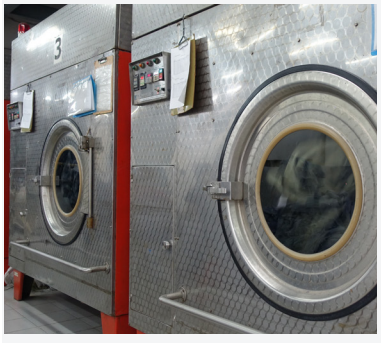
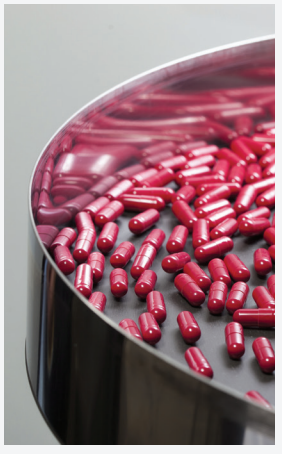
AYVAZ





INDUSTRIAL SOLUTIONS

Rev.07.24

info@ayvaz.com | www.ayvaz.com

About Ayvaz

Established in 1948, Ayvaz has been at the forefront of flexible connection parts manufacturing for over seven decades. Our extensive range of products includes various types and customized designs tailored to meet the specific needs of different industries.

Our company's reputation remains high, built on a foundation of providing innovative and reliable solutions to our partners. This steadfast commitment to quality and innovation has earned us the trust and loyalty of cooperators worldwide.

At Ayvaz, we are dedicated to supporting our partners around the clock, ensuring that they feel the presence and expertise of our "flexible solutions" no matter where their businesses are located. Our global reach and unwavering dedication to excellence make Ayvaz a name synonymous with reliability and innovation in the industry.

Consulting

At Ayvaz, we offer a wide range of products catering to various industries, ensuring that we meet the diverse needs of our clients. Our services go beyond just providing products; we also offer comprehensive engineering activities from product specification to project estimation, ensuring that we deliver the most specific solutions for each unique case.

Our team of experts is dedicated to sharing their knowledge and expertise with potential clients. We take pride in assisting those who encounter challenges with calculations for piping systems and product selection in new plants. Whether you are dealing with complex projects or need precise product recommendations, Ayvaz is here to provide the support and guidance you need.

FOOD&BEVERAGE

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

In cooking boilers, bakery ovens, liquid heat exchangers, product heaters, bottle washing machines 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.

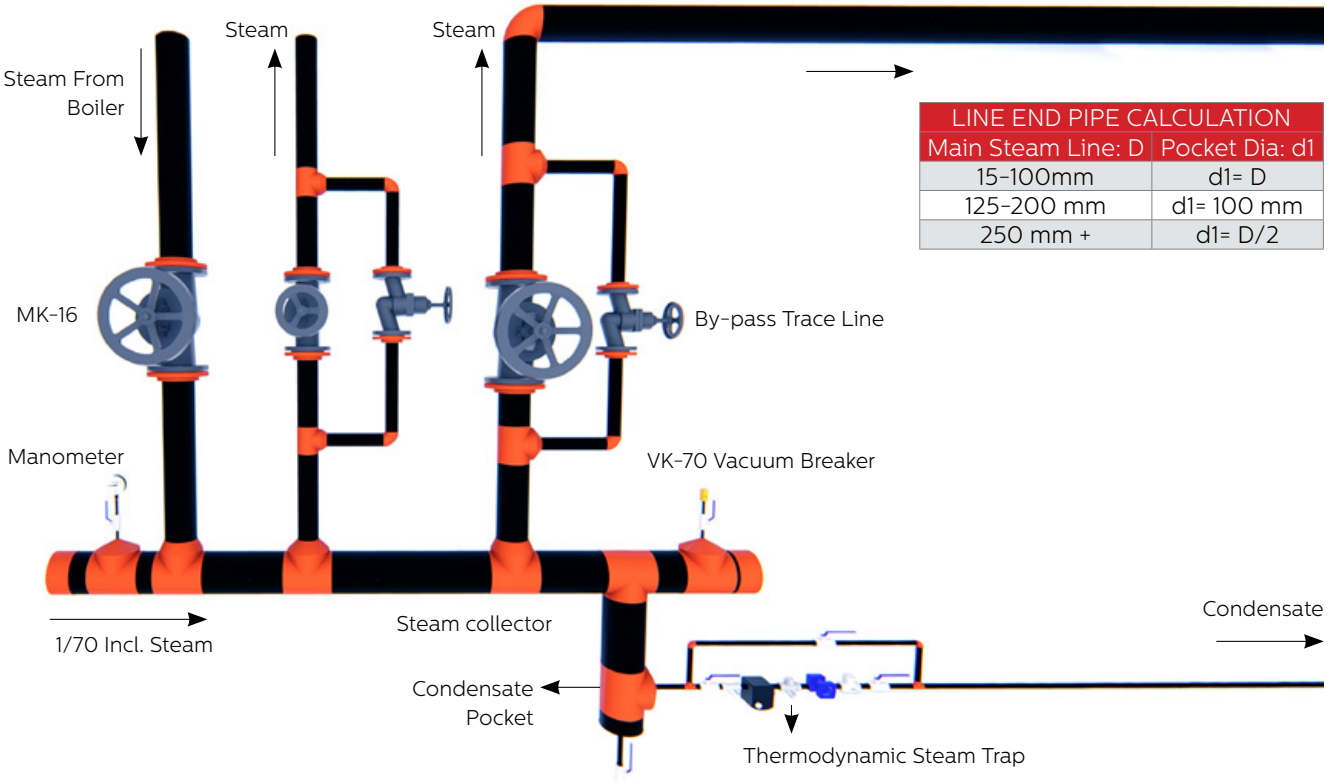
We aimed to explain our audit experiences and technical knowledge to partners and introduce different type of steam applications and all related products with details in this catalogue.

STEAM DISTRIBUTION

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;



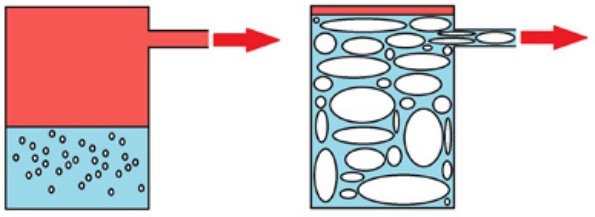
LINE END PIPE CALCULATION	
Main Steam Line: D	Pocket Dia: d1
15-100mm	d1= D
125-200 mm	d1= 100 mm
250 mm +	d1= D/2

WATER DRAGGING IN STEAM LINES

In some cases hot boiler water can mix with steam and may drag to the system. This gets steam wet and may caouse hugh water mass in system. This happens in that 3 case bellow;

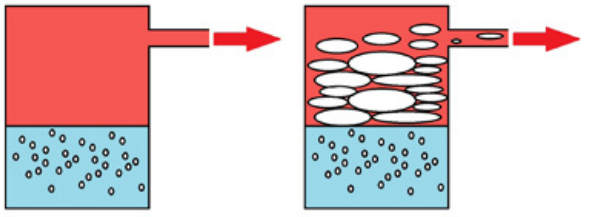
PEAK REQUESTS (PRIMING)

At the system startup, if all machines open in the same moment, boiler tank can not produce steam for request. It cause water dragging to the system and pressure loss in the steam boiler. When the pressure reduce suddenly, for balance the pressure, steam boiler start to boil and try to produce steam as fast as it can. This water steam mix drags to the system.



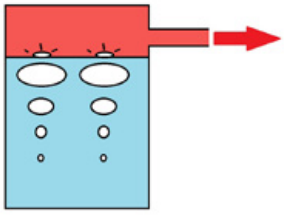
FOAMING

The components in the raw water which do not process properly process the water treatment process or the mixed condensate mixed with the condensate, cause the formation of bubbles in the cauldron. These foams fill the boiler and are dragged into the system due to the effect of steam. Foams contain water that is released when it explodes. This water damages the system.



BUBBLING

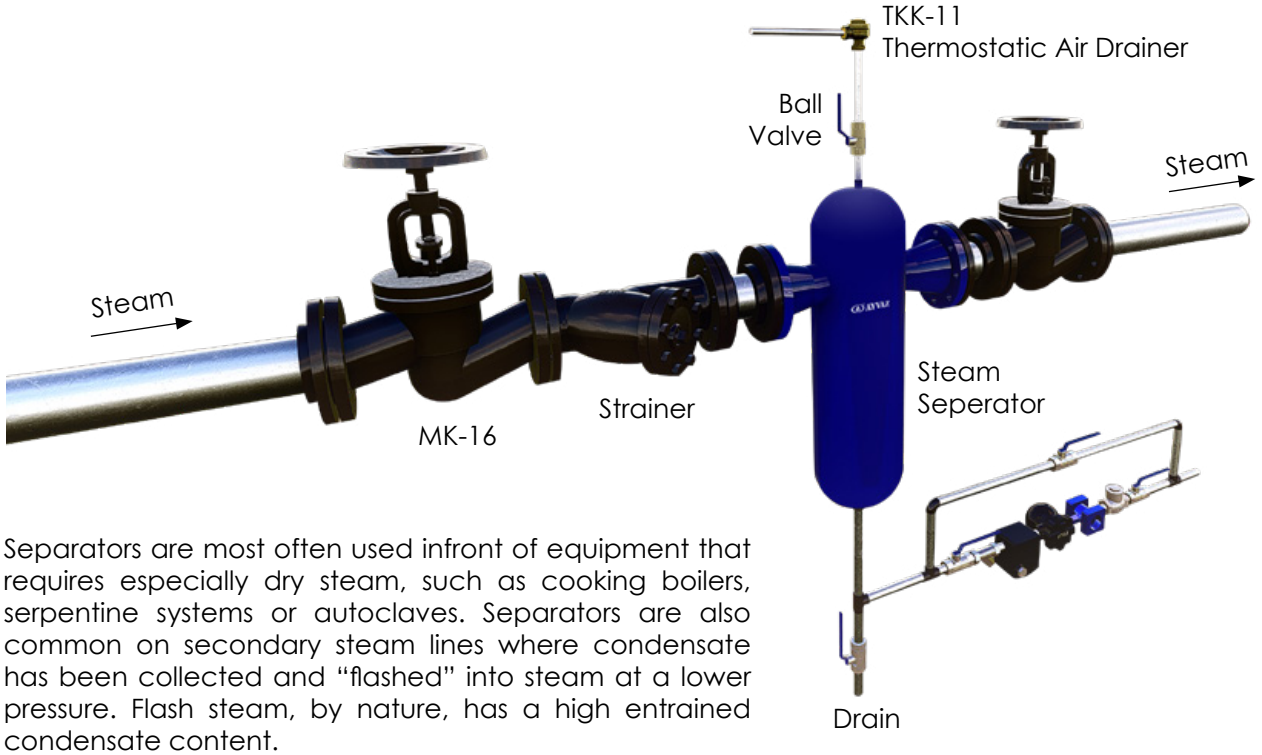
When water starts to boil on a metal heating surface, a steam bubble is formed in the water. This steam balloon rises rapidly and rises to the surface of the water. When the bubble breaks the surface of the water, some water is discharged from the surface. Discharged water continues to exist as mist at the same temperature as steam. It is usually discharged from the boiler together with the rapid flow of steam. The rest is suspended at the surface of the water since it is less dense than the density of water.



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.

BLOWDOWN SYSTEMS

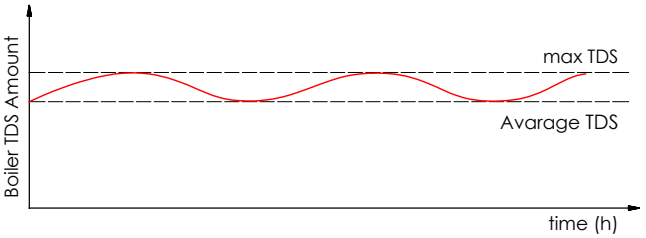
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

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.

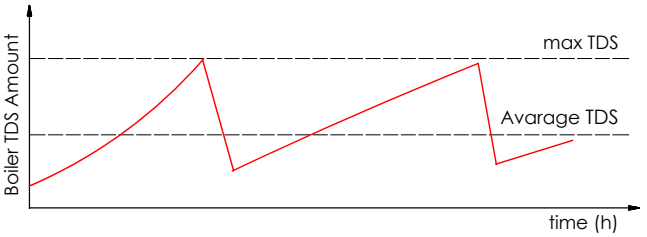
When the valve is opened, the sludge in the lower area of the boiler is effectively discharged by the high water velocity due to the pressure difference. Depending on the type of water preparation system and the dosing system, the steam boiler reaches salt and other foreign substances.

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.

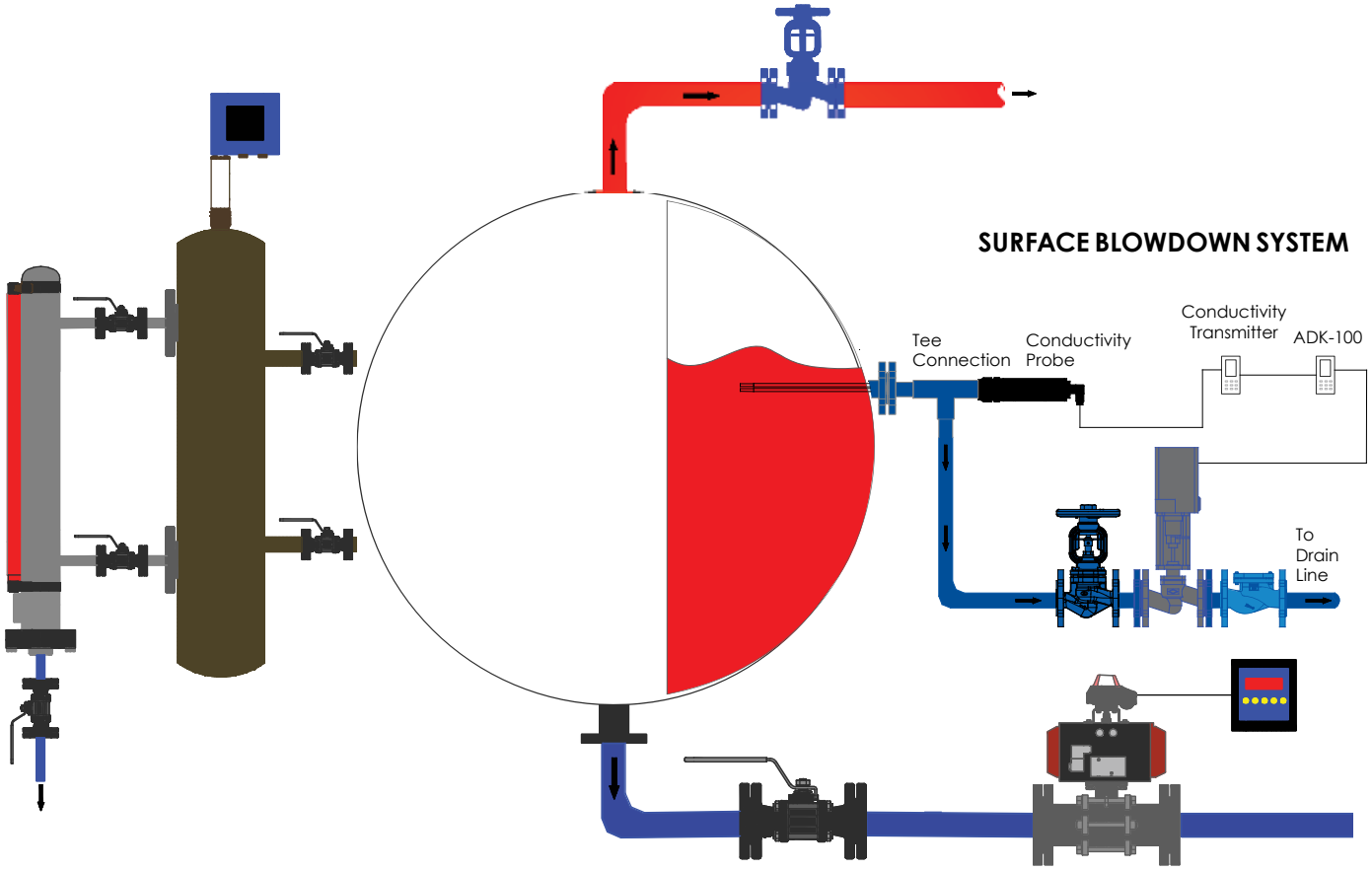


Automatic Blowdown System



Manuel Blowdown System

APPLICATION EXAMPLE



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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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.

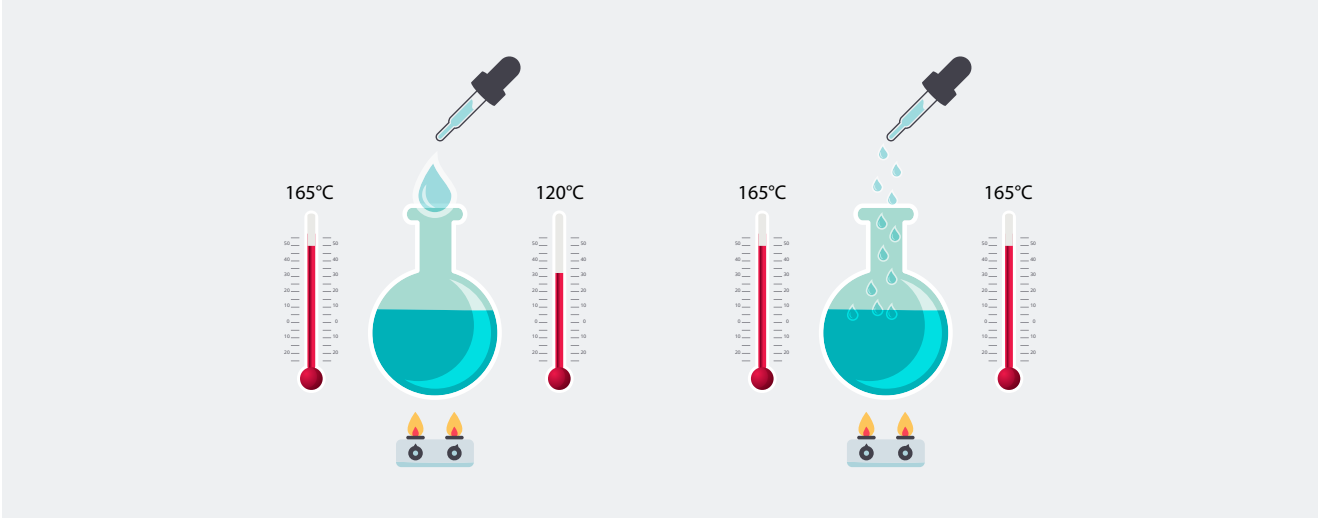
Filtered Steam - Steam, which is generated by conventional boiler, is filtered to remove condensate and solid particles. FDA approved chemicals used in standard boilers. If the pipe is a standard carbon steel or black iron, it must be replaced with 316 Stainless Steel. All the condensate is recovered.

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.

The hygienic thermostatic steam trap is designed to remove condensate from clean and pure steam applications such as CIP/SIP, sterile steam barriers, direct hygienic steam usage, reactors and process lines.

FEED WATER SYSTEMS

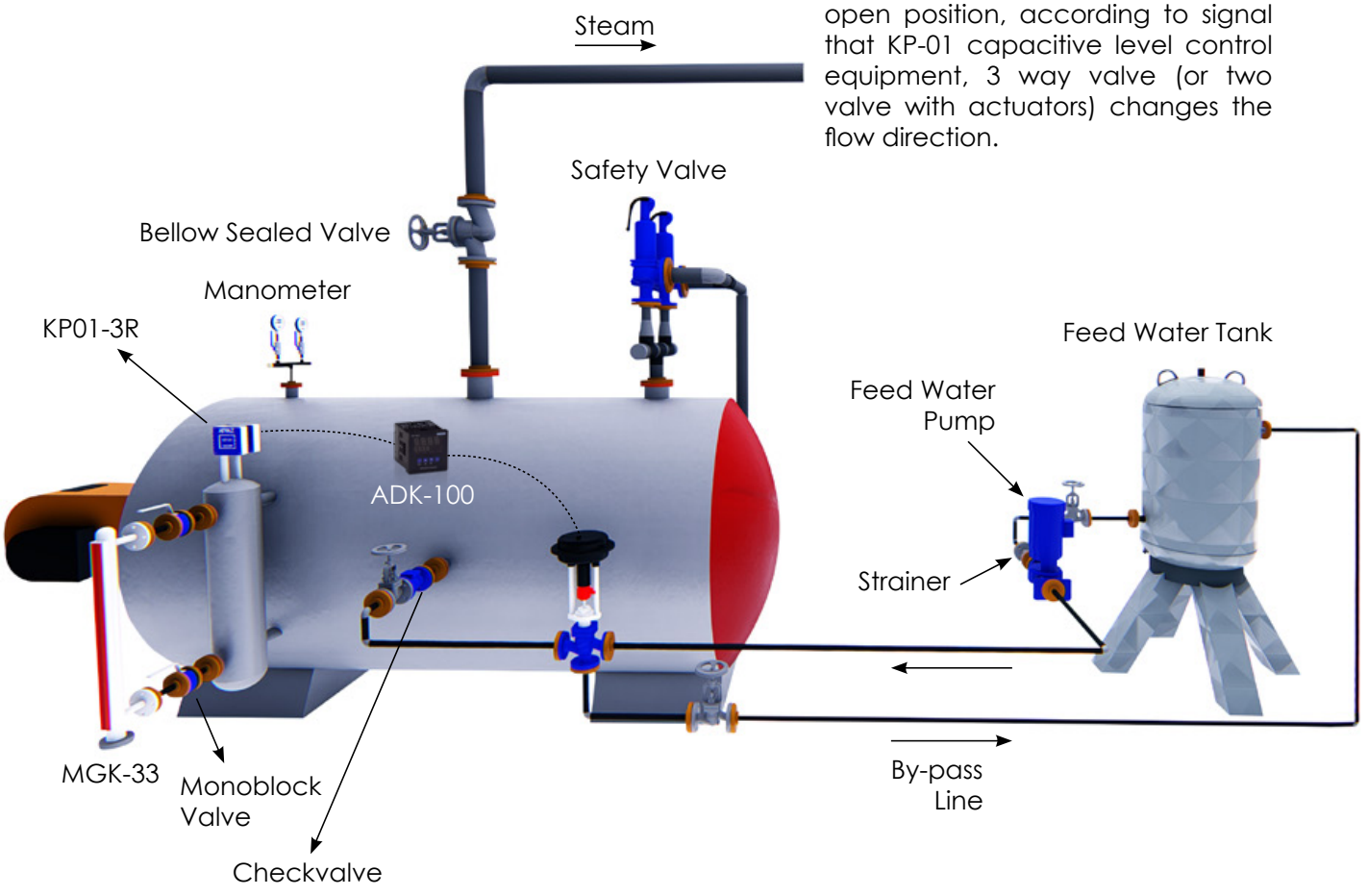


There are 2 general types of feed water system, such as; proportional and on-off. Main differences between proportional and on-off systems are;

- On-off systems are more economical than proportional systems.
- With proportional systems, pressure and temperature drops will be prevented.

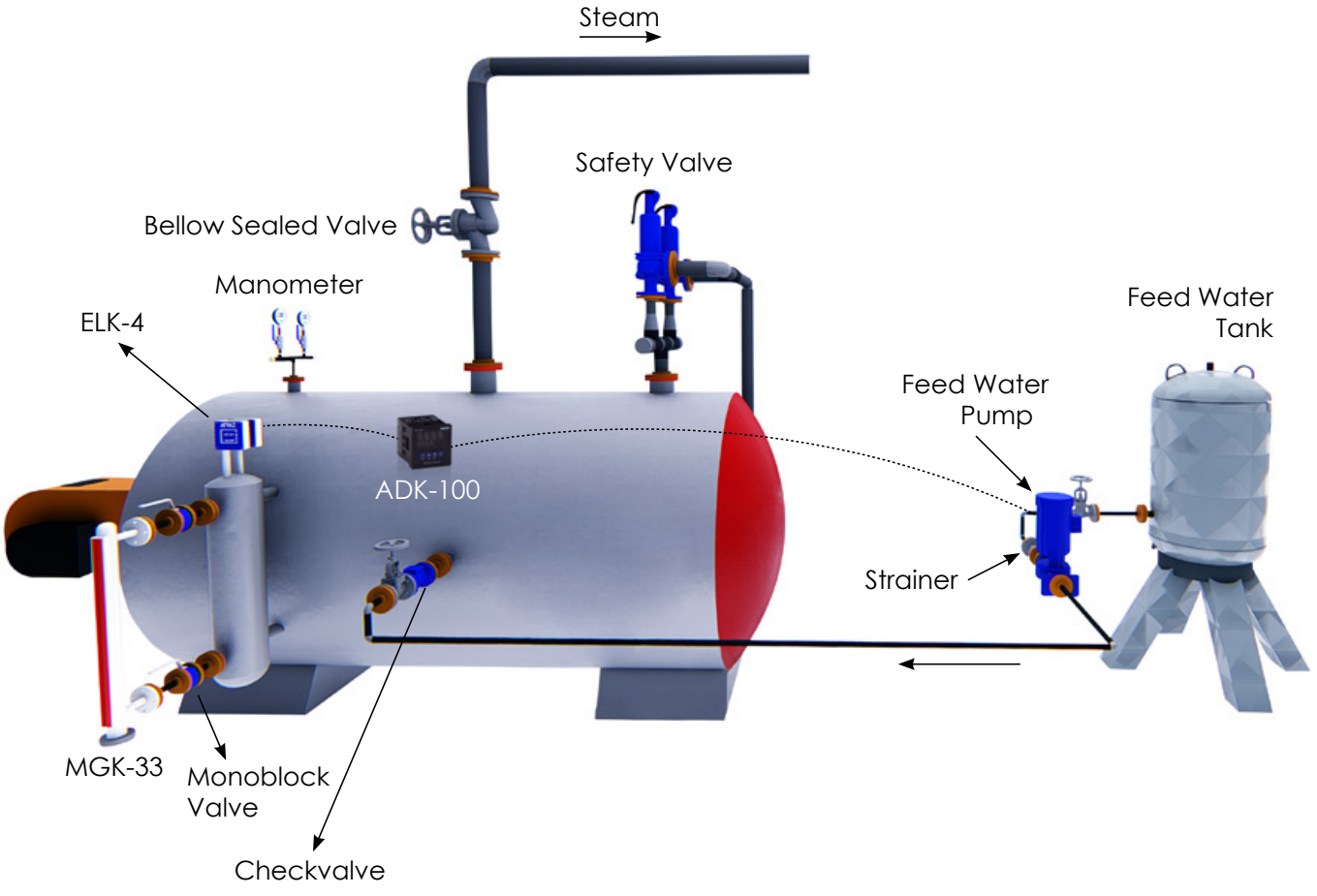
PROPORTIONAL FEED WATER SYSTEMS

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.



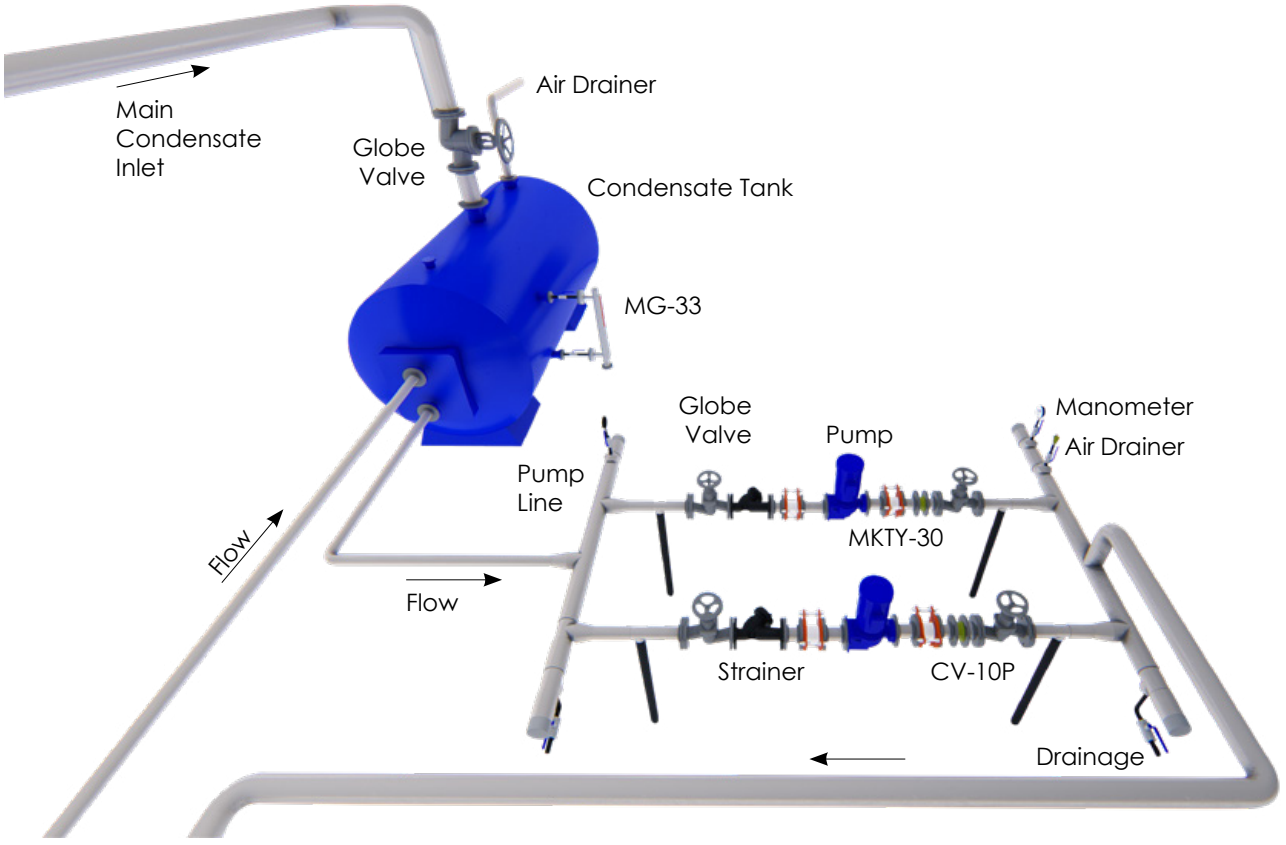
ON-OFF FEED WATER SYSTEMS

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



CONDENSATION RECOVERY LINE

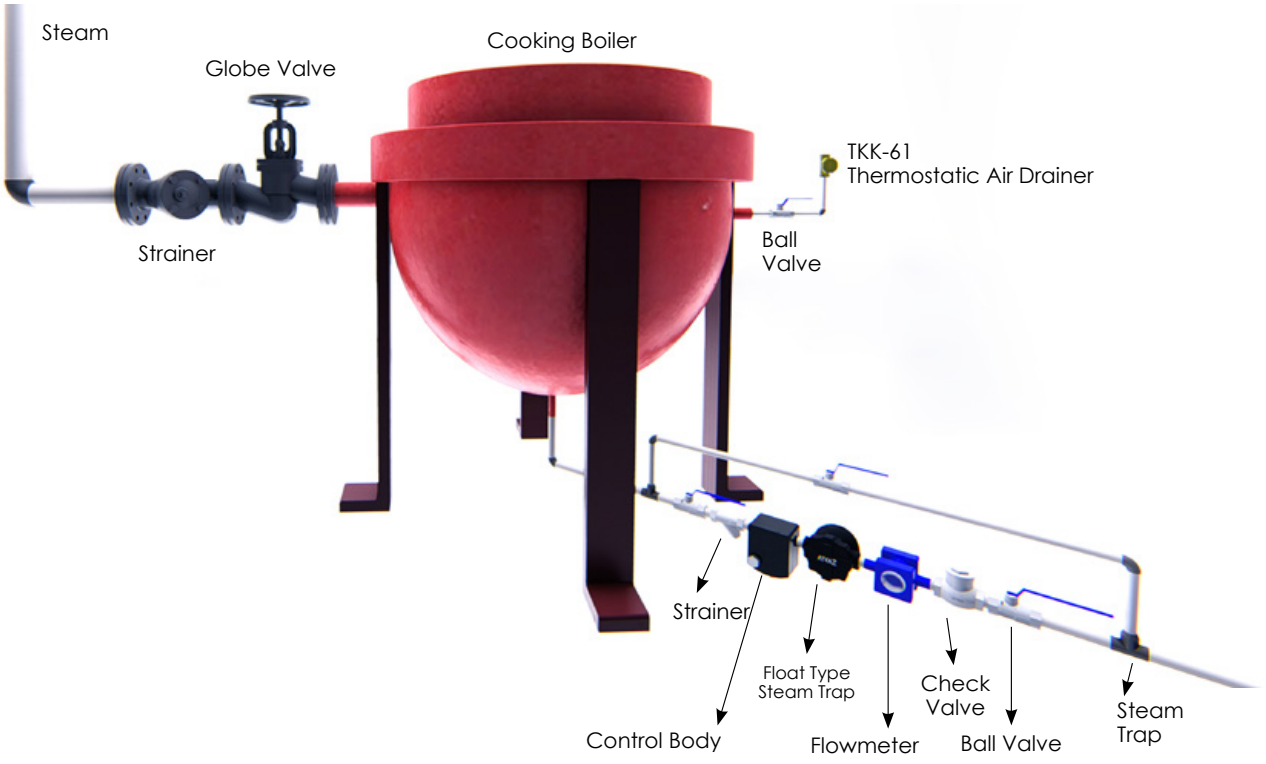
After process, saturated steam will transfer the energy and condensation will collect with steam traps to the condensate tanks. Condensate will mix with water supply in feed water tank by pumps, like the diagram below.



BOILER COOLING-HEATING CONTROL

After cooking process or during the process, when cooking boiler reaches to set temperature, control valve will reduce the steam flow and that will cause pressure drops. This pressure drops are directly connected with temperature reduces and heat losses.

Although in heat exchanger systems, many control valves are using, if the pressure is not equal or higher than the pressure after steam trap, discharging does not avaible. This problem is STALL. With the condensate pump system, users can prevent it.



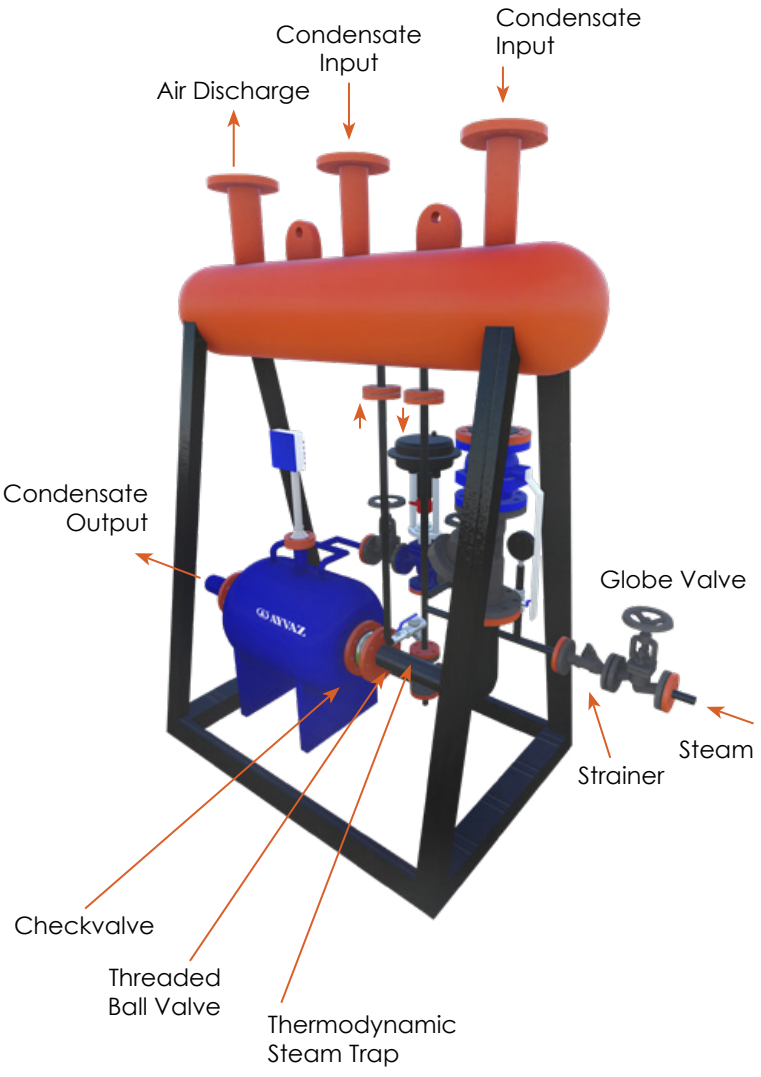
CONDENSATION AMOUNT

FOOD & BEVERAGE INDUSTRIES STANDARD MACHINE INFORMATION				STEAM CONSUMPTION (kg/h)	
Type Of Device or Process		STEAM PRESSURE (bar)	CAPACITY	CLOSED COND. SYSTEM	OPEN COND. SYSTEM
FOOD PROCESS	Milk Pasteurization	0,5	Per 1 kg of Milk	0,17	
	Pasteurization of Liquid Egg	1,5	Per 1 kg of Egg	0,12	
	Oven - Dough Room	0,5-1,0	Per 1 m of trough lenght	0,8	
	White Bread Production		Per 1 m^2 of surface	1,3	
	Rye Bread Production		Per 1m^2 of surface	3	
	Candy Cooking Pot	6,00	120 liter	17	20
	Candy Heater	6,0	Per 1m^2 of Jacket	25	30
	Chocolate Melt Process	6,0	jacketed Pot in 600 mm of Diameter	16	19
BEVERAGE PROCESS	Bottle Washing	0,5-1,0	100 Bottles/min	136	
	Shirink Tunnel	4,0		300	
ANIMAL FEED	Bait Production	4,0-6,0	Per 1 t/h of bait	60-75	
INDUSTRIAL KITCHEN EQUIPMENT	Tea Pot	0,5	50 liter	25	
	Cooking Pot		100 liter	40	
			150 liter	50	
			200 liter	60	
			300 liter	70	
			400 liter	80	
			600 liter	100	
	Tilt Meal Pot		40 liter	25	
			60 liter	35	
	Steam Jacketed Water Heater	1,0-2,0	40 liter	8	
			230 liter	30	
	Plate and Dish Warmer		Per 10m^2 of Surface	30	
	Oven		Per 1m^3 of Volume	25	
	Vegetable Steamer			14	
	Potato Steamer			14	
	Oyster Steamer			7	
	Clam - Lobster Steamer			14	
	Dish Washer			32	
	Steam Table			55	

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.

