AYVAZ

INDUSTRIAL SOLUTIONS

DYE

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info@ayvaz.com | www.ayvaz.com

DYE INDUSTRIAL SOLUTIONS

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.

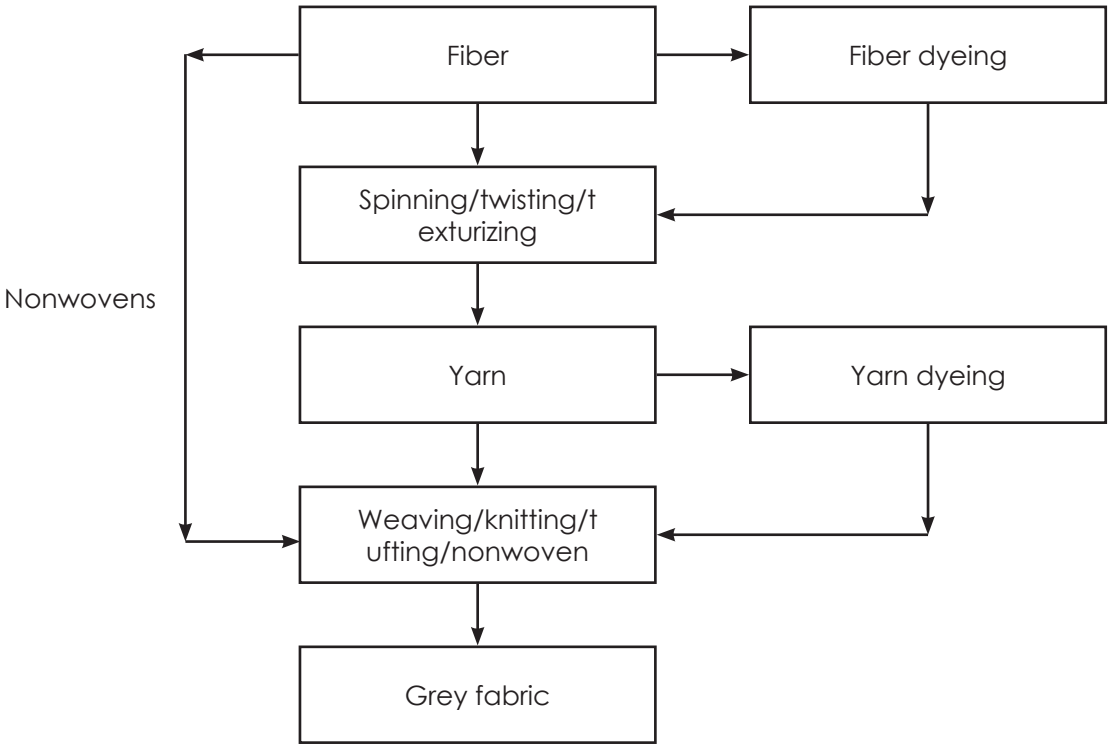
However, in the modern retail store, the color of textile products is a major contributor to what is referred to as fashion. The color is very important with apparel, carpet, upholstery, curtains, drapes, sheets and towels. All of the items are marketed with an emphasis on their specific color.

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.

