whereas, by purchasing 4 units of 3 t/h modules in the cascade system, you meet your steam needs and make a backup by placing the 5th unit next to these units. If we continue with the same example we had; Five units of 3 t/h cascade systems can be installed in a smaller area than two 12 t/h boilers. In this case, your initial investment cost will also be much lower.

Steam Turbine - Steam Expander

Industrial plants using steam can reduce the steam pressure for different production points. This is achieved by the pressure-reducing station at the point where the steam is produced.

The steam turbine, which increases efficiency in facilities that use steam pressure reducing stations, can produce a maximum of 5,500 kWh of electricity. Optimizing the flow rate and pressure value is a critical factor in the system's electricity generation. Depending on the variability in these values, the amount of electricity generation may increase or decrease.

Single stage between 20 - 500 kW
Single or multi-stage between 100 - 1.000
Multi-stage between 1.000 - 5.500 kW

20 - 1.000 kW capacity range
Maximum inlet pressure is 45 bar (g) 460 °C
Minimum outlet pressure is 1 bar (g)

1.000 - 5.500 kW capacity range

Maximum inlet pressure is 65 bar (g) 500 °C

Minimum outlet pressure is 1 bar (g)

Capacity increase with serial connection

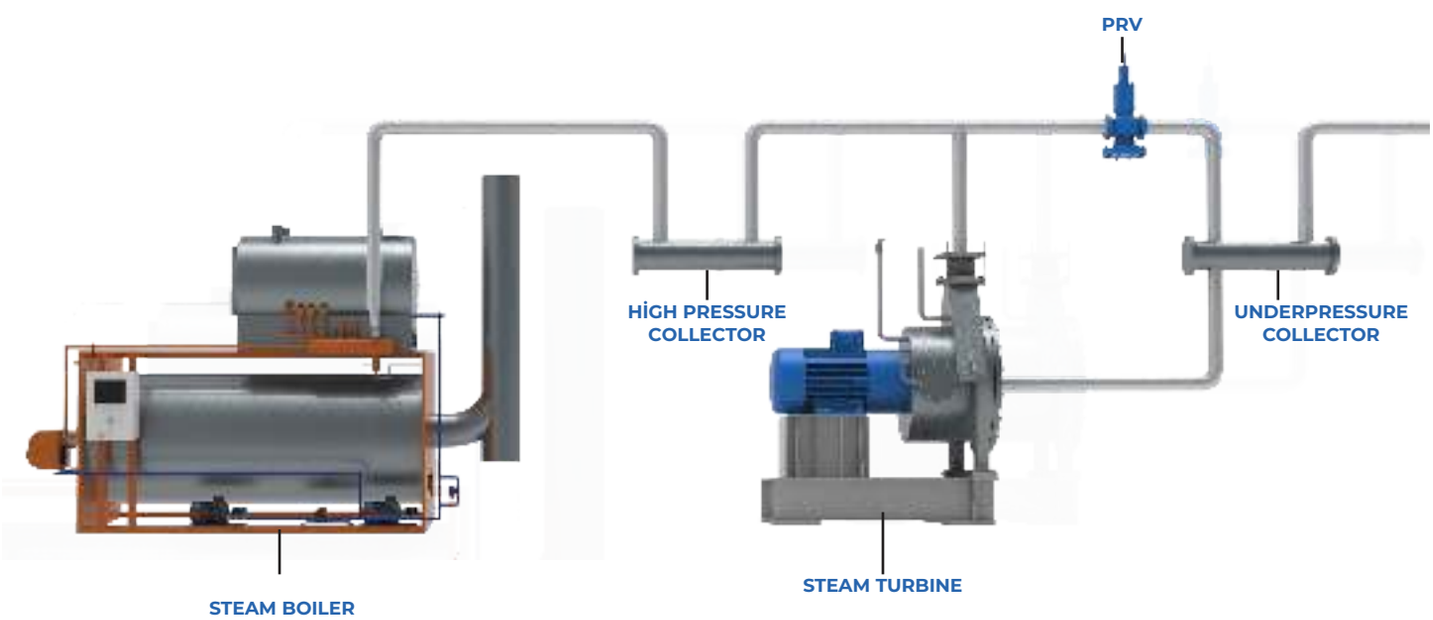
Low maintenance costs

High efficiency

Steam flow and pressure control

High power factor monitoring and control system

Two or three modulating controlled steam inlet options in variable steam flows



23 years of industry experience
with high customer satisfaction!

The objective of TANPERA is to continue to “makes the change happen” and to be “the best” in distributing our world-standard products and sales to keep high customer satisfaction at the forefront is the priority a wider market and sector.

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