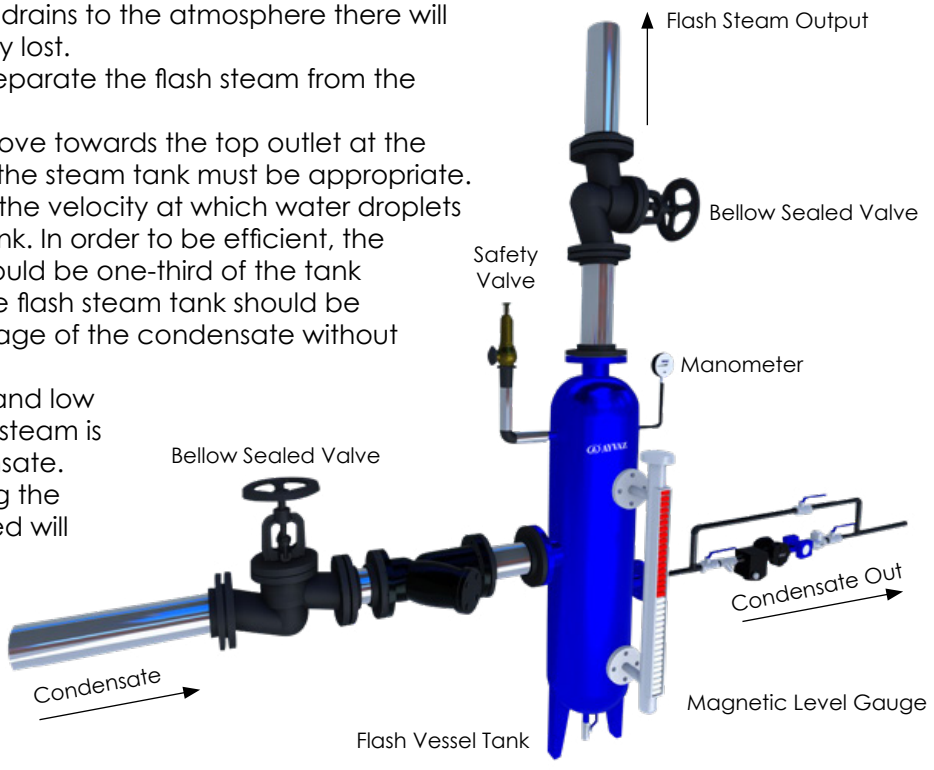
When the condensate pressure is smaller than the opposite pressure in condensate pump, discharge operation do not ocur. Steam is occurs the condensate discharging with entering the body, which have more pressure than the opposite pressure. When the condensate limit is gettin bottom limit of the tank, 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.

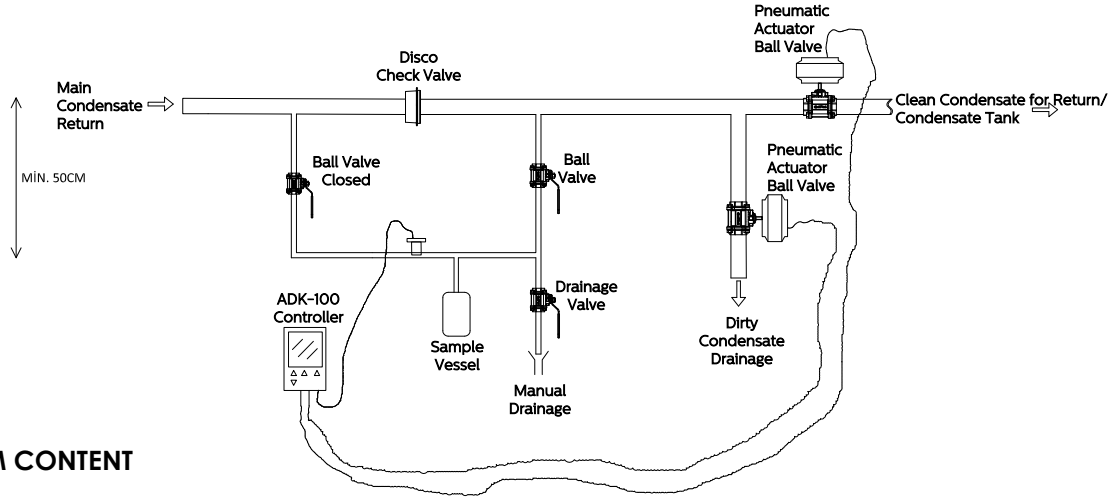
Industrial facilities have many wasted heat sources such as rotten steam and hot water returning from fabric washing. At the same time, there are applications that require heat, such as domestic hot water production and office heating. With the Ayvaz plate heat exchanger you will use to transfer heat 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.

CONDENSATE POLLUTION CONTROL

This system, which is located at the entrance of the condensate tank, continuously measures the electrical conductivity of the condensate water. The conductivity measurement probe value is transmitted at the system control value. The controller compares the set conductivity value with the set value. When the set value is exceeded, the discharge valve opens and the condensate is discharged.

When the electric conductivity value is lower than the set value, the discharge valve closes and the condensate tank line is opened. It is sent to the condensate tank.

Since the electrical conductivity varies with temperature, the conductivity probe used in the system must be able to measure the conductivity at the temperature together with the conductivity so that the conductivity of the condensate at every temperature can be measured accurately.



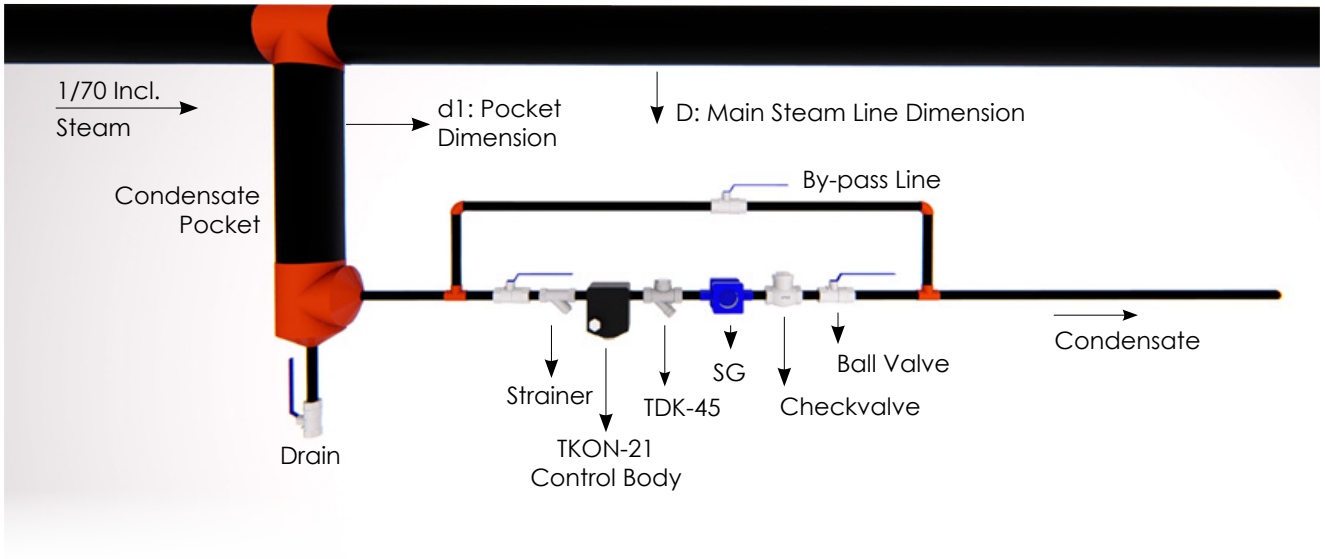
SYSTEM CONTENT

- Stainless disc checkvalve
- Double effective pneumatic actuated stainless ball valve normally open
- Double effective pneumatic actuated stainless ball valve normally closed
- Conductivity transmitter B&C electronic C3600 4-20mA (110x90x60mm)
- Conductivity sensor sensorex CS675 httc 250 PSI 200C 1" diving length
  Sensor diameter 19mm cable side 3/4 ADK-100 controller
- Stainless ball valve threaded 304 quailty

STEAM LINE APPLICATIONS

MAIN STEAM LINE APPLICATION

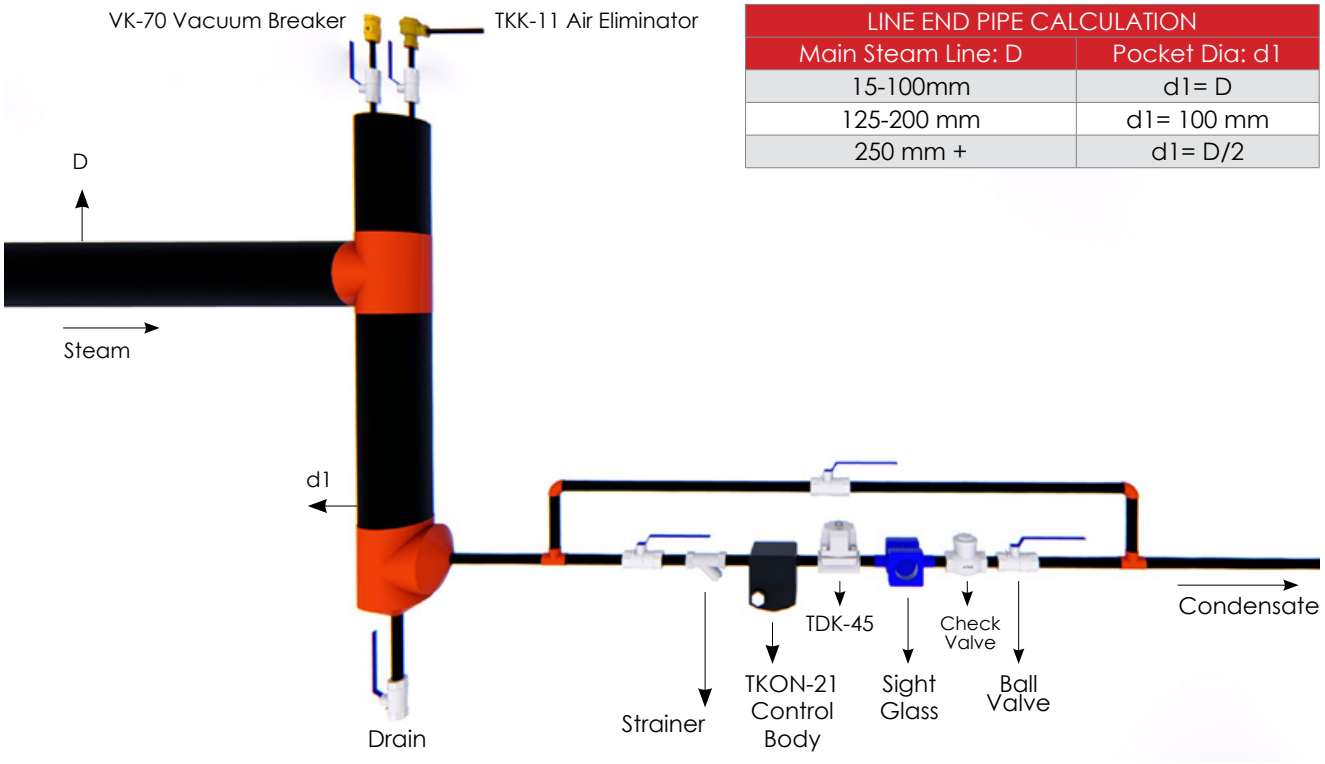
Condensate discharge unit should be placed in main steam lines in every 50 meters if the line is indoor and insulated or in every 30 meters if the line is outdoor and insulated. If any equipment like pressure reducer, pressure holder or proportional valve is installed in the line, a condensate discharge unit must be placed before these equipment.



LINE END APPLICATION

If the steam systems are closed by the process, the steam will turn to condensation until it is turned on again. The volume difference will be filled with air. When the system is switched on again, the air must be evacuated to allow the steam to easily fill the line. This is only possible with “End of Line Application”.

The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind must be thermodynamic.



LINE END PIPE CALCULATION	
Main Steam Line: D	Pocket Dia: d1
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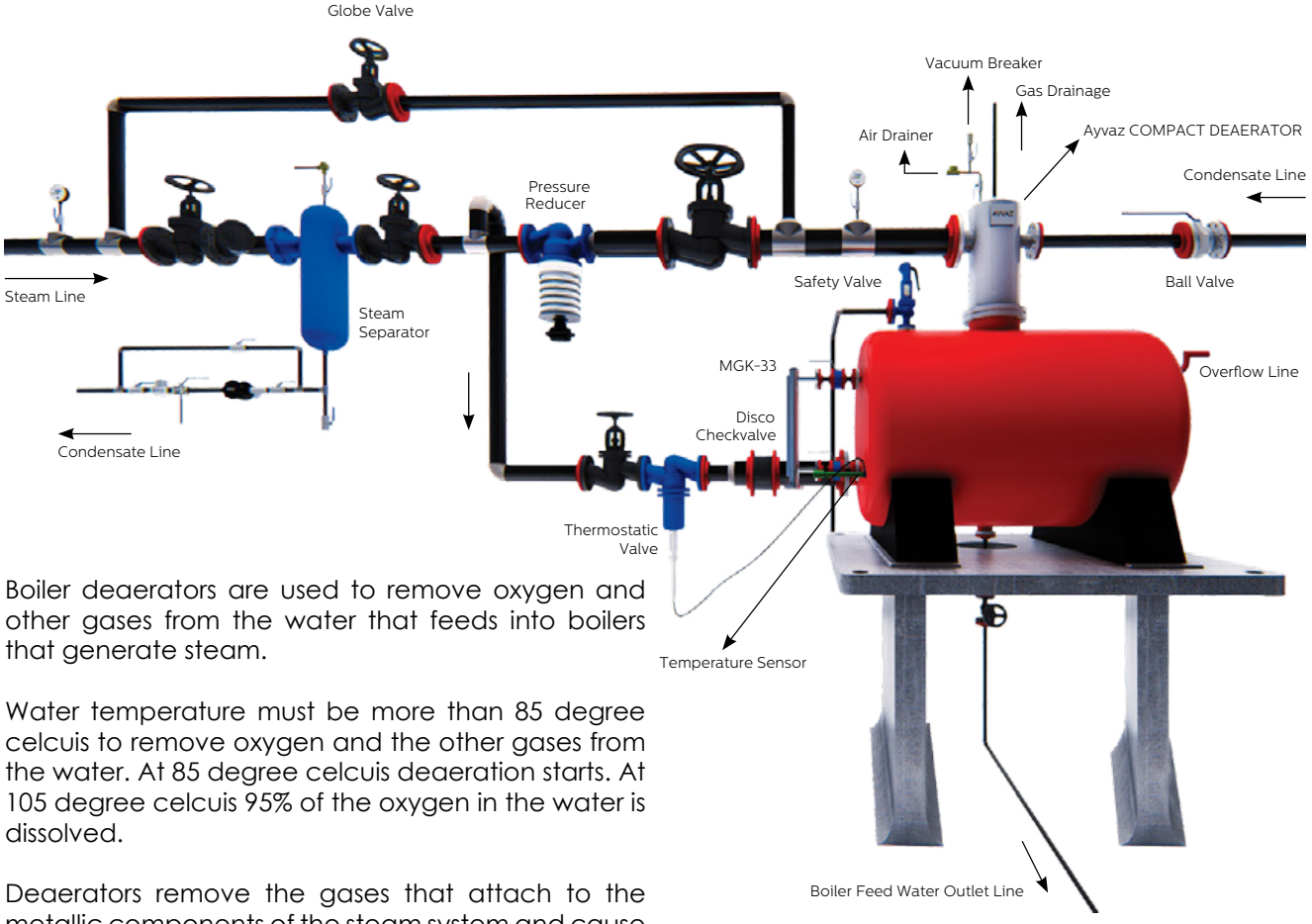
DEAERATORS



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.

OIL&GAS

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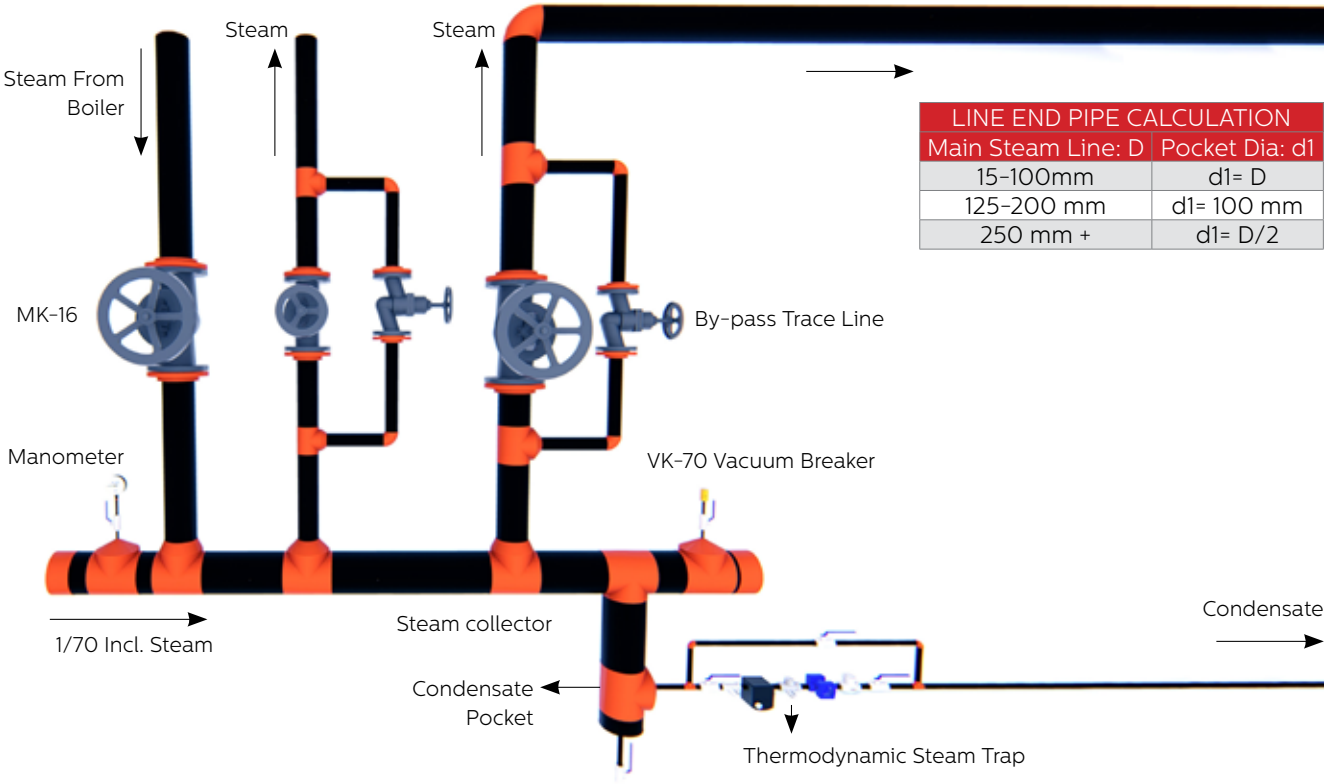

LINE END PIPE CALCULATION	
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15-100mm	d1= D
125-200 mm	d1= 100 mm
250 mm +	d1= D/2

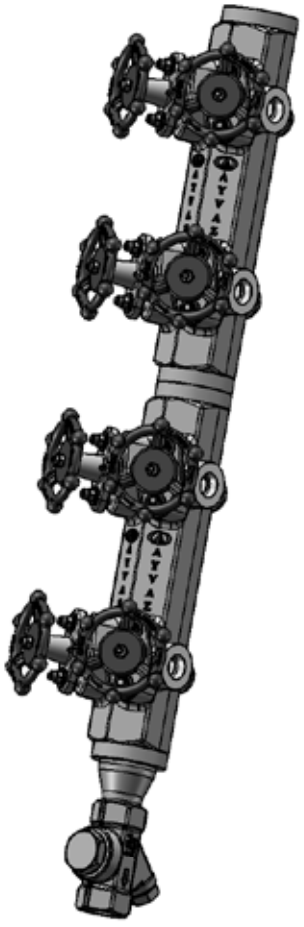
DISTRIBUTION AND COLLECTION

Operation
KT-13 is used for both steam distribution and condensate generation. Piston valves must be completely open or closed during the operation. These valves are not designed for flow control. Because of the wide sealing area of the piston valves, usage of an additional valve for sealing is not necessary

Installation
KT-13 condensate manifolds are designed for vertical installation. It is suggested to insulate the condensate manifolds in order to prevent heat loses and to protect the users.
Condensate Generating

It is suggested to install the KT-13 as the condensate exit to come up to the top side. A stop valve for blowing off should be place underneath the condensate generator. Usage of diffuser is suggested as well.

Steam Distribution
Suggested installation is to connect the steam entry to the top of the condensate manifold. A steam trap unit should be placed at the bottom. The discharge from this steam trap unit should return to the condensate line properly. If discharging will be done to the atmosphere, a diffuser must be used.



INSULATION

Steam traps and valves require periodic maintenance, easily applicable and removable jacket type insulations are more appropriate rather than fixed insulation applications for these armatures. A valve jacket is a simple and smart solution for preventing heat losses around the valves at hot or cold liquid transporting pipelines.

Thermal energy benefit by jacket type insulations is dependent on some factors likewise process temperature, ambient temperature and wind speed.

Un-insulated valves cause energy loses, reducing energy loses to the minimum level by using valve jackets helps to reduce operation costs. Easily removable valve jackets make the maintenance easier.

SELECTION CRITERIA

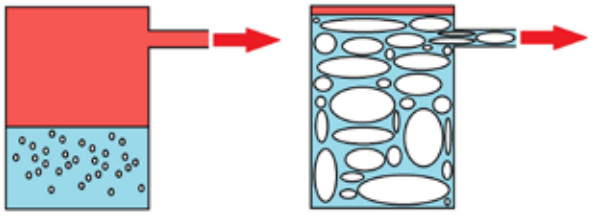
- Resistance to Different Operating Temperatures: Protects physical and thermal properties.
- Physical Strength: It should not lose its original properties during (vibration), storage, loadings, operation and application.
- Mechanical Strength: should not deteriorate in expansion and contraction.
- It must be easy to install.
- Resistance to Flammability: must be considered and covered with appropriate coating techniques.
- Resistance to Corrosive Effects: Water, steam etc. resistance to leaks or condensation.
- Insulation Thickness and Weight: Investment cost should be observed.

WATER DRAGGING IN STEAM LINES

In some cases hot boiler water can mix with steam and may drag to the system. This gets steam wet and may caouse hugh water mass in system. This happens in that 3 case bellow;

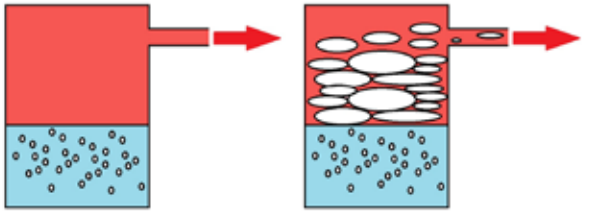
PEAK REQUESTS (PRIMING)

At the system startup, if all machines open in the same moment, boiler tank can not produce steam for request. It cause water dragging to the system and pressure loss in the steam boiler. When the pressure reduce suddenly, for balance the pressure, steam boiler start to boil and try to produce steam as fast as it can. This water steam mix drags to the system.



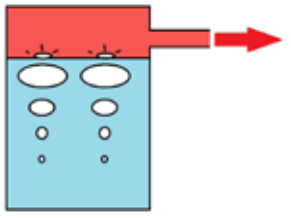
FOAMING

The components in the raw water which do not process properly process the water treatment process or the mixed condensate mixed with the condensate, cause the formation of bubbles in the cauldron. These foams fill the boiler and are dragged into the system due to the effect of steam. Foams contain water that is released when it explodes. This water damages the system.



BUBBLING

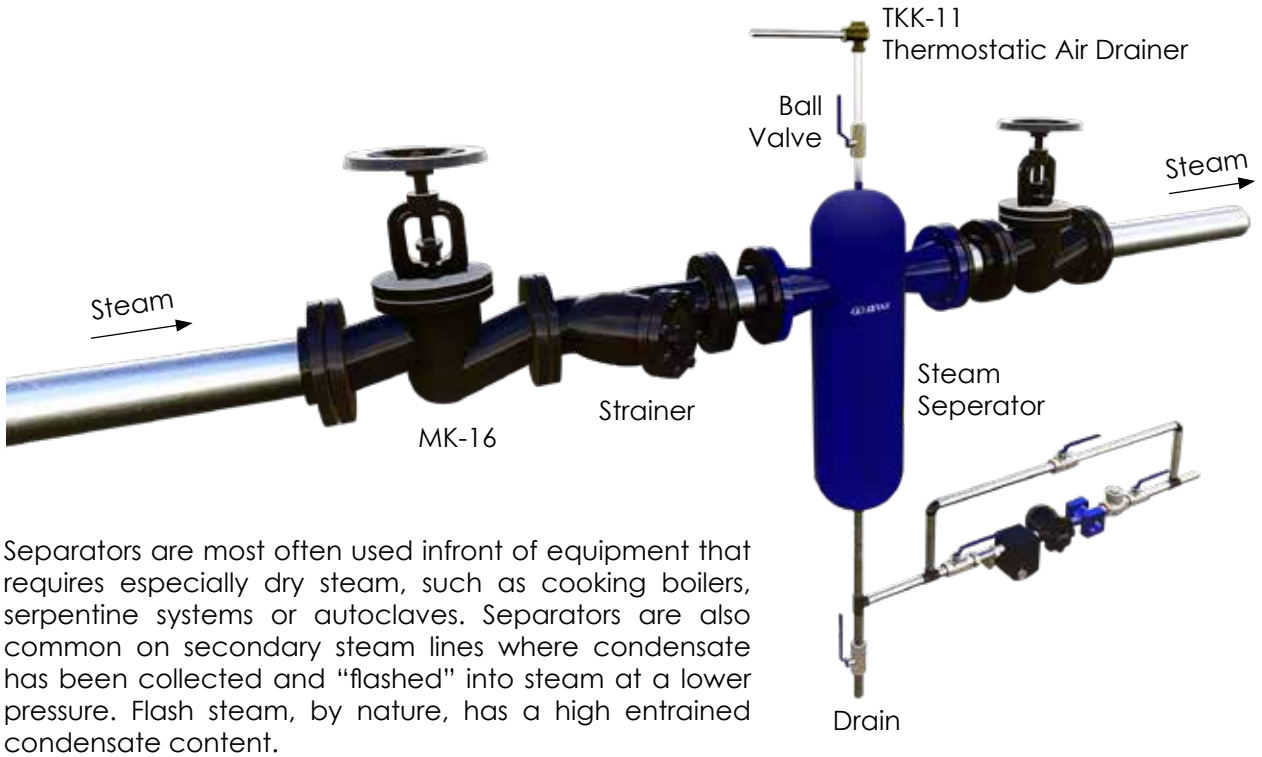
When water starts to boil on a metal heating surface, a steam bubble is formed in the water. This steam balloon rises rapidly and rises to the surface of the water. When the bubble breaks the surface of the water, some water is discharged from the surface. Discharged water continues to exist as mist at the same temperature as steam. It is usually discharged from the boiler together with the rapid flow of steam. The rest is suspended at the surface of the water since it is less dense than the density of water.



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.

BLOWDOWN SYSTEMS

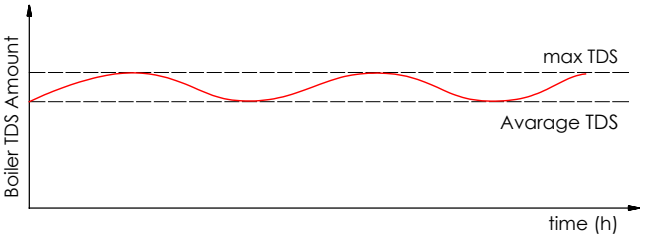
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

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.

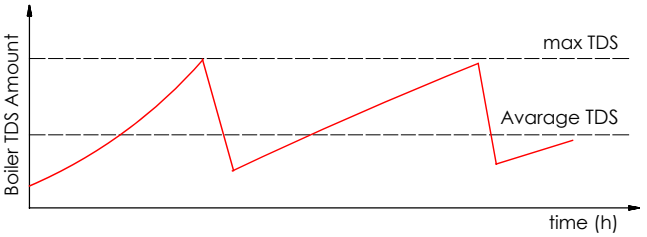
When the valve is opened, the sludge in the lower area of the boiler is effectively discharged by the high water velocity due to the pressure difference. Depending on the type of water preparation system and the dosing system, the steam boiler reaches salt and other foreign substances.

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.

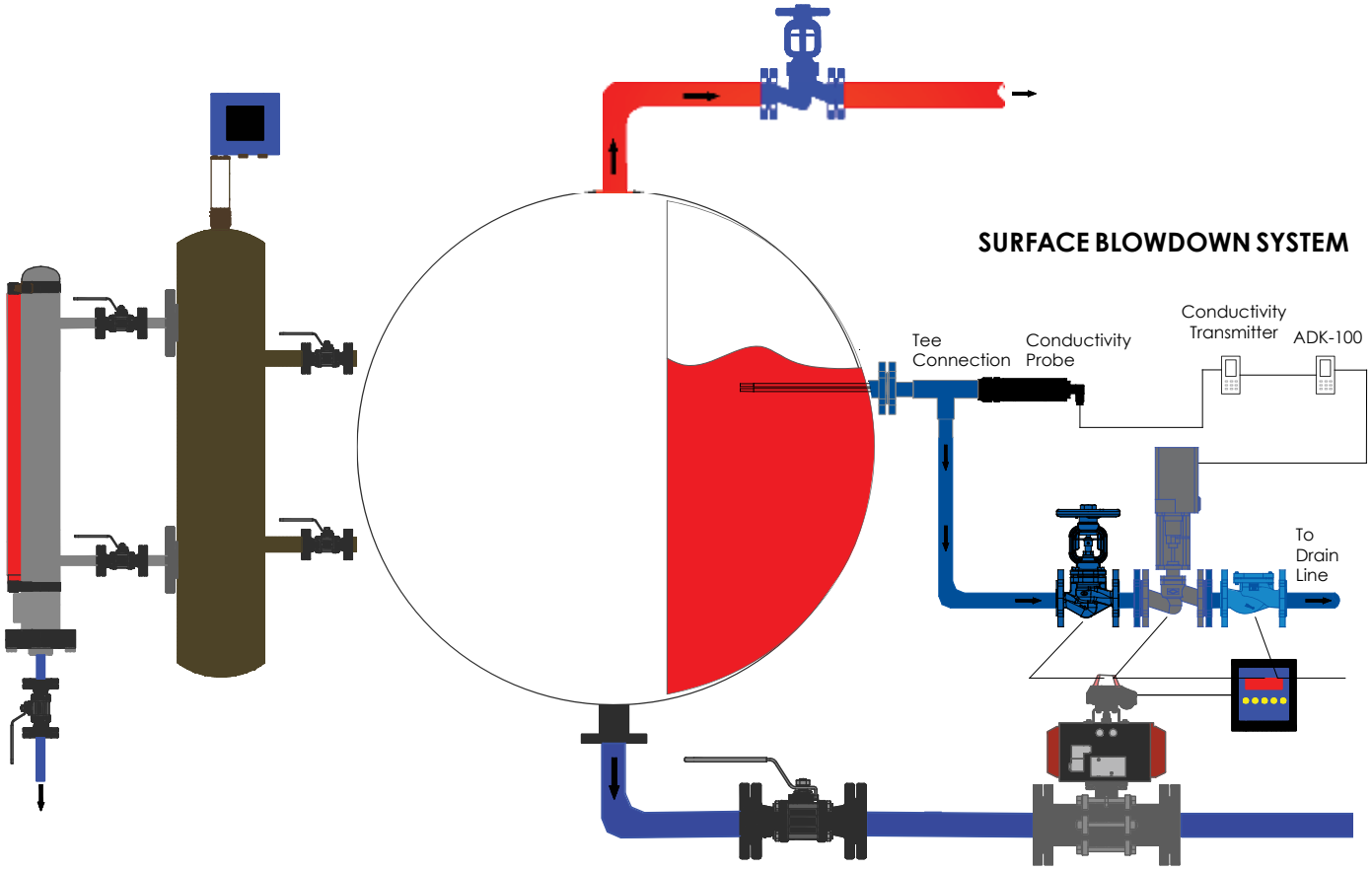


Automatic Blowdown System

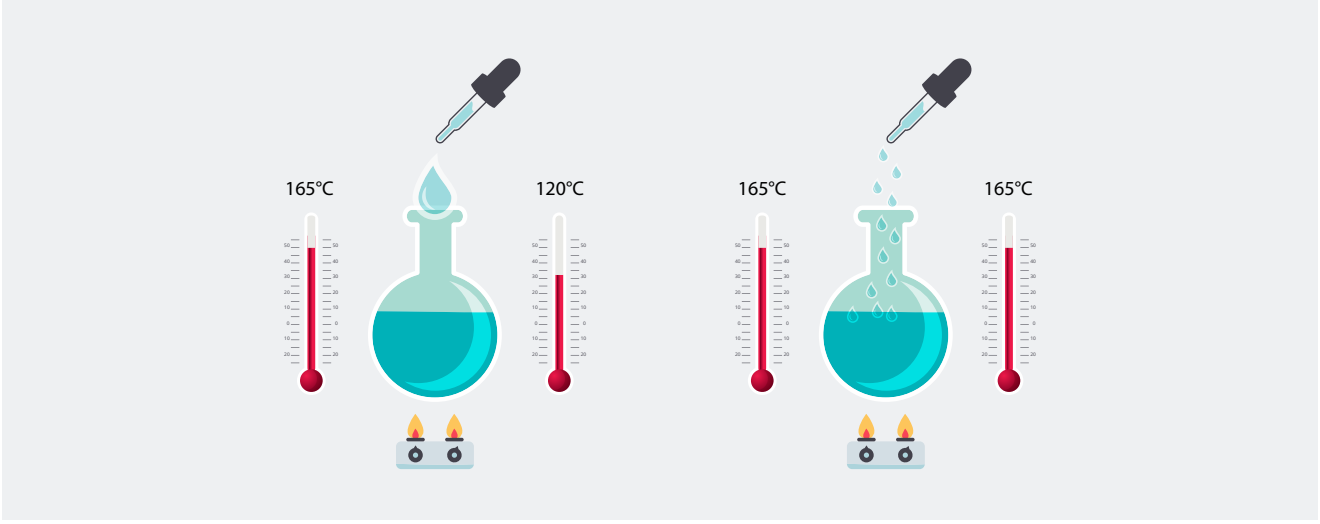


Manuel Blowdown System

APPLICATION EXAMPLE



FEED WATER SYSTEMS

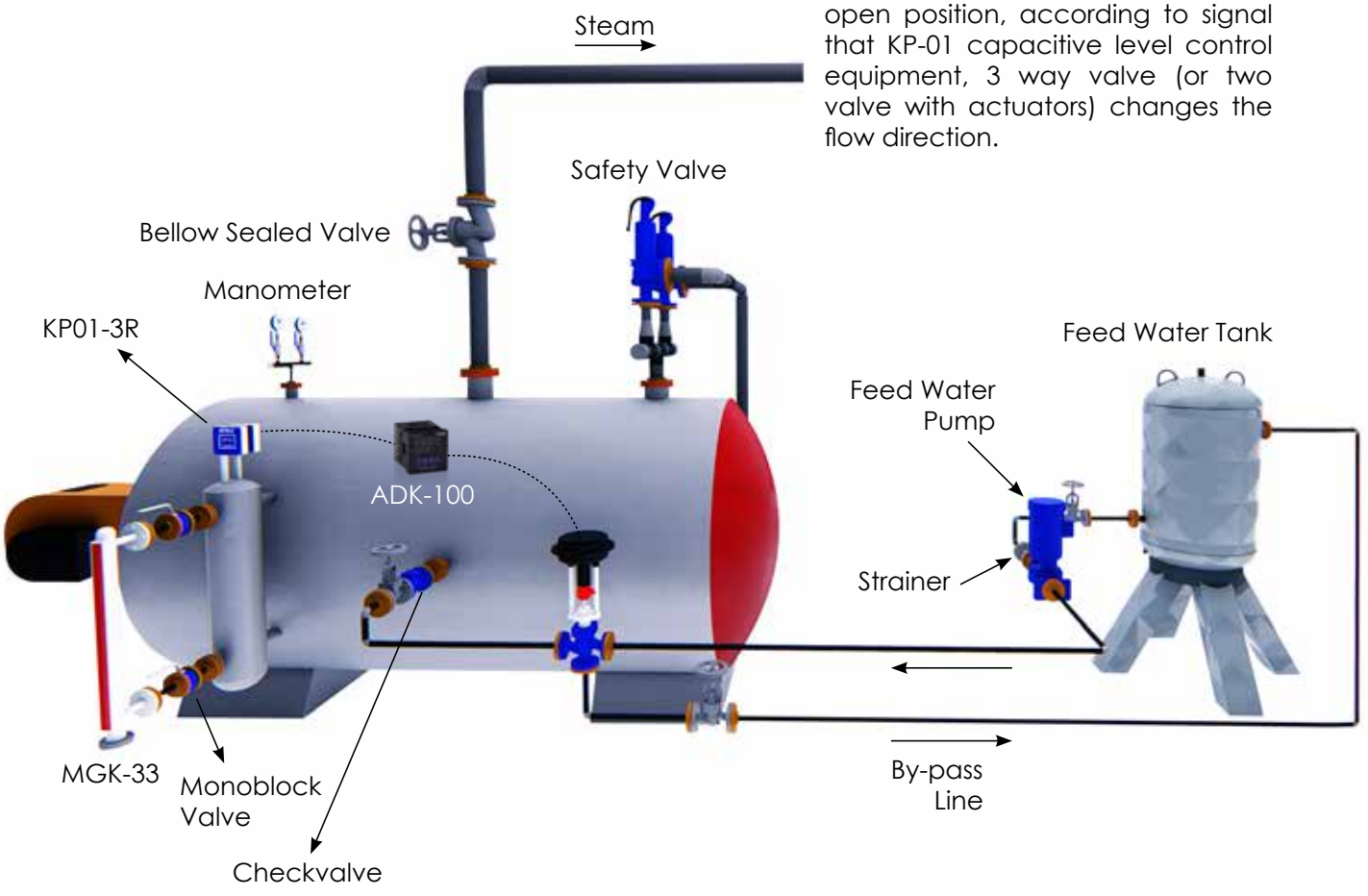


There are 2 general types of feed water system, such as; proportional and on-off. Main differences between proportional and on-off systems are;

- On-off systems are more economical than proportional systems.
- With proportional systems, pressure and temperature drops will be prevented.

