AYVAZ

INDUSTRIAL SOLUTIONS

BOILER ASSEMBLY

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BOILER ASSEMBLY

Energy is getting more important day by day. According to the diminishing of energy sources in industries searching for alternative sources for increasing the productivity.

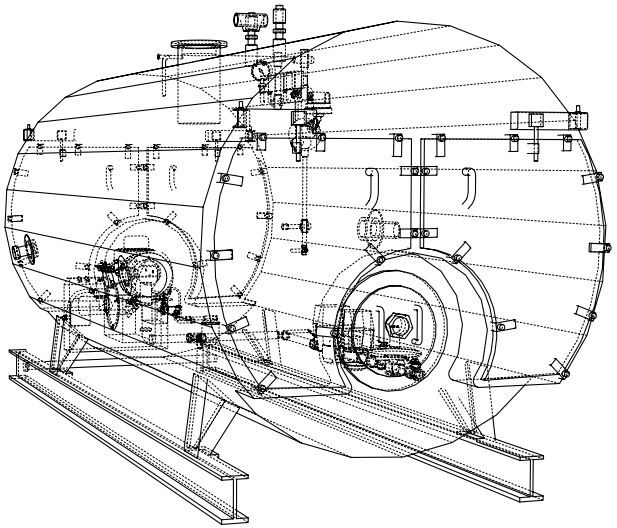
In boilers, deareators, headers or any other processes' energy efficiency can be 25-30% higher according to application investments with low redemption times.

In this case steam getting more important. Trapping steam and more heat usage depends on the correct steam equipment selection. Althought steam traps look simple and small, their mission is very complex.

Saving more energy is related to the right chosen steam equipment and sizes. Working principles should be known well for choosing the right steam equipment for the process.

As Ayvaz, we are working for to produce best quality steam equipment in our factory in Istanbul in order to help our customers and the users to get the most efficiency from their steam systems.

We aimed to explain our audit experiences and technical knowledge to partners and introduce different type of steam applications and all related products with details in this catalogue.



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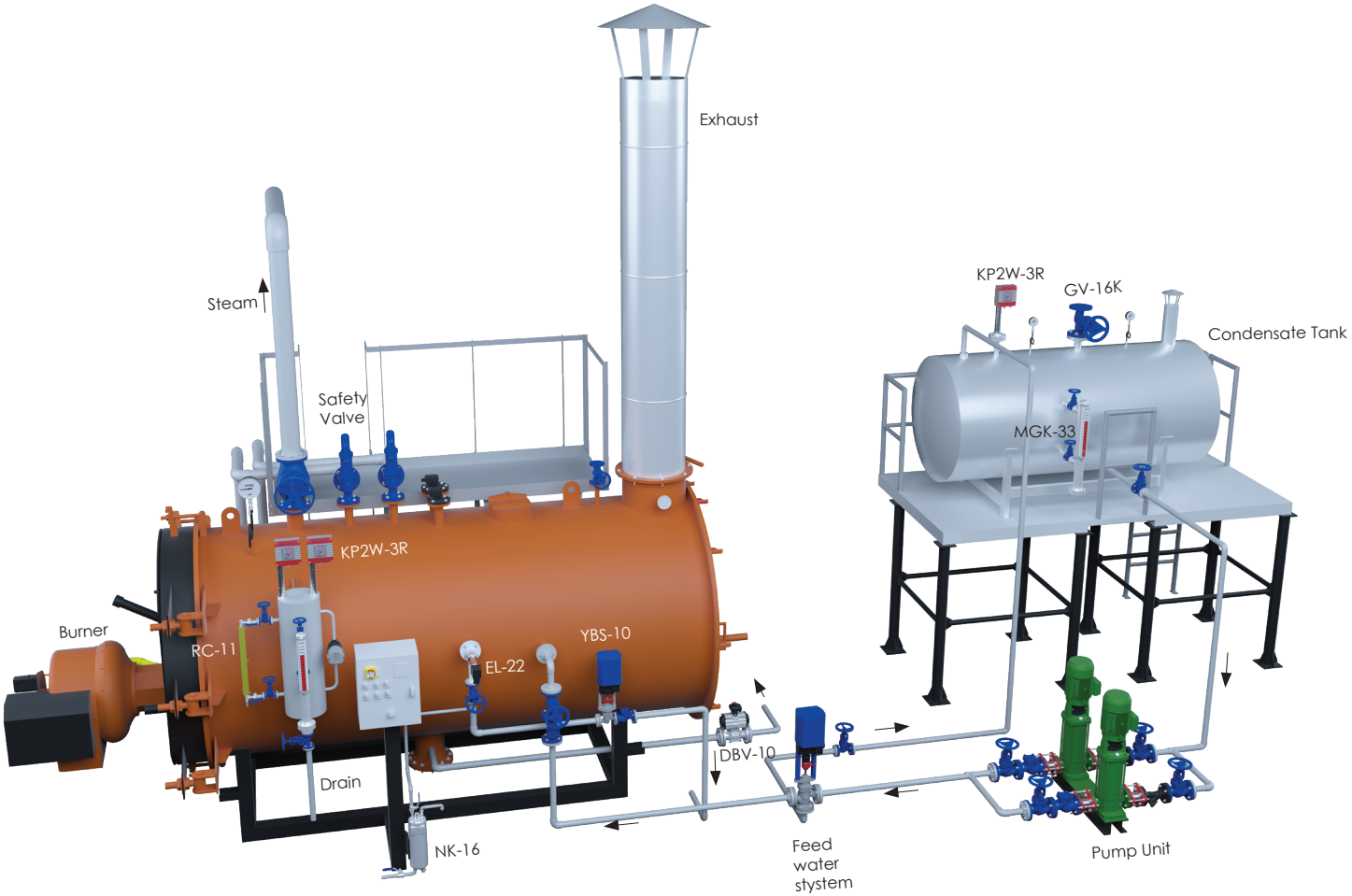

HYGIENIC APPLICATIONS

When "Steam Cleaning" is mentioned, it is often referred to as "Hygienic Steam" rather than system steam.

This is usually divided into 4 different categories:

System Steam - FDA approved standard boiler chemicals are used in a typical conventional water treatment and inside the steam generated boiler. The tubing is standard carbon steel or even black pipe can be cast iron. All the condensate is recovered.

Filtered Steam - Steam, which is generated by conventional boiler, is filtered to remove condensate and solid particles. FDA approved chemicals used in standard boilers. If the pipe is a standard carbon steel or black iron, it must be replaced with 316 Stainless Steel. All the condensate is recovered.

Hygienic Steam - is not include any addiction (boiler chemicals etc.) and iyonized or produced by reverse osmosis systems. All materials, components and pipes are 316 L Stainless Steel. Rarely recovered condensate is typically sent to a settling tank and then it is for water purification.

Pure Water - is not include any addiction (boiler chemicals etc.) and which is production of pure water. All materials, components and pipes are 316 L Stainless Steel.