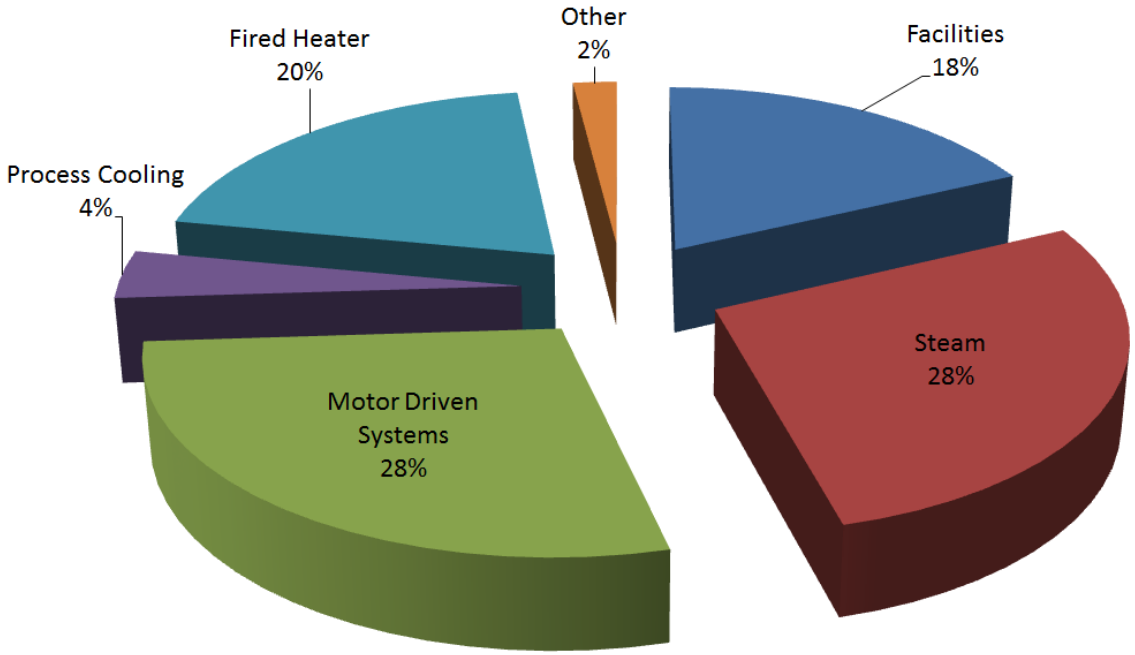
DYE PROCESSES



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



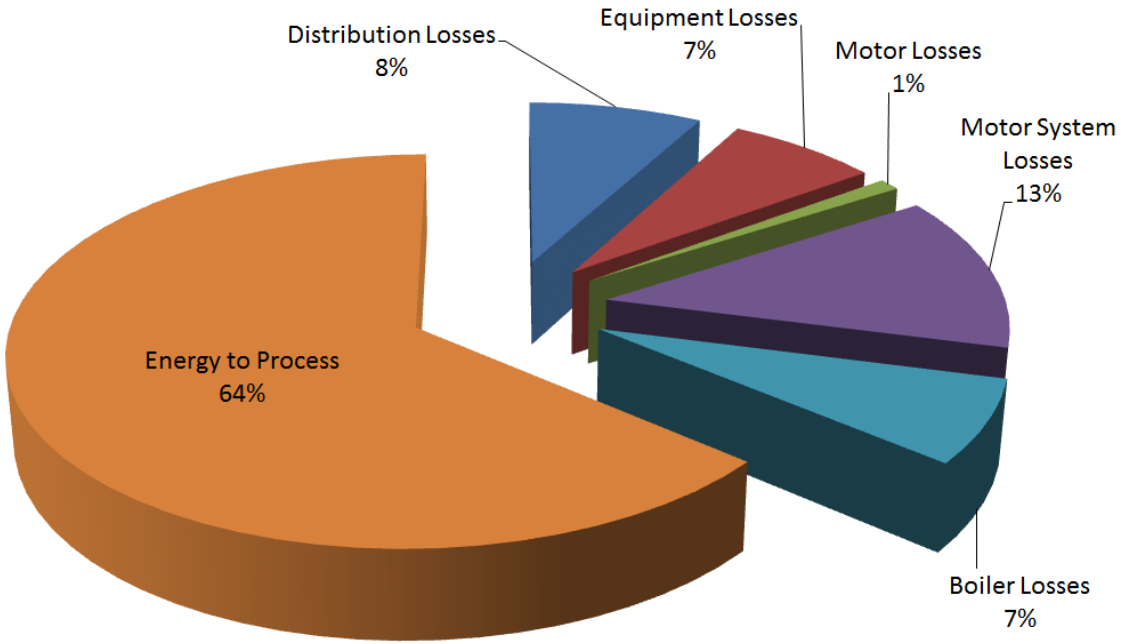
STEAM USAGE IN TEXTILE INDUSTRY

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.

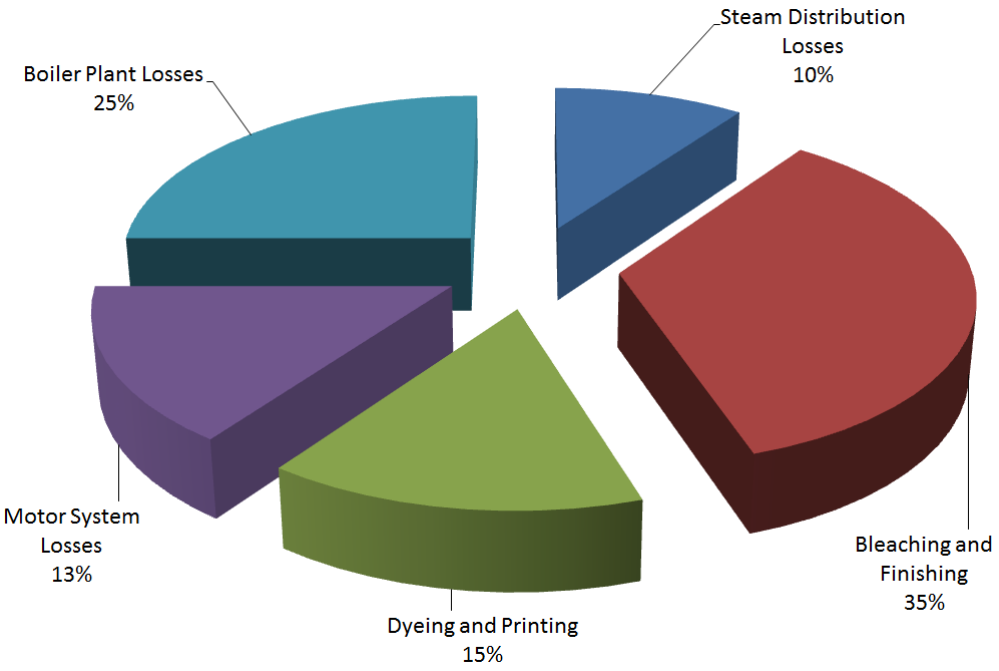
However, as shown below, process wastes are one of the major sources of waste of end-use energy waster in the textile industry.