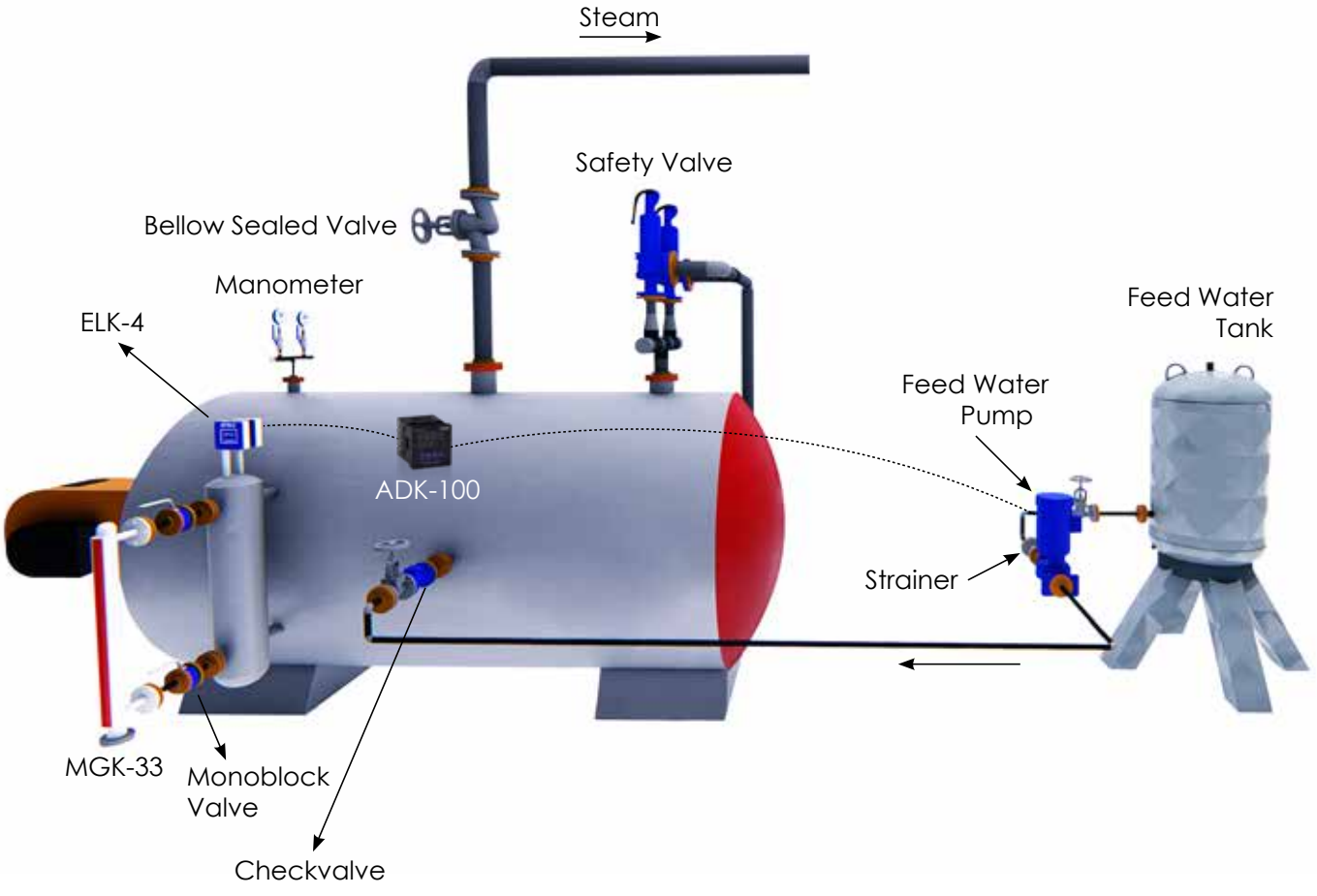
PROPORTIONAL FEED WATER SYSTEMS

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.



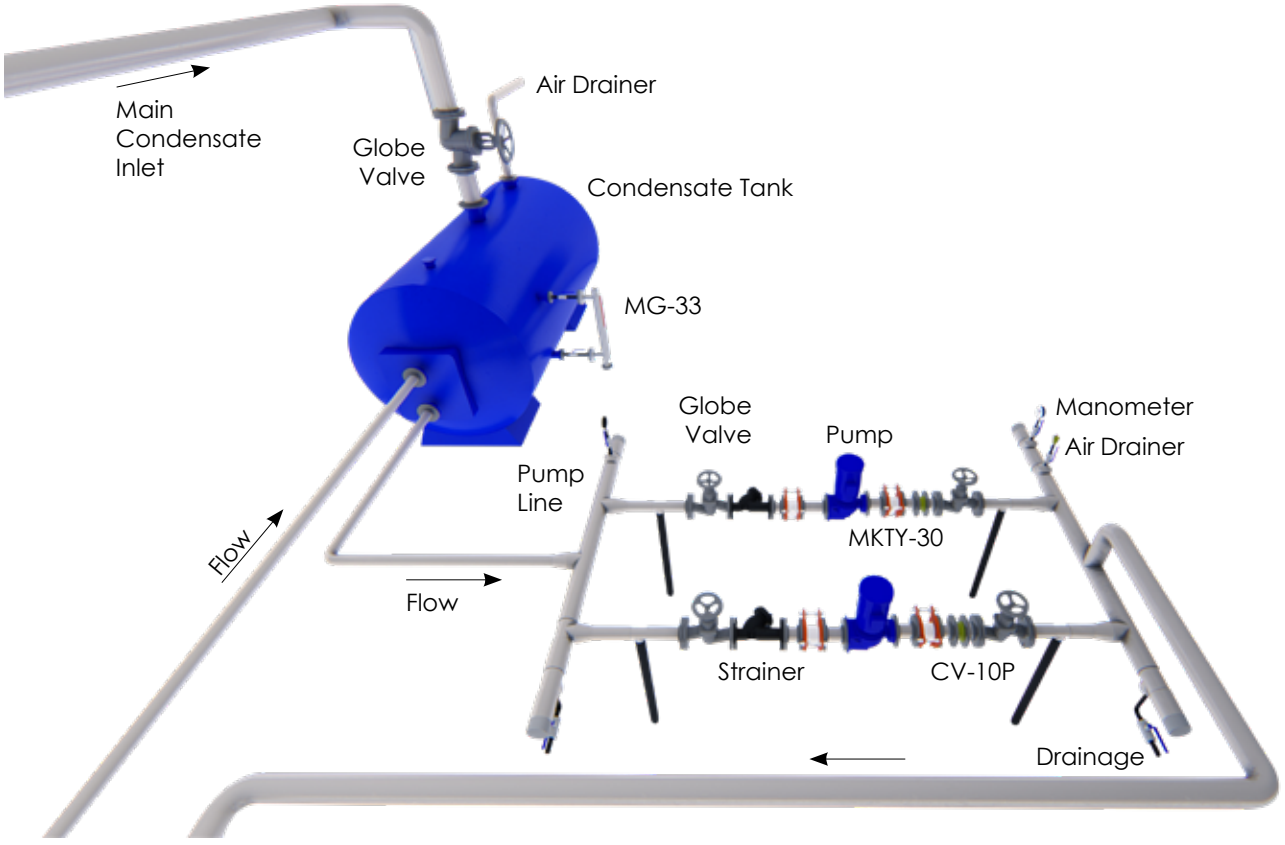
ON-OFF FEED WATER SYSTEMS

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



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.



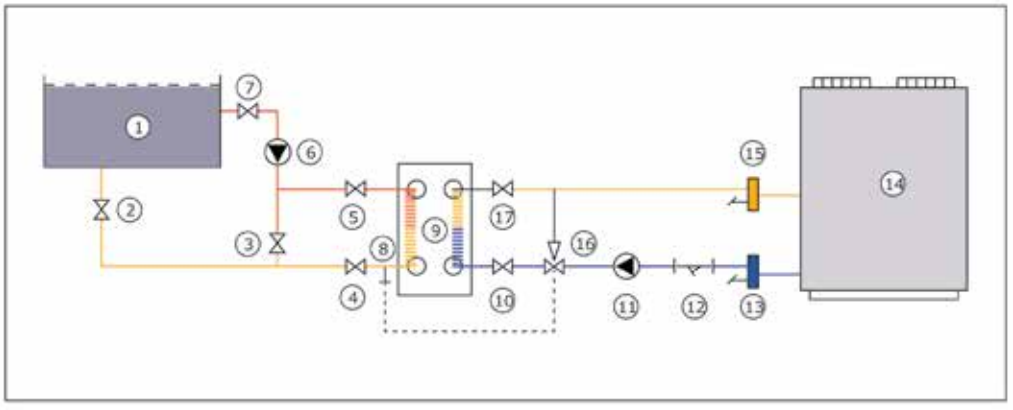
APPLICATIONS

Cooling of Rolling Oil

The oil used in the rolling mills becomes hot as a result of the process and the lubricating properties are reduced; as a result, operating performance isreduced. Ayvaz plate heat exchangers are used to keep the rolling oil at optimum temperature. With the cooling tower and the chiller circuit connected to the secondary circuit of the heat exchanger, and a simple automation, your rolling oil remains constant at the desired temperatures and your plant operates at maximum performance.

Boron Oil Cooling

Boron oil, one of the cornerstones of industry, is the lifeblood especially for metal cutting. The quality and temperature of the boron oil are very important for maximum efficiency and maximum life from the cutting edge. In order to keep the boron oil at optimum temperature, the cooling tower or chiller used with Ayvaz plate heat exchangers provides maximum efficiency.

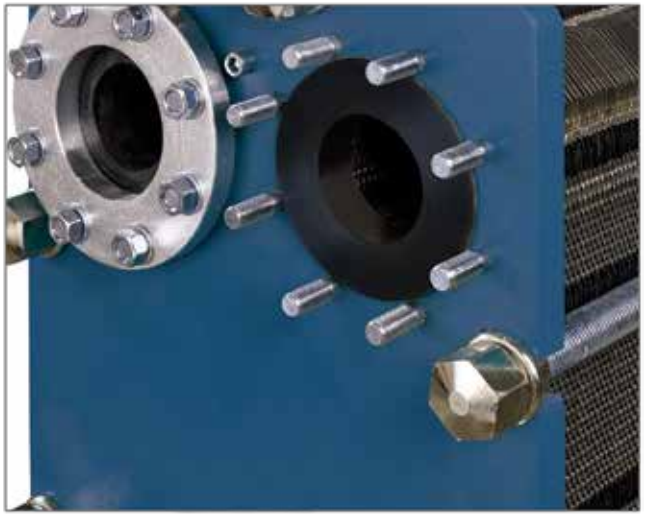


1	Oil Tank	5	Valve	9	Heat Exchanger	13	Going Collector	17	Valve
2	Valve	6	Oil Circulation Pump	10	Valve	14	Cooling Tower		
3	Valve	7	Valve	11	Circulation Pump	15	Returning Collector		
4	Valve	8	Oil Tank	12	Dirt Holder	16	Threeway Rational Valve		

APPLICATIONS

Chiller Group Circuit

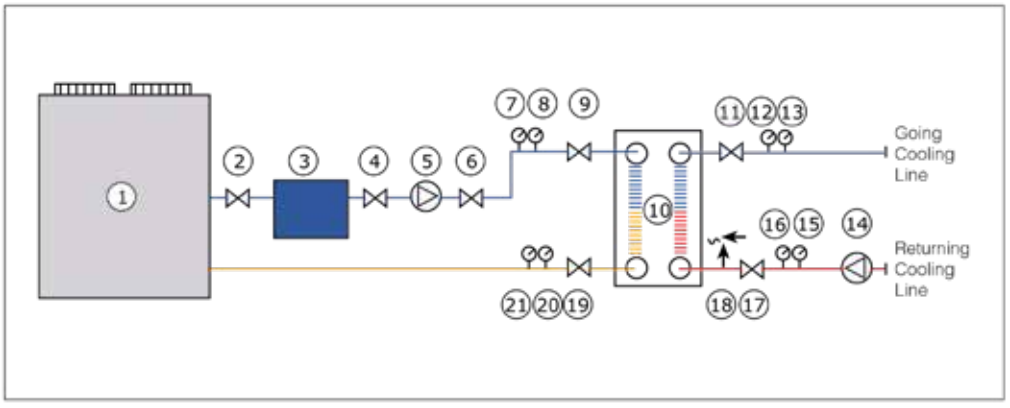
The cooling tower is generally insufficient for applications where low temperature water is desired. Therefore, chillers are preferred in these applications. Chiller groups are generally very sensitive, expensive and difficult to repair. Therefore, in case of any negative situation that may arise from the installation, large damages can occur. The Ayvaz plate heat exchangers separate the system from the chiller circuit, allowing the two systems to operate independently of each other, as well as the heat transfer between them.



APPLICATIONS

Cooling Group Circuit

Nowadays, cooling towers are the most commonly used cooling source to meet the cooling needs of industrial plants. Ayvaz plate heat exchangers are used in both types of these open and closed towers. Since some solid particles from the medium are mixed into the water in the open towers, the water where these particles are located cannot be sent. Directly to the system to be cooled. Using the Ayvaz plate heat exchanger between the system to be cooled and the open tower, the two systems are separated as two separate circuits and the Ayvaz plate heat exchangers collect all the risks on themselves. In case of contamination over time, only the heat exchanger can be cleaned and the system will perform the same performance again.

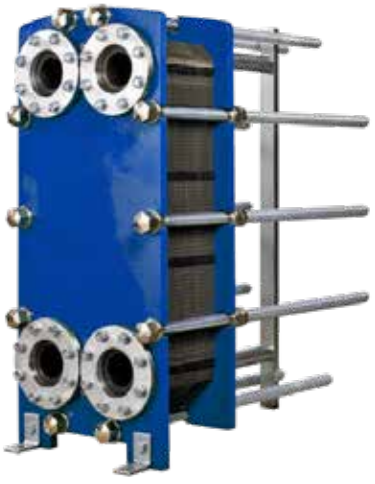


1	Cooling Group	6	Valve	11	Valve	16	Manometer	21	Manometer
2	Valve	7	Thermometer	12	Thermometer	17	Valve		
3	Tank	8	Manometer	13	Manometer	18	Safety Valve		
4	Valve	9	Valve	14	Circulation Pump	19	Valve		
5	Circulation Pump	10	Heat Exchanger	15	Thermometer	20	Thermometer		

APPLICATIONS

Waste Heat Recovery

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 partthat 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.



WORKING PRINCIPLE

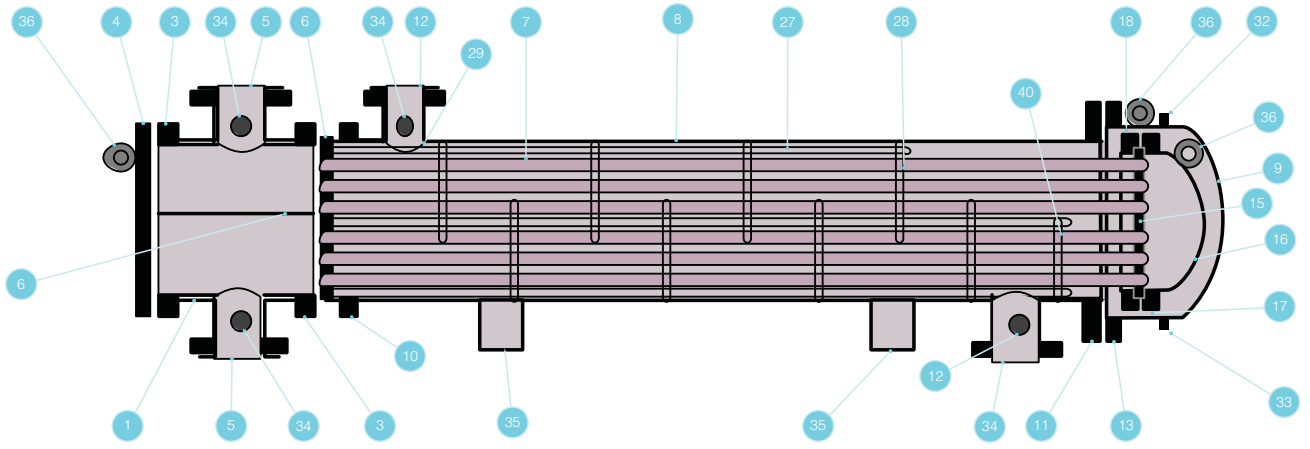
Working Principle of Shell & Tube Heat Exchangers

Shell & Tube heat exchangers are used in the public and private sectors of iron and steel, machinery industry, petroleum, petrochemical, gas, power plants, food, pharmaceutical, health, paper industry, leather, textile, air conditioning, ship and marine industrial facilities. in military, construction, swimming pool, geothermal and contracting sectors, in the areas of heating and cooling.

It is the most widely used heat exchanger in industrial facilities such as iron and steel, petroleum, petrochemical, gas, power plants, food, pharmaceuticals, leather, textiles, air conditioning, ships and maritime sectors.

The heat exchangers used in the industries can be used in all sectors where there is a second alternative energy requirement from an alternative energy.

SHELL & TUBE HEAT EXCHANGERS COMPONENTS



1	Fixed Head-Channel	9	Body Cover	17	Floating Head Flange	25	Packing Seal Ring	33	Unloading Connection
2	Fixed Head-Nozzle	10	Body Flange-Fixed Front Side	18	Floating Head Rear Assembly	26	Flashlight Ring	34	Measuring Instrument Connection
3	Fixed Head, Flanged Channel	11	Body Flange - Rear Side	19	Segment	27	Connecting Rods and Gaps	35	Support
4	Channel Cover	12	Body Inlet	20	Rear Flange	28	Suppression or Support Plates	36	Lifting Ring
5	Fixed Head Inlet	13	Body Cover Flange	21	Floating Head Cover	29	Inlet Surge Board (Curtain)	37	Support
6	Fixed Tube Mirror	14	Expansion Connection	22	Floating Tube Mirror Shirt	30	Longitudinal Surveillance Plate (Curtain)	38	Sluice
7	Tubes	15	Floating Tube Miror	23	Seal Box Flange	31	Chamber	39	Liquid Level Connection
8	Body	16	Floating Head Cover	24	Seal	32	Airing Connection		

ADVANTAGES

Advantages of Shell & Tube Heat Exchangers;

- They can be designed and manufactured to operate at very high pressures.
- Highly flexible and robust design.
- They can be designed and manufactured to operate at very high and very low temperatures.
- They are resistant to thermal shocks.
- There is no size limitation.
- They can be used in all applications.
- Pressure losses are minimal and can be kept to a minimum in accordance with the process purpose.
- They can be easily dismantled and reassembled for maintenance, repair and cleaning.
- Maintenance and repairs are easy.
- Pipe diameter, pipe number, pipe length, pipe pitch and pipe arrangement can be changed. Therefore, the design of tube heat exchangers has a lot of flexibility.

Heat transfer applications often require different solutions for different processes. After obtaining the necessary information in the process, it is designed by the expert engineers in the field and the schematic drawing is extracted. After the schematic drawing is checked, there is no dimensional problem and production pictures are taken.

U SHAPED – STRAIGHT S&T HEAT EXCHANGERS

Each heat exchanger approved for production is a process-specific heat exchanger, which is usually designed and which is similar. After the heat exchangers are manufactured, it is possible to isolate the heat losses to the minimum by isolating them if desired. There is no capacity limit in the production of pipe heat exchangers.

Heat exchangers can be grouped in multiple ways by connecting in series or parallel and their capacities can be increased. Ayvaz, which provides the provision of facilities that require high capacities such as Petrochemical Plants and Power Plants, is one of the leading companies in the sector with its experience in this field.

DOUBLE TUBE HEAT EXCHANGERS

The preferred type of product for safety reasons is the double tube safe heat exchangers where the fluids are mixed with each other.

A possible leakage is reported by means of an electrical signal through a pressure switch or a float in the control chamber.

The double walled safety tubes in the tube bundle are heat transfer tubes with thin channels that create a leakage space after the two tubes are connected.

In addition to oil cooling systems, the transformer is also used in chemical process engineering, heat recovery, food processes and domestic hot water heaters.

Copper and copper alloys are generally preferred in the products, and carbon steel and stainless steel materials are used according to the processes.

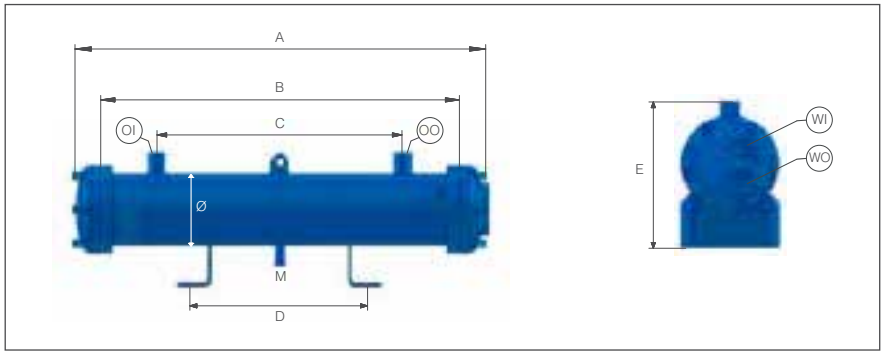
Depending on the application and processing requirements, special designs are selected on the inner or outer pipe to ensure the best heat transfer and processing.

OIL COOLERS

Many machines used in the industry need cooling during their work. The cooling process is usually caused by the collision of the water from the cooling tower or the chiller in the heat exchanger by the machine. AYVAZ oil coolers can be used in all types of applications. Oil coolers can be manufactured as standard in certain dimensions and can be manufactured in special manufacturing processes.

GROOVED COPPER TUBE OIL HEAT EXCHANGERS

In AYVAZ oil coolers, internal pipes can be manufactured from grooved copper pipes and turbulent flow can be provided. In this way, heat transfer is much higher than standard flat tube heat exchangers. In standard products, the inner tubes are made of copper and the quality of all other equipments are manufactured as ST35.8.



PETROCHEMICAL & REFINERIES

The petrochemical industry uses petroleum and natural gas based feedstocks such as naphtha, LPG, gas oil to produce plastics, rubber and fiber raw materials and other intermediates which are consumed by several sectors such as packaging, electronics, automotive, construction, textile and agriculture.

Ayvaz produces all type of refractory lined expansion joints including gimbal, universal tied or pantographic linked types for FCCU systems.

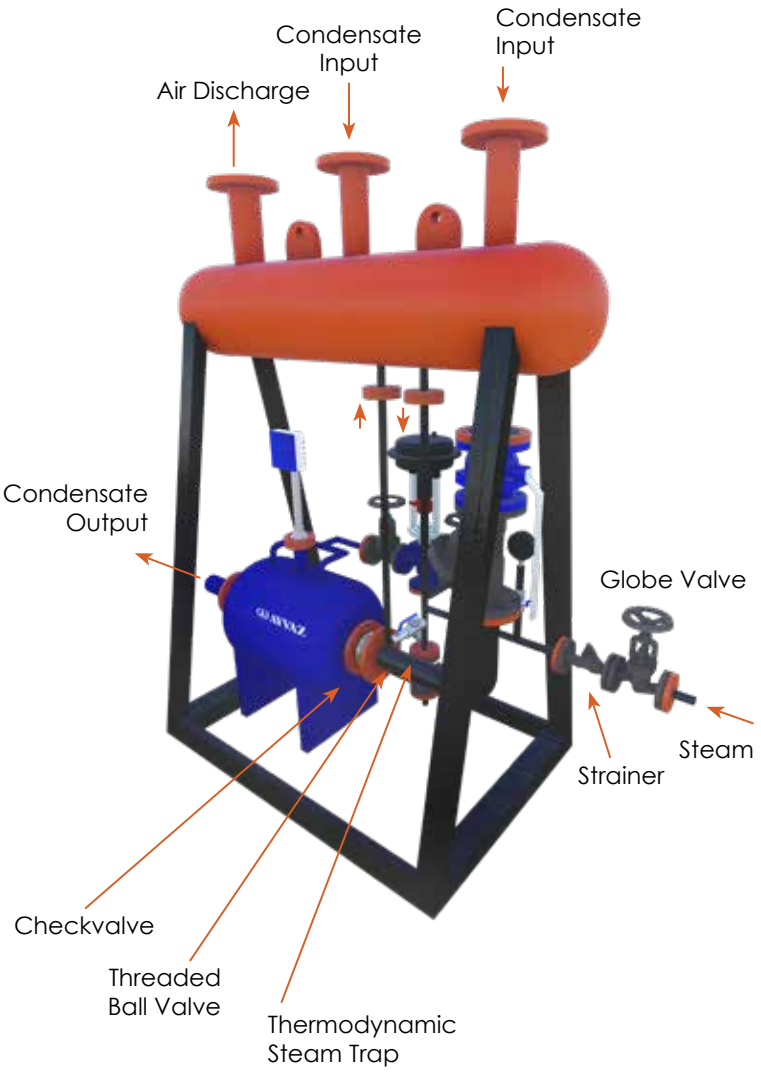
Cold Wall expansion joints are refractory lined to ensure the outside wall temperature does not exceed the maximum. The wall is made from stainless steels and the lining is designed inside of the expansion joint. Hot Wall expansion joints are designed with the refractory lining on the inside as a thermal barrier. The purpose of the lining is to withstand abrasion from the catalyst flow medium.

The expansion joint is a key component in this application because of critical operating conditions, and the selection of bellows material is very important. Double ply or redundant ply bellows are commonly utilized for FCCU applications. The simple double ply bellows utilizes the strength of both plies to withstand the operation conditions, and the redundant ply bellows are designed to let each ply take up the full load. So, if the inner ply is leaking, the outer ply will be able to take up the load and continuously operate without failure.

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.

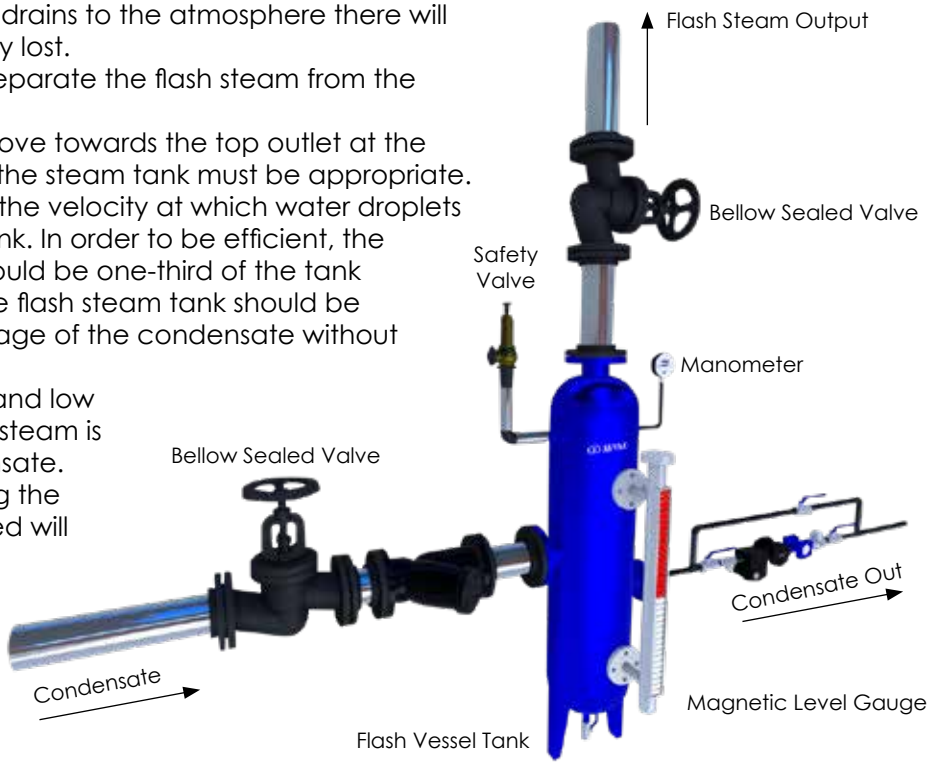
When the condensate pressure is smaller than the opposite pressure in condensate pump, discharge operation do not ocur. Steam is occurs the condensate discharging with entering the body, which have more pressure than the opposite pressure. When the condensate limit is gettin bottom limit of the tank, 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.



FLOWMETERS

The most practical solution to prevent the waste of energy in today's world; is to control the amount of fuel used - steam. In order to do this, it is necessary to know the flow amounts. If the flow amounts are known; efficient use of energy becomes easier.

Flowmeter; It is the name given to the device that measures the fluids such as gas, liquid or steam passing through an installation in terms of unit quantity / unit time.

Measures dimensions mechanically or electronically. Flowmeter with another definition; It is a type of device used to measure the volume or mass of a gas or liquid. Flowmeter devices may also be referred to by more than one name, depending on a particular industry. These expressions are mostly: such as flow meter, flow indicator, liquid meter, flow rate sensor and so on.

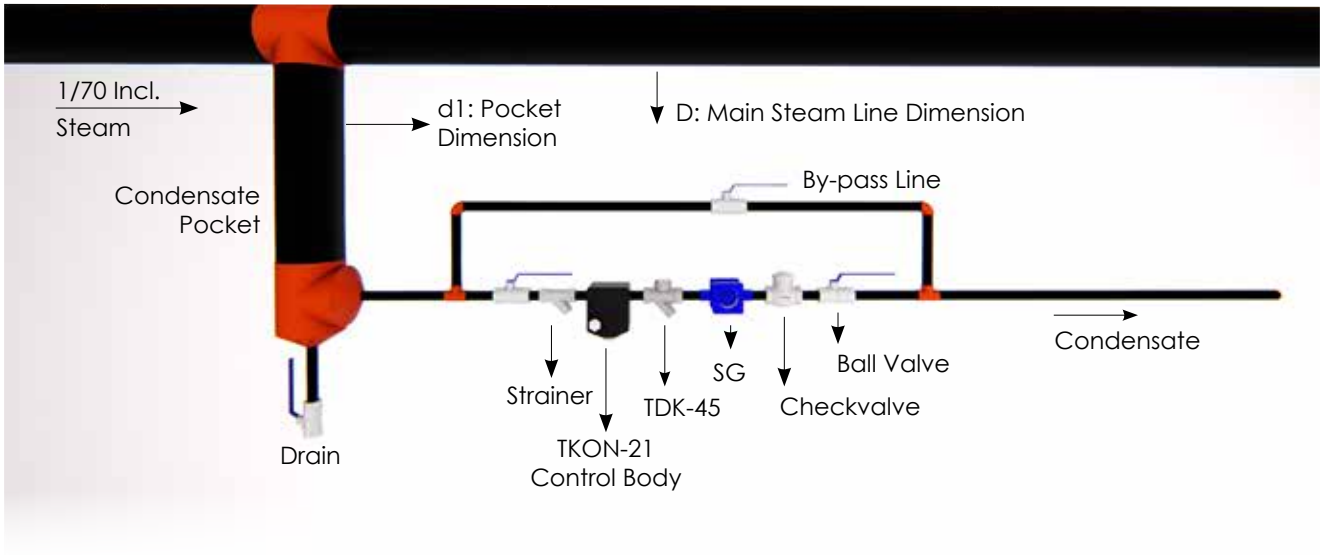
One of the biggest benefits of the flowmeter is that it ensures that the liquid is at the maximum level in terms of solubility. Flow meters are devices designed in different ways. Flowmeter devices are sometimes used by measuring built into the pipe. Sometimes measurements can be made on the pipe. This situation varies depending on the characteristics of the flowmeter device.

Flowmeter devices that measure the flow rate of solid, liquid or gaseous substances are generally devices used for motors, compressors, pumps or heat exchangers. It is used both to measure the accuracy of manufacturing and to evaluate product performance. When we look at the areas where the flowmeter is used, we see that it is mostly used by mechanical engineers.

STEAM LINE APPLICATIONS

MAIN STEAM LINE APPLICATION

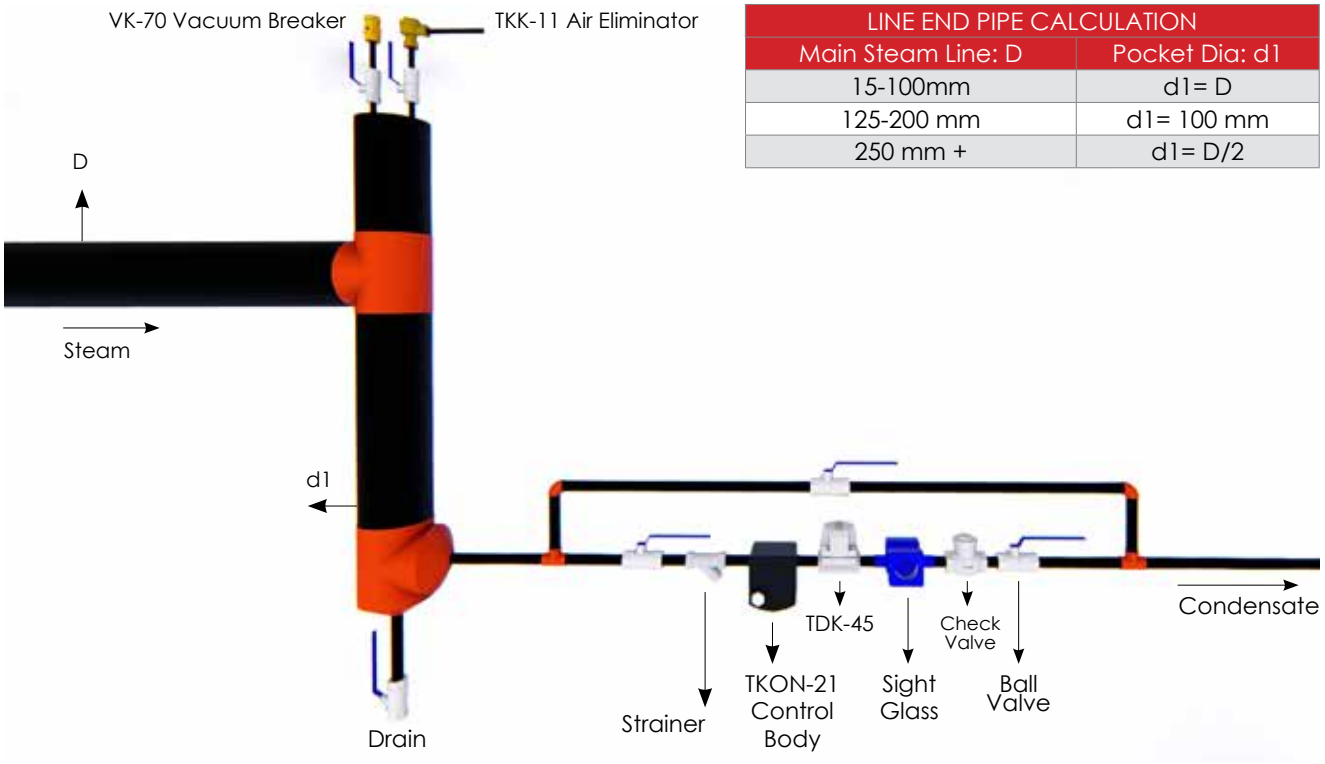
Condensate discharge unit should be placed in main steam lines in every 50 meters if the line is indoor and insulated or in every 30 meters if the line is outdoor and insulated. If any equipment like pressure reducer, pressure holder or proportional valve is installed in the line, a condensate discharge unit must be placed before these equipment.



LINE END APPLICATION

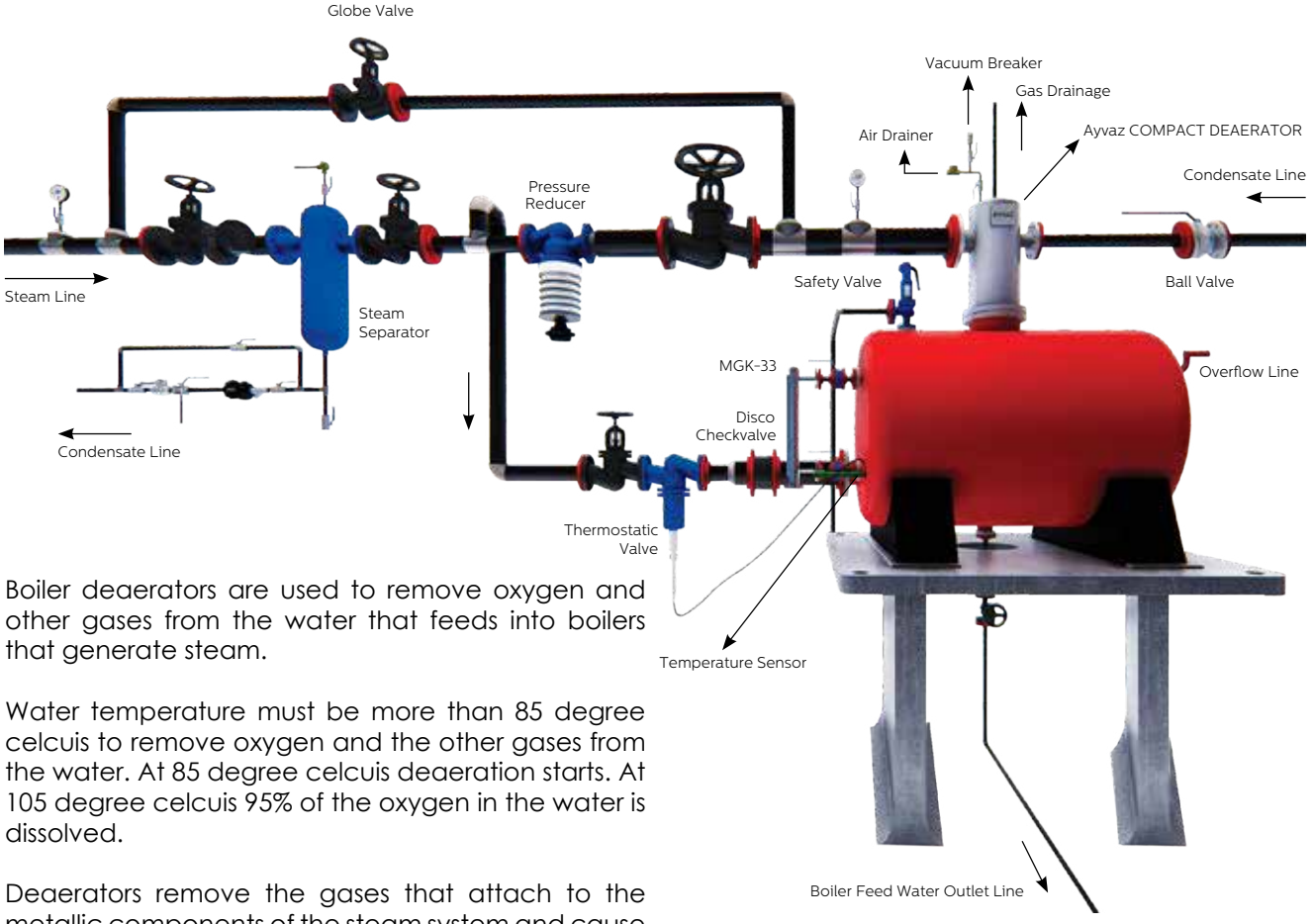
If the steam systems are closed by the process, the steam will turn to condensation until it is turned on again. The volume difference will be filled with air. When the system is switched on again, the air must be evacuated to allow the steam to easily fill the line. This is only possible with “End of Line Application”.