HYGIENIC STEAM GENERATORS

VERTICAL TYPE HYGIENIC STEAM GENERATORS

SIZE	300	500	750	1000	1500	2000	3000
POWER							
Steam Power (kg/h)	300	500	750	1000	1500	2000	3000
Heat Output (kW)	203	338	508	676	1014	1352	2028
Consumption kg/h	360	600	900	1200	1800	2400	3600
DIMENSIONS							
Height A (mm)	2450	2450	2450	2450	2800	2800	2800
Width B (mm)	1230	1230	1230	1230	1480	1480	1480
Depth (C mm)	780	780	780	780	1180	1180	1180
Weight (kg)	350	380	400	500	750	800	950
CONNECTIONS							
electrical (kW)	0,75	0,75	0,75	0,75	0,75	0,75	0,75
Pure Steam (DN)	40	50	65	80	100	125	150
Primary Steam (DN)	25	32	32	40	50	65	80
Condensate (DN)	32	32	32	40	50	50	65
Water In (DN)	15	15	15	15	25	25	25
Drain (DN)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"

This clean steam converter generates clean steam in accordance with EN285, optimized for the supply of sterilizers and ventilation systems.

After it has been preheated in the feed water preheater by the condensate, the demineralized water is led into the thermal high-temperature degasser.

HYGIENIC STEAM APPLICATIONS

Steam system is perfect for heat transfer application for petrochemicals, pulp mill and paper industries.

Food companies should use filtered steam at a minimum level or use hygienic steam to remove the risk of contamination.

Pure steam is the highest grade choice and is required for pharmaceutical and biotechnological applications.

Hygienically and pure steam; It is used for sterilization, vacuuming, humidification and heating processes in food, pharmaceutical, cosmetic and hospital establishments. Since steam used in these processes must meet the hygiene norms, hygienically steam generation is provided by second hygienically steam generators which are suitable for sterile steam conditions.

Steam Purity Range	Steam Application Area
Pure	Pharmaceutical Industry
	Biotechnology
Clean	Hospital
	Cosmetic
	Food & Beverage
Filtered	Food & Beverage
Plant	Hvac
	Textile
	Petrochemical

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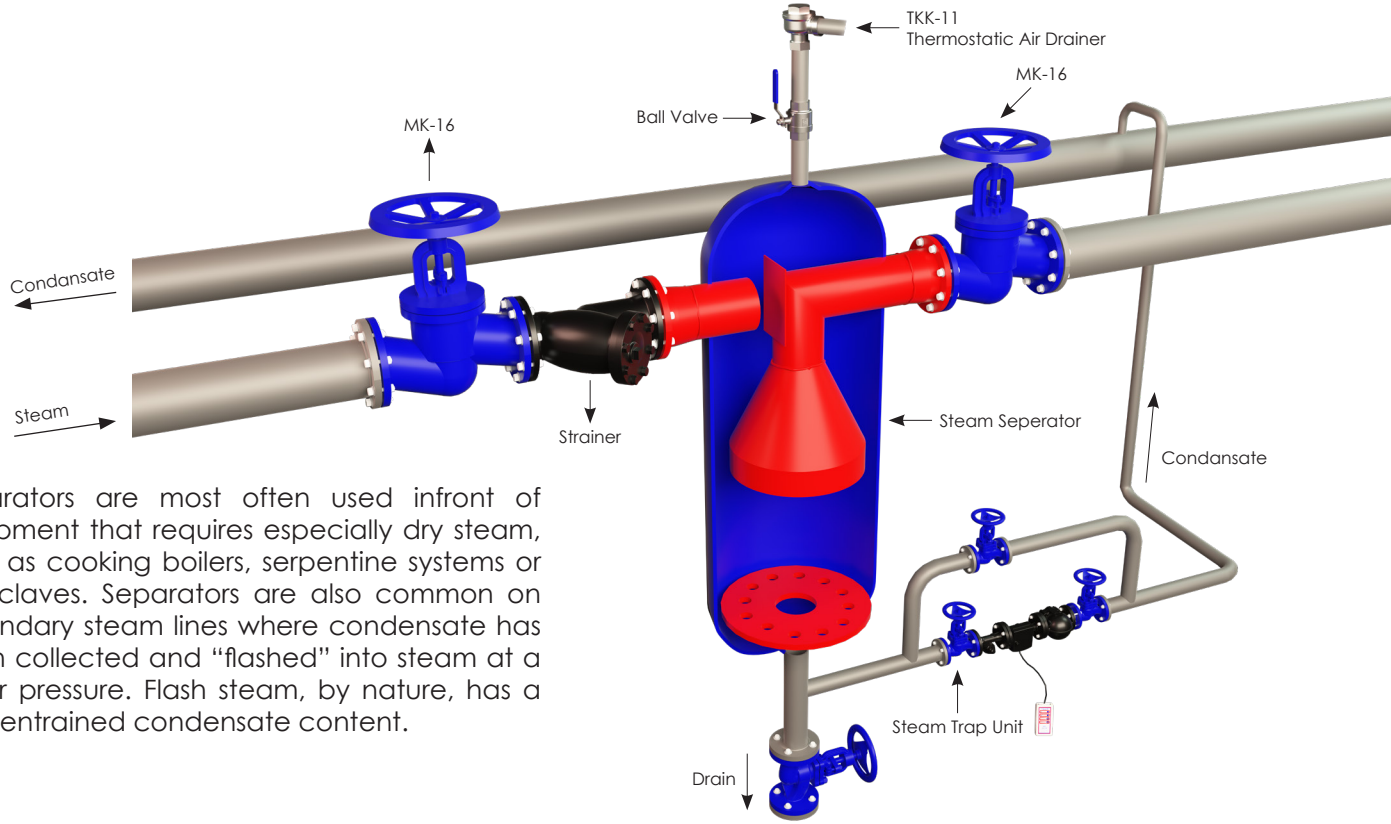
STEAM SEPARATOR SYSTEMS