Figure 2- Energy Wastes in Textile Indsutry

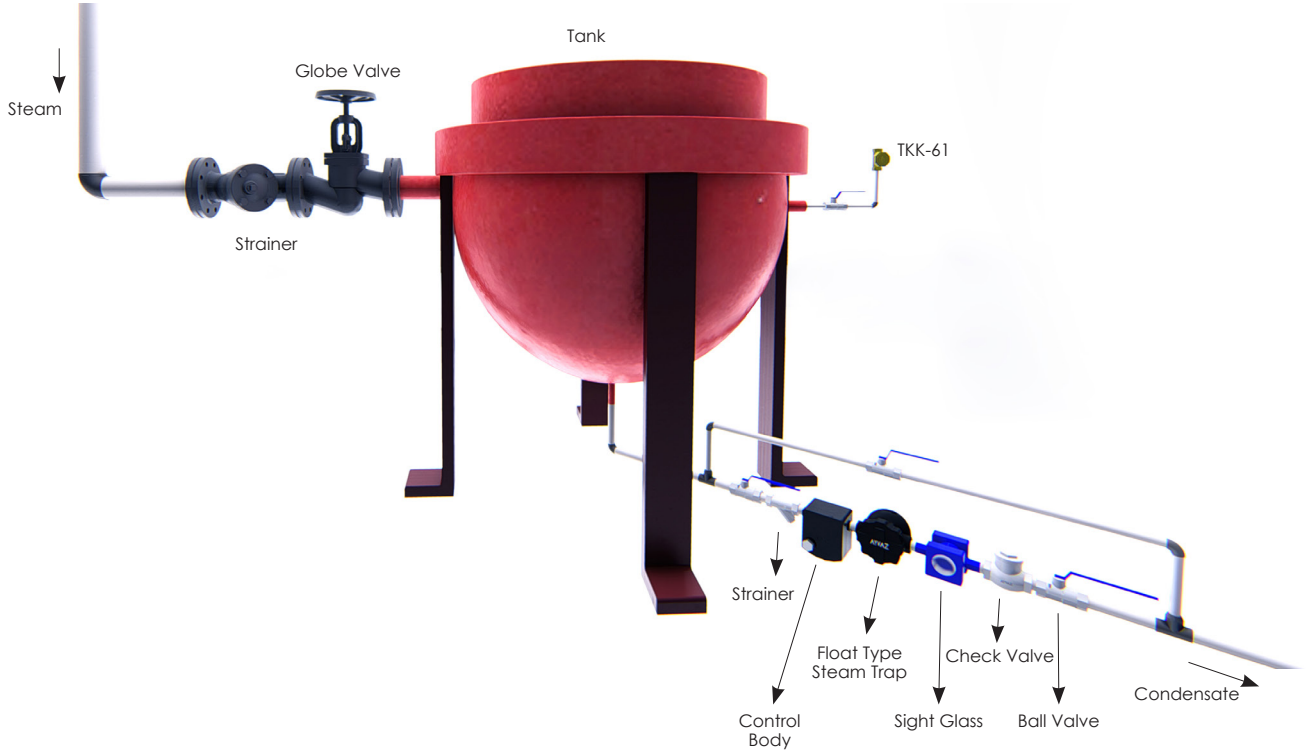


CONDENSATION AMOUNT

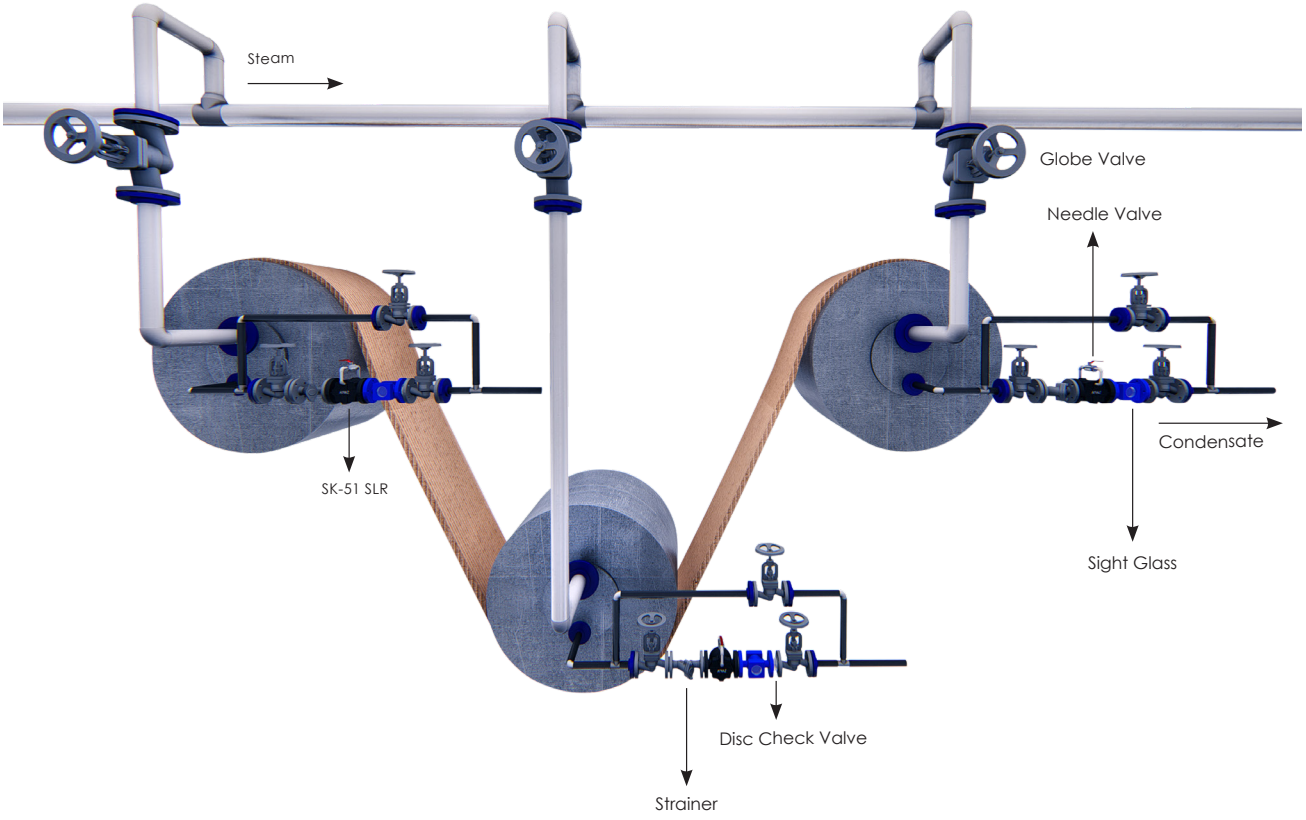
Item	Share of total thermal energy use
Product heating	16.6 %
Product drying	17.2 %
Waste water loss	24.9 %
Heat released from equipment	12.3 %
Exhaust gas loss	9.3 %
Idling	3.7 %
Evaporation from liquid surfaces	4.7 %
Un-recovered condensate	4.1 %
Loss during condensate recovery	0.6 %
Others	6.6 %
Total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



DYING TANK


Steam
Globe Valve
Tank
TKK-61
Strainer
Strainer
Float Type
Steam Trap
Check Valve
Condensate
Control
Body
Sight Glass
Ball Valve

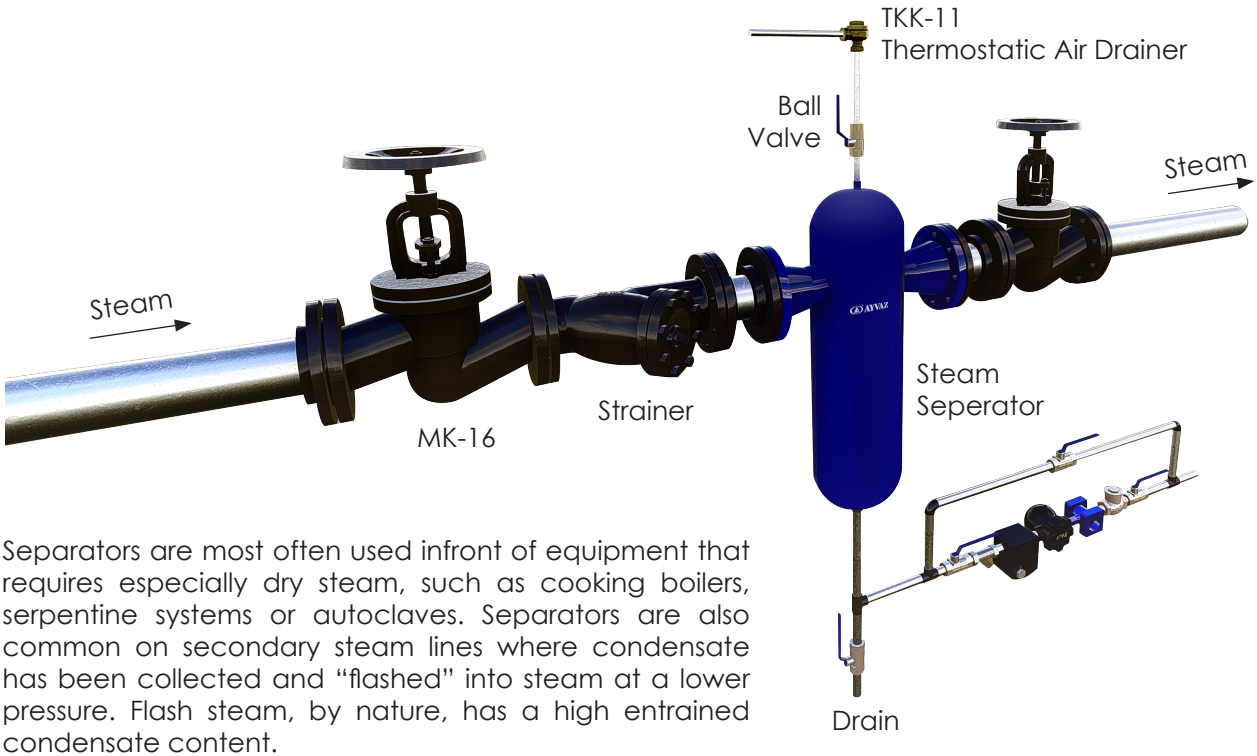
CYLINDERS


Steam
Globe Valve
Needle Valve
SK-51 SLR
Condensate
Sight Glass
Disc Check Valve
Strainer

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.