The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind must be thermodynamic.



LINE END PIPE CALCULATION	
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.

PHARMACEUTICAL

Nowadays; products manufactured in industries should be high quality and low cost. To reduce the cost, instead of reducing the quality of the material used in the product; it is necessary to reduce energy losses in the process.

Reducing energy losses is possible by transferring energy in a correct and efficient way. This method is the correct product selection.

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As Ayvaz, we are working for 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.

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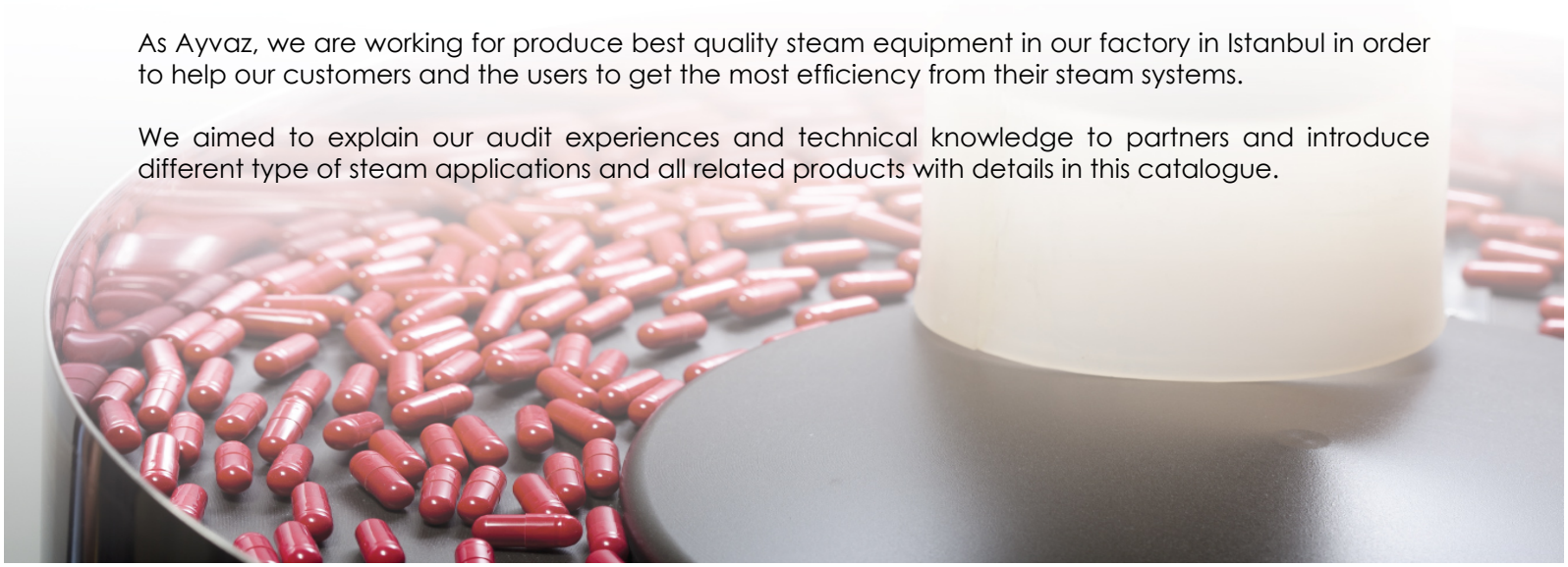

STAINLESS STEEL HEAT EXCHANGERS

The difference of food plate heat exchangers from other heat exchangers is their hygienic nature in terms of their bodies and all surfaces in contact with food are produced as stainless. In addition, the gaskets have FDA (food conformity) certificate.

Usage Areas

- Milk Heating and Cooling
- Pasteurisers
- Juice Pasteurisers
- Cream Cooling
- Brine Heating and Cooling
- Whey Processing

HYGIENIC STEAM TRAPS

HTT-6 HYGIENIC THERMOSTATIC STEAM TRAP

The hygienic thermostatic steam trap is designed to remove condensate from clean and pure steam applications such as CIP/SIP, sterile steam barriers, direct hygienic steam usage, reactors and process lines.

PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316L
Seat - Gasket	PTFE, Teflon
Thermosatic Capsule Connections	Hastelloy - Stainless Steel Socket

APPLICATION AREAS

Hygienic Applications
Food and Beverage Industries

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	6 bar
Max. Operating Temperature (TMO)	165°C

TKK-41/42 THERMOSTATIC STEAM TRAP / AIR RELEASER

PRODUCT FEATURES

Body	Stainless Steel AISI 304 (316 OPT.)
Thermostatic Capsule	Hastelloy
Strainer, Seat	Stainless Steel AISI 304
Connection Types	Threaded

APPLICATION AREAS

Convector Heaters
Heaters
Steam Jacket Pipelines
Drying Units
Pressing Units

OPERATING CONDITIONS

Max. Operating Pressure (PMO) 45 bar
Max. Operating Temperature (TMO) 250°C

HYGIENIC STEAM TRAPS

TDK-71 THERMODYNAMIC STEAM TRAP

PRODUCT FEATURES

Body	Stainless Steel AISI 304
Cover	Stainless Steel AISI 304
Strainer, Disc, Seat	Stainless Steel AISI 304
Connection Types	Threaded

APPLICATION AREAS

Main Steam Lines Turbines
Marine Applications Presses
Irons

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	Stainless Steel AISI 304
Body Pressure Class	Stainless Steel AISI 304
Max. Operating Temperature (TMO)	400°C

SK-61 FLOAT TYPE STEAM TRAP

APPLICATION AREAS

Tanks, pans, heat exchangers, drying cylinders, ovens

PRODUCT FEATURES

Body and Cover	Stainless Steel AISI 316
Internals and float	Stainless Steel
Connection Types	Flanged and threaded

OPERATING CONDITIONS

Max. Operating Pressure	(PMO) 25 bar
Max. Operating Temperature	(TMO) 250°C
Max. Differential Pressure	(ΔP) 4,5-10-14

HYGIENIC STEAM TRAPS

SK-61C FLOAT TYPE STEAM TRAP WITH SIGHT GLASS

PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316
Internals and Float	Stainless Steel
Connection Types	Flanged and Threaded

APPLICATION AREAS

Tanks, pans, heat exchangers, ovens, drying cylinders

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	25 bar
Max. Operating Temperature (TMO)	250°C
Max. Differential Pressure (ΔP)	4,5-10-14

SFK-61 FLOAT TYPE STEAM TRAP FLOATING BALL

PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316
Internals and Float	Stainless Steel
Connection Types	Flanged and Threaded

APPLICATION AREAS

Tanks, pans, heat exchangers, ovens, drying cylinders

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	25 bar
Max. Operating Temperature (TMO)	250°C
Max. Differential Pressure (ΔP)	4,5-10-14

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 GENERATORS

There, the feed water is further heated by pure steam and degassed in countercurrent with high efficiency. Three stages ensure safe and efficient separation of the non-condensable gases.

There is a calming section in the lower area of the degassing. The degassed water is fed into the separator tank with the plate heat exchanger. The pure steam is generated in the plate heat exchanger by means of heating steam.

Before the pure steam is fed into the pure steam line, it flows through a highly effective steam conditioning system that optimally processes the pure steam.

ADVANTAGES OF VERTICAL HYGIENIC STEAM GENERATOR

- The use of plate heat exchangers leads to a very compact and cost-saving plant concept.
- The vertical design and assembly of the heat exchanger in the blow-down-valve saves space.
- The specially designed control equipment enables precise function of steam generator.
- The thermal degassing unit is separated from the clean steam through well proved separation units. Pressure- and load fluctuations do not affect the efficiency of the degassing unit.
- An additional steam conditioning unit improves the quality of the produced clean steam.
- The especially for this plants produced feedback control offers a fast reacting function.
- The also integrated feeding water heat unit / raw condensate cooling unit improves the thermal efficiency and decreases the amount of raw steam needed, approx. 15 %.
- The alternate offered DUPLEX-concept gives best breakdown reliability and the possibility of an over boost operation.

HYGIENIC STEAM GENERATORS

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

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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EXPANSION JOINTS

METAL BELLOWS EXPANSION JOINTS

AXIAL EXPANSION JOINTS

APPLICATION AREAS

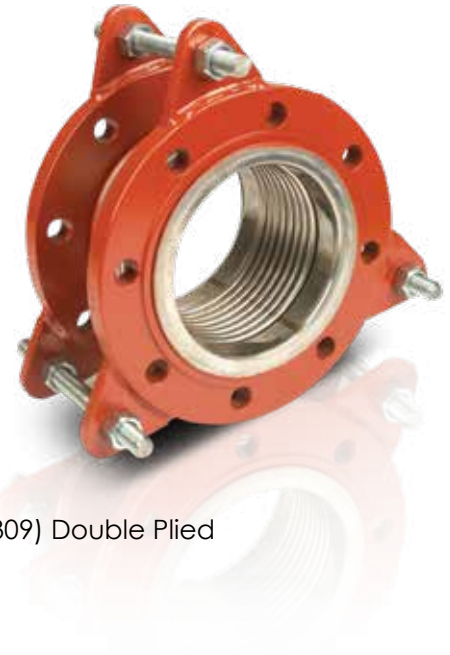
Hot and cold water systems
Steam and gas media related systems
Oil transporting lines
Pressured systems
Pumps, motors, machines

PRODUCT FEATURES

Bellow Material	Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309)
Nominal Diameter	DN25 (1/2") - DN5000 (200")
Operating Pressure	PN 2,5/6/16/25/40/64
Operating Temperature	-10°C/+550°C
Connection Types	Fixed and Floating Flanged and Welded Ended
Flange Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Optional	Inner Sleeve Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309)
Certificate	PED 2014 / 68 / EU Cat.III Mod. H

* Higher operating pressure is subject to special design and manufacturing.
Please contact our sales team.

EXPANSION JOINTS



METAL BELLOWS EXPANSION JOINTS

VIBRATION ABSORBER EXPANSION JOINTS WITH TIE ROD

APPLICATION AREAS

Vibration absorption of rotating elements
Pressured systems
Pumps, motors, machines, compressors
Pressured systems
Industrial pipeline construction
Gas and water supply

PRODUCT FEATURES

Bellow Material	Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309) Double Plied
Nominal Diameter	DN25 (1/2") - DN5000 (200")
Operating Pressure	PN 2,5/6/16/25/40/64
Operating Temperature	-10°C/+550°C
Connection Types	Fixed Flanged
Flange Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Tie Rod Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Certificate	PED 2014 / 68 / EU Cat.III Mod. H

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FLEXIBLE METAL HOSES

INDUSTRIAL HOSES

BRAIDED AND NON-BRAIDED HOSES WITH FITTINGS

APPLICATION AREAS

Heating, air conditioning and ventilation applications
Chemical and petrochemical plants
Oil and gas processing
Ship building and drilling
Food processing

PRODUCT FEATURES

Hose Type	Standard corrugated metal hose
Hose Material	Stainless Steel AISI 316L - AISI 321
Braiding Material	Stainless Steel AISI 304
Fittings Types	Flange,Welded ends, Threaded
Fittings Materials	Carbon Steel St. 37.2 / Stainless Steel (Optional)

DIN EN ANSI ISO

* Please contact our sales team for hose lengths and connections

LEVEL CONTROL

LEVEL ELECTRODES

ELK-4/ELK-4F

APPLICATION AREAS

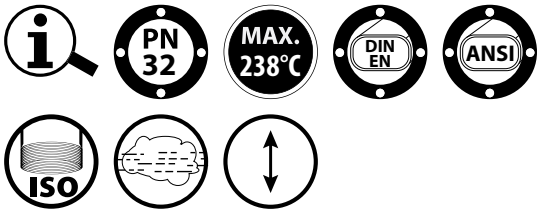
Steam boilers
Supply tanks
Chemical applications
Marine application

OPERATING CONDITIONS

Main Power Supply	230V ± 10%,50-60 Hz 115V±10%,50-60 Hz 24V±10%,50-60 Hz
Power Consumption	5 VA
Fuse	Thermal fuse Tmax=115°C
Precision	Degree 1: 10µS Degree 2: 0.5µS
Output	3 Volt-free relay contact (dry)

PRODUCT FEATURES

Box Panel	Aluminium Injection
Body	Stainless Steel 1.4517
Flange	Forged Steel 1.0460
Electrodes	Stainless Steel 1.4517
Electrode Insulation	PTFE
Intermediate Disc	PTFE
Connections	Flanged and threaded
Max. Operating Pressure	32 bar
Max. Operating Temperature	238°C



DIMENSIONS		
ELK4 (Threaded) DIN ISO 228/1	ELK 4F (Flanged) PN 40, DIN 2635	Length (mm)
1"	DN50	500 1000 1500

LEVEL CONTROL

LEVEL ELECTRODES

KP-01 CAPACITIVE LEVEL ELECTRODE

APPLICATION AREAS

Steam boilers
Supply tanks
Concrete tanks
Plastic tanks
Marine applications

OPERATING CONDITIONS

Main Power Supply	230V ± 10%,50-60 Hz 24V±10%,50-60 Hz
Power Consumption	5 VA
Fuse	Thermal fuse Tmax=115°C
Precision	Degree 1:Water ≥0.5µS/cm Degree 2:Water ≥20µS/cm Degree 3:Fuel Oil εr 2.3
Output	4-20 m Analog Proportional

PRODUCT FEATURES

Body	Stainless Steel 1.4517
Box Panel	Aluminium Injection
Flange	Forged Steel 1.0460
Electrodes	Stainless Steel 1.4517
Electrode Insulation	PTFE
Intermediate Disc	PTFE
Connections	Flanged and threaded
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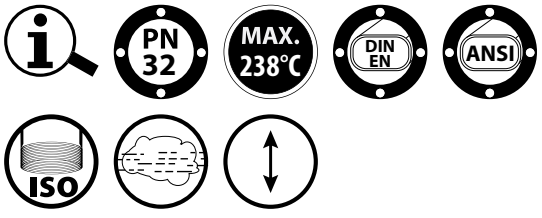


DIMENSIONS		
KP01 (Threaded) DIN ISO 228/1	KP01-F (Flanged) PN 40,DIN 2635	Length (mm)
3/4"	DN50	300 all sizes are available in between 2000

LEVEL CONTROL

LEVEL GAUGES

MG-33 MAGNETIC LEVEL GAUGE

APPLICATION AREAS

Steam boilers
All liquid tanks
Chemical industry
LPG tanks, underground tanks
Marine applications

PRODUCT FEATURES

Body	Stainless Steel AISI 316
Float	Stainless Steel AISI 316L
Magnetic Disc	Plastic
Flange Material	Carbon Steel St. 37.2 (Opt. Stainless Steel)
Connections	Flange
Max. Operating Pressure	16 bar
Max. Permissible Temperature	160°C
Contact Signal	Yes
Drain Plug	3/4"

DIMENSIONS	
MG-33 (Flanged) PN 16	Length (mm)
DN15 DN20 DN25	300 all sizes are available in between 5000

* Please contact our sales team for our bigger lengths.

LEVEL CONTROL

FLOAT SWITCHES

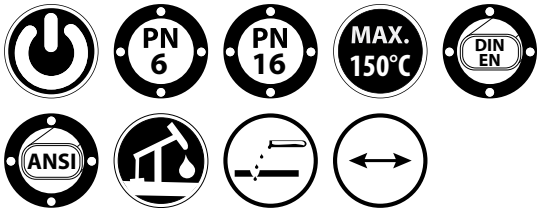
C-4 FLOAT SWITCH

APPLICATION AREAS

Water storage tanks
Waste water tanks
Shipbuilding
Fuel tanks
Small boilers
Condensate tanks
Chemical storage vessels

PRODUCT FEATURES

Float	Stainless Steel AISI 316L
Connections	Square Flange
Flange Material	Carbon Steel St. 37.2/Stainless Steel
Shaft	Aluminium Injection
Micro switches	16A (Normally open or closed)
Max. Operating Pressure	6/16 bar
Max. Operating Temperature	-20/+150°C



DIMENSIONS	
C-4 Square Flange (mm)	Length (mm)
94x94x15	From flange to the end of the float 250 mm

STEAM SEPERATORS

STEAM SEPERATOR
SPR-16/25/40

APPLICATION AREAS
Steam lines
Gas applications

PRODUCT FEATURES

Body	Carbon Steel / Stainless Steel (Optional)
Internals	Stainless Steel AISI 304
Connections	Flanged

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	16/25/40 bar
Max. Operating Temperature (TMO)	200°C

DIMENSIONS		
PN	FLANGED (DN)	THREADED (inch)
16	15 20 25 32 40	1/2"
25	50 65	3/4"
40	80 100 125 150 200	1"

FLOWMETERS

The most practical solution to prevent the waste of energy in today's world; is to control the amount of fuel used - steam. In order to do this, it is necessary to know the flow amounts. If the flow amounts are known; efficient use of energy becomes easier.

Flowmeter; It is the name given to the device that measures the fluids such as gas, liquid or steam passing through an installation in terms of unit quantity / unit time.

Measures dimensions mechanically or electronically. Flowmeter with another definition; It is a type of device used to measure the volume or mass of a gas or liquid. Flowmeter devices may also be referred to by more than one name, depending on a particular industry. These expressions are mostly: such as flow meter, flow indicator, liquid meter, flow rate sensor and so on.

One of the biggest benefits of the flowmeter is that it ensures that the liquid is at the maximum level in terms of solubility. Flow meters are devices designed in different ways. Flowmeter devices are sometimes used by measuring built into the pipe. Sometimes measurements can be made on the pipe. This situation varies depending on the characteristics of the flowmeter device.

Flowmeter devices that measure the flow rate of solid, liquid or gaseous substances are generally devices used for motors, compressors, pumps or heat exchangers. It is used both to measure the accuracy of manufacturing and to evaluate product performance. When we look at the areas where the flowmeter is used, we see that it is mostly used by mechanical engineers.

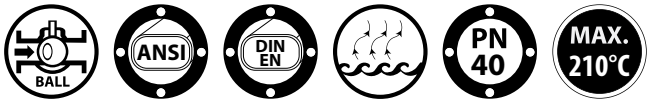
BLOWDOWN SYSTEM

BLOWDOWN SYSTEMS

DBV-10 BOTTOM BLOWDOWN VALVE

APPLICATION AREAS
Steam boilers (Safety)

System Elements
3 Pieced Ball Valve (V-3FP)
Timer
Pnuematic Actuator
Selenoid Valve
Limit Switch



FLANGED	
DIMENSIONS	DN40 Please contact our sales team for customized dimensions.

PRODUCT FEATURES DBV-10	
BALL VALVE	
Body Material	Stainless Steel AISI 304/316
Ball Material	Stainless Steel AISI 304/316
Stem	Stainless Steel AISI 304/316
Body Gasket	PTFE
Ball Seat	R-PTFE (15%)
Nominal Pressure (PN)	40 bar
Max. Operating Temp.	-50/+210°C

PNEUMATIC ACTUATOR	
Body Material	Epoxy Coated Aluminium Injection
Pistons	Aluminium Cast
Shaft Material	Cadmium Coated Steel
Tightness Component	Nitrile Rubber
Valve Connection	Standard

BLOWDOWN SYSTEM

BLOWDOWN SYSTEMS

YBS-10 SURFACE BLOWDOWN SYSTEM

APPLICATION AREAS
Steam boilers (Safety)

System Elements
DN20, PN 40 Forged Steel Bellow Sealed Stop Valve
DN20, PN 40 Stainless Steel Disc Check Valve
Conductivity Measuring Probe
Conductivity Transmitter (with LCD screen)
Digital Regulator
Surface Control Valve with Electric Motor
Anti corrosion Control Panel
Service Support Before Installation

ANSI · DIN EN · PN 40 · MAX. 210°C

DIMENSIONS	FLANGED
	DN20 Please contact our sales team for customized dimensions.

HYGIENIC APPLICATIONS

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- Pasteurisers
- Juice Pasteurisers
- Cream Cooling
- Brine Heating and Cooling
- Whey Processing

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PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316L
Seat - Gasket	PTFE, Teflon
Thermosatic Capsule Connections	Hastelloy - Stainless Steel Socket

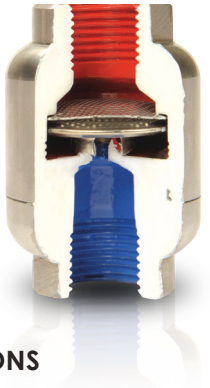
APPLICATION AREAS

Hygienic Applications
Food and Beverage Industries

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	6 bar
Max. Operating Temperature (TMO)	165°C

TKK-41/42 THERMOSTATIC STEAM TRAP / AIR RELEASER



PRODUCT FEATURES

Body	Stainless Steel AISI 304 (316 OPT.)
Thermostatic Capsule	Hastelloy
Strainer, Seat	Stainless Steel AISI 304
Connection Types	Threaded

APPLICATION AREAS

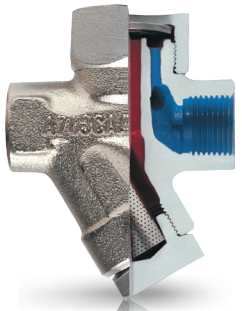
Convector Heaters
Heaters
Steam Jacket Pipelines
Drying Units
Pressing Units

OPERATING CONDITIONS

Max. Operating Pressure (PMO) 45 bar
Max. Operating Temperature (TMO) 250°C

HYGIENIC STEAM TRAPS

TDK-71 THERMODYNAMIC STEAM TRAP



PRODUCT FEATURES

Body	Stainless Steel AISI 304
Cover	Stainless Steel AISI 304
Strainer, Disc, Seat	Stainless Steel AISI 304
Connection Types	Threaded

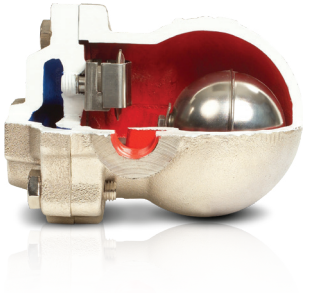
APPLICATION AREAS

Main Steam Lines Turbines
Marine Applications Presses
Irons

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	Stainless Steel AISI 304
Body Pressure Class	Stainless Steel AISI 304
Max. Operating Temperature (TMO)	400°C

SK-61 FLOAT TYPE STEAM TRAP



APPLICATION AREAS

Tanks, pans, heat exchangers, drying cylinders, ovens

PRODUCT FEATURES

Body and Cover	Stainless Steel AISI 316
Internals and float	Stainless Steel
Connection Types	Flanged and threaded

OPERATING CONDITIONS

Max. Operating Pressure	(PMO) 25 bar
Max. Operating Temperature	(TMO) 250°C
Max. Differential Pressure	(ΔP) 4,5-10-14

HYGIENIC STEAM TRAPS

SK-61C FLOAT TYPE STEAM TRAP WITH SIGHT GLASS

PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316
Internals and Float	Stainless Steel
Connection Types	Flanged and Threaded

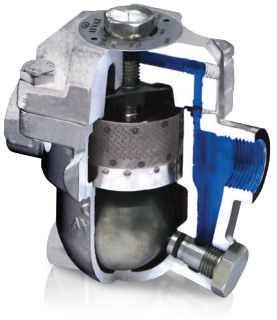
APPLICATION AREAS

Tanks, pans, heat exchangers, ovens, drying cylinders

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	25 bar
Max. Operating Temperature (TMO)	250°C
Max. Differential Pressure (ΔP)	4,5-10-14

SFK-61 FLOAT TYPE STEAM TRAP FLOATING BALL



PRODUCT FEATURES

Body and Coupling	Stainless Steel AISI 316
Internals and Float	Stainless Steel
Connection Types	Flanged and Threaded

APPLICATION AREAS

Tanks, pans, heat exchangers, ovens, drying cylinders

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	25 bar
Max. Operating Temperature (TMO)	250°C
Max. Differential Pressure (ΔP)	4,5-10-14

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 GENERATORS

There, the feed water is further heated by pure steam and degassed in countercurrent with high efficiency. Three stages ensure safe and efficient separation of the non-condensable gases.

There is a calming section in the lower area of the degassing. The degassed water is fed into the separator tank with the plate heat exchanger. The pure steam is generated in the plate heat exchanger by means of heating steam.

Before the pure steam is fed into the pure steam line, it flows through a highly effective steam conditioning system that optimally processes the pure steam.

ADVANTAGES OF VERTICAL HYGIENIC STEAM GENERATOR

- The use of plate heat exchangers leads to a very compact and cost-saving plant concept.
- The vertical design and assembly of the heat exchanger in the blow-down-valve saves space.
- The specially designed control equipment enables precise function of steam generator.
- The thermal degassing unit is separated from the clean steam through well proved separation units. Pressure- and load fluctuations do not affect the efficiency of the degassing unit.
- An additional steam conditioning unit improves the quality of the produced clean steam.
- The especially for this plants produced feedback control offers a fast reacting function.
- The also integrated feeding water heat unit / raw condensate cooling unit improves the thermal efficiency and decreases the amount of raw steam needed, approx. 15 %.
- The alternate offered DUPLEX-concept gives best breakdown reliability and the possibility of an over boost operation.

HYGIENIC STEAM GENERATORS

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

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

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 seconder hygienically steam generators which are suitable for sterile steam conditions.

HYGIENIC EXPANSION JOINTS

METAL BELLOWS EXPANSION JOINTS

AXIAL EXPANSION JOINTS

APPLICATION AREAS

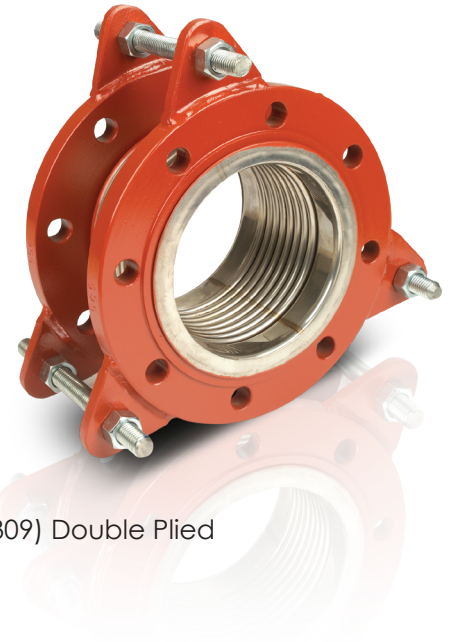
Hot and cold water systems
Steam and gas media related systems
Oil transporting lines
Pressured systems
Pumps, motors, machines

PRODUCT FEATURES

Bellow Material	Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309)
Nominal Diameter	DN25 (1/2") - DN5000 (200")
Operating Pressure	PN 2,5/6/16/25/40/64
Operating Temperature	-10°C/+550°C
Connection Types	Fixed and Floating Flanged and Welded Ended
Flange Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Optional	Inner Sleeve Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309)
Certificate	PED 2014 / 68 / EU Cat.III Mod. H

* Higher operating pressure is subject to special design and manufacturing.
Please contact our sales team.

HYGIENIC EXPANSION JOINTS



METAL BELLOWS EXPANSION JOINTS

VIBRATION ABSORBER EXPANSION JOINTS WITH TIE ROD

APPLICATION AREAS

Vibration absorption of rotating elements
Pressured systems
Pumps, motors, machines, compressors
Pressured systems
Industrial pipeline construction
Gas and water supply

PRODUCT FEATURES

Bellow Material	Stainless Steel AISI 321 (Opt. 304, 316L, 316TI, 309) Double Plied
Nominal Diameter	DN25 (1/2") - DN5000 (200")
Operating Pressure	PN 2,5/6/16/25/40/64
Operating Temperature	-10°C/+550°C
Connection Types	Fixed Flanged
Flange Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Tie Rod Material	Carbon Steel St. 37.2 as standard, the material can be customized on request
Certificate	PED 2014 / 68 / EU Cat.III Mod. H

* Higher operating pressure is subject to special design and manufacturing.
Please contact our sales team.

HYGIENIC FLEXIBLE METAL HOSES

INDUSTRIAL HOSES

BRAIDED AND NON-BRAIDED HOSES WITH FITTINGS

APPLICATION AREAS

Heating, air conditioning and ventilation applications
Chemical and petrochemical plants
Oil and gas processing
Ship building and drilling
Food processing

PRODUCT FEATURES

Hose Type	Standard corrugated metal hose
Hose Material	Stainless Steel AISI 316L - AISI 321
Braiding Material	Stainless Steel AISI 304
Fittings Types	Flange,Welded ends, Threaded
Fittings Materials	Carbon Steel St. 37.2 / Stainless Steel (Optional)

DIN EN ANSI ISO

* Please contact our sales team for hose lengths and connections

HYGIENIC LEVEL CONTROL

LEVEL ELECTRODES

ELK-4/ELK-4F

APPLICATION AREAS

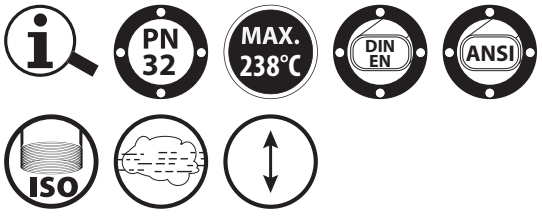
Steam boilers
Supply tanks
Chemical applications
Marine application

OPERATING CONDITIONS

Main Power Supply	230V ± 10%,50-60 Hz 115V±10%,50-60 Hz 24V±10%,50-60 Hz
Power Consumption	5 VA
Fuse	Thermal fuse Tmax=115°C
Precision	Degree 1: 10µS Degree 2: 0.5µS
Output	3 Volt-free relay contact (dry)

PRODUCT FEATURES

Box Panel	Aluminium Injection
Body	Stainless Steel 1.4517
Flange	Forged Steel 1.0460
Electrodes	Stainless Steel 1.4517
Electrode Insulation	PTFE
Intermediate Disc	PTFE
Connections	Flanged and threaded
Max. Operating Pressure	32 bar
Max. Operating Temperature	238°C



DIMENSIONS		
ELK4 (Threaded) DIN ISO 228/1	ELK 4F (Flanged) PN 40, DIN 2635	Length (mm)
1"	DN50	500 1000 1500

HYGIENIC LEVEL CONTROL

LEVEL ELECTRODES

KP-01 CAPACITIVE LEVEL ELECTRODE

APPLICATION AREAS

Steam boilers
Supply tanks
Concrete tanks
Plastic tanks
Marine applications

OPERATING CONDITIONS

Main Power Supply	230V ± 10%,50-60 Hz 24V±10%,50-60 Hz
Power Consumption	5 VA
Fuse	Thermal fuse Tmax=115°C
Precision	Degree 1:Water ≥0.5µS/cm Degree 2:Water ≥20µS/cm Degree 3:Fuel Oil εr 2.3
Output	4-20 m Analog Proportional

PRODUCT FEATURES

Body	Stainless Steel 1.4517
Box Panel	Aluminium Injection
Flange	Forged Steel 1.0460
Electrodes	Stainless Steel 1.4517
Electrode Insulation	PTFE
Intermediate Disc	PTFE
Connections	Flanged and threaded
Max. Operating Pressure	32 bar
Max. Operating Temperature	238°C

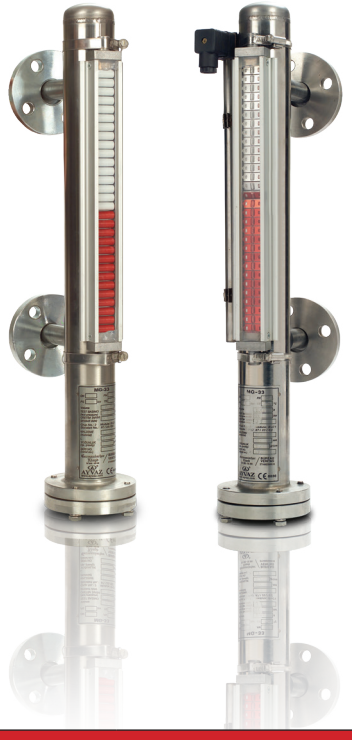
* Please contact our sales team for our bigger lengths.

DIMENSIONS		
KP01 (Threaded) DIN ISO 228/1	KP01-F (Flanged) PN 40,DIN 2635	Length (mm)
3/4"	DN50	300 all sizes are available in between 2000

HYGIENIC LEVEL CONTROL

LEVEL GAUGES

MG-33 MAGNETIC LEVEL GAUGE



APPLICATION AREAS

Steam boilers
All liquid tanks
Chemical industry
LPG tanks, underground tanks
Marine applications

PRODUCT FEATURES

Body	Stainless Steel AISI 316
Float	Stainless Steel AISI 316L
Magnetic Disc	Plastic
Flange Material	Carbon Steel St. 37.2 (Opt. Stainless Steel)
Connections	Flange
Max. Operating Pressure	16 bar
Max. Permissible Temperature	160°C
Contact Signal	Yes
Drain Plug	3/4"

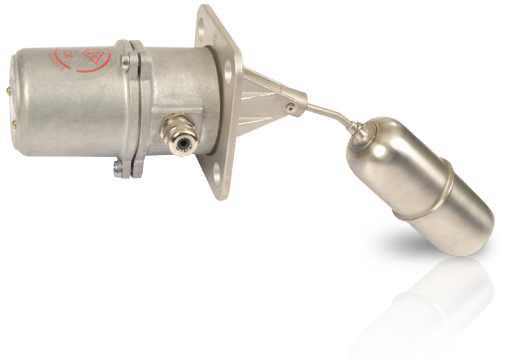
DIMENSIONS	
MG-33 (Flanged) PN 16	Length (mm)
DN15 DN20 DN25	300 all sizes are available in between 5000

* Please contact our sales team for our bigger lengths.

HYGIENIC LEVEL CONTROL

FLOAT SWITCHES

C-4 FLOAT SWITCH

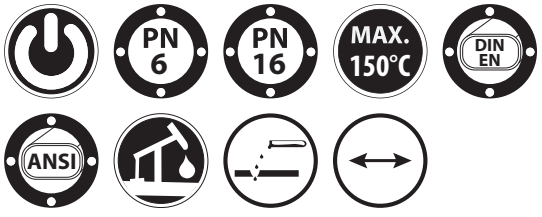


APPLICATION AREAS

Water storage tanks
Waste water tanks
Shipbuilding
Fuel tanks
Small boilers
Condensate tanks
Chemical storage vessels

PRODUCT FEATURES

Float	Stainless Steel AISI 316L
Connections	Square Flange
Flange Material	Carbon Steel St. 37.2/Stainless Steel
Shaft	Aluminium Injection
Micro switches	16A (Normally open or closed)
Max. Operating Pressure	6/16 bar
Max. Operating Temperature	-20/+150°C



DIMENSIONS	
C-4 Square Flange (mm)	Length (mm)
94x94x15	From flange to the end of the float 250 mm

HYGIENIC STEAM SEPERATORS

STEAM SEPERATOR
SPR-16/25/40

APPLICATION AREAS
Steam lines
Gas applications

PRODUCT FEATURES

Body	Carbon Steel / Stainless Steel (Optional)
Internals	Stainless Steel AISI 304
Connections	Flanged

OPERATING CONDITIONS

Max. Operating Pressure (PMO)	16/25/40 bar
Max. Operating Temperature (TMO)	200°C

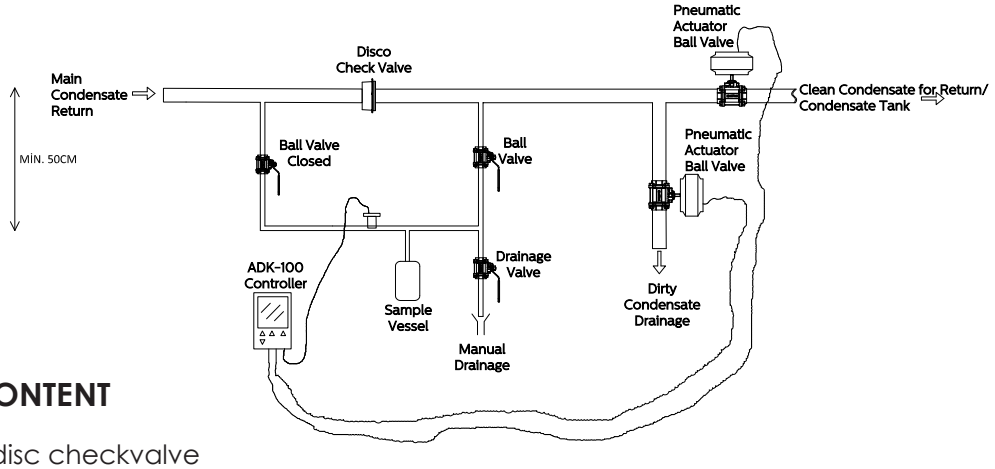
DIMENSIONS		
PN	FLANGED (DN)	THREADED (inch)
16	15 20 25 32 40	1/2"
25	50 65	3/4"
40	80 100 125 150 200	1"

CONDENSATE POLLUTION CONTROL

This system, which is located at the entrance of the condensate tank, continuously measures the electrical conductivity of the condensate water. The conductivity measurement probe value is transmitted at the system control value. The controller compares the set conductivity value with the set value. When the set value is exceeded, the discharge valve opens and the condensate is discharged.

When the electric conductivity value is lower than the set value, the discharge valve closes and the condensate tank line is opened. It is sent to the condensate tank.