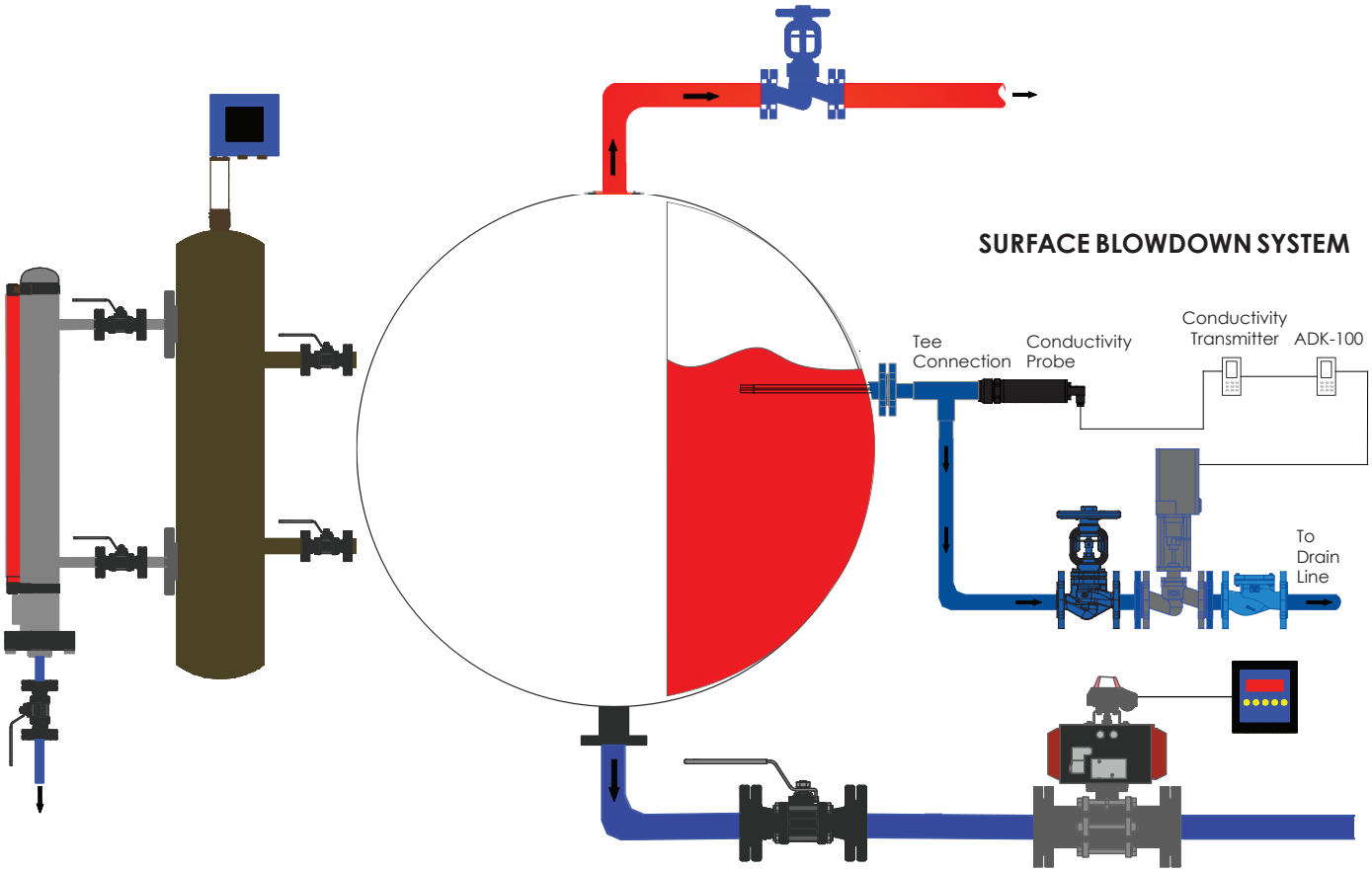
In some cases, saturated steam may distribute directly with single line from boiler. That distribution may cause water draggings at system start up. To prevent that problem, separator systems must be installed directly to the steam lines.

In cases where dry and clean steam is required, branch line should be connected to the machine and process with a steam separator. This will help to collect the water at the bottom of the separator and to be discharged from the steam trap.



Separators are most often used infront of equipment that requires especially dry steam, such as cooking boilers, serpentine systems or autoclaves. Separators are also common on secondary steam lines where condensate has been collected and “flashed” into steam at a lower pressure. Flash steam, by nature, has a high entrained condensate content.

APPLICATION EXAMPLE



BLOWDOWN SYSTEMS

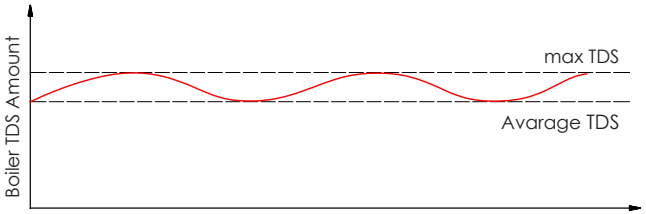
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

Sediments must be evacuated periodically to prevent the formation of the sludge layer. Bottom blowdown valves are used for this purpose. The bottom blowdown valve is opened and the pressurized boiler water is discharged from the lower zone of the boiler.

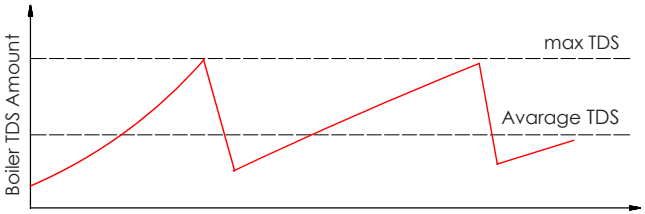
When the valve is opened, the sludge in the lower area of the boiler is effectively discharged by the high water velocity due to the pressure difference. Depending on the type of water preparation system and the dosing system, the steam boiler reaches salt and other foreign substances.

As a result of evaporation, the salinity in the boiler water increases. Salt concentration higher than the limit value causes the boiler stone, boiler corrosion and foam formation.

The foam can also reach the steam installation. Thus, the steam quality decreases and the accumulation of water forces the armatures.