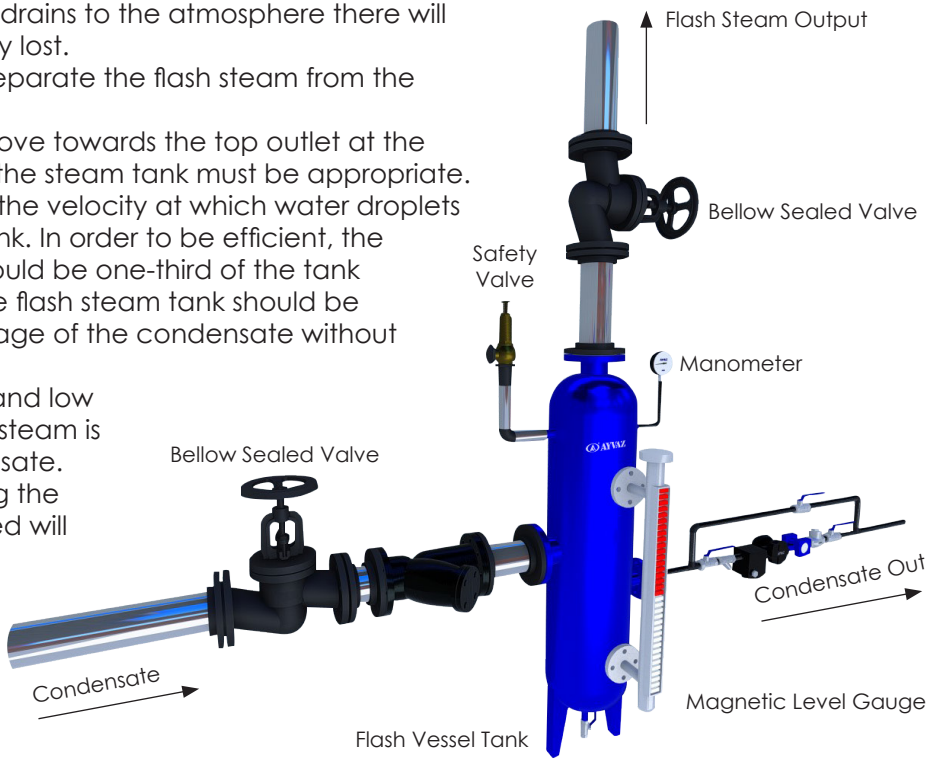


Separators are most often used infront of equipment that requires especially dry steam, such as cooking boilers, serpentine systems or autoclaves. Separators are also common on secondary steam lines where condensate has been collected and "flashed" into steam at a lower pressure. Flash steam, by nature,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

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.

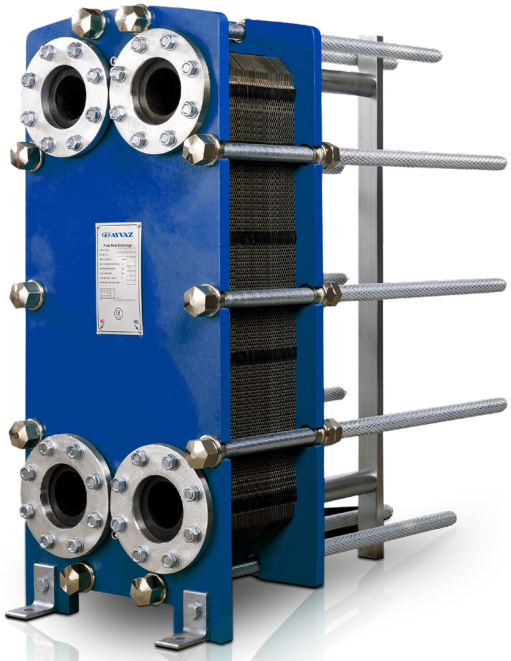
Why Flash Steam is Important?
It includes too much energy and it can be mount to different installation areas. If Flash Steam drains to the atmosphere there will be waste energy and effeciency lost.
Flash Steam Tanks are used to separate the flash steam from the condensate water.
In order for the flash 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.