Since the electrical conductivity varies with temperature, the conductivity probe used in the system must be able to measure the conductivity at the temperature together with the conductivity so that the conductivity of the condensate at every temperature can be measured accurately.



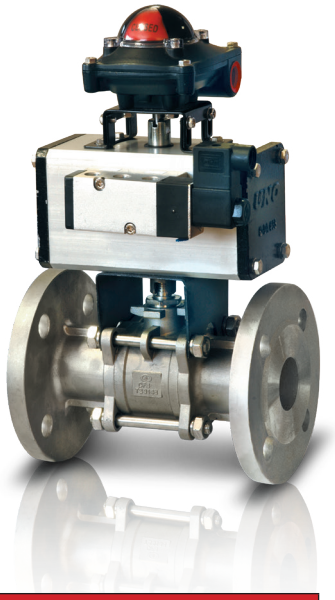
SYSTEM CONTENT

- Stainless disc checkvalve
- Double effective pneumatic actuated stainless ball valve normally open
- Double effective pneumatic actuated stainless ball valve normally closed
- Conductivity transmitter B&C electronic C3600 4-20mA (110x90x60mm)
- Conductivity sensor sensorex CS675 httc 250 PSI 200C 1" diving length
Sensor diameter 19mm cable side 3/4 ADK-100 controller
- Stainless ball valve threaded 304 quailty

BLOWDOWN SYSTEM

BLOWDOWN SYSTEMS

DBV-10 BOTTOM BLOWDOWN VALVE



APPLICATION AREAS
Steam boilers (Safety)

System Elements
3 Pieced Ball Valve (V-3FP)
Timer
Pnuematic Actuator
Selenoid Valve
Limit Switch

FLANGED	
DIMENSIONS	DN40 Please contact our sales team for customized dimensions.

PRODUCT FEATURES DBV-10	
BALL VALVE	
Body Material	Stainless Steel AISI 304/316
Ball Material	Stainless Steel AISI 304/316
Stem	Stainless Steel AISI 304/316
Body Gasket	PTFE
Ball Seat	R-PTFE (15%)
Nominal Pressure (PN)	40 bar
Max. Operating Temp.	-50/+210°C

PNEUMATIC ACTUATOR	
Body Material	Epoxy Coated Aluminium Injection
Pistons	Aluminium Cast
Shaft Material	Cadmium Coated Steel
Tightness Component	Nitrile Rubber
Valve Connection	Standard

BLOWDOWN SYSTEM

BLOWDOWN SYSTEMS

YBS-10 SURFACE BLOWDOWN SYSTEM

APPLICATION AREAS
Steam boilers (Safety)

System Elements
DN20, PN 40 Forged Steel Bellow Sealed Stop Valve
DN20, PN 40 Stainless Steel Disc Check Valve
Conductivity Measuring Probe
Conductivity Transmitter (with LCD screen)
Digital Regulator
Surface Control Valve with Electric Motor
Anti corrosion Control Panel
Service Support Before Installation

ANSI DIN EN PN 40 MAX. 210°C

DIMENSIONS	FLANGED
	DN20 Please contact our sales team for customized dimensions.

LAUNDRY

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

In boilers, dryers, heat exchangers, iron heaters, washing machines 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 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.

STEAM USAGE IN LAUNDRY – WASHING MACHINE

WASHING MACHINE

OPERATING PROCESS
The solvent used in the washing machines must be heated before being sprayed onto the laundry. This process is costly when done with electricity. Steam is supplied to the solvent heating units of the washing machines. The condensate that will be formed from the solvent mixing steam of the washing machines cannot be reused. for this reason, only the entrances of the washing machines have a steam trap group.

STEAM USAGE
25-400 kg/h Steam Usage
1-7 BAR Working Pressure
120-140 C Working Temperature

EQUIPMENT NEEDS
Thermodynamic Steam Trap (main line) x1
Bellow Sealed Valve x3
Strainer x1
Checkvalve x1

WASHING MACHINE TYPES
Conventional textile washing and spinning machines barrier type hygienic washing and squeezing machines tunnel type washing and squeezing machines.

WATER DRAGGING IN STEAM LINES – DRYERS

DRYERS

OPERATING PROCESS
They are used for drying the laundry which does not need to be ironed or which needs to be pre-dried before ironing. Various capacities are available with single doors, separate loading and unloading doors or tilting models. They are electrically heated, steam or gas heated and their drums are stainless steel or galvanized. The working principles are the drying of the laundry by hot air circulation while the laundry rotates in the drum.

STEAM USAGE
25-400 kg/h Steam Usage
1-7 BAR working pressure
120-140 C Working Temperature

EQUIPMENT NEEDS
Thermodynamic Steam Trap (main line) x 1
Bellow Sealed Valve x 3
Strainer x 1
Checkvalve x 1
Stainless Steel Flexible Metal Hoses

DRYER TYPES
Tumble Dryers
Tunnel Type Dryers
Cylndric Dryers

STEAM USAGE IN LAUNDRY – IRONING

IRONING

STEAM USAGE
25-35 kg/h Steam Usage
4-5 BAR working pressure
150-160 C Working Temperature

EQUIPMENT NEEDS
Thermodynamic Steam Trap x1
Bellow Sealed Valve x3
Strainer x1
Checkvalve x1

IRON TYPES
Cylinder Irons
Roller Folding Machines
Roller Folding / Ironing, Feeding Machines
Finishing Irons
Model Irons
Blowers
Iron Robots

CONDENSATION AMOUNT

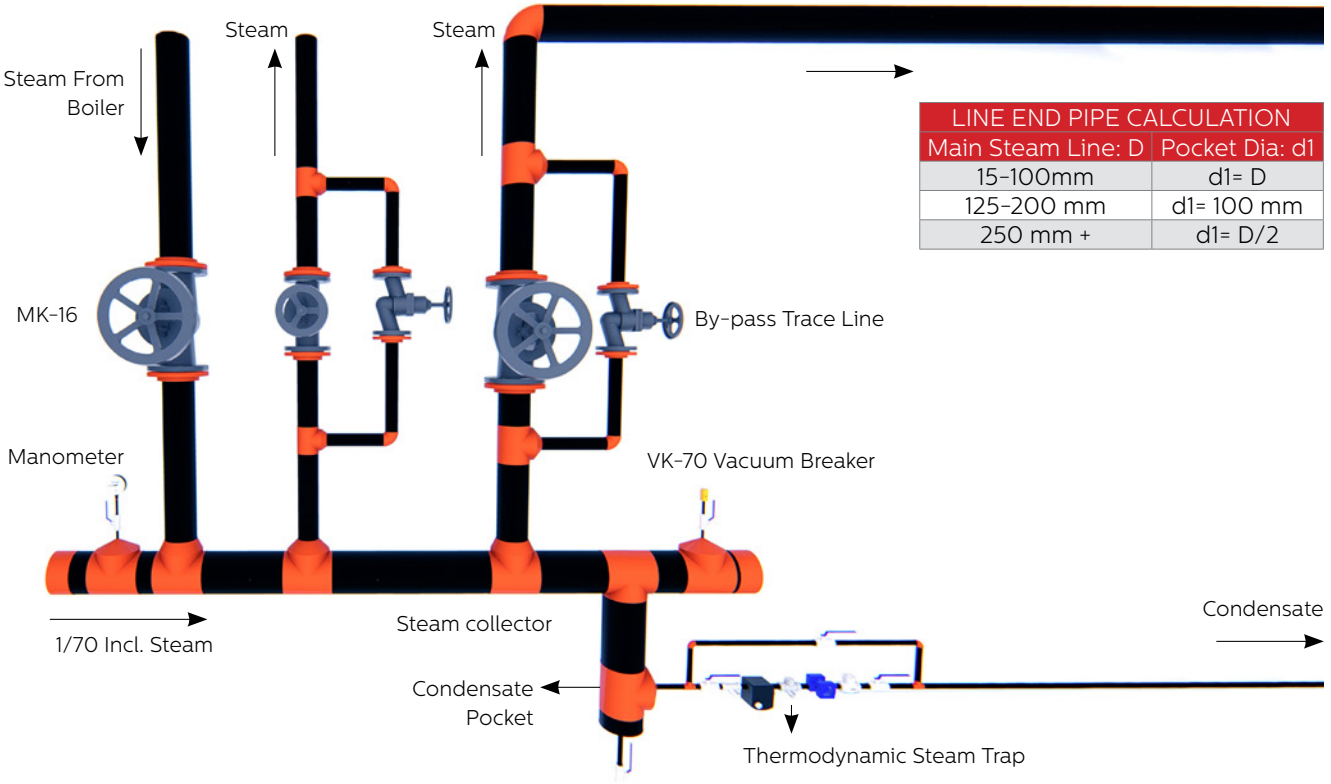
TEXTILE INDUSTRY STANDARD MACHINE INFORMATION				STEAM CONSUMPTION (kg/h)	
TYPE OF DEVICE OR PROCESS		STEAM PRESSURE (bar)	CAPACITY	CLOSED COND. SYSTEM	OPEN COND. SYSTEM
LAUNDRY MACHINES	Stain Removal Machine	4,0 - 5,0		5	
	Dry Cleaner		1 kg of Clothes		0,5
	Laundry		20 kg of Clothes	21	25
			40 kg of Clothes	30	35
			60 kg of Clothes	43	50
			100 kg of Clothes	68	80
			150 kg of Clothes	85	100
			300 kg of Clothes	102	120
DRYING MACHINES	Tumble Dryer		20 kg of Clothes	21	25
			30 kg of Clothes	30	35
			40 kg of Clothes	38	45
			60 kg of Clothes	55	65
			100 kg of Clothes	94	110
			150 kg of Clothes	136	160
			160 kg of Clothes	340	400
INDUSTRIEL IRONS	Steam Irons			5	
	Trousers Press			25	
	Robot Irons			30	
	Model Blower			30	
	Trousers Blower			35	
	Cylinder Iron		50 kg of Clothes	26	30
	Cylinder Iron		75 kg of Clothes	34	40
	Cylinder Iron			51	60
	Cylinder Iron			85	100

STEAM DISTRIBUTION

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;



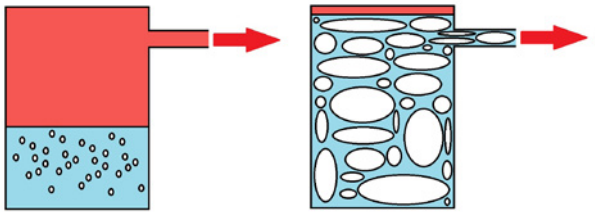
LINE END PIPE CALCULATION	
Main Steam Line: D	Pocket Dia: d1
15-100mm	d1= D
125-200 mm	d1= 100 mm
250 mm +	d1= D/2

WATER DRAGGING IN STEAM LINES

In some cases hot boiler water can mix with steam and may drag to the system. This gets steam wet and may caouse hugh water mass in system. This happens in that 3 case bellow;

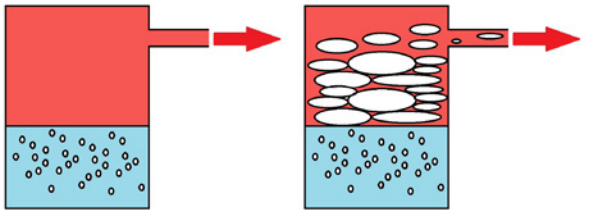
PEAK REQUESTS (PRIMING)

At the system startup, if all machines open in the same moment, boiler tank can not produce steam for request. It cause water dragging to the system and pressure loss in the steam boiler. When the pressure reduce suddenly, for balance the pressure, steam boiler start to boil and try to produce steam as fast as it can. This water steam mix drags to the system.



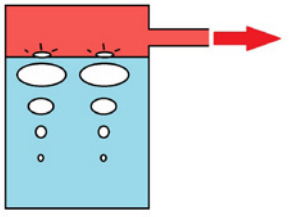
FOAMING

The components in the raw water which do not process properly process the water treatment process or the mixed condensate mixed with the condensate, cause the formation of bubbles in the cauldron. These foams fill the boiler and are dragged into the system due to the effect of steam. Foams contain water that is released when it explodes. This water damages the system.



BUBBLING

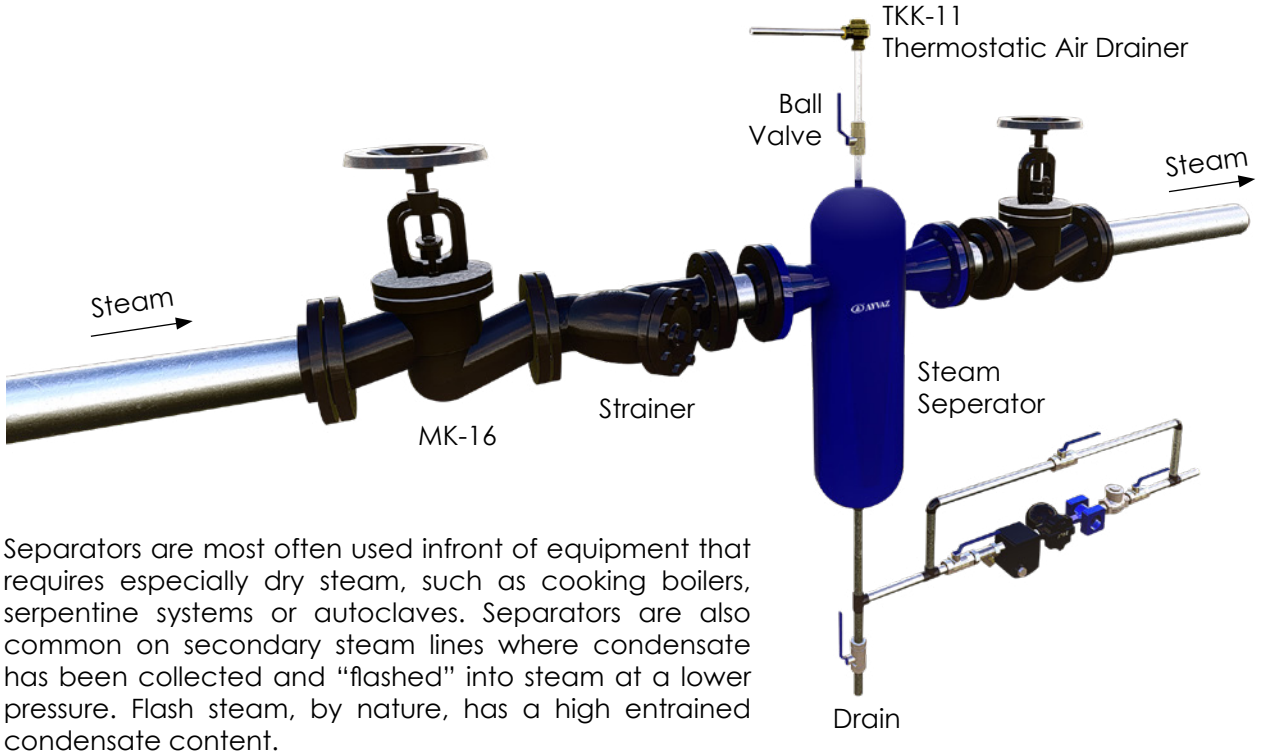
When water starts to boil on a metal heating surface, a steam bubble is formed in the water. This steam balloon rises rapidly and rises to the surface of the water. When the bubble breaks the surface of the water, some water is discharged from the surface. Discharged water continues to exist as mist at the same temperature as steam. It is usually discharged from the boiler together with the rapid flow of steam. The rest is suspended at the surface of the water since it is less dense than the density of water.



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.

BLOWDOWN SYSTEMS

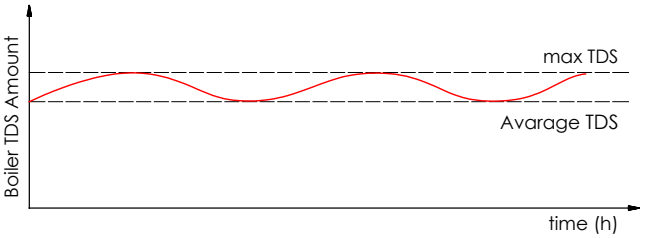
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

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.

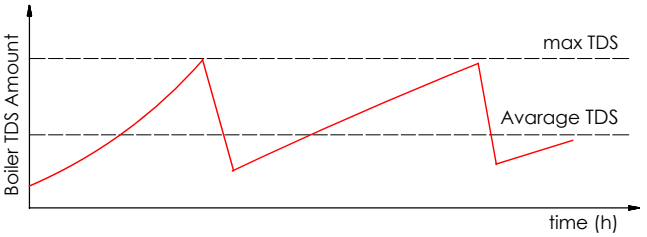
When the valve is opened, the sludge in the lower area of the boiler is effectively discharged by the high water velocity due to the pressure difference. Depending on the type of water preparation system and the dosing system, the steam boiler reaches salt and other foreign substances.

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.

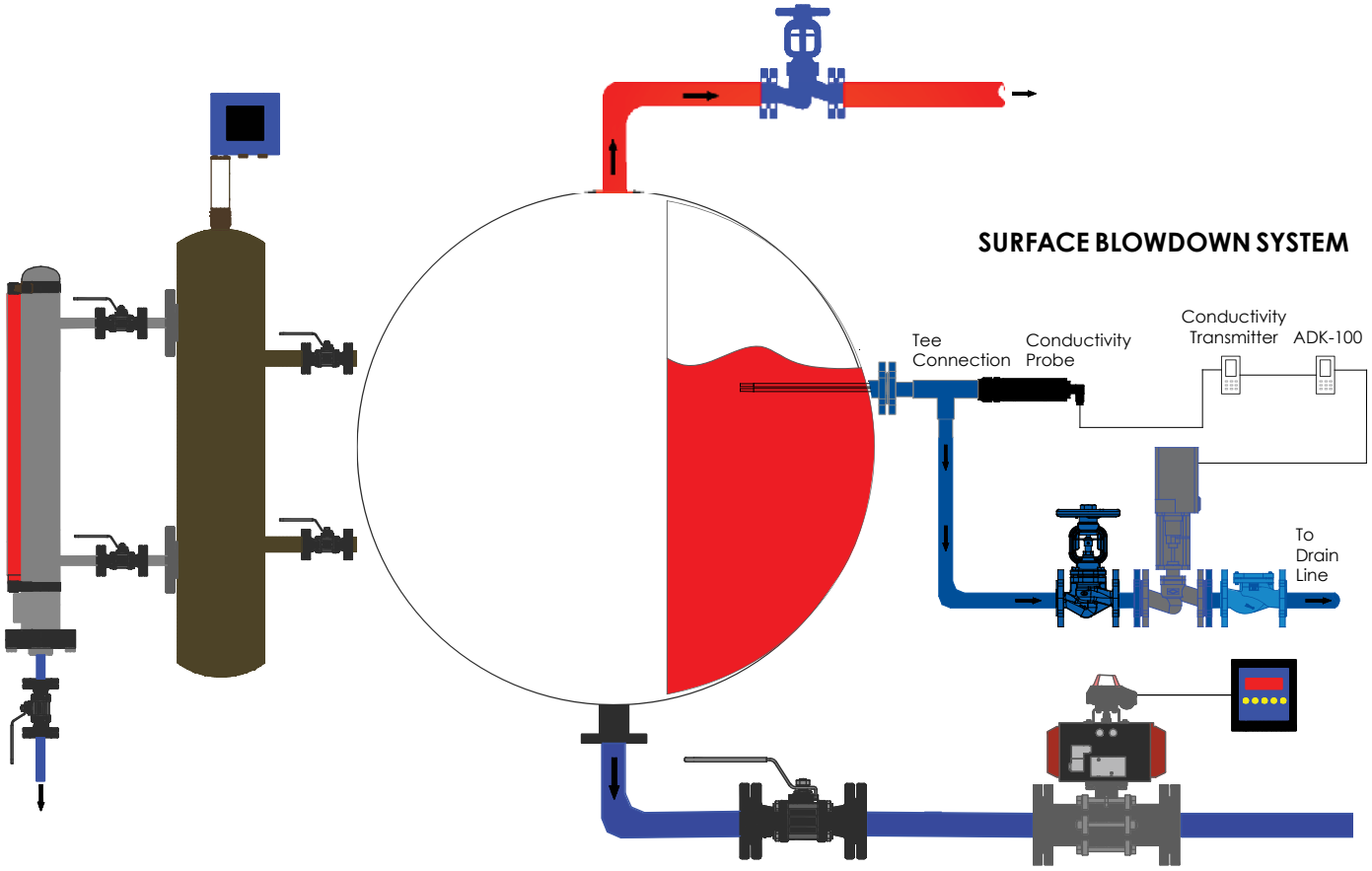


Automatic Blowdown System

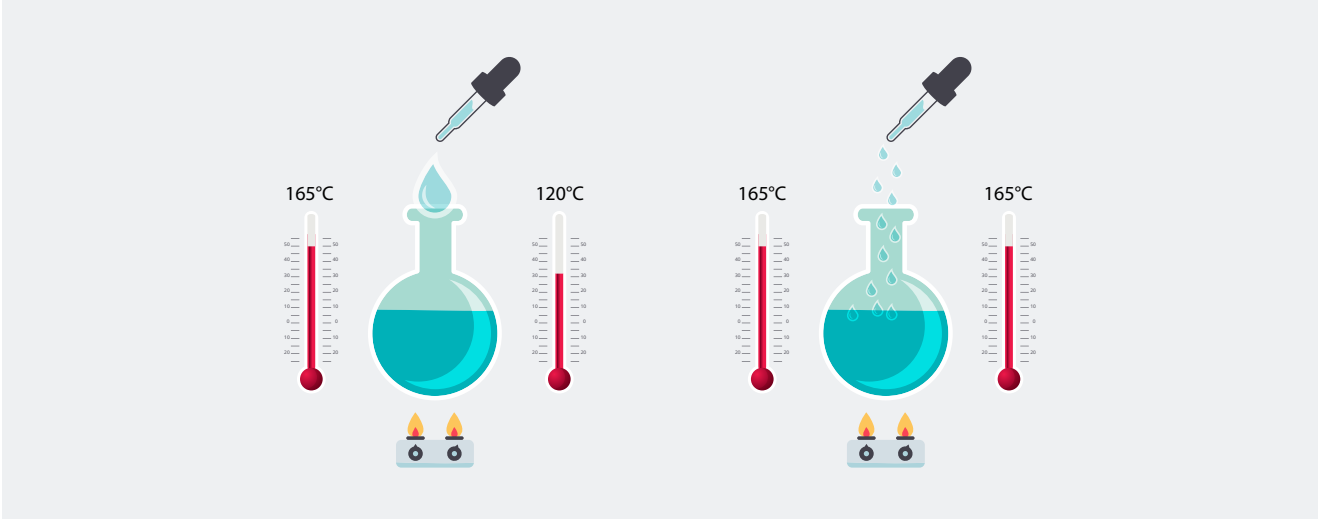


Manuel Blowdown System

APPLICATION EXAMPLE



FEED WATER SYSTEMS



There are 2 general types of feed water system, such as; proportional and on-off. Main differences between proportional and on-off systems are;

- On-off systems are more economical than proportional systems.
- With proportional systems, pressure and temperature drops will be prevented.

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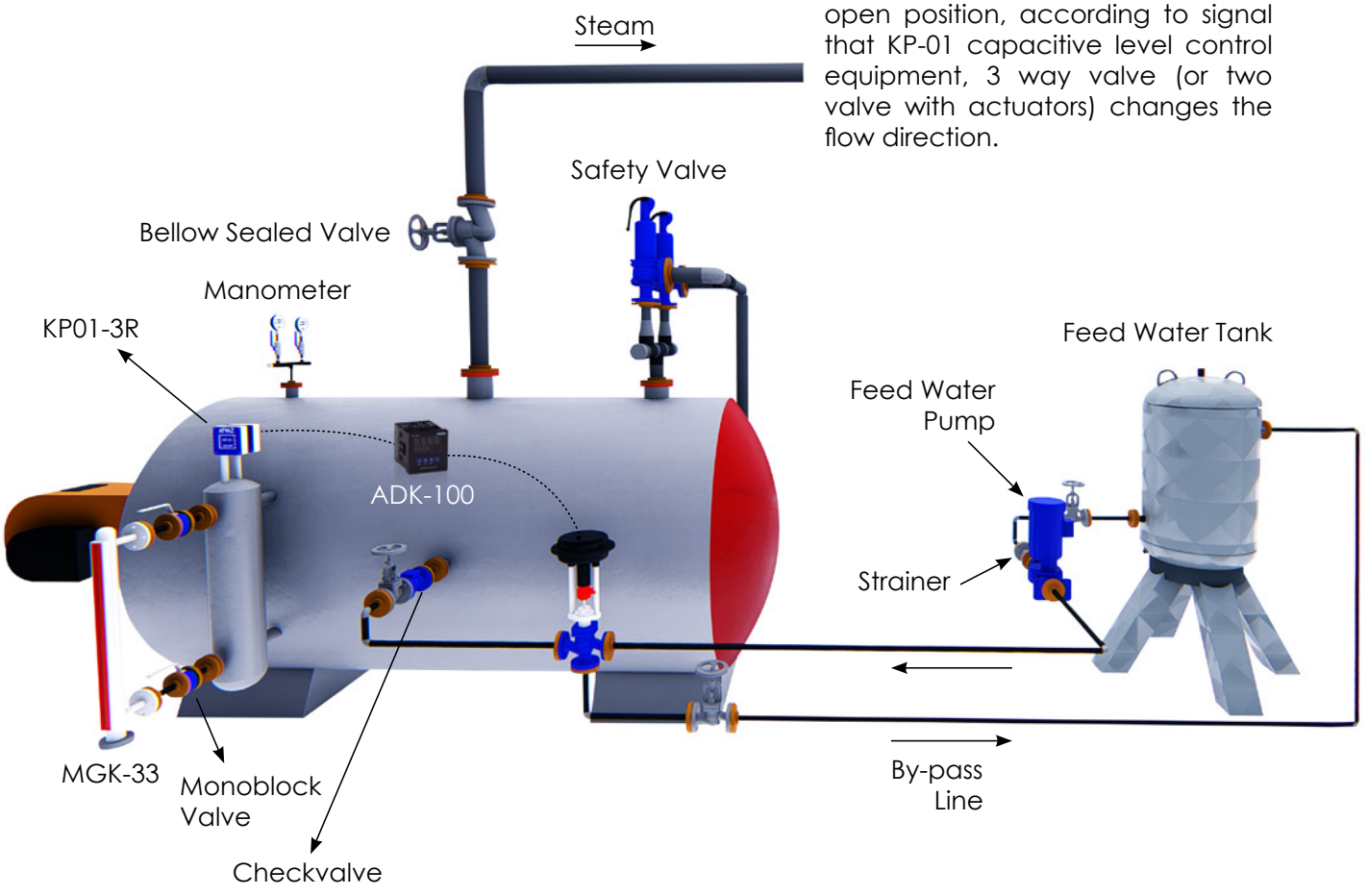
Feed water pump is allways in open position, according to signal that KP-01 capacitive level control equipment, 3 way valve (or two valve with actuators) changes the flow direction.



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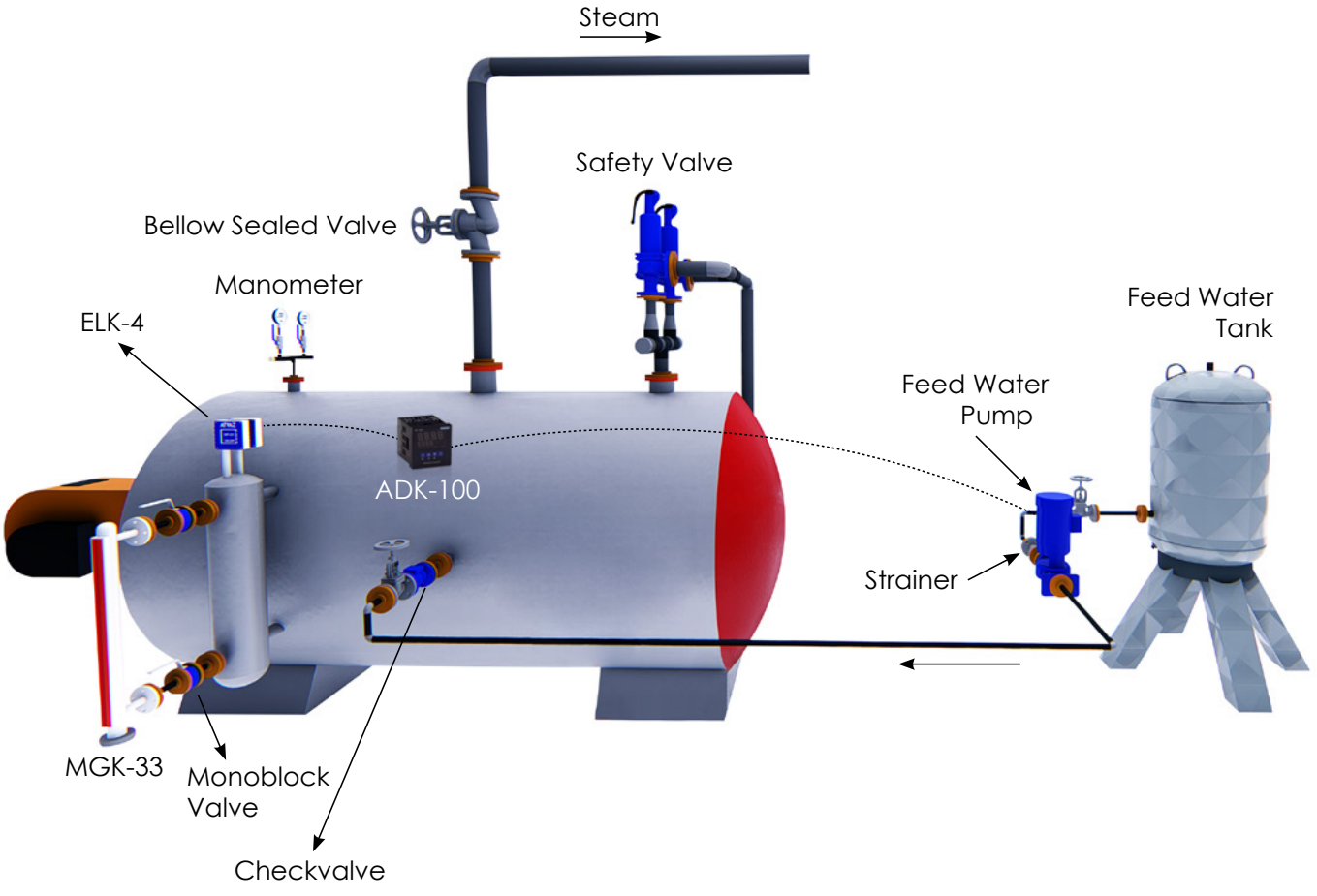

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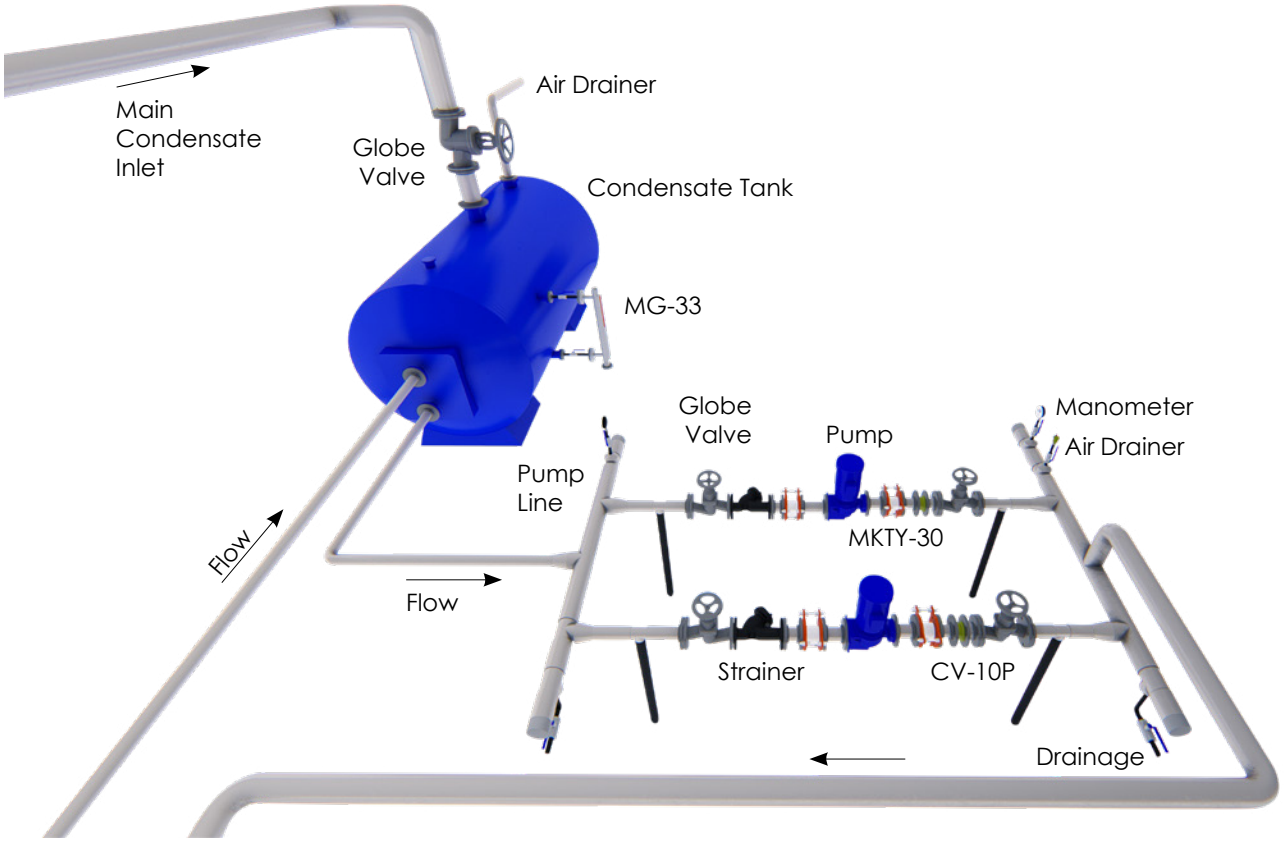

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In order for the flash steam to move towards the top outlet at the correct speed, the diameter of the steam tank must be appropriate. This speed is about 3-5 m/s and the velocity at which water droplets can reach the bottom of the tank. In order to 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.
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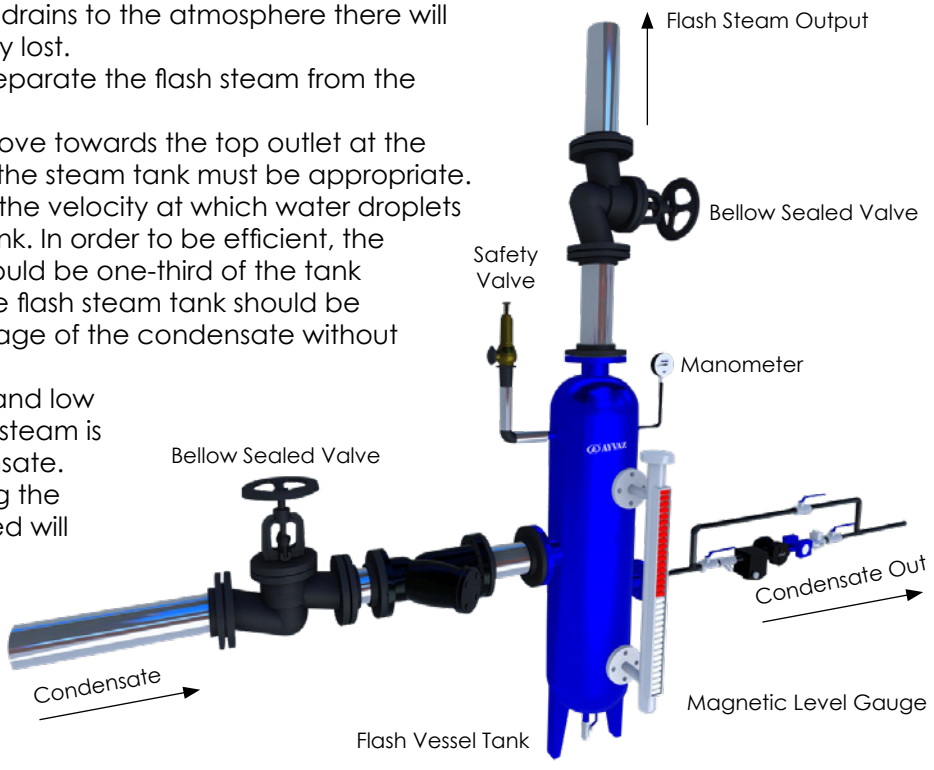

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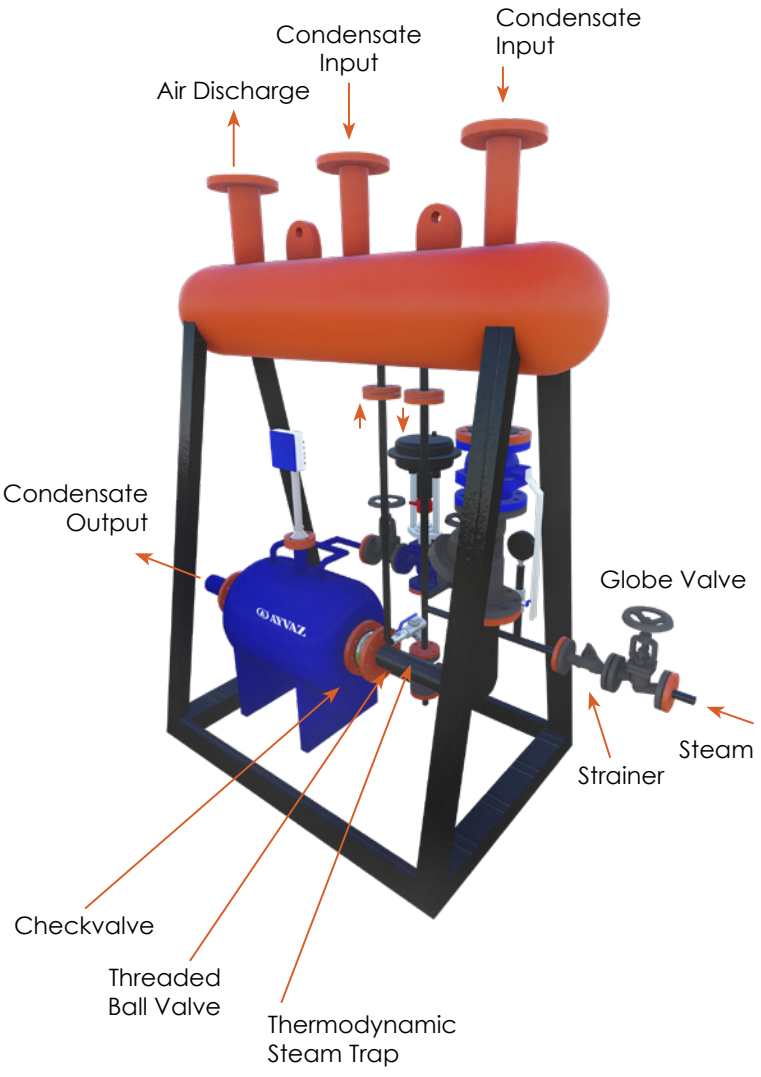


HEAT EXCHANGERS

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.