Automatic Blowdown System



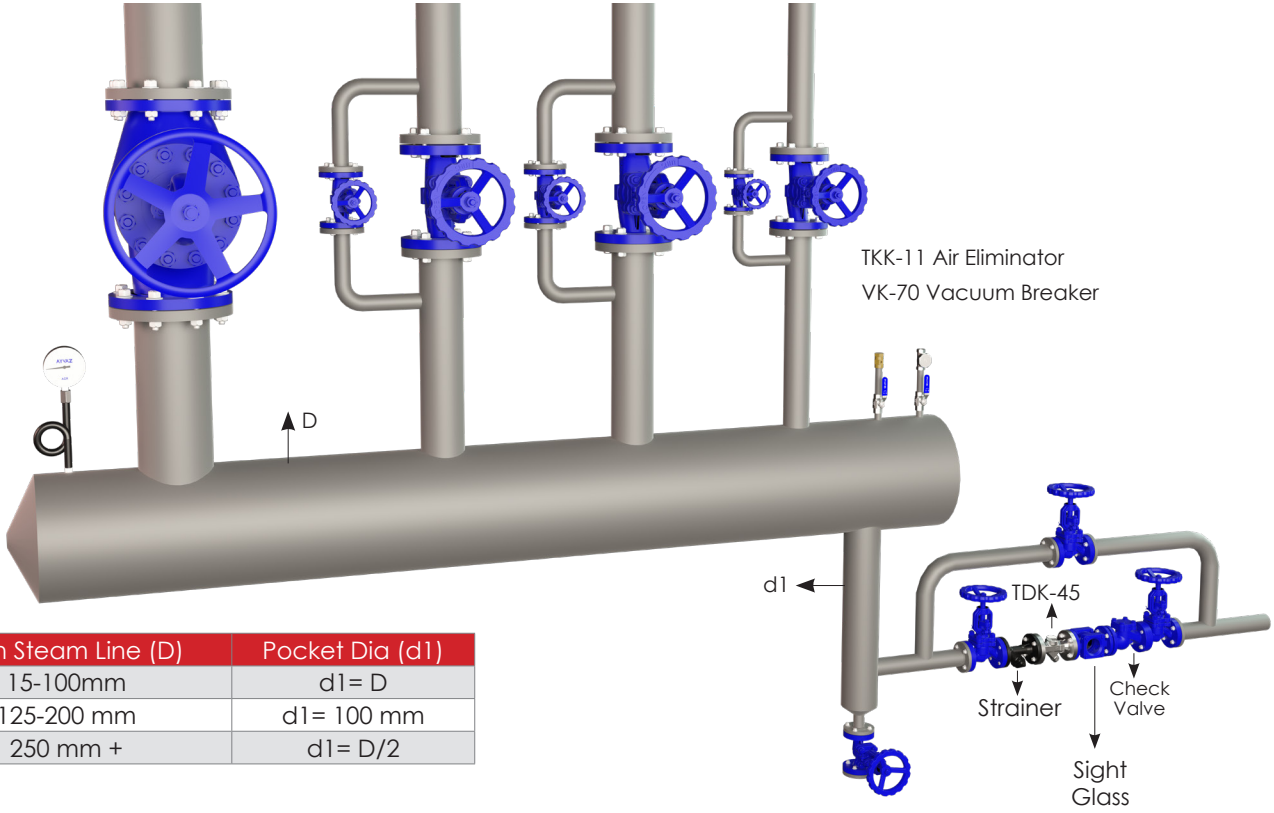
Manuel Blowdown System

BOILER ROOM

The system that distributes steam is called collector. Steam condensates in the collectors. The condensate is usually charged by thermodynamic steam traps from the collectors.

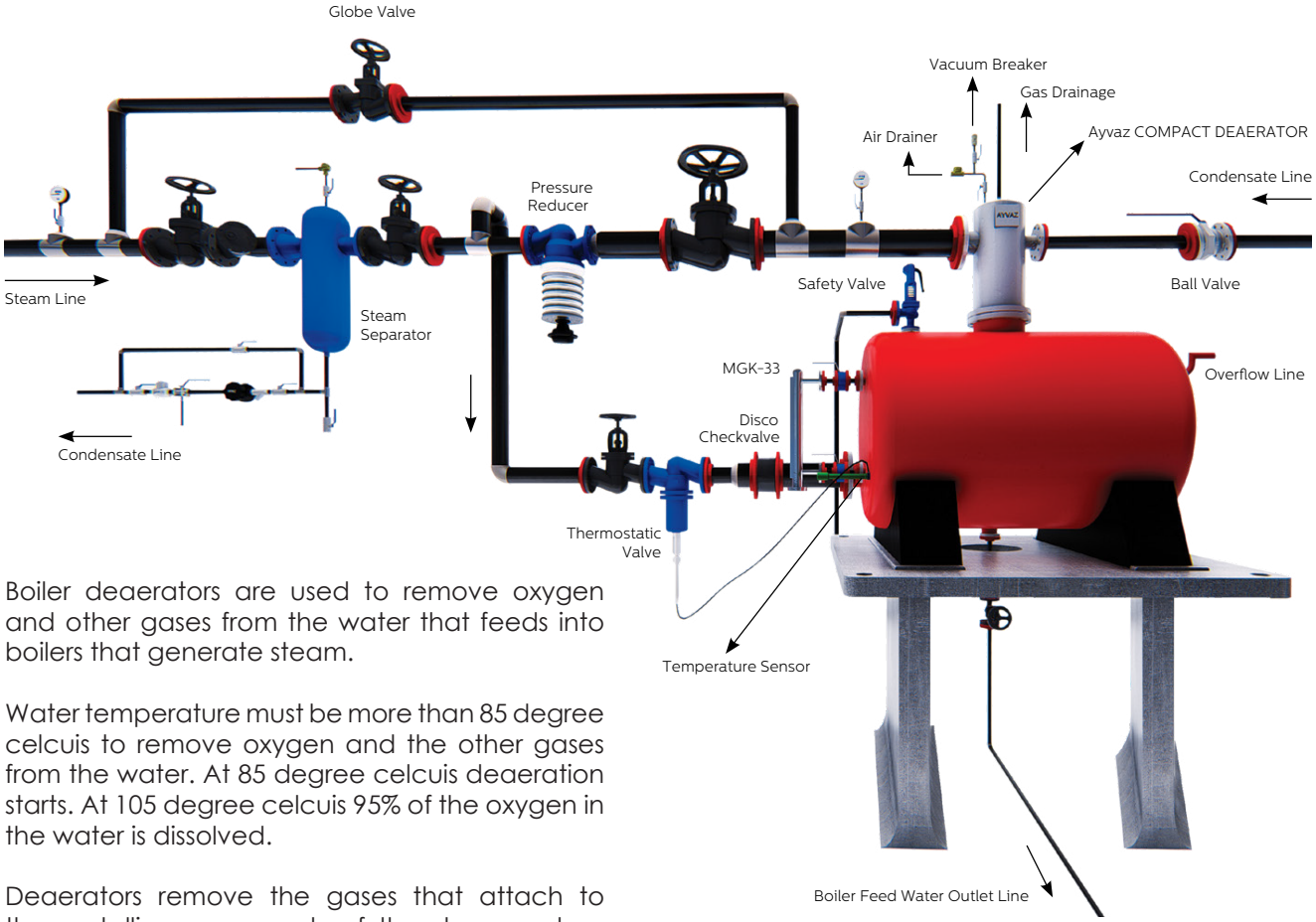
Steam collectors are the first stop in steam distribution. Saturated steam comes directly from boiler. MK-16 bellow seal valves are best option instead of globe valves at this installation.

Collector sizes can calculated with $D=\sqrt{(d_1^2+d_2^2+d_3^2...d_n^2)}$ formula. Steam trap's pocket size can select according to selection table below;



Main Steam Line (D)	Pocket Dia (d1)
15-100mm	d1= D
125-200 mm	d1= 100 mm
250 mm +	d1= D/2

DEAERATORS



Boiler deaerators are used to remove oxygen and other gases from the water that feeds into boilers that generate steam.

Water temperature must be more than 85 degree celcuis to remove oxygen and the other gases from the water. At 85 degree celcuis deaeration starts. At 105 degree celcuis 95% of the oxygen in the water is dissolved.

Deaerators remove the gases that attach to the metallic components of the steam system and cause corrosion by forming oxides, or rust. Oxygen and carbon dioxide are responsible for corrosion(pitting). There are two types of boiler deaerators: Tank model or compact deaerators.