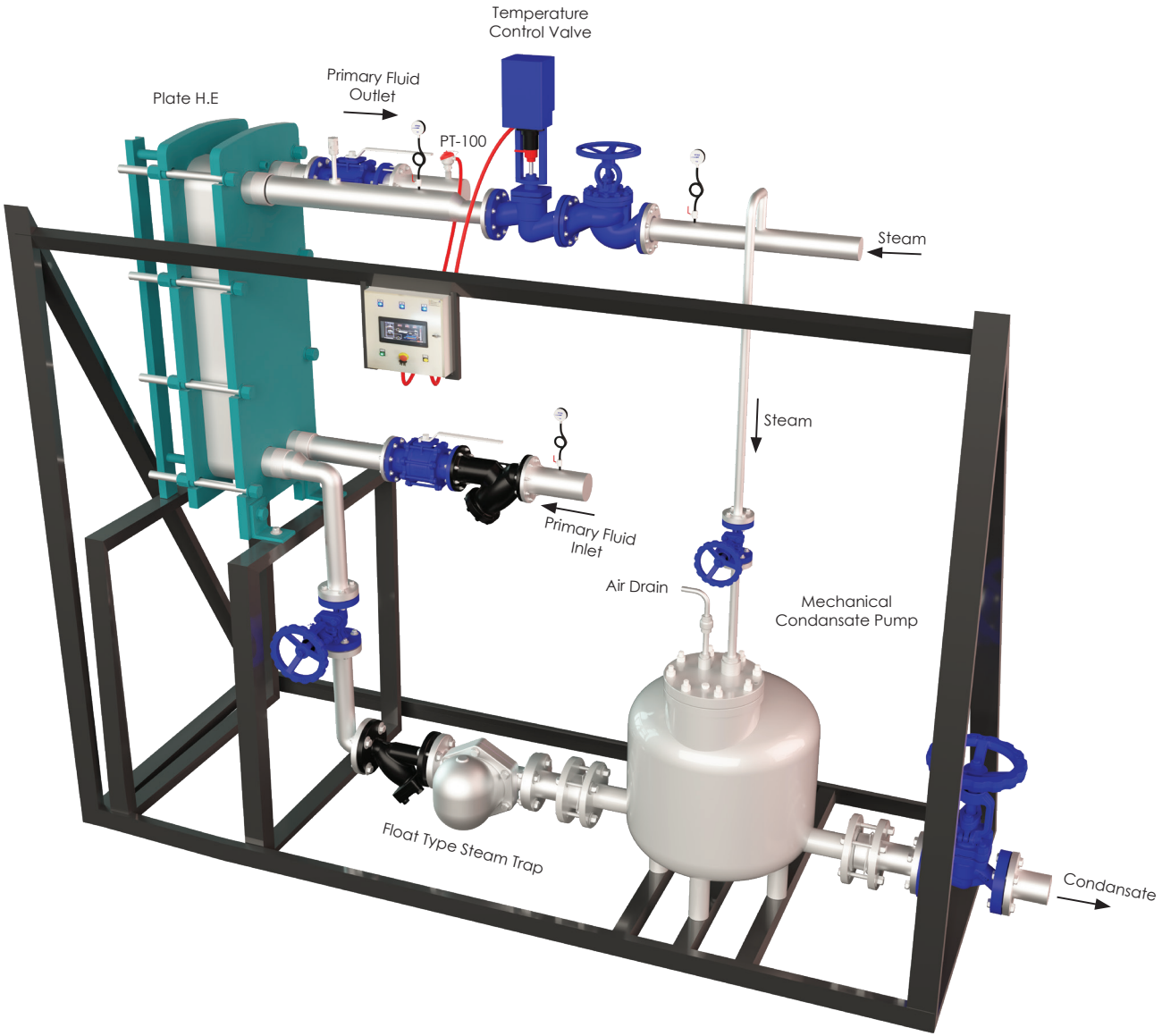


HEAT EXCHANGERS

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.




Temperature
Control Valve
Primary Fluid
Outlet
Plate H.E
PT-100
Steam
Steam
Primary Fluid
Inlet
Air Drain
Mechanical
Condansate Pump
Float Type Steam Trap
Condansate

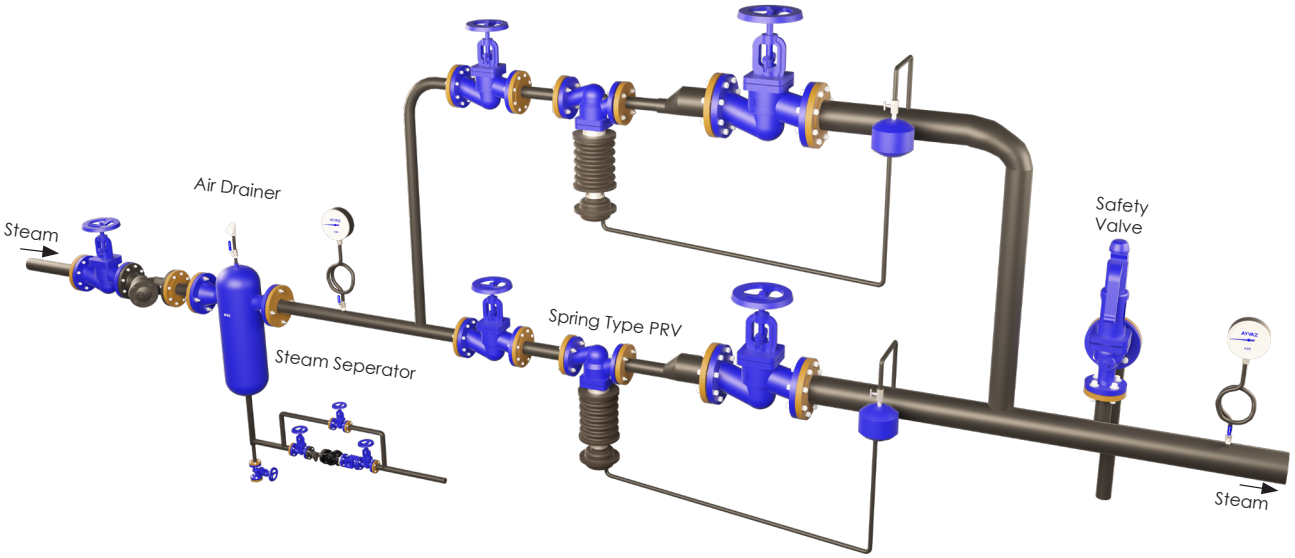
PRESSURE REDUCING STATION

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

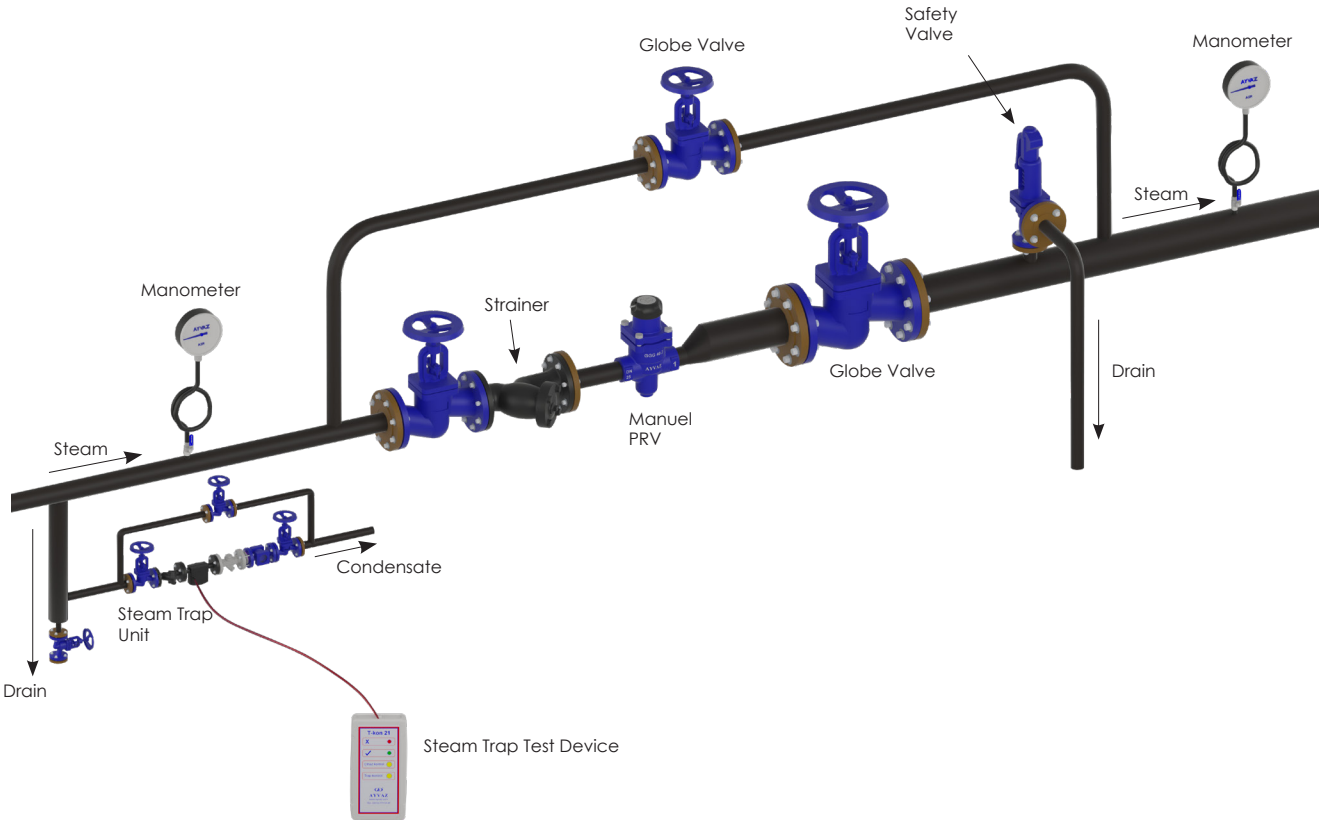
Regardless of the type of steam or condensate management system, the primary vapor pressure on the line should be accurate and balanced.