PRESSURE REDUCING SYSTEM

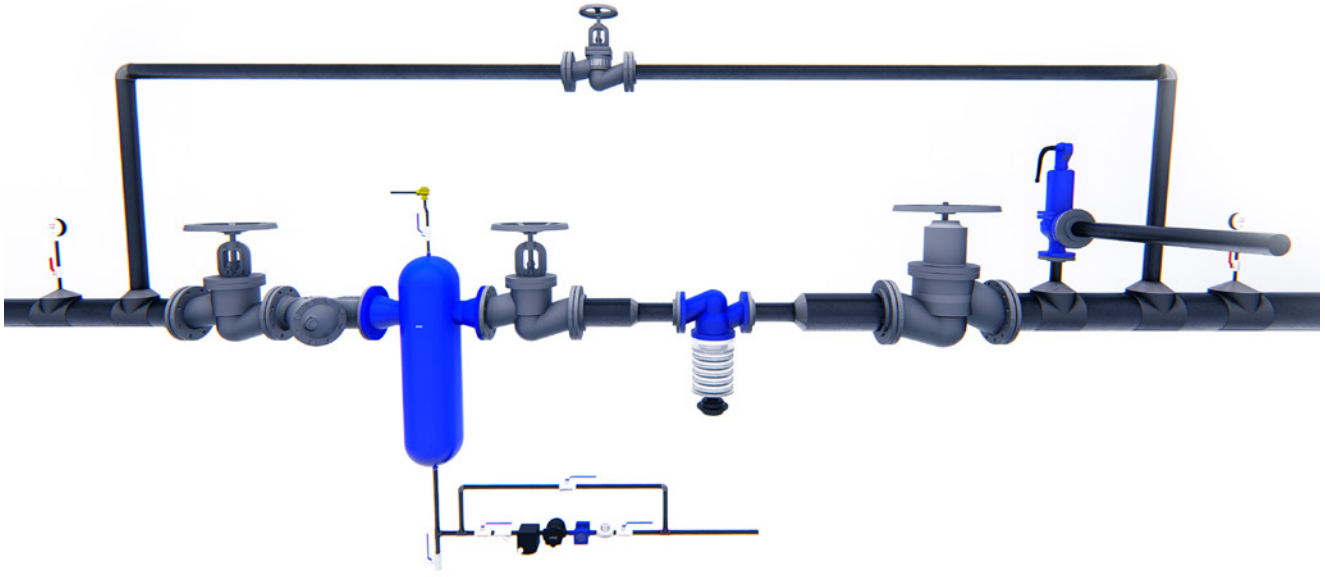
It requires a primary steam pressure of up to 7 bar for older-style machines in laundry lines and up to 16 bar for new high-speed machines.

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.

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

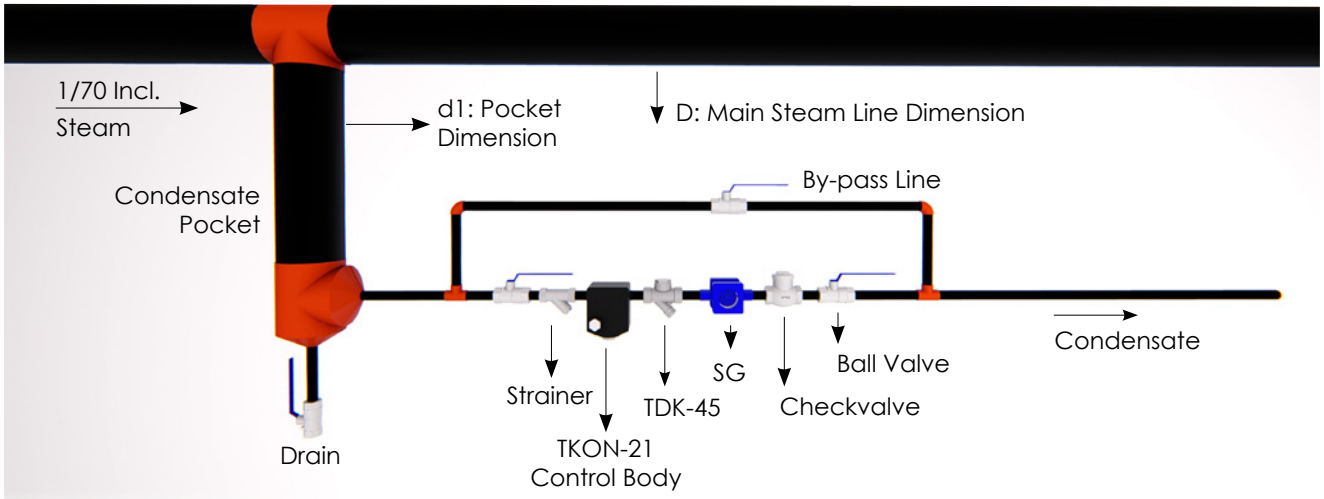
The choice of the main pressure reducing valve must depend on the needs of the system. In a folding machine where the same pressure is always required in high temperature cylinders with a very stable demand throughout the process, a direct effective pressure reducing valve of the correct size can be safely used.



STEAM LINE APPLICATIONS

MAIN STEAM LINE APPLICATION

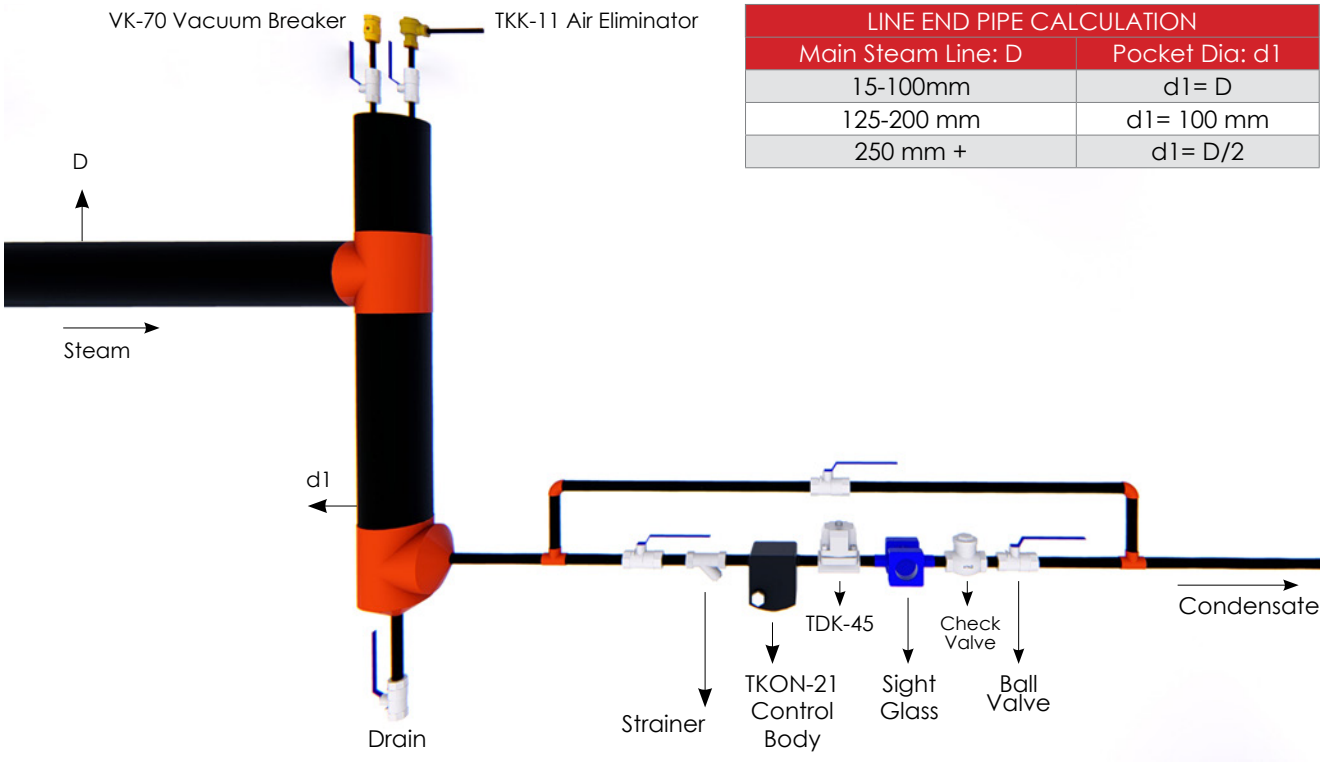
Condensate discharge unit should be placed in main steam lines in every 50 meters if the line is indoor and insulated or in every 30 meters if the line is outdoor and insulated. If any equipment like pressure reducer, pressure holder or proportional valve is installed in the line, a condensate discharge unit must be placed before these equipment.



LINE END APPLICATION

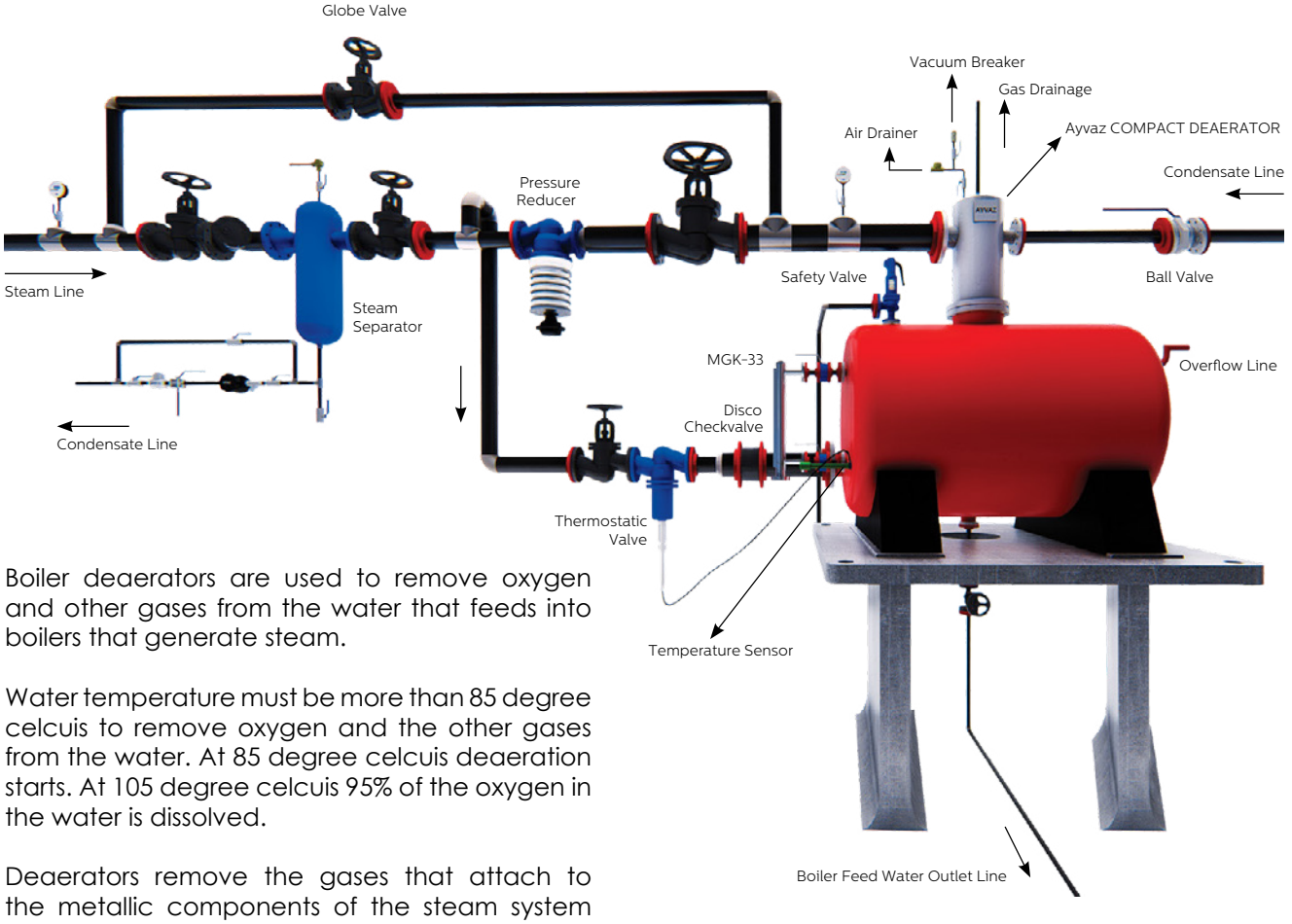
If the steam systems are closed by the process, the steam will turn to condensation until it is turned on again. The volume difference will be filled with air. When the system is switched on again, the air must be evacuated to allow the steam to easily fill the line. This is only possible with “End of Line Application”.

The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind must be thermodynamic.



LINE END PIPE CALCULATION	
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.

DYE

Nowadays; products manufactured in industries should be high quality and low cost. To reduce the cost, instead of reducing the quality of the material used in the product; it is necessary to reduce energy losses in the process.

Reducing energy losses is possible by transferring energy in a correct and efficient way. This method is the correct product selection.

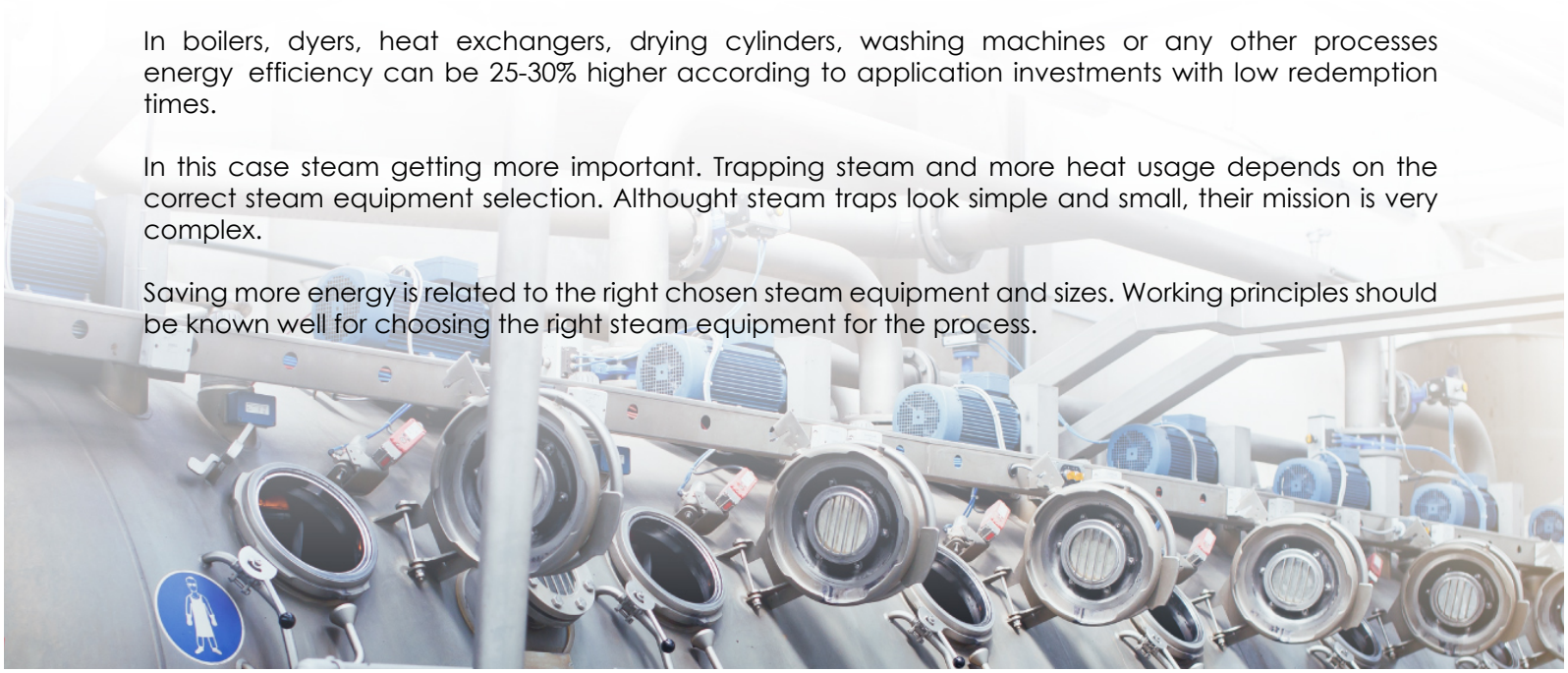
Ayvaz can lead your energy with steam traps, blowdown systems, energy recovery & deaerators, steam condensate level controllers, hygienic steam applications and isolation materials.

Color is an extremely important aspect of modern textiles. The color of a textile product is a major factor in the marketing and use of that product. The color of textiles can be used to differentiate groups of people such as uniforms used for athletic teams, hospital personnel or military organizations. Color can also be functional such as camouflage or protective uniforms. However, in the modern retail store, the color of textile products is a major contributor to what is referred to as fashion. The color is very important with apparel, carpet, upholstery, curtains, drapes, sheets and towels. All of the items are marketed with an emphasis on their specific color.

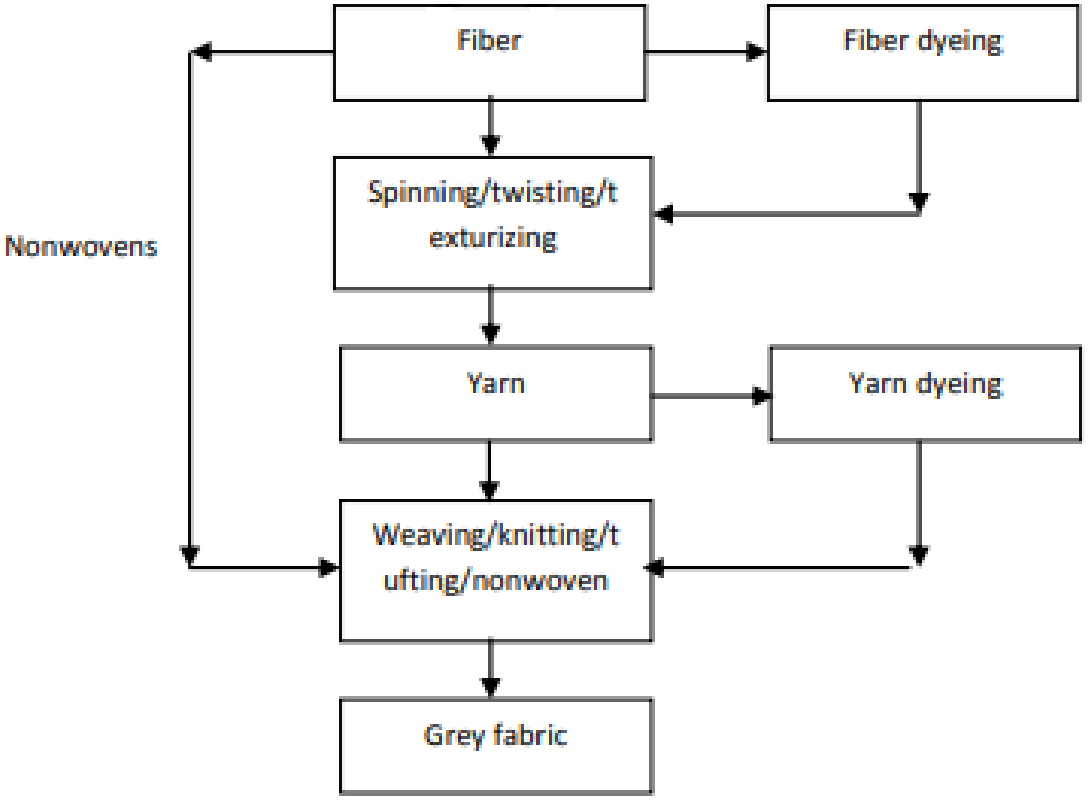
In boilers, dyers, heat exchangers, drying cylinders, washing machines or any other processes energy efficiency can be 25-30% higher according to application investments with low redemption times.

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.



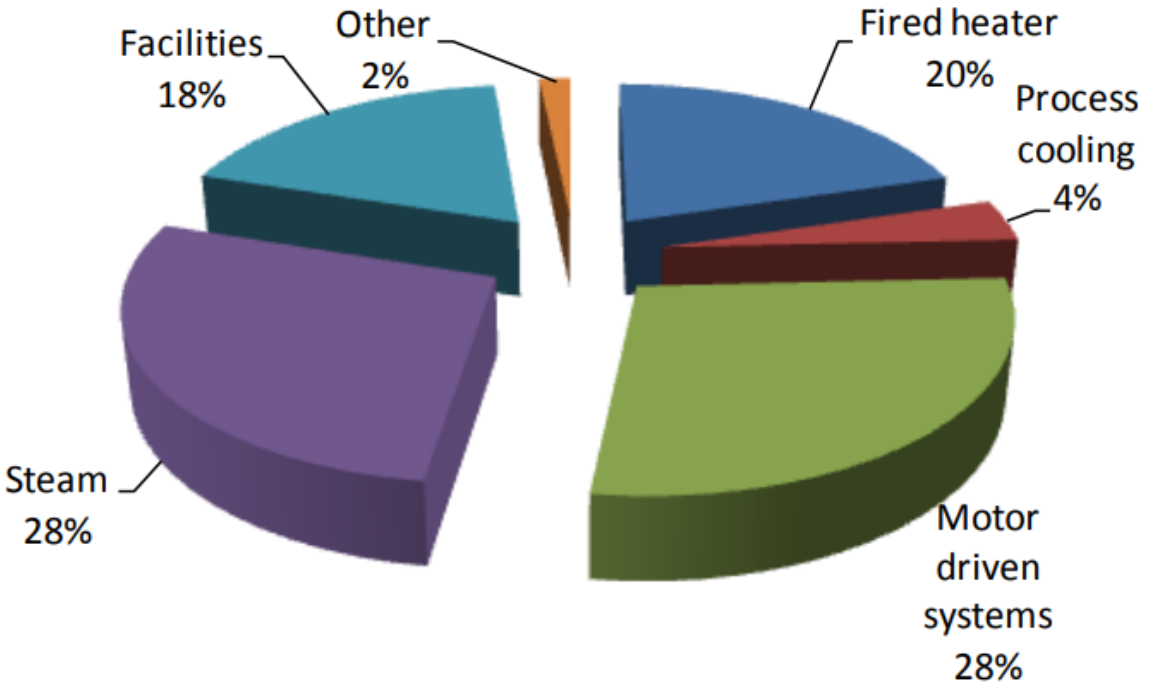
DYE PROCESSES



STEAM USAGE IN TEXTILE INDUSTRY

As is shown in the figure below, in the textile industry steam and motor-driven systems (pumps, fans, compressed air, material handling, material processing, etc.) have the highest share of end-use energy use and each one accounts for 28% of total final energy use in the textile industry.

Figure 1 - Systems in textile

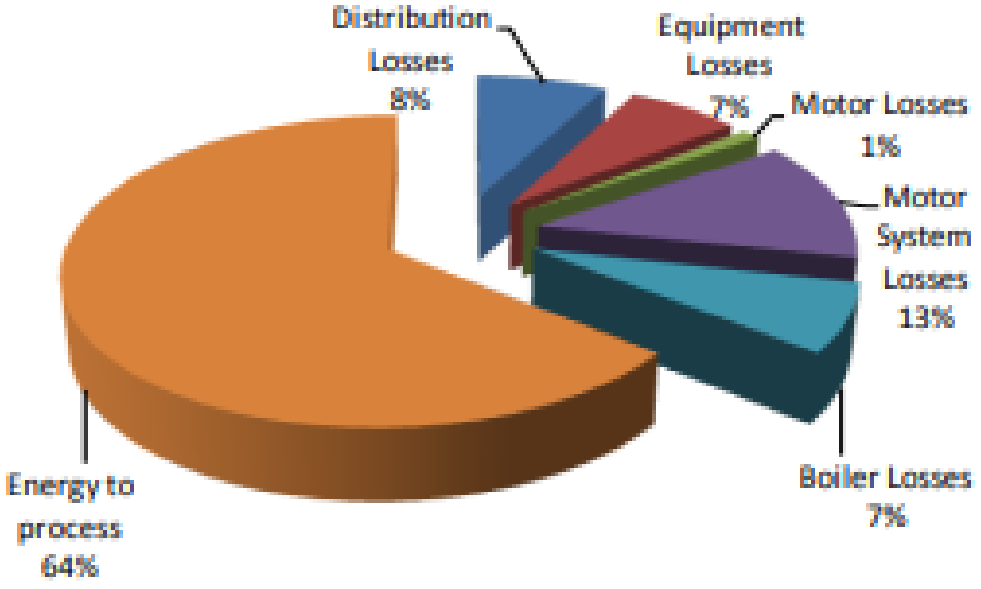


STEAM USAGE IN TEXTILE INDUSTRY

As indicated, there are significant losses of energy within textile plants. Figure 2 shows the onsite energy loss profile for the textile industry. Around 36% of the energy input to the textile industry is lost onsite. Motor driven systems have the highest share of onsite energy waste (13%) followed by distributions and boiler losses (8% and 7% respectively). The share of losses could vary for the textile industry in other countries depending on the structure of the industry in those countries.

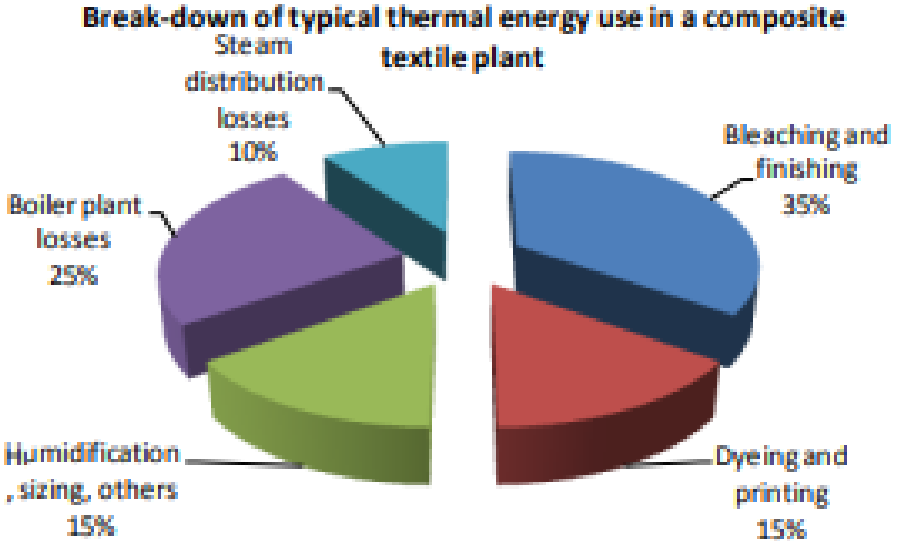
However, as shown below, process wastes are one of the major sources of waste of end-use energy waster in the textile industry.

Figure 2- Energy Wastes in Textile Indsutry



CONDENSATION AMOUNT

Item	Share of total thermal energy use
Product heating	16.6 %
Product drying	17.2 %
Waste water loss	24.9 %
Heat released from equipment	12.3 %
Exhaust gas loss	9.3 %
Idling	3.7 %
Evaporation from liquid surfaces	4.7 %
Un-recovered condensate	4.1 %
Loss during condensate recovery	0.6 %
Others	6.6 %
Total	100%

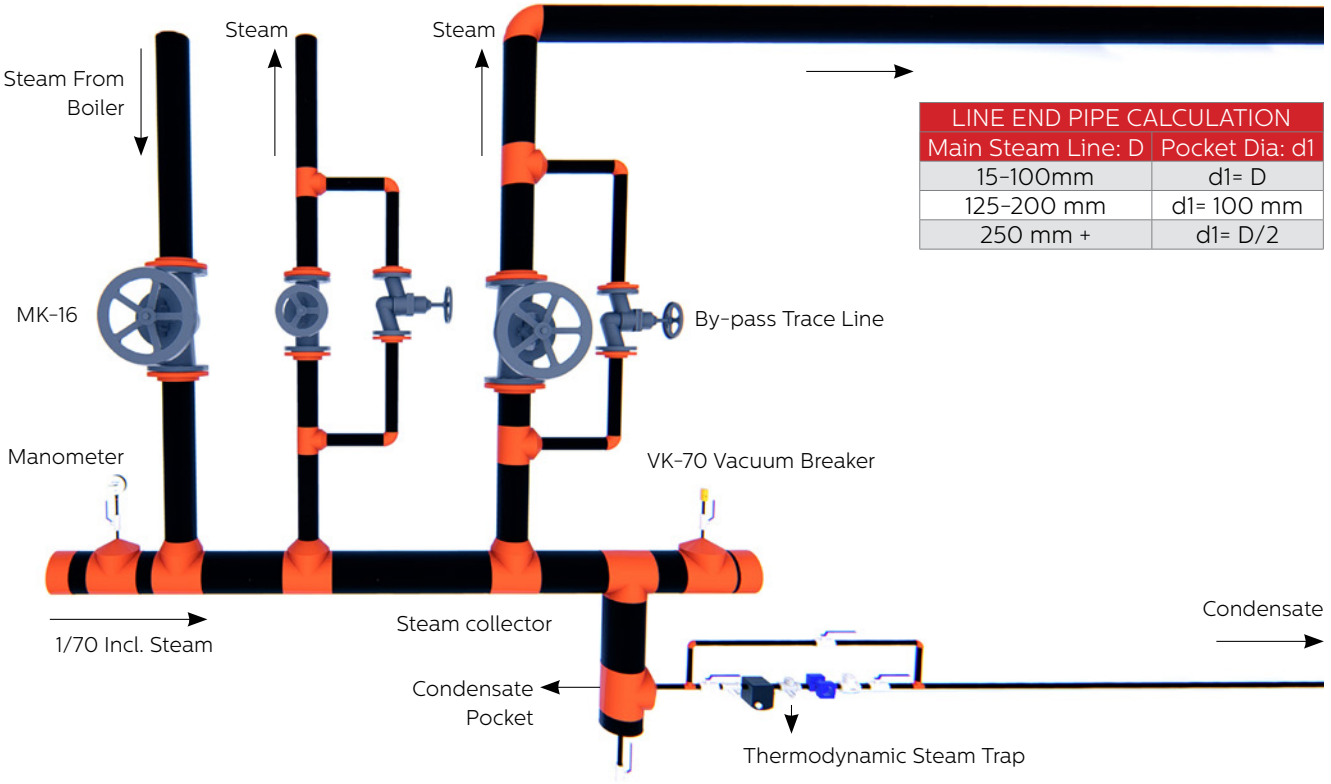


STEAM DISTRIBUTION

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;



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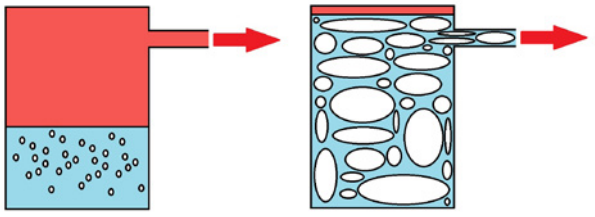
WATER DRAGGING IN STEAM LINES

In some cases hot boiler water can mix with steam and may drag to the system. This gets steam wet and may caouse hugh water mass in system. This happens in that 3 case bellow;

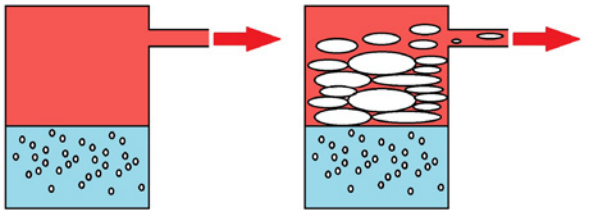
PEAK REQUESTS (PRIMING)

At the system startup, if all machines open in the same moment, boiler tank can not produce steam for request. It cause water dragging to the system and pressure loss in the steam boiler. When the pressure reduce suddenly, for balance the pressure, steam boiler start to boil and try to produce steam as fast as it can. This water steam mix drags to the system.



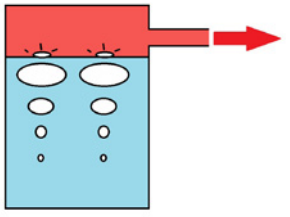
FOAMING

The components in the raw water which do not process properly process the water treatment process or the mixed condensate mixed with the condensate, cause the formation of bubbles in the cauldron. These foams fill the boiler and are dragged into the system due to the effect of steam. Foams contain water that is released when it explodes. This water damages the system.



BUBBLING

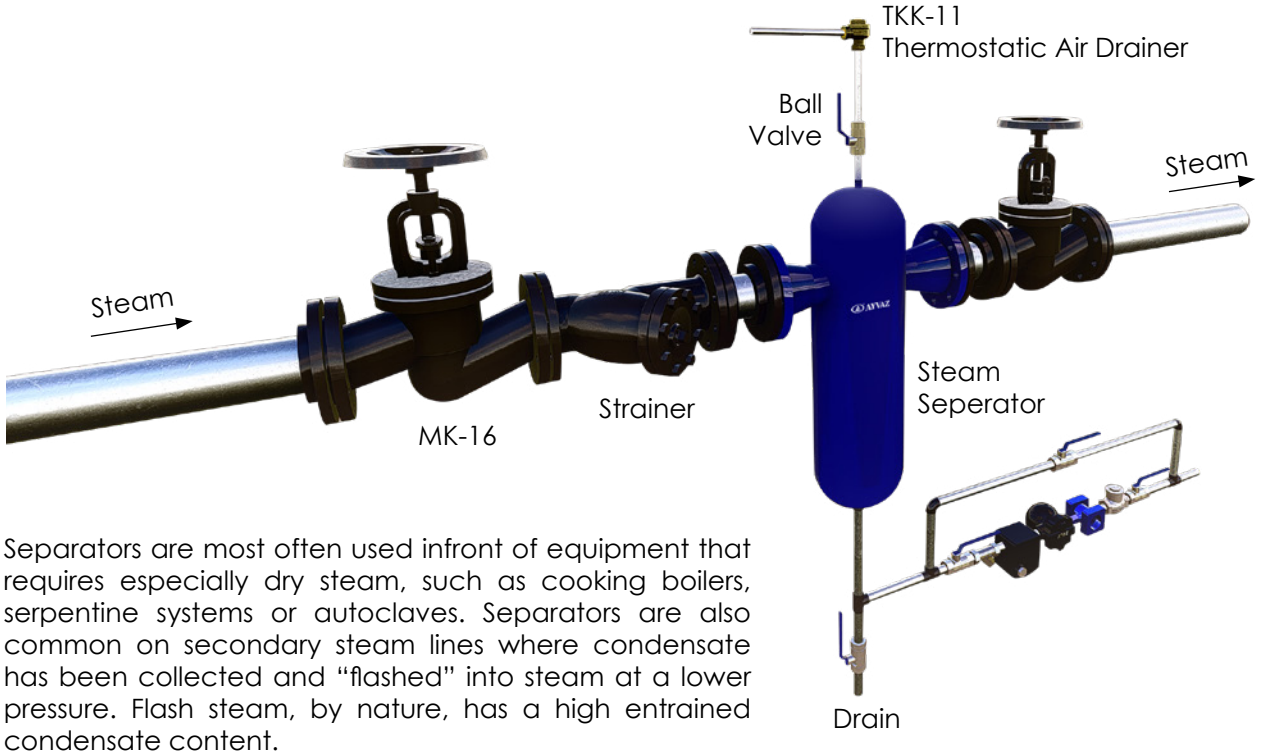
When water starts to boil on a metal heating surface, a steam bubble is formed in the water. This steam balloon rises rapidly and rises to the surface of the water. When the bubble breaks the surface of the water, some water is discharged from the surface. Discharged water continues to exist as mist at the same temperature as steam. It is usually discharged from the boiler together with the rapid flow of steam. The rest is suspended at the surface of the water since it is less dense than the density of water.



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.

BLOWDOWN SYSTEMS

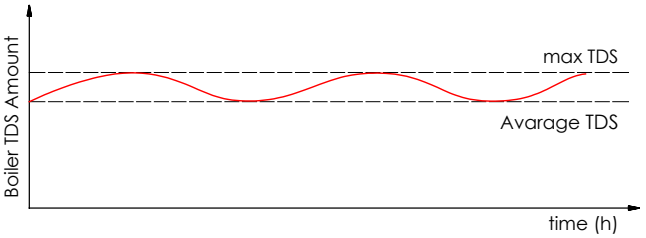
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

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.