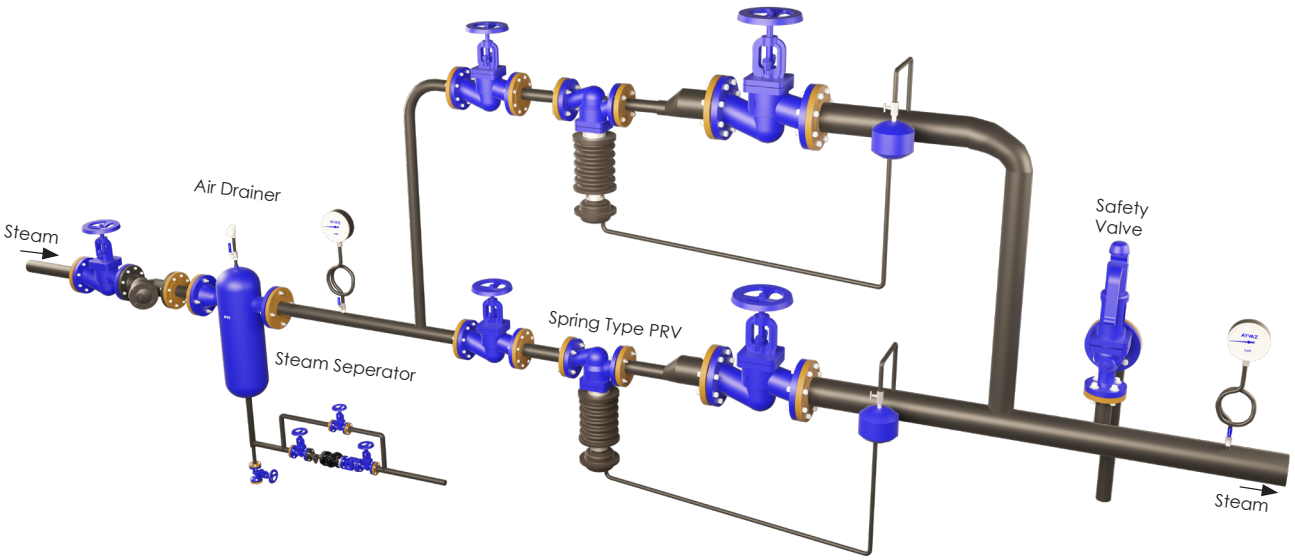
PRESSURE REDUCING STATION

It requires a primary steam pressure of up to 7 bar for older-style machines in laundry lines and up to 16 bar for new high-speed machines.

Regardless of the type of steam or condensate management system, the primary vapor pressure on the line should be accurate and balanced.

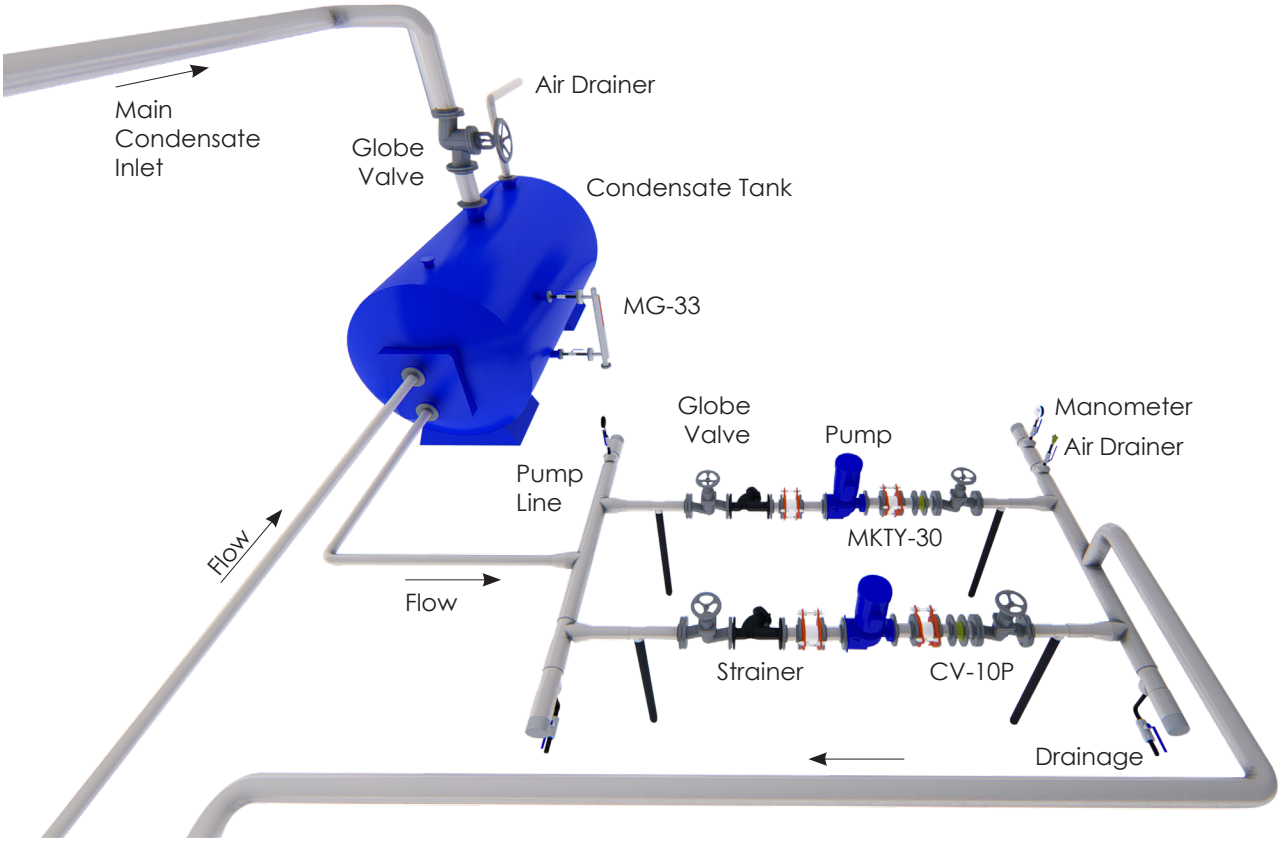
Folding machine's rollers, small pre-heaters, press irons and cylinder irons usually operate at the highest temperature.

Required high pressure steam within 4±0.3 bar (± 2°C).