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

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



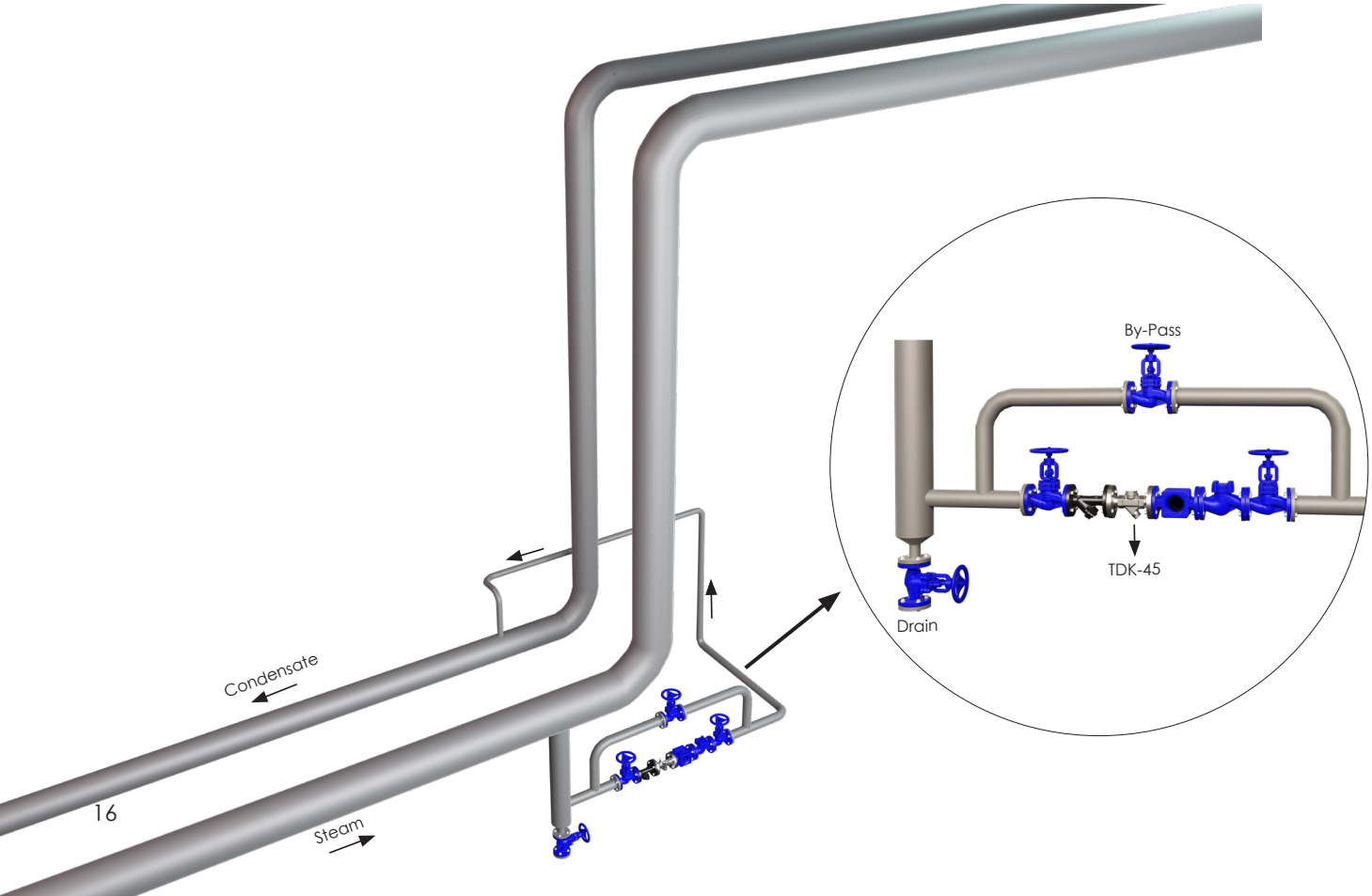
The choice of the main pressure reducing valve must depend on the needs of the system. In a folding machine where the same pressure is always required in high temperature cylinders with a very stable demand throughout the process, a direct effective pressure reducing valve of the correct size can be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