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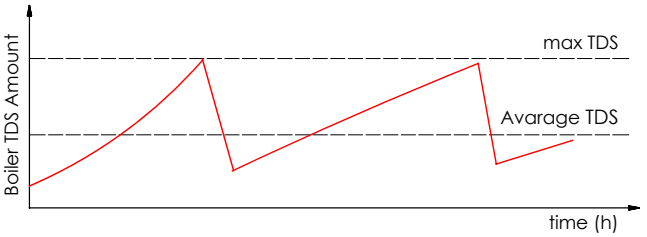

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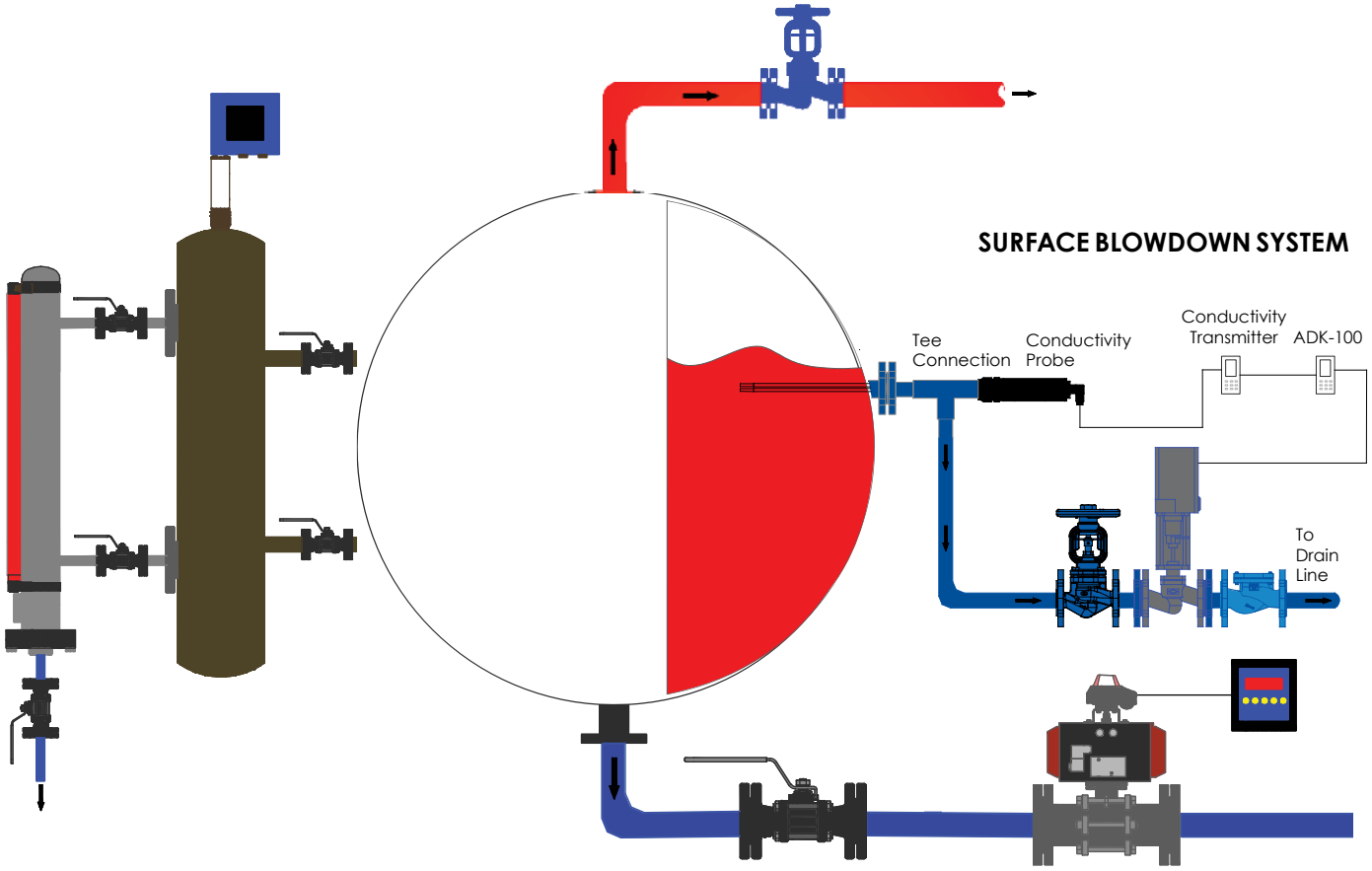

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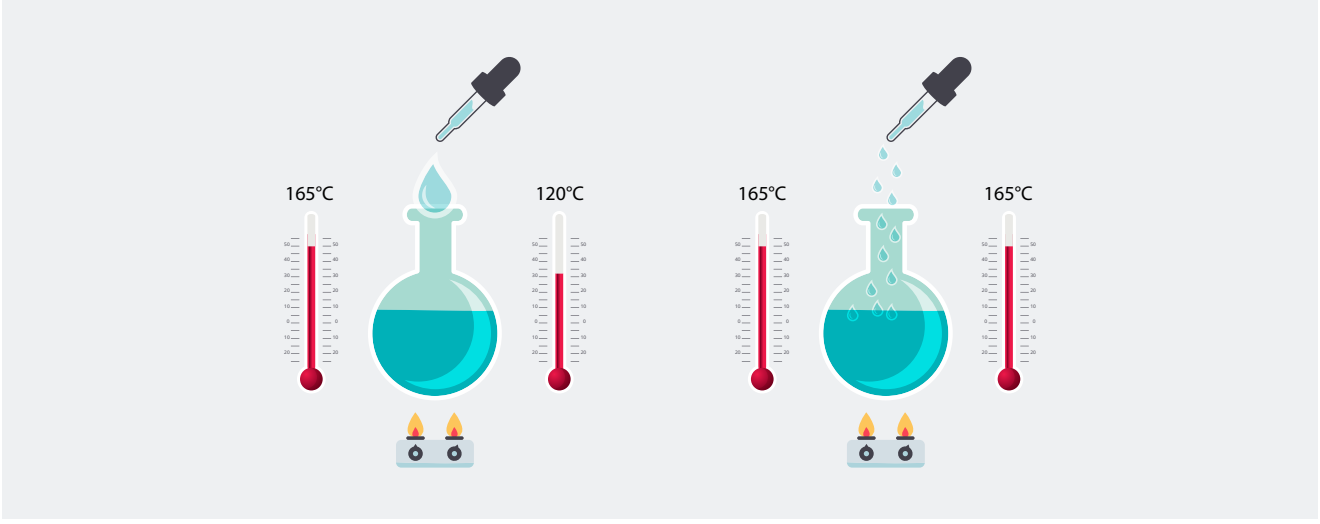

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Hot dyeing system	60–100	9.0	35.0	9.0
Conventional warm dyeing system	40–80	6.5	2.5	7.0
Best available technology	30–40	3.9	1.5	5.5
Huntsman AVITERA SE and ERIOPON LT	15–20	1.7	0.65	4.0

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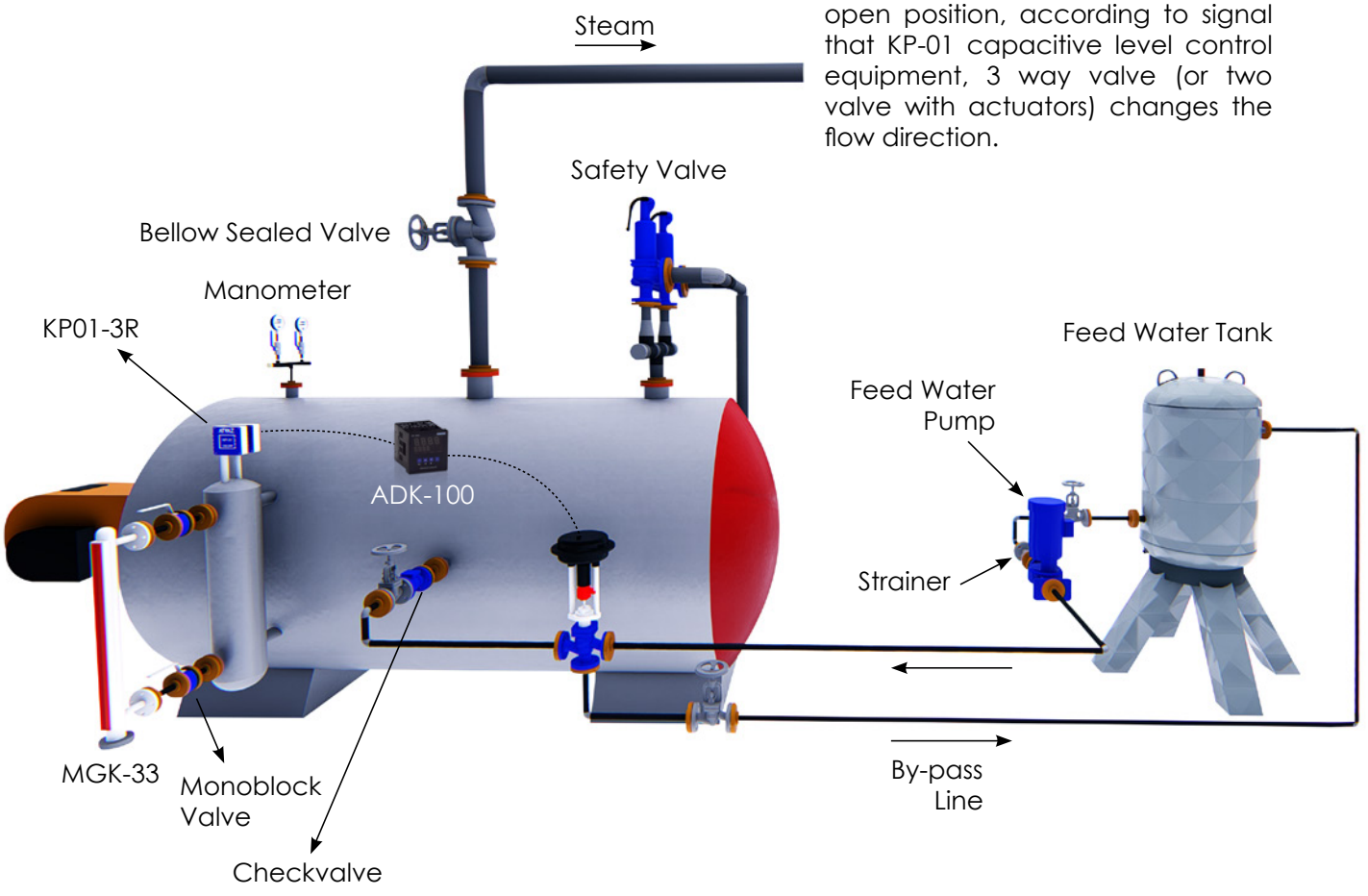

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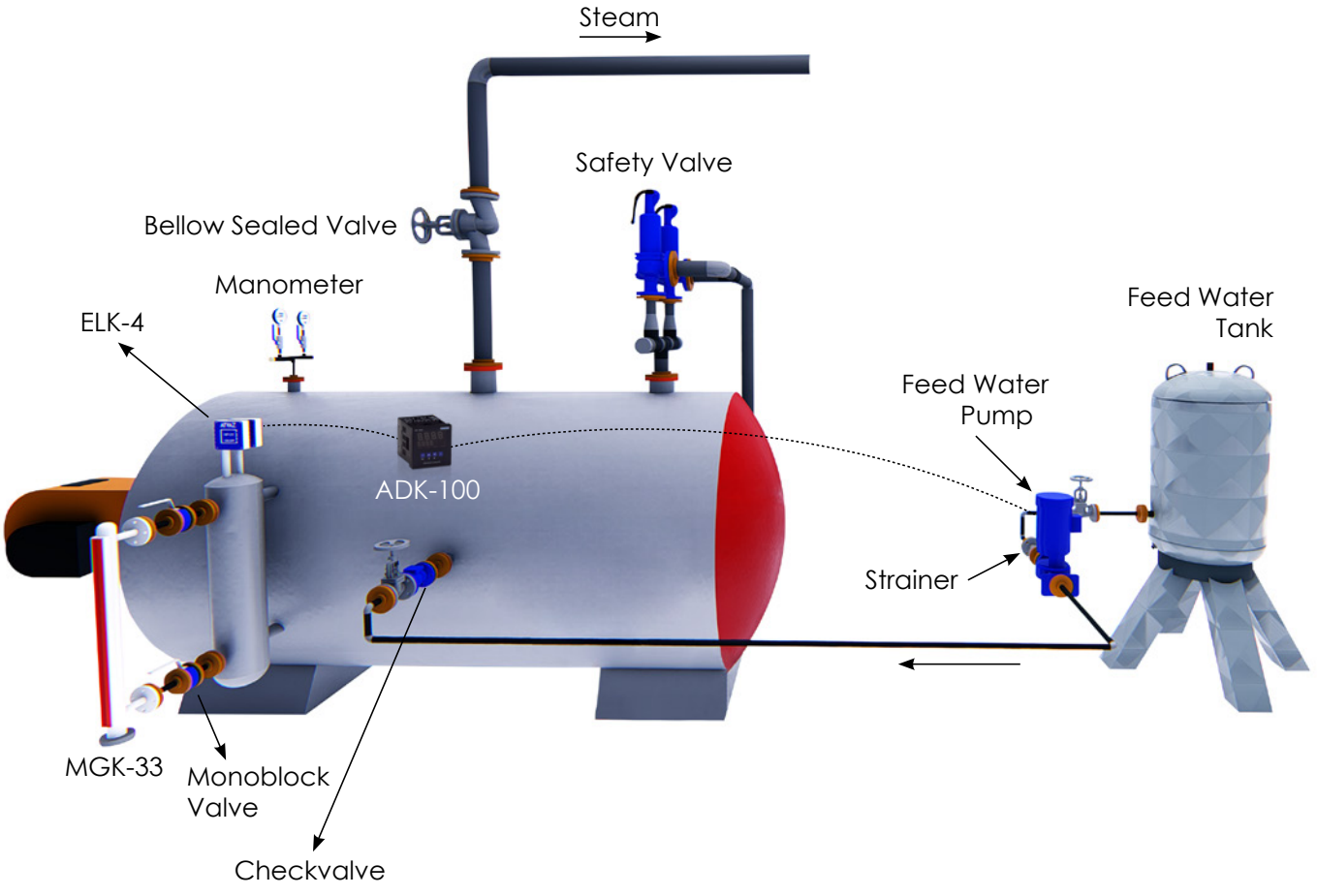

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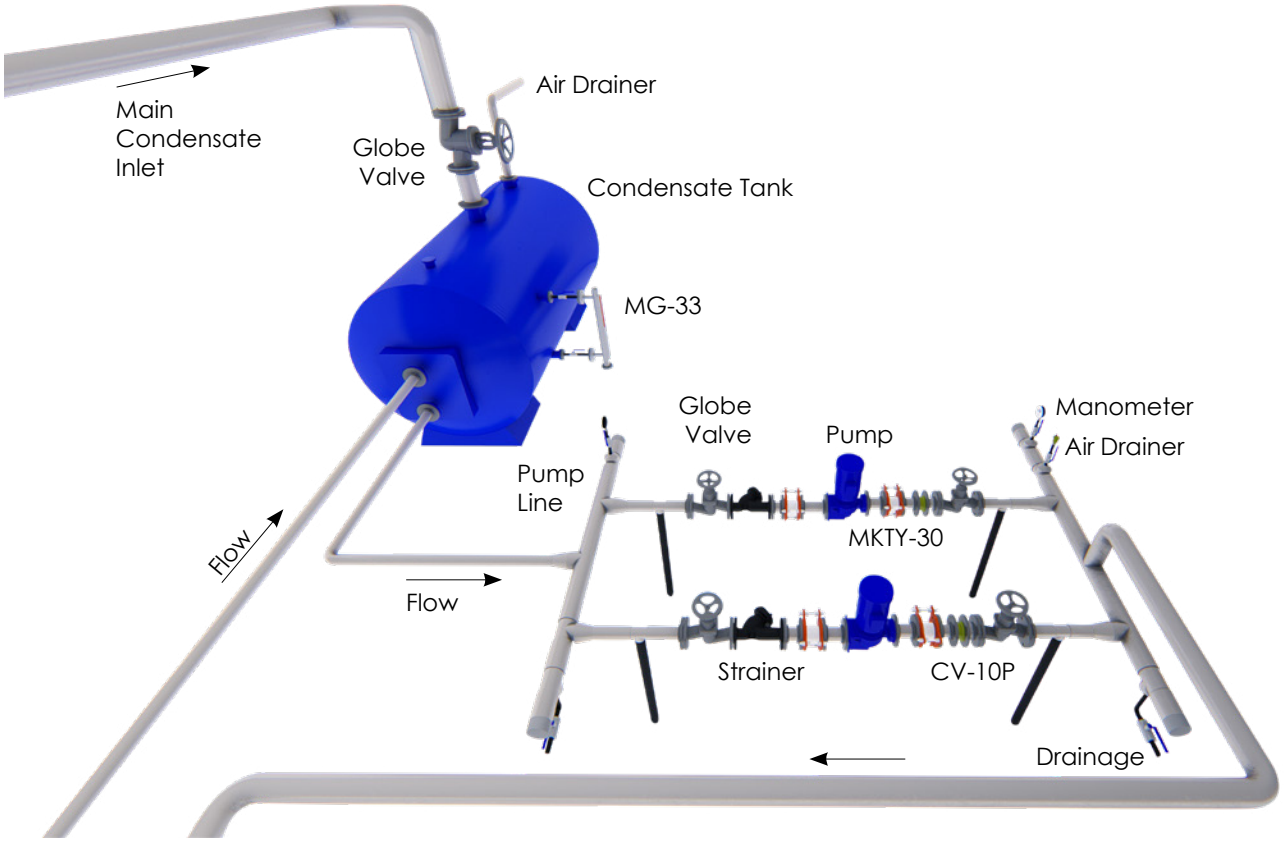

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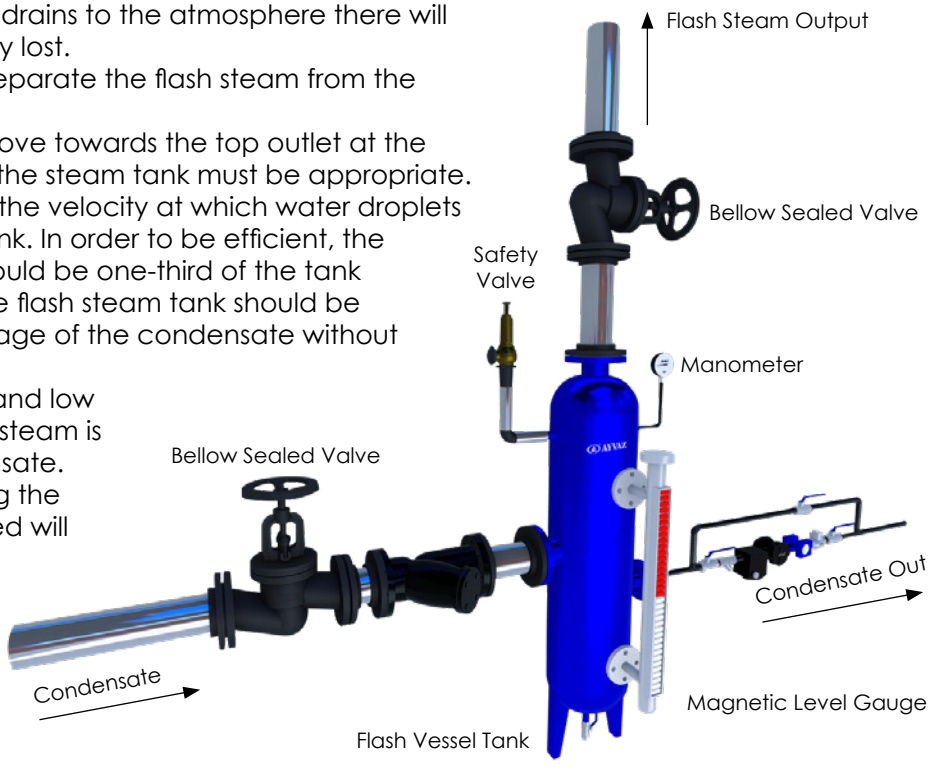

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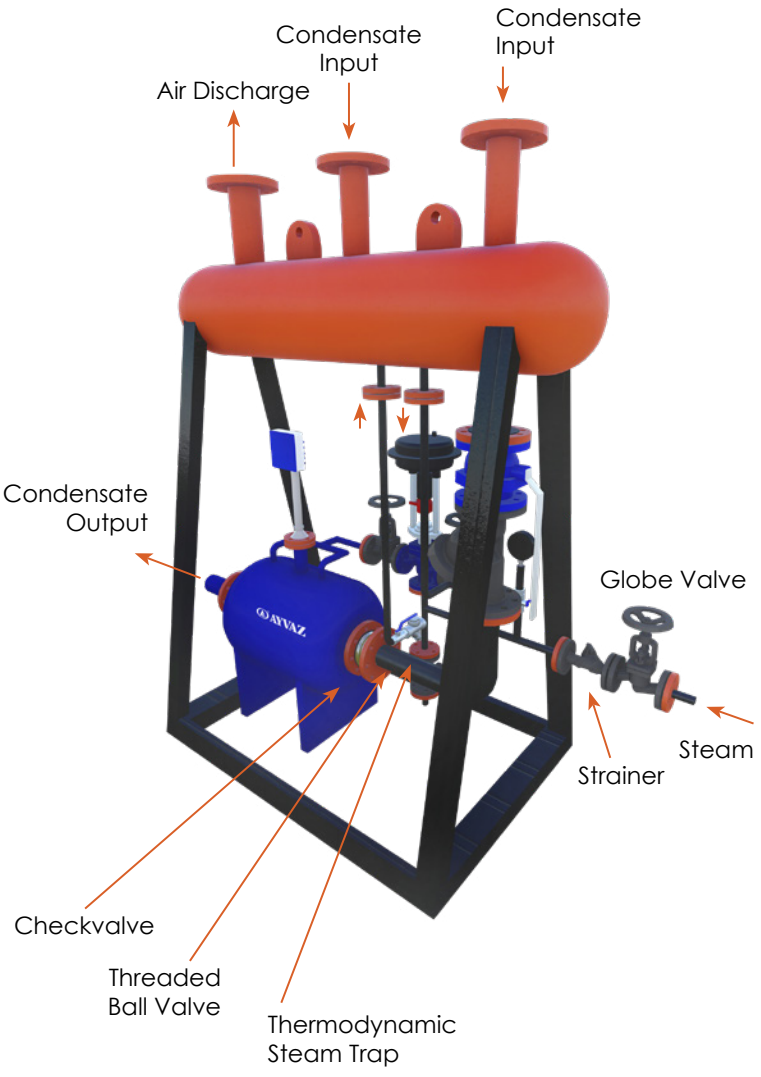


HEAT EXCHANGERS

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.

PRESSURE REDUCING SYSTEM

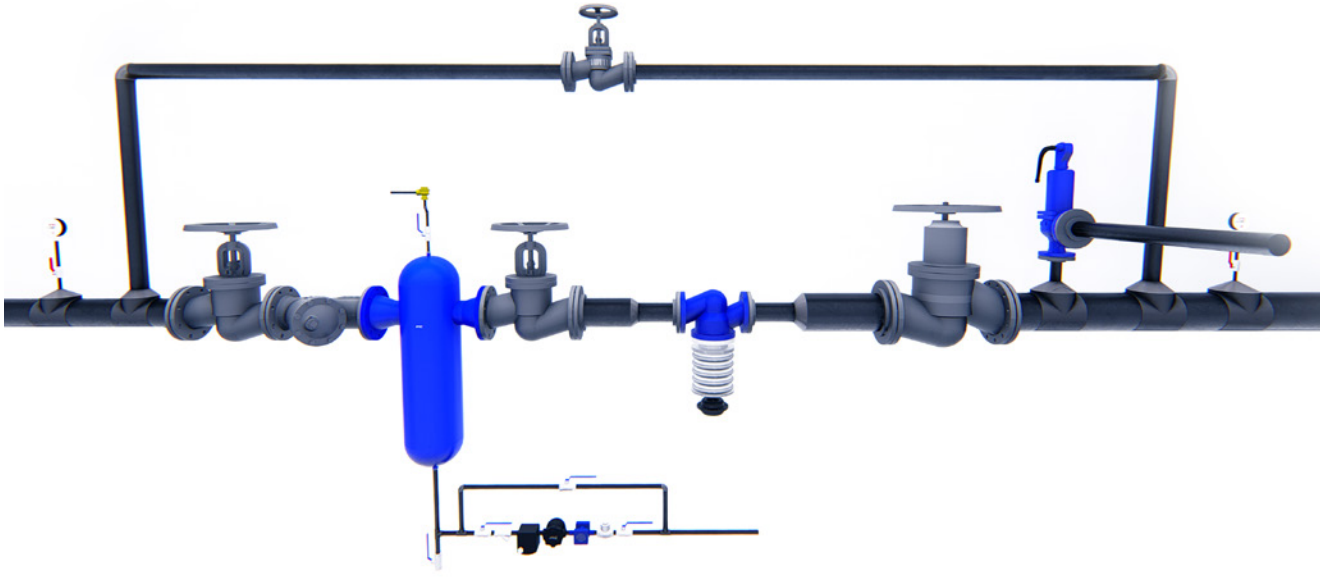
It requires a primary steam pressure of up to 7 bar for older-style machines in laundry lines and up to 16 bar for new high-speed machines.

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

Fabric dye machine's rollers, small pre-heaters, yarn fabric dyers and cylinder dryers usually operate at the highest temperature.

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

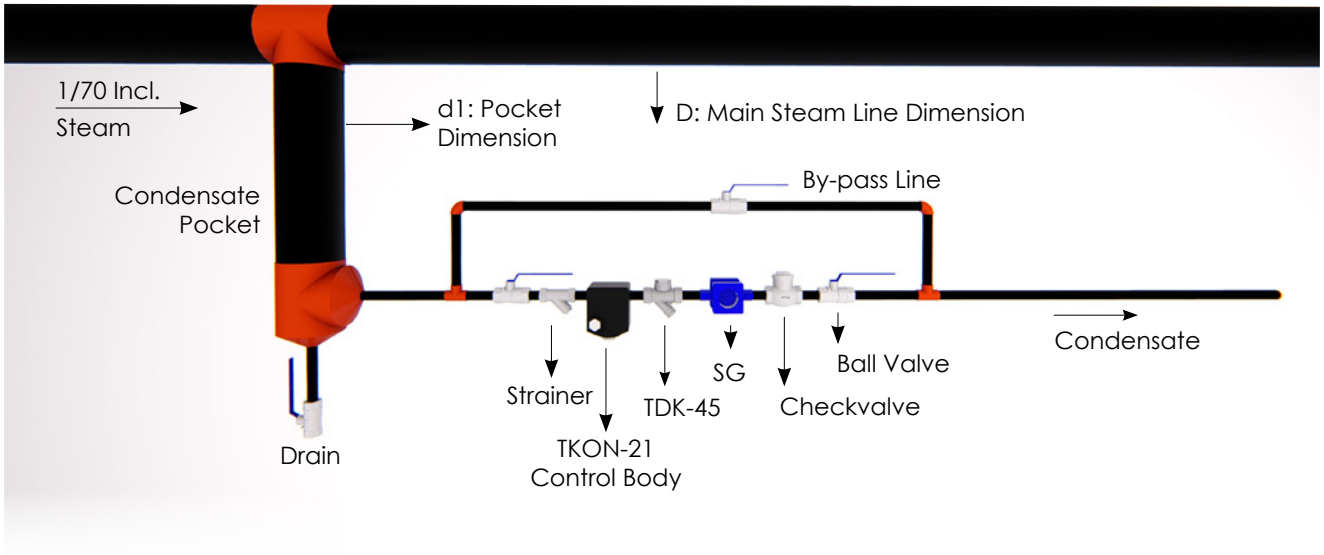
The choice of the main pressure reducing valve must depend on the needs of the system. In a folding machine where the same pressure is always required in high temperature cylinders with a very stable demand throughout the process, a direct effective pressure reducing valve of the correct size can be safely used.



STEAM LINE APPLICATIONS

MAIN STEAM LINE APPLICATION

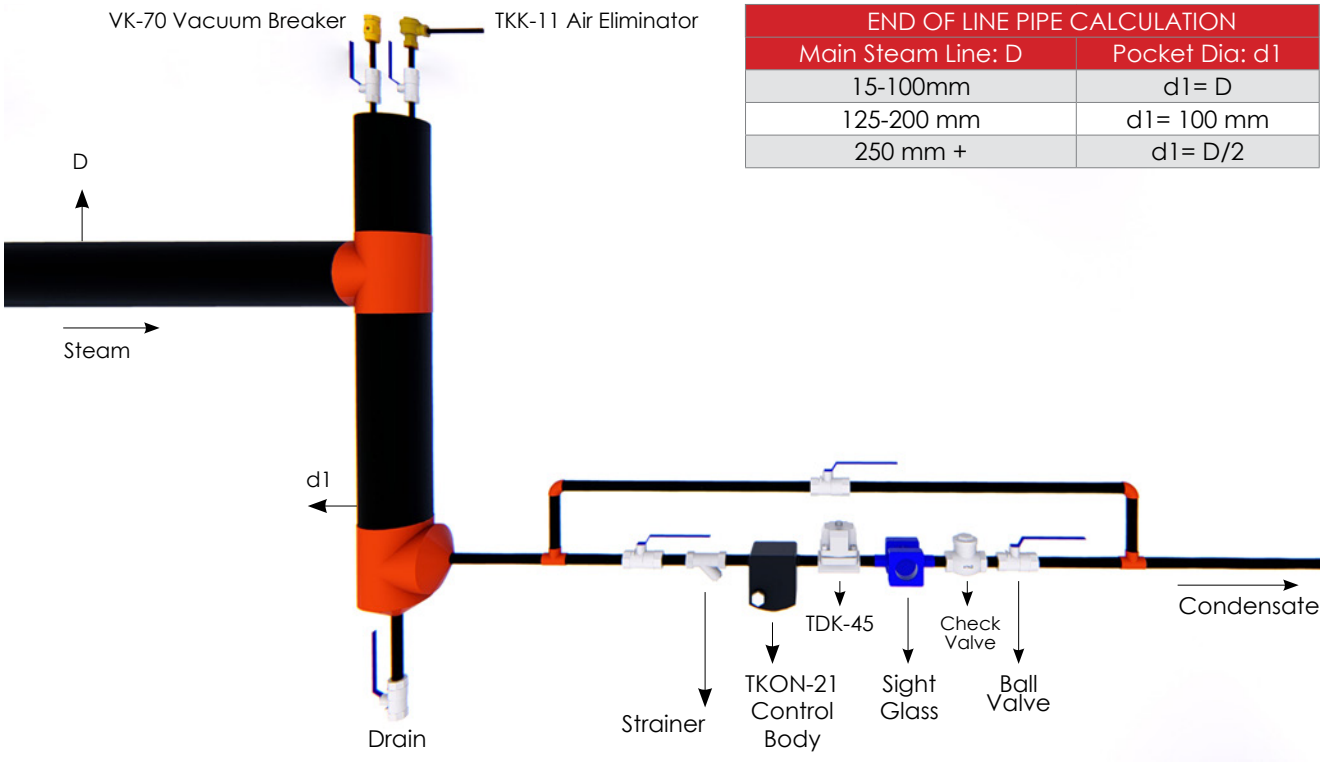
Condensate discharge unit should be placed in main steam lines in every 50 meters if the line is indoor and insulated or in every 30 meters if the line is outdoor and insulated. If any equipment like pressure reducer, pressure holder or proportional valve is installed in the line, a condensate discharge unit must be placed before these equipment.



END OF LINE APPLICATION

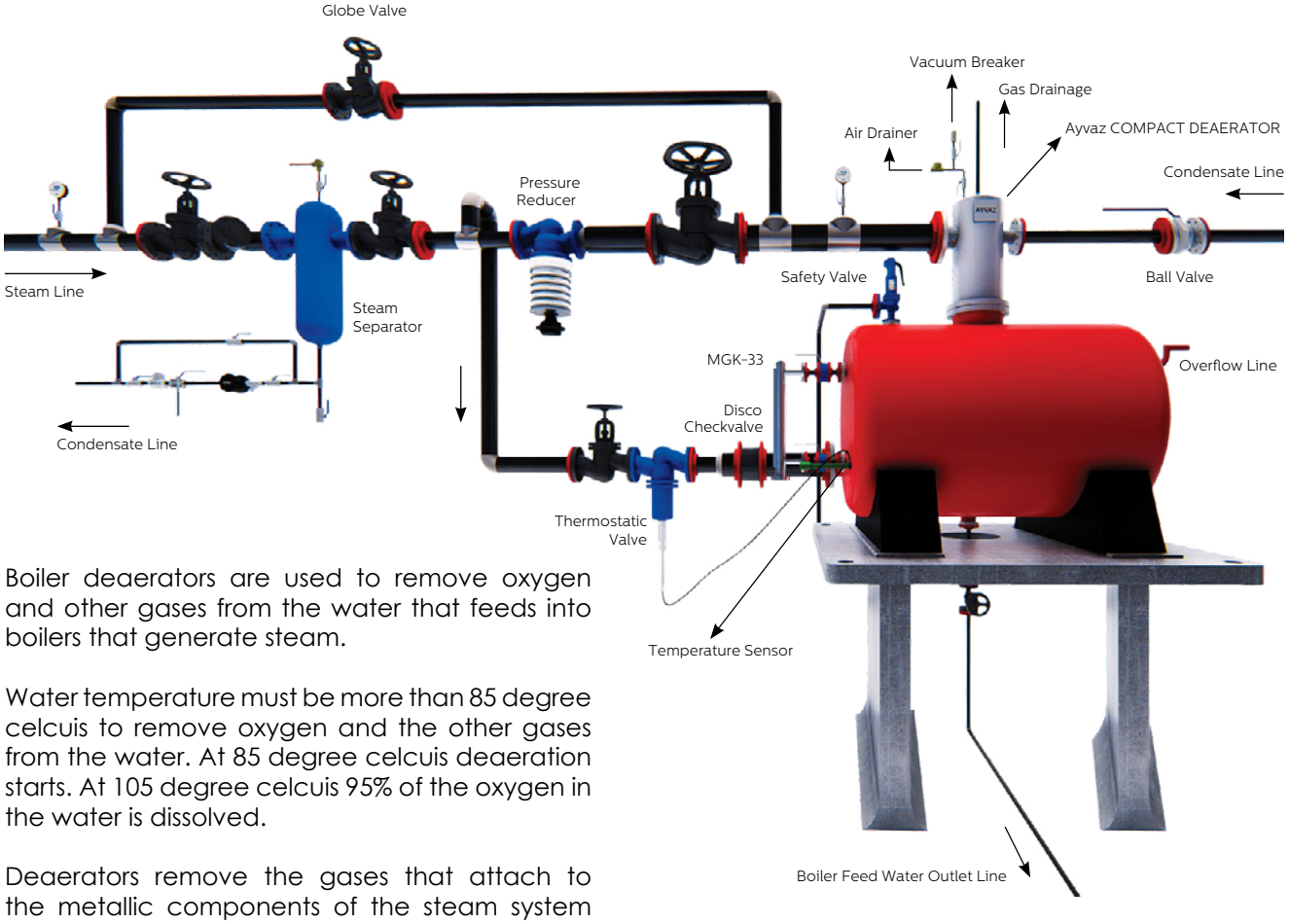
If the steam systems are closed by the process, the steam will turn to condensation until it is turned on again. The volume difference will be filled with air. When the system is switched on again, the air must be evacuated to allow the steam to easily fill the line. This is only possible with “End of Line Application”.

The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind must be thermodynamic.



END OF LINE PIPE CALCULATION	
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.

INDUSTRIAL SOLUTIONS

CORRUGATED CARDBOARD & PAPER

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

In corrugated cardboard industries energy efficiency can be 25-30% higher according.

As Ayvaz, in this brochure we prepared for corrugated cardboard manufacturers, which is one of the leading sectors that use intensive steam; Why steam is used, the points to be considered at steam usage points and energy efficiency are mentioned.

Corrugated cardboard (coating) consists of two flat sheets called lining and the corrugated part called groove in the middle of these sheets are adhered to each other.

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

CORRUGATED CARDBOARD INDUSTRIES

There are different types of corrugated board for use in different types of products which differ in terms of groove size and profile.

Corrugated cardboard can be folded and cut to an endless number of shapes and sizes for use as packaging. Corrugated cardboard is a high-performance packaging material designed to pack and protect various products.

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.

The product formed by the combination of these three layers has more power than the individual layers have. ts structure consisting of successive corrugations gives the corrugated board hardness and durability. The air circulation between the gutters acts as a sealant and plays a protective role against temperature changes.

STEAM USAGE

Corrugated board is produced by bonding a liner to a flap. The pleated portion, described as groove or corrugated, is obtained by a pair of steam exhausting cylinders. The steam used in the process is used to provide the heat required for the preparation and shaping by the machine and for bonding. To ensure that temperatures are accurately controlled, high quality dry steam must be supplied to the machine at the correct pressure.

Water droplets or non-condensed gases carried (dragged) in the steam installation reduce the temperature of the steam and affect the heat transfer rate. This will make it difficult to achieve the desired production temperatures and, in some cases, will not even be possible.

STEAM USAGE

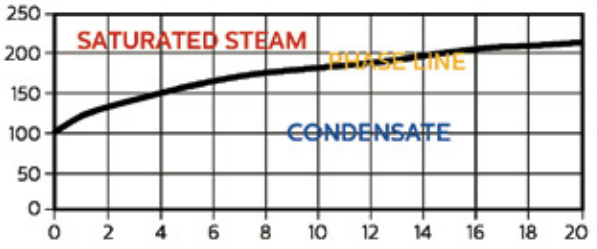
As steam is faster and more efficient than other heat transfer fluids, it has been used in corrugated cardboard sector for many years as in many other sectors.

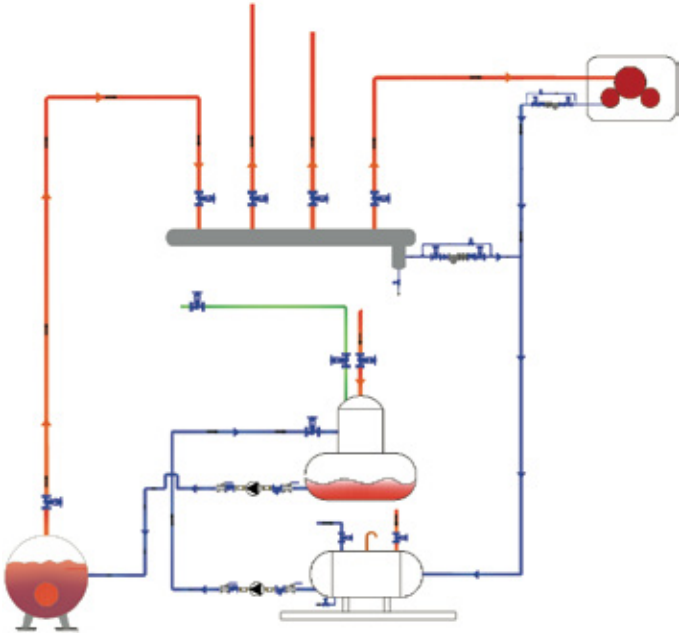
One of the properties of saturated steam is that its temperature is directly related to the pressure. Therefore, the temperature of the rollers and heating pans in the corrugated line can be adjusted accurately by controlling the pressure of the steam. The high-speed corrugated rollers operate at temperatures up to 190 ° C, ie they require a steam supply of 14 to 16 bar.