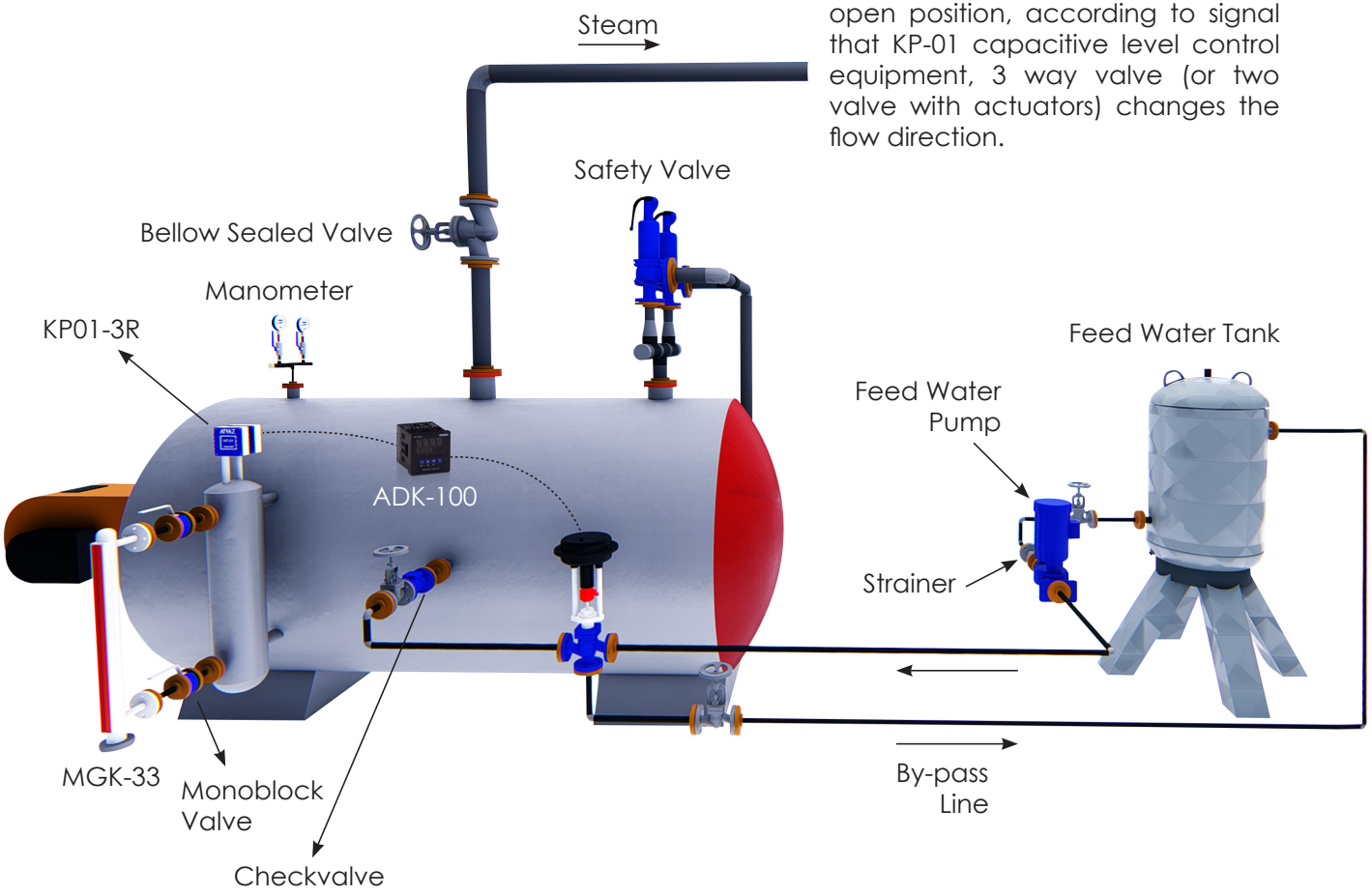
CONDENSATION RECOVERY LINE

After process, saturated steam will transfer the energy and condensation will collect with steam traps to the condensate tanks. Condensate will mix with water supply in feed water tank by pumps, like the diagram below.



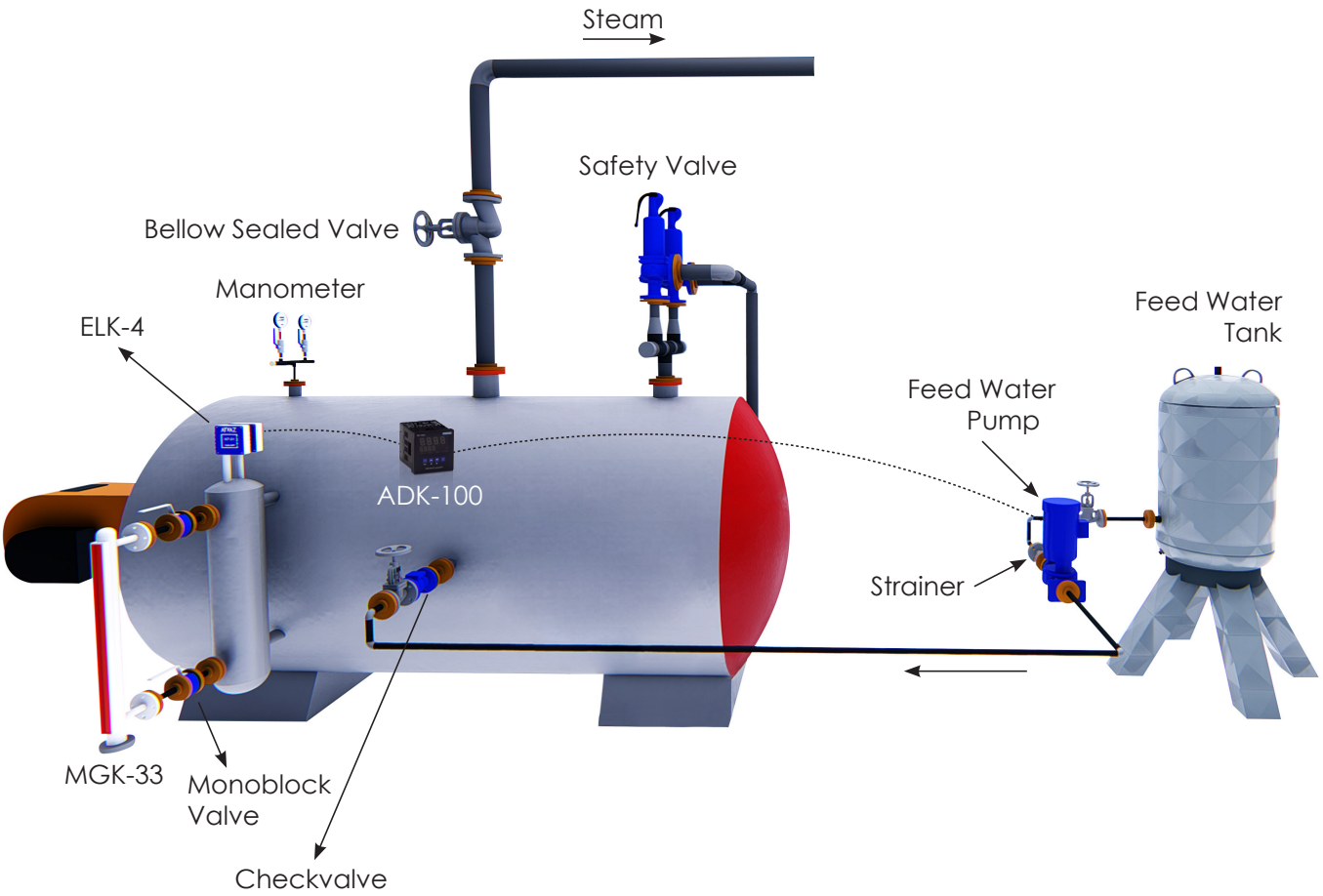
PROPORTIONAL FEED WATER SYSTEMS

Feed water pump is allways in open position, according to signal that KP-01 capacitive level control equipment, 3 way valve (or two valve with actuators) changes the flow direction.