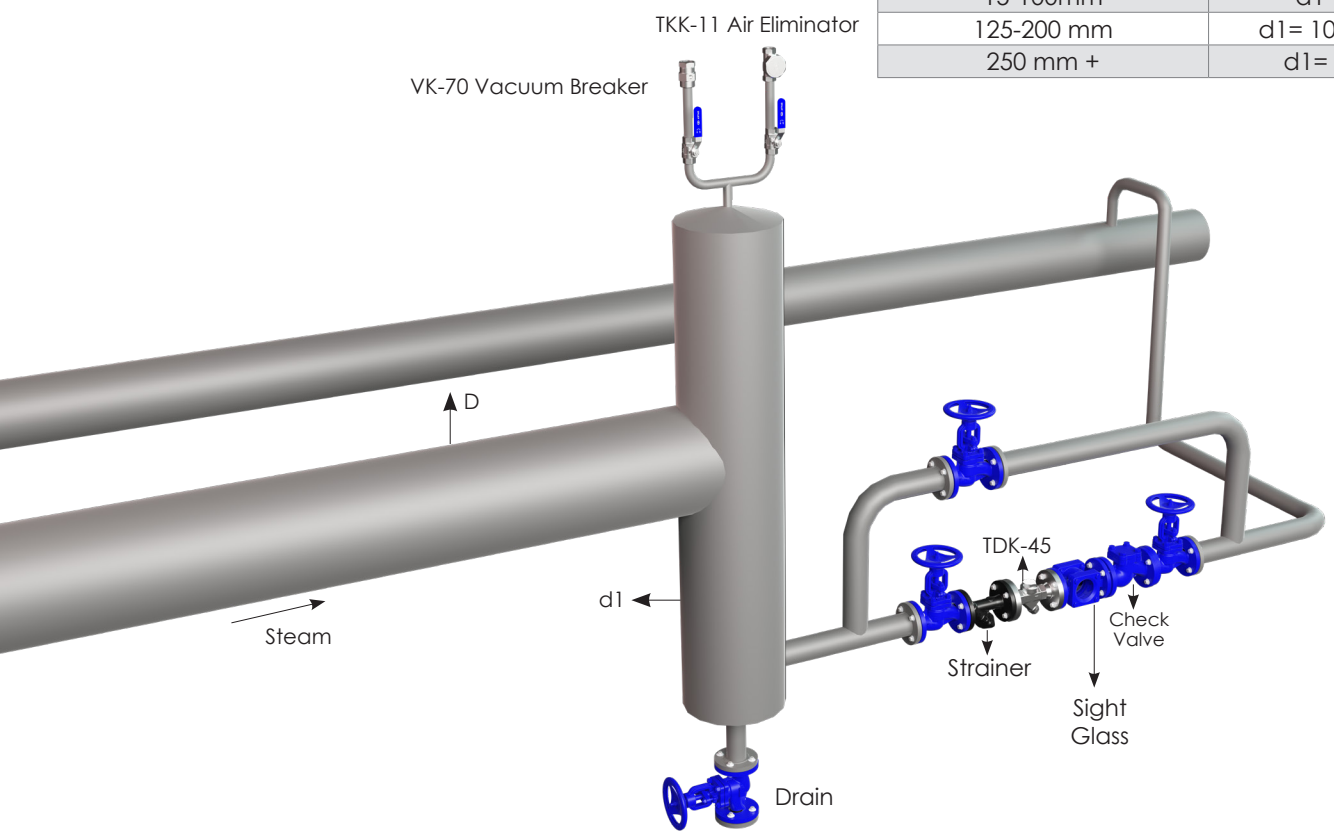


LINE END APPLICATION

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".

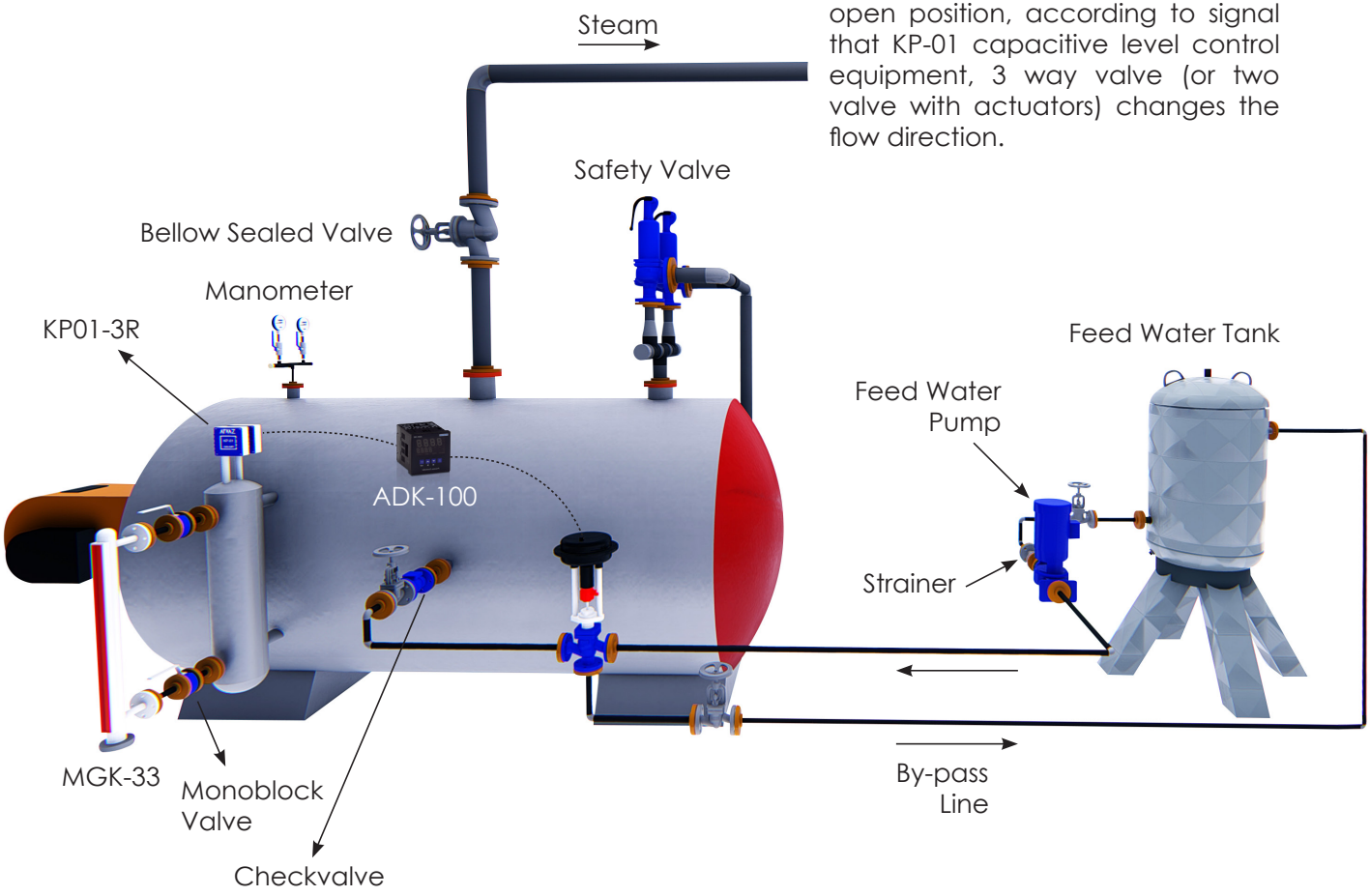
The occurred air and condensate around connection areas in the pipelines are dragged to the end of the line. If that air and condensate are not discharged, they may block the steam flow. In such cases, formed air and condensate are discharged with a line end application shown below. The steam trap kind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

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



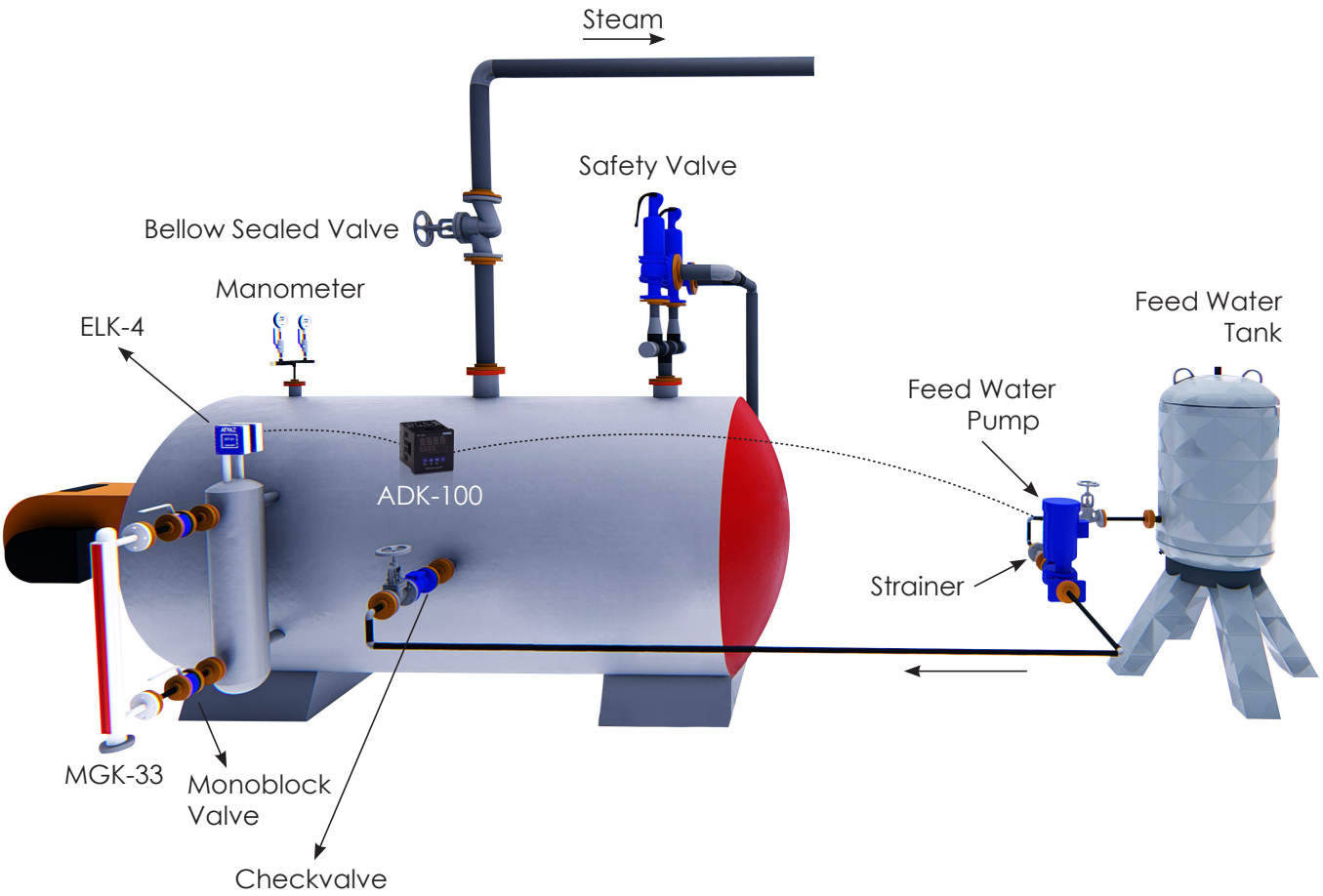
PROPORTIONAL FEED WATER SYSTEMS

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.

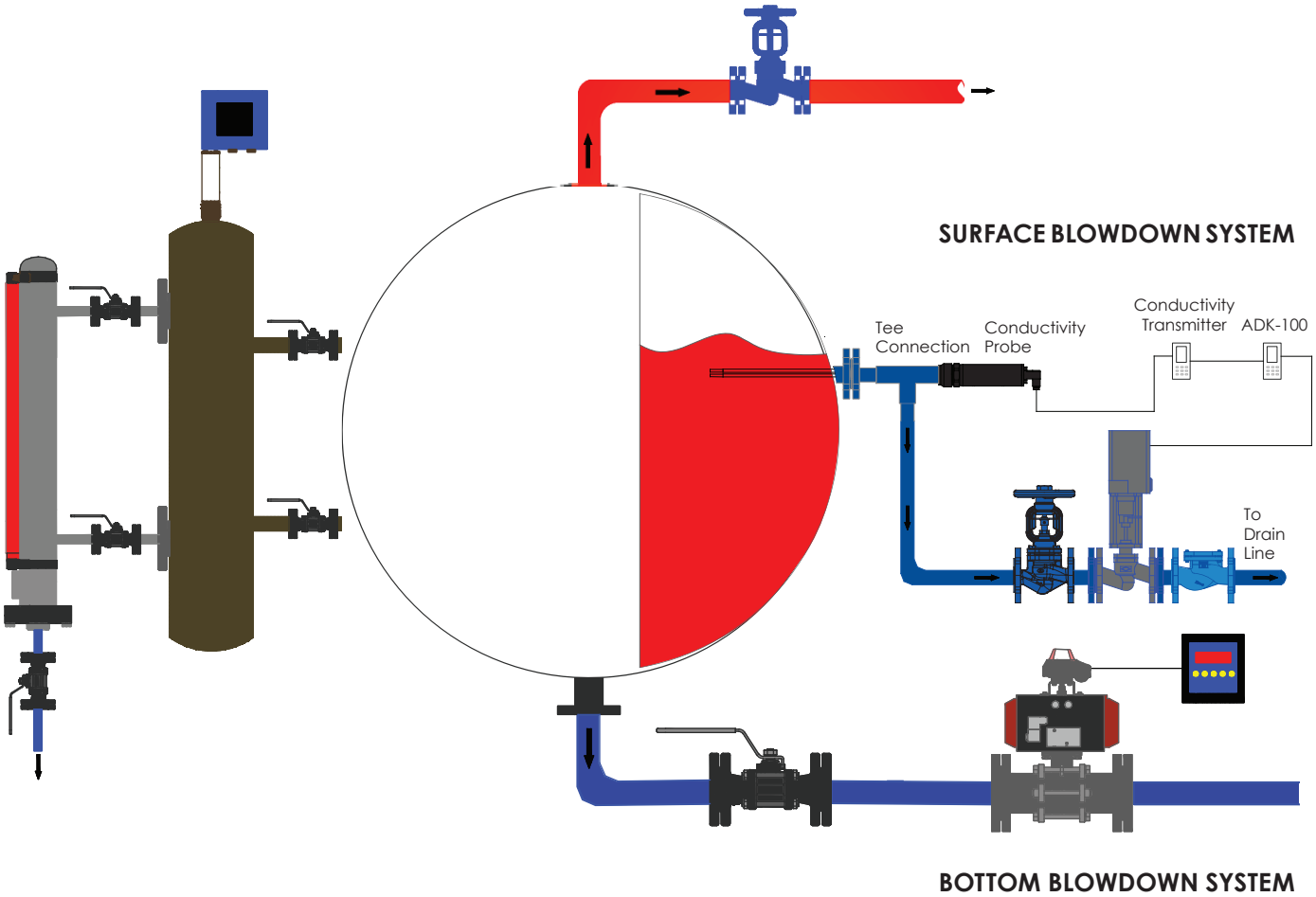


ON-OFF FEED WATER SYSTEMS

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



APPLICATION EXAMPLE



BLOWDOWN SYSTEMS