It is clear that for the production of high-quality corrugated board with low production costs, the corrugated machine must operate at the most efficient speed and efficiently use the heat available in the steam.

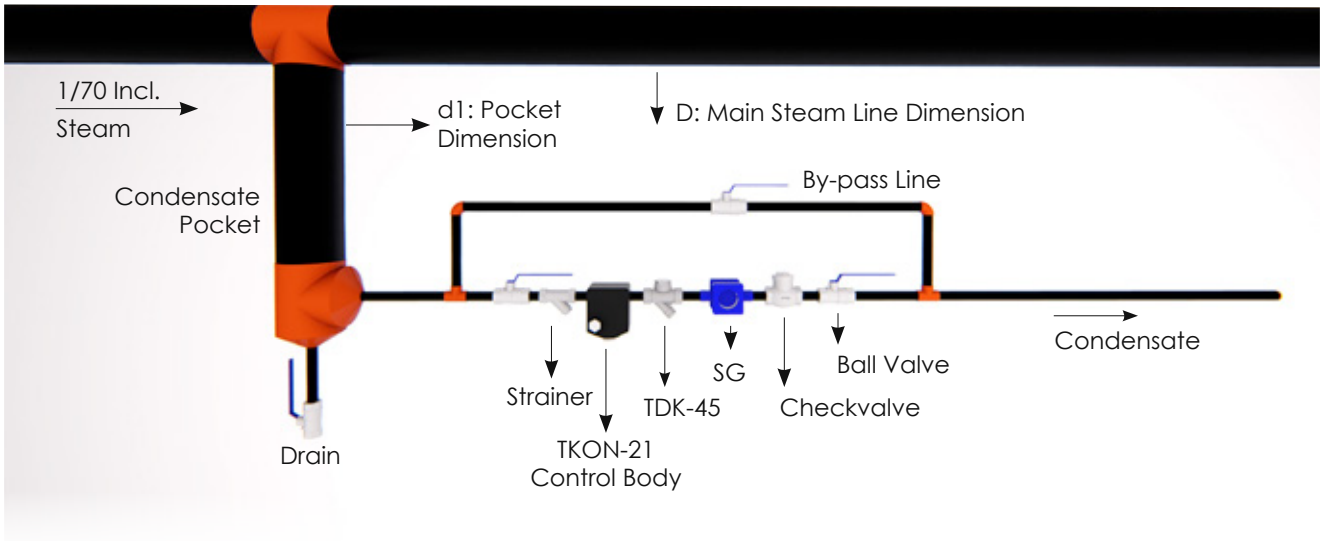
In order to achieve this, it is necessary to consider the design and operation of the complete steam and condensate system, taking into account the type of corrugated board, its speed and the different types of corrugated produced.

Steam from the boiler room should contain as little moisture and condensed gas as possible. The steam produced in the boiler should not contain water. Separating water from the boiler will minimize the risk of pipeline damage due to ram impacts. If water is being dragged from your boiler, there are several possible causes. AYVAZ® engineers will detect problems in your boiler room.





STEAM LINE APPLICATIONS



Steam from the boiler room is transported to the corrugated cardboard machine through the steam pipeline distribution system. The steam must be present at the right pressure, in sufficient quantity and in the best possible condition in cylinders and pans.

The correct diameter of the pipelines carrying steam from the boiler to the corrugated machine is very important. The steam velocity must be within the limits and the pressure drop must be kept to a minimum. AYVAZ® will be happy to advise you on your distribution pipeline sizing.

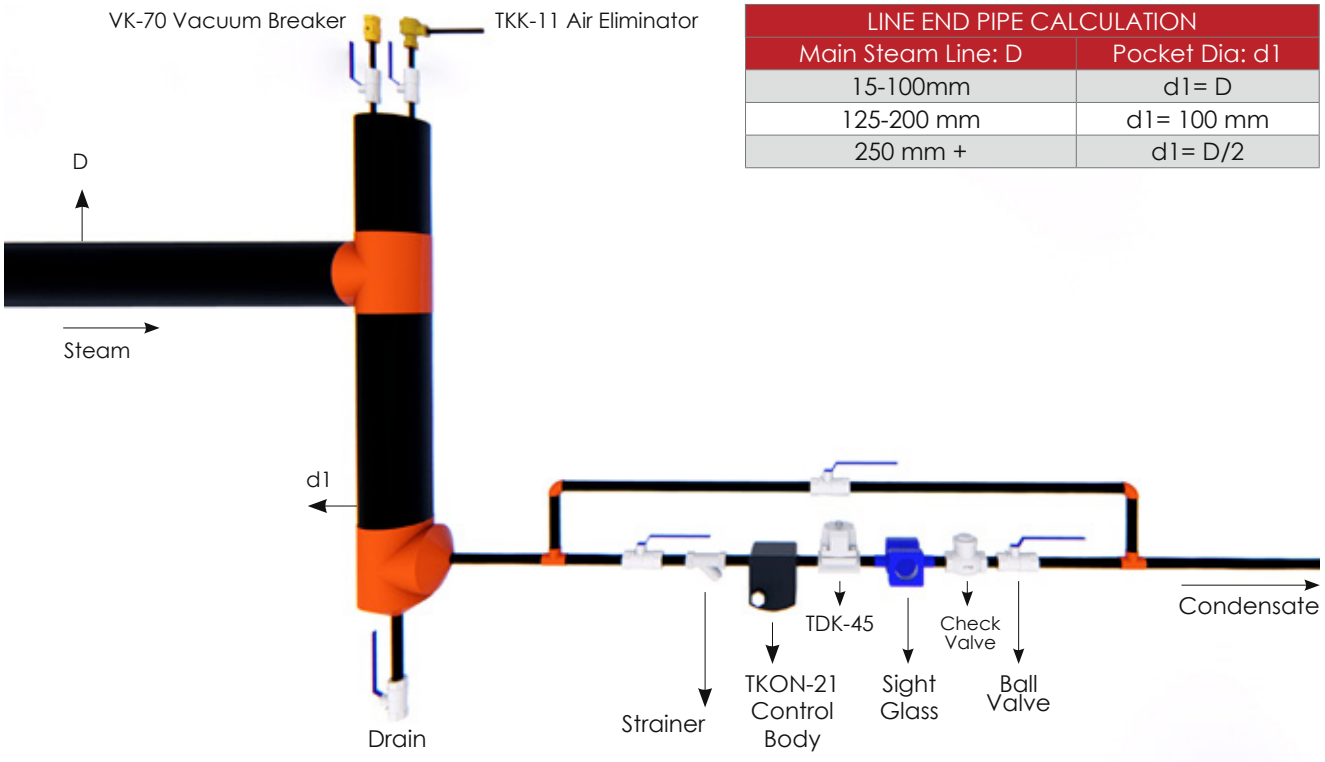
Installing the right steam metering equipment allows you to monitor corrugated cardboard performance, assist in energy management, and provide information to help correct costing of corrugated production. This is particularly important if a corrugating machine makes different types of corrugations.

You can make safe and accurate measurements with AYVAZ®, Vortex type steam meters.

LINE END APPLICATION

If the steam systems are closed by the process, the steam will turn to condensation until it is turned on again. The volume difference will be filled with air. When the system is switched on again, the air must be evacuated to allow the steam to easily fill the line. This is only possible with “End of Line Application”.

The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind must be thermodynamic.



LINE END PIPE CALCULATION	
Main Steam Line: D	Pocket Dia: d1
15-100mm	d1= D
125-200 mm	d1= 100 mm
250 mm +	d1= D/2

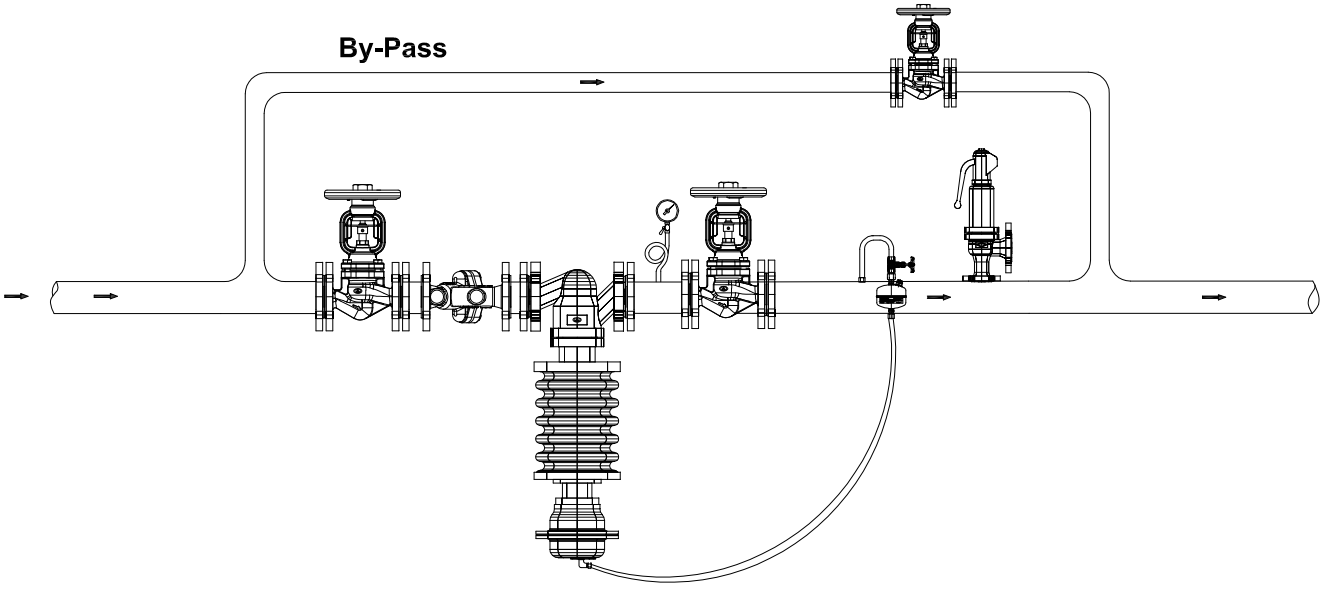
PRV APPLICATION

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

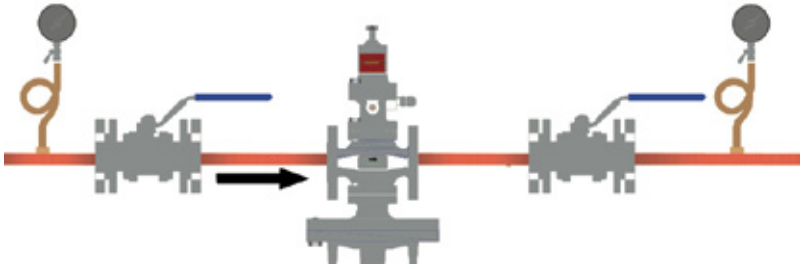
Regardless of the type of steam or condensate management system, the primary vapor pressure on the corrugated board should be accurate and balanced.

Corrugated rollers, small pre-heaters, press rollers and the first part of the double backer usually operate at the highest temperature. They require high pressure steam within ± 0.3 bar (± 2°C).

The choice of the main pressure reducing valve must depend on the needs of the corrugated machine. In a corrugated machine where the same pressure is always required in high temperature cylinders with a very stable demand throughout the process, a direct effective pressure reducing valve of the correct size can be safely used.



PRV APPLICATION



In the AYVAZ® product range, there are different types of "pressure reducing valves from simple directacting pressure reducing valves to more flexible pneumatic valves and electro-pneumatic positioner combinations.

If the high temperature cylinders are in a corrugated line that requires different pressures, a pneumatic system with high precision and remote adjustment can be utilized with the supply pressure set from a single controller or a central control panel.

AYVAZ® can supply many different types of steam pressure control systems and make the best choice for your application.

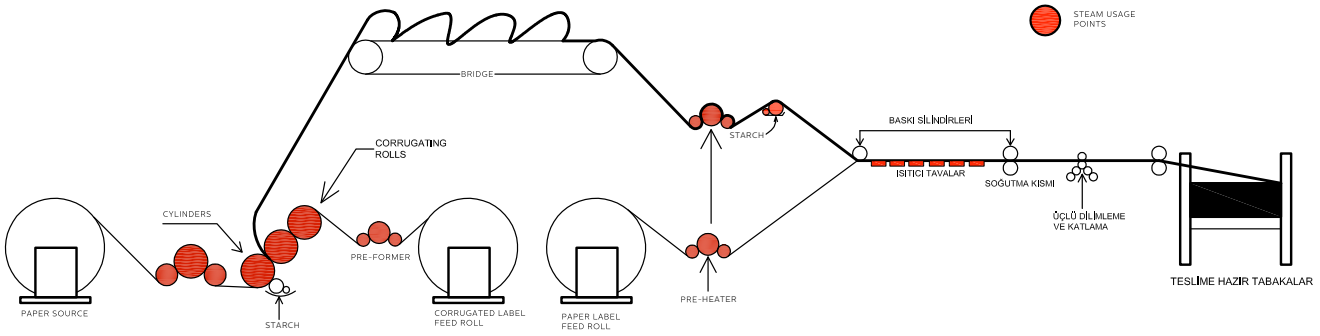
INSULATION JACKETS

The steam distribution system must be insulated to ensure that radiation losses are kept to a minimum.

Even when isolated, some steam condensation and condensation in the pipeline may cause some heat losses. It is very important to drain this condensate so that the steam coming into the machine is as dry as possible. It is also necessary to remove condensate from the distribution pipe to prevent damage from ram impacts. This pushes the condensate deposits along the pipeline at steam velocity.

With AYVAZ®, AEROGEL, it is possible to insulate not only steam and condensate lines, but also the bottom surfaces of the heating pan and the flex hoses at the inlet and outlet of the cylinders.

APPLICATIONS

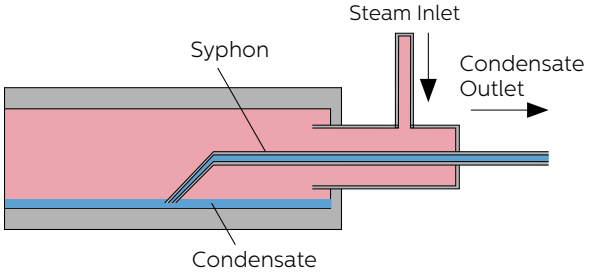


The double-skinned sheet producing a typical corrugated board consists of two single sealing units with double supporting sections using steam at various pressures.

In addition, the finishing sections may include slicers, shooters, cutters, on-line printers, etc., which do not require steam for operation, but only need steam for space heating and humidification. It contains.

STATIC CYLINDERS

In some corrugated machines, static rollers are used as preheaters. Depending on the required temperature, steam is supplied at pressures ranging from 3 bar to 16 bar. As they are inert, the vapor inside condenses and forms a puddle at the bottom.

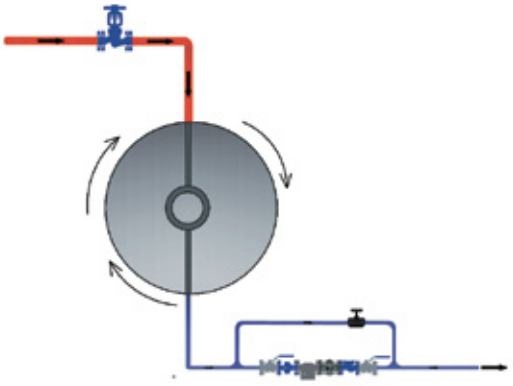


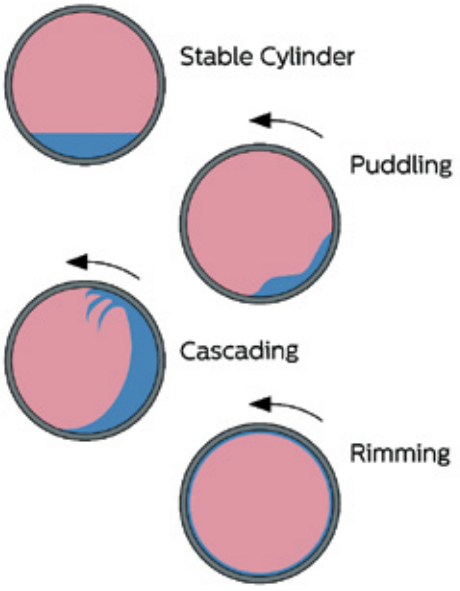
A siphon pipe is installed in the cylinder, and the pressure difference between the steam inlet and the condensate outlet must allow condensation to flow upwards into the siphon pipe and exit the cylinder.

However, this is often not possible.

The correct choice of the trap for this application should be of the float type with an internal air vent and a **needle valve** that can open the steam lock.

APPLICATIONS





Space heating and humidification requirements must be taken into account to ensure optimal conditions for the preparation and storage of corrugated board sheets. AYVAZ® has extensive experience in this field and can advise on your heating and humidification systems.

The steam lock inhibiting valve will allow the condensate to discharge in the siphon pipe, which may cause the trap to close. Thus, it enables the cylinder to be discharged from the moment condensation occurs and allows the noncondensable gases to pass through the thermostatic air vent to make maximum heat transfer through the cylinder wall.

HEATED ROTATE CYLINDERS

Most of the steam-heated rollers in the corrugated cardboard line rotate. The steam enters the cylinders and the condensate flows out through a rotating connection. The condensate is normally drawn from a fixed siphon.

To maintain the correct cylinder surface temperature, the steam pressure must be checked correctly and removed immediately after condensate condensation has formed.

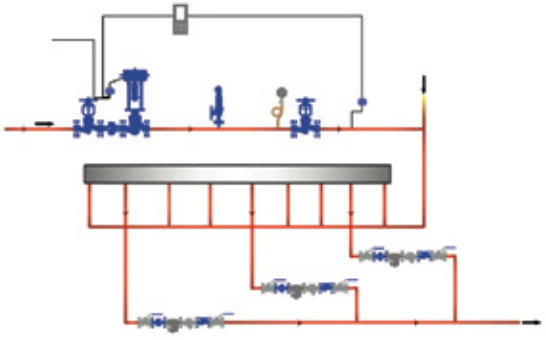
Condensate build-up is influenced by many factors such as how the cylinder rotates, cylinder diameter, machine speed, condensation rate, and condensation rim depth in the cylinder.

Depending on these various factors, either 'puddling', 'cascading' or 'rimming' condensate will form.

In order to determine the most effective and economical method of condensate evacuation process, it is necessary to know which of the three condensates are located. For this, it is necessary to know what is happening at the actual machine operating speeds. Cylinder temperatures will be decisive as a result of evaluations with operators.

APPLICATIONS

If the set temperature can not be achieved in the cylinders, if the by-pass valves of the traps have to be opened, or if the steam heads explode and steam leaks, the condensate remain in the cylinders.
The first choice in the decision will be the siphon. Given the necessary data, experts in this field can advise on the correct type and size. Different siphon structure methods can be used to discharge the condensate from the cylinder. There is no single siphon selection as operating conditions vary from machine to machine and from cylinder to cylinder.
For low-speed cylinders where no agglomeration occurs, a float trap will be sufficient to prevent vapor lock. However, if it is known that Stacking will occur; Usually a new generation of machine speeds is available, it may be necessary to provide a sweeping / blowing system with a trap / valve combination.
A centrifugal force of about 3 g (three times the gravitational acceleration) or more acts on the condensate in a rotating cylinder and causes adhesion against its inner edge. For condensate discharge, the condensate must exceed the centrifugal force, first through the top of the siphon and then through the rotating steam nozzle.
In most cases, the use of stationary siphons and high differential pressures between the cylinders on the cylinder are sufficient to overcome this force.
If this is not the case, however, 'sweeping / blowing steam / may need to be added to aid evacuation of the condensate.
Steam passing through the needle valve on the steam trap is steam entering the cylinder but not condensing. Because at this point there is no effect to form the heat transfer and steam does not condense.
With this needle valve, the sweeping / blowing amount of the steam condensate mixture in a corrugated cardboard cylinder can normally be controlled.

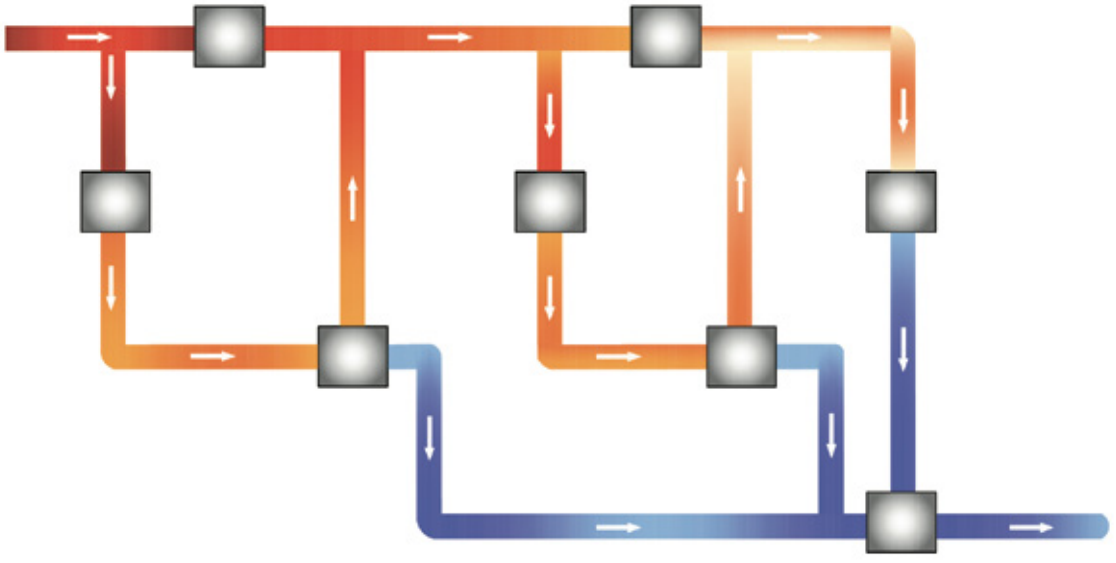


Steam-heated pan groups provide final conditioning to corrugated board prior to finishing. The heating pan process is normally divided into three parts.

In a normal corrugated cardboard operation, it requires high pressure steam to provide high temperature to the first section.

CASCADE SYSTEMS

If a cascade cascade type flash steam system is installed for pans, most of the demand in medium and low pressure pans can be met by the flash steam exiting the high pressure sections of the gutter. In cases where the flash steam cannot meet all the demand, a set of pressure reducing valves will be required to provide live (make-up) steam.



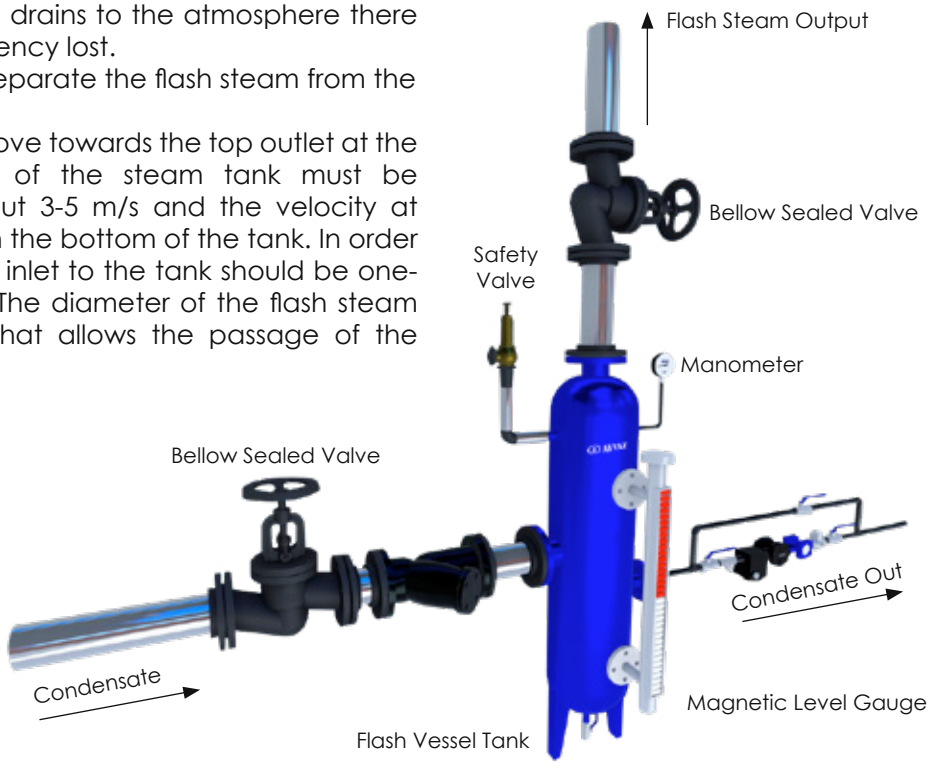
A method for recovering and using the vapor of flash and steam is a cascading type of condensate management system. A corrugated cardboard machine requires steam at various pressures and can utilize high-pressure condensate flash steam to meet a portion of the steam demand.

AYVAZ® Flash Steam Tank Systems can be used to deliver the flash steam separated from the high pressure condensate for energy recovery to the sections requiring lower temperature in the process.

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.



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.

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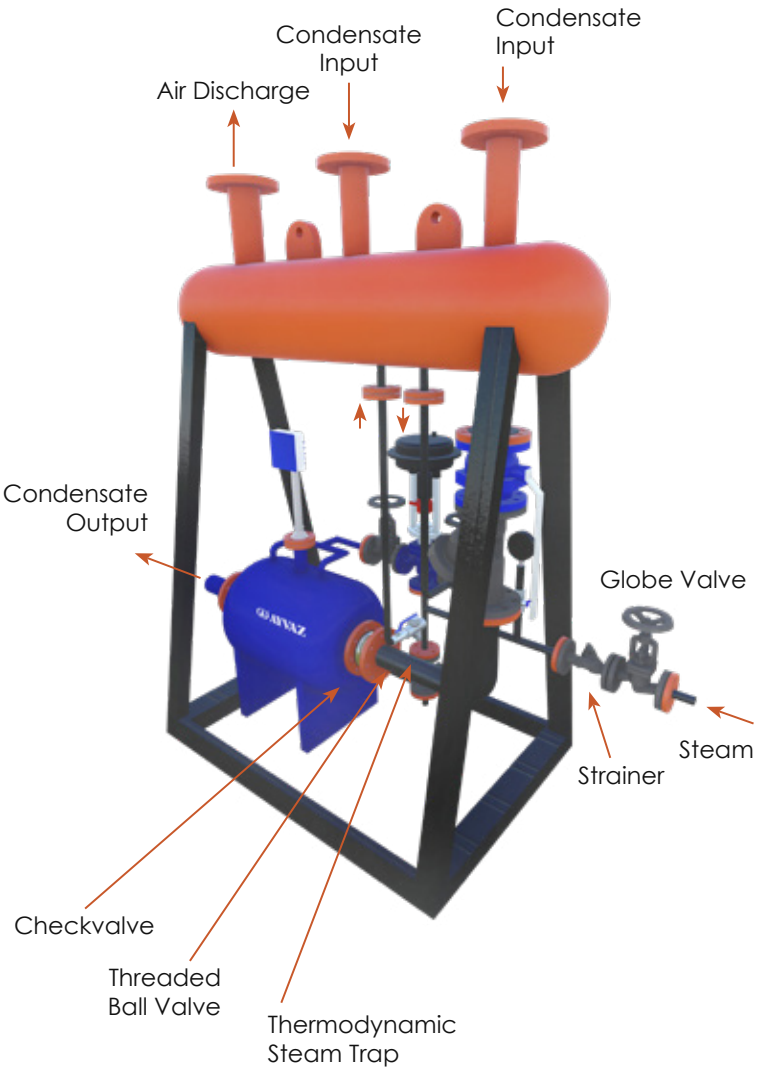


APPLICATIONS

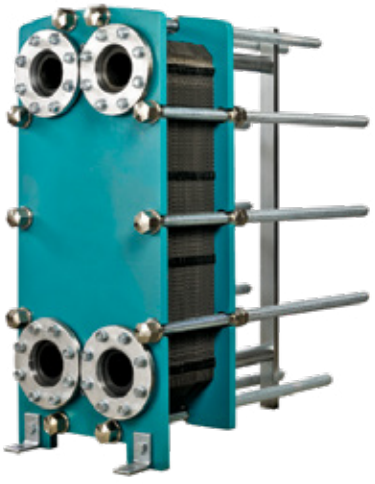
Heat Recovery Systems

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.

APPLICATIONS

Waste Heat Recovery

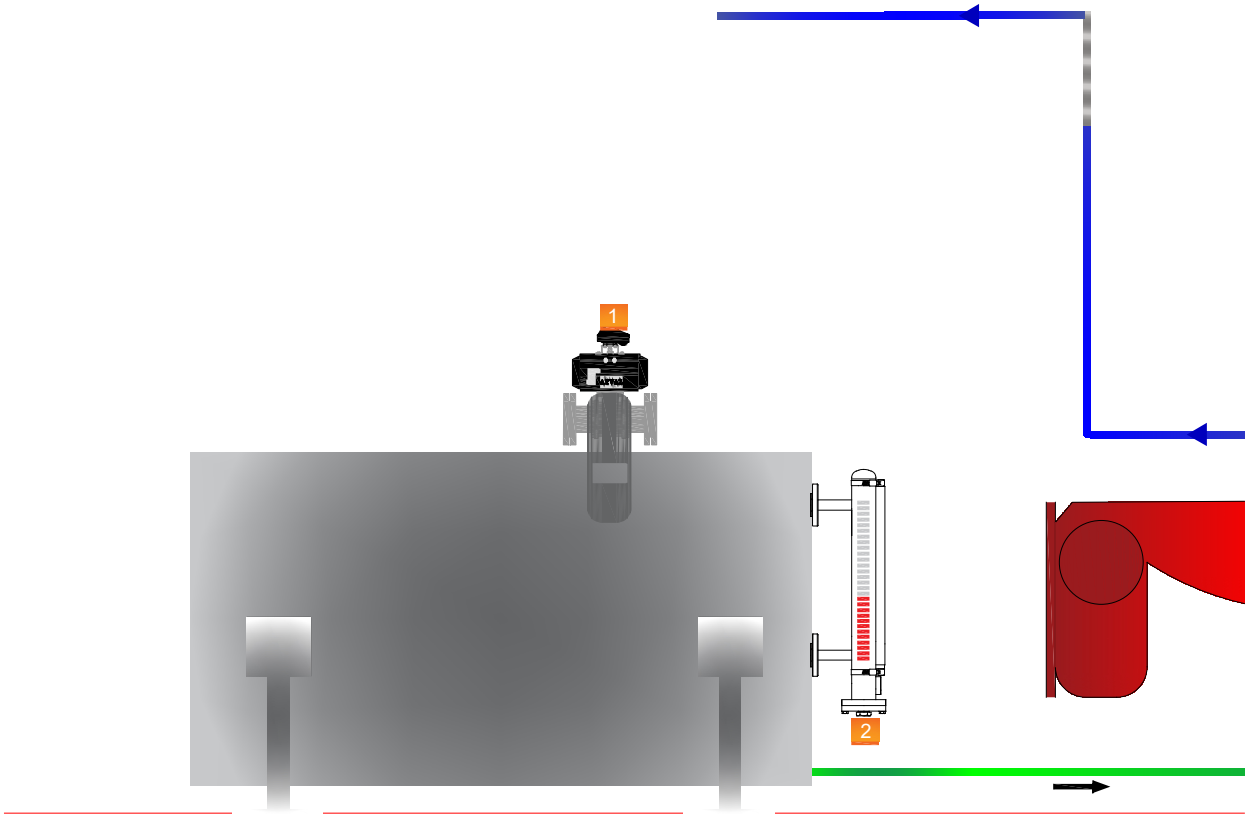
Industrial facilities have many wasted heat sources such as rotten steam and hot water returning from fabric washing. At the same time, there are applications that require heat, such as domestic hot water production and office heating. With the Ayvaz plate heat exchanger you will use to transfer heat from existing heat sources to the partthat 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 ROOM

TANK SECTION (FEED WATER, DEAERATOR, CONDENSATE RECOVERY)

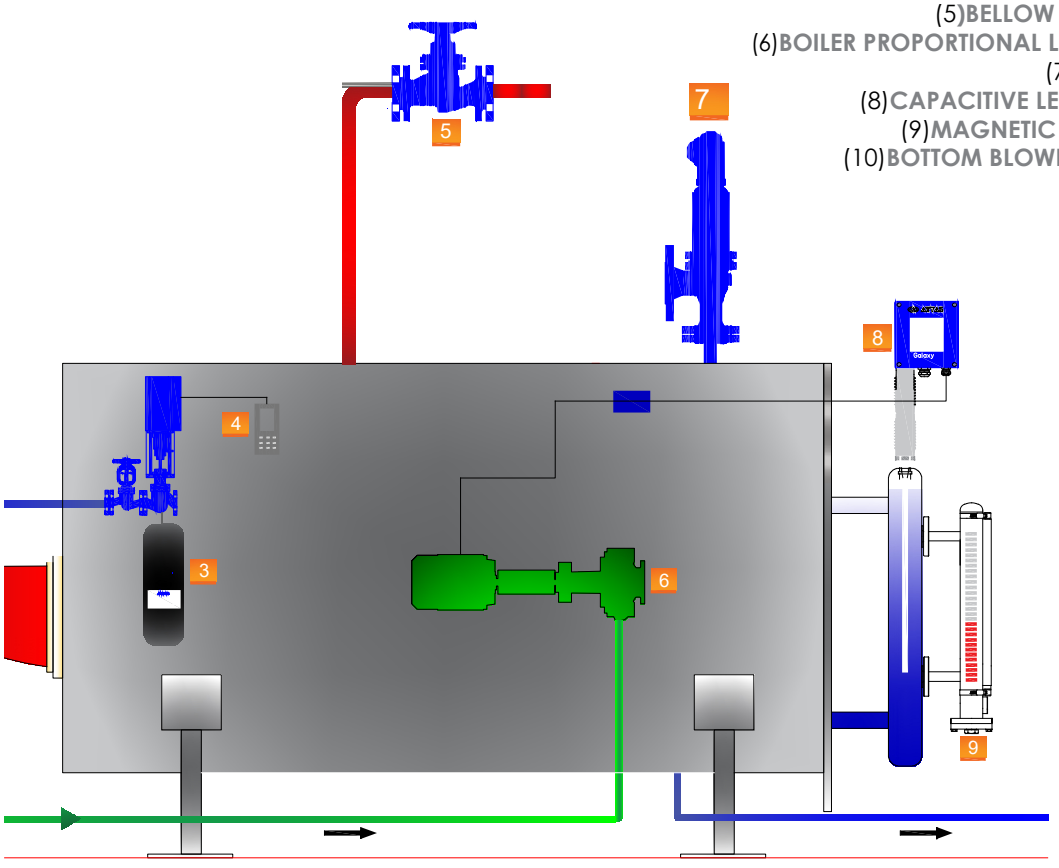
(1) DEAERATOR▶ASD
(2)MAGNETIC LEVEL GAUGE▶MG-33S



BOILER ROOM

BOILER

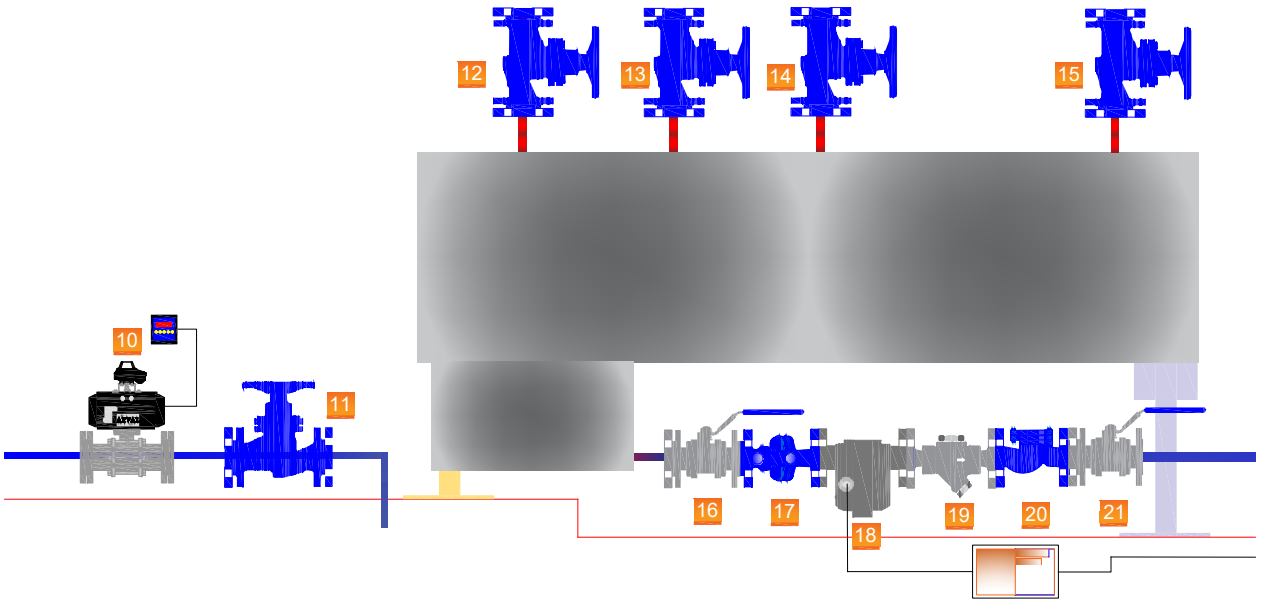
(3)BOILER WATER SAMPLING GASKETINER▶NK-16
(4)SURFACE BLOWDOWN SYSTEM▶YBS-10
(5)BELLOW SEALED VALVE▶MK-16
(6)BOILER PROPORTIONAL LEVEL CONTROL SYSTEM
(7)SAFETY VALVE▶L9-BP
(8)CAPACITIVE LEVEL ELECTRODE▶KP-01
(9)MAGNETIC LEVEL GAUGE▶MG-33
(10)BOTTOM BLOWDOWN VALVE▶DBV-10



BOILER ROOM

COLLECTOR (HEADER)

(12-13-14-15)**BELLOW SEALED VALVE**►MK-16
(16-21)**STAINLESS STEEL BALL VALVE**►V3-F
(17)**STRAINERS**►PTY-40
(18)**STEAM TRAP CONTROLLING UNIT**►TKON
(19)**THERMODYNAMIC STEAM TRAP**►TDK-45
(20)**CHECK VALVE**►CLV-50



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