ON-OFF FEED WATER SYSTEMS

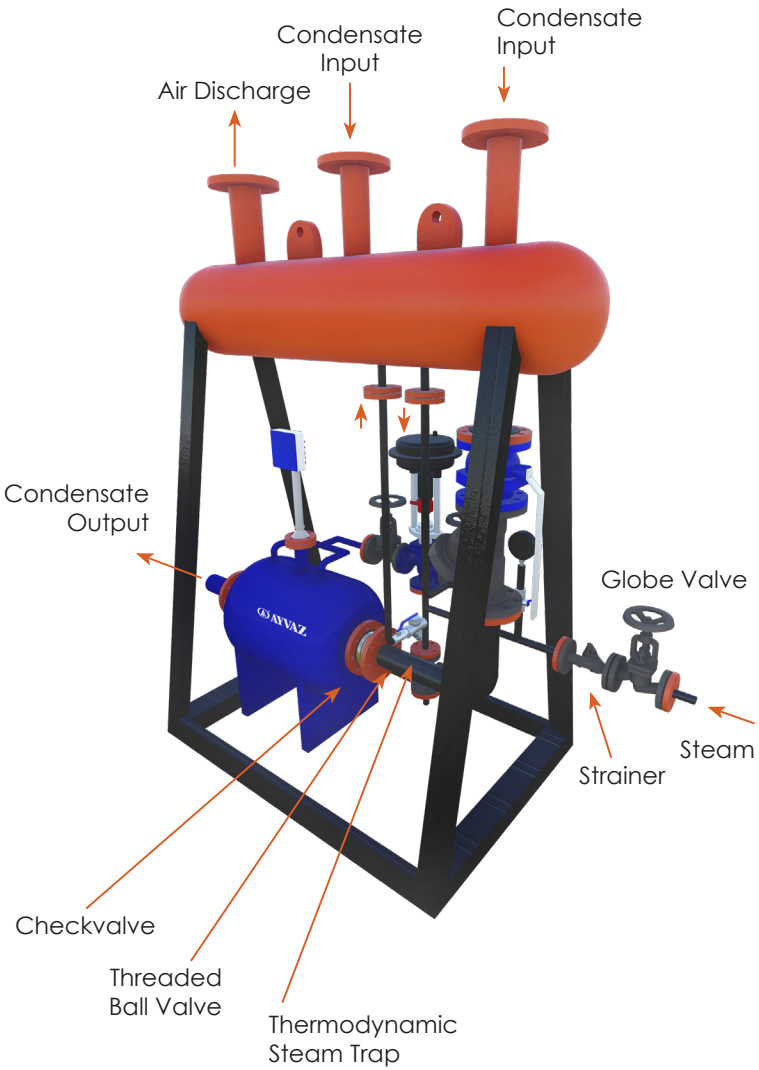
Feed water pump is opening and closing continously, according to signal that ELK-4 probe level control equipment, control valve changes the flow direction.



CONDENSATE PUMP SYSTEM

Condensate comes from the input collector and goes on internal pipe and access check valve than enter in condesate pump body so tank is getting full. In tank when the condensate comes on the upper limit, ELK-2 level gauge check the conductivity and change it to electrical signal and send it to 3 way pneumatic valve for the giving contact which is on the steam line than allows it to be opened. In normally steam has more high pressure than the condensate pressure. When 3 way valve is close, system discharge condensate from the system with thermodynamic steam trap.

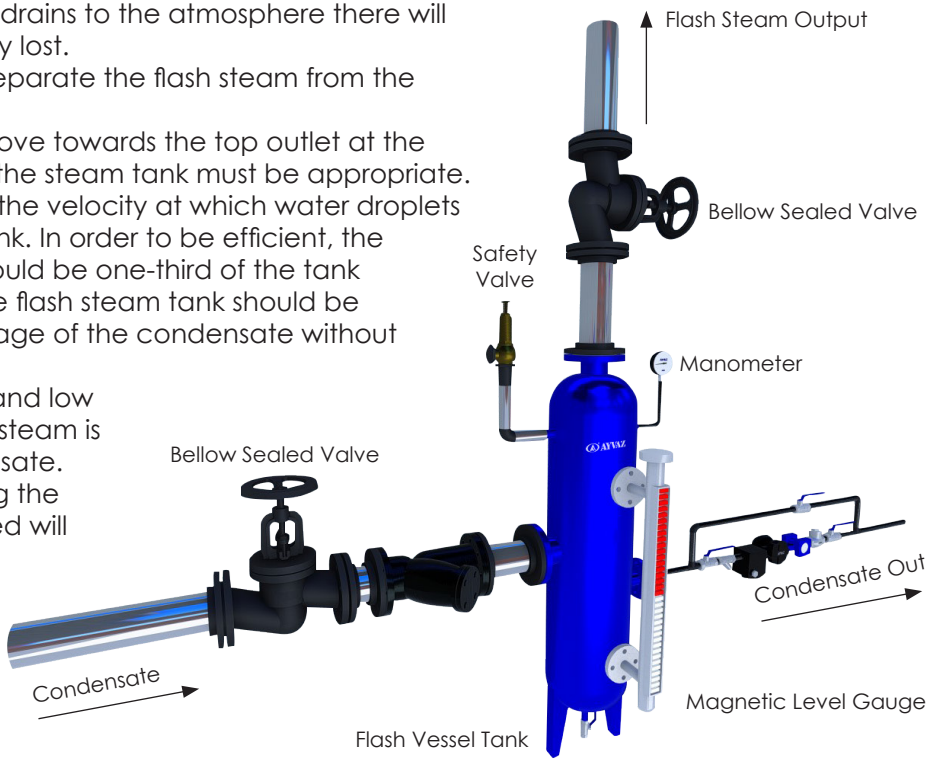
When the condensate pressure is smaller than the opposite pressure in condensate pump, discharge operation do not ocur. Steam is occurs the condensate discharging with entering the body, which have more pressure than the opposite pressure. When the condensate limit is gettin bottom limit of the tank, ELK-2 level gauge send electrical signal to 3-way pneumatic valve for close the system for entering steam. After that condens enter again and getting full tank . This operation frequency is connect between the condensate quantity. If the users want they can be follow the condensate quantity, from contoller.



FLASH STEAM RECOVERY SYSTEMS

The most important components in a cascade system are the Flash Steam Tank Systems which separate the flash vapor from the condensate where the flash and the sweep / blow steam are located.
A common mistake in enterprises is called “separator”.
It is important that the condensate is drained effectively and not allowed to accumulate in the separators. They can be emptied with a steam trap, an electrically driven pump / level control device, or a steam-driven pump system with a lower choice of both investment costs and operating costs.

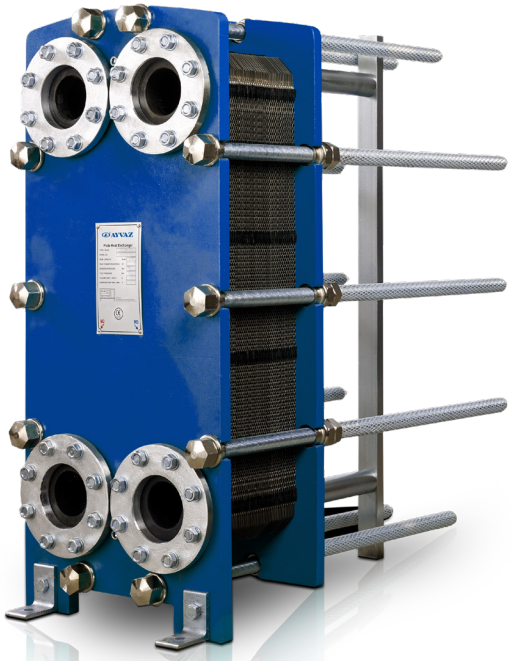
Why Flash Steam is Important?
It includes too much energy and it can be mount to different installation areas. If Flash Steam drains to the atmosphere there will be waste energy and effeciency lost.
Flash Steam Tanks are used to separate the flash steam from the condensate water.
In order for the flash steam to move towards the top outlet at the correct speed, the diameter of the steam tank must be appropriate. This speed is about 3-5 m/s and the velocity at which water droplets can reach the bottom of the tank. In order to be efficient, the condensate inlet to the tank should be one-third of the tank neck below. The diameter of the flash steam tank should be a diameter that allows the passage of the condensate without coming into turbulence.
If the difference between high and low pressure is small. The amount of steam is less than the amount of condensate. Flash steam outlet pipe selecting the diameter according to the speed will cause the tank to remain small. In which case the tank must be selected to be two diameters larger.



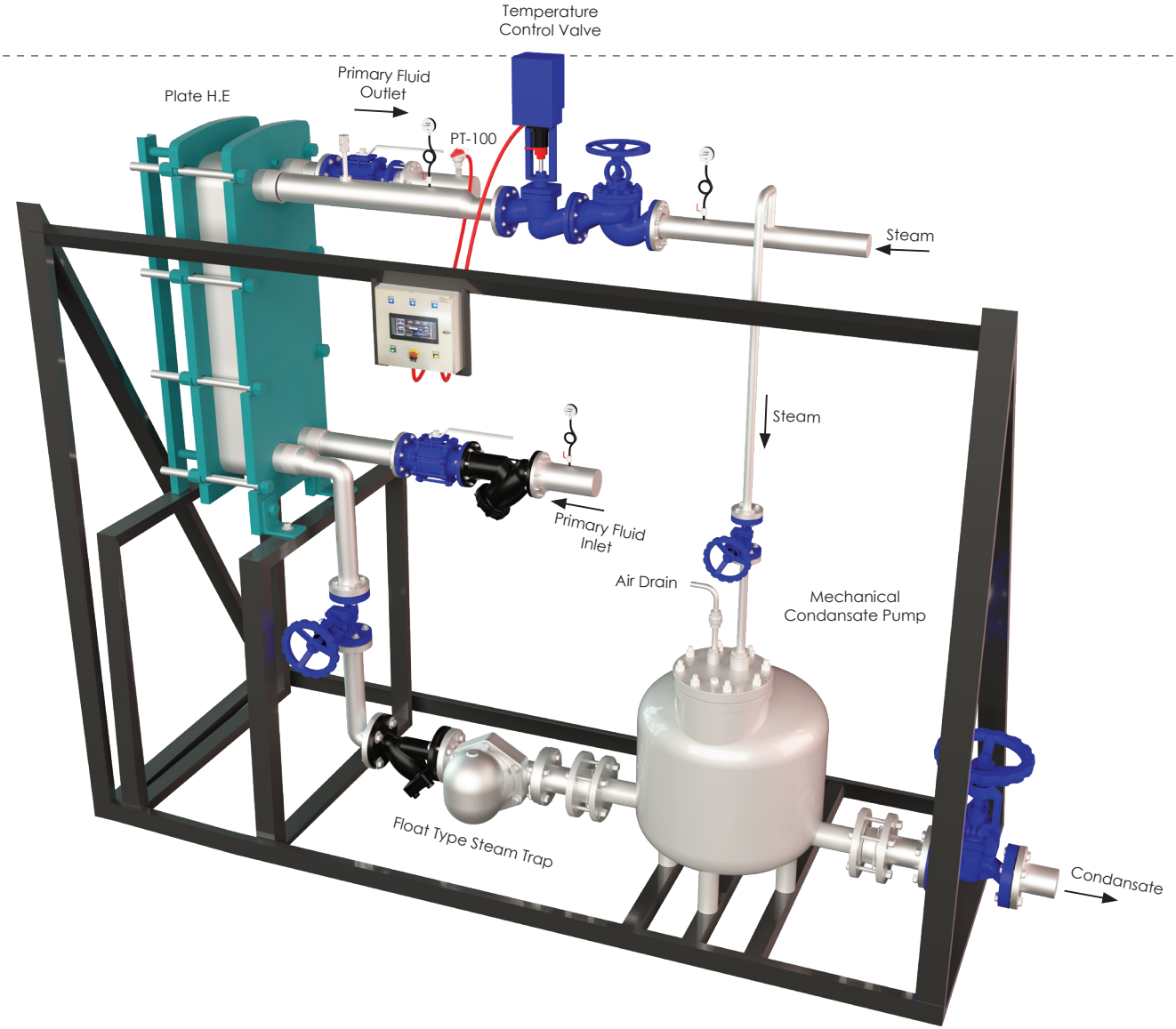
HEAT EXCHANGERS

In today's conditions, where energy is getting more expensive day by day, there is no need to waste energy in industry or individual use. The budgets allocated to energy in industrial establishments have increased by 20% -40% in recent years and they are at the top of the expenses section. Taking all these points into account, the recovery of energy has become very important. Ayvaz plate heat exchangers prevent the waste of your thermal energy with wide variety of plate and gaskets suitable for each system.

Industrial facilities have many wasted heat sources such as rotten steam and hot water returning from fabric washing. At the same time, there are applications that require heat, such as domestic hot water production and office heating. With the Ayvaz plate heat exchanger you will use to transfer heat from existing heat sources to the part that needs heat, you do not waste your heat and you need to save extra heat for the heat requirement. Nowadays, the most important factor that will relax businesses is to reduce costs. Energy expenses, one of the biggest factor in expenses, are now worth the gold for everyone and cannot be ignored. A heat exchanger to be used for heat recovery with a rough calculation now pays off in 3-6 months and starts to add value to the operation in a short time.



BOILER ASSEMBLY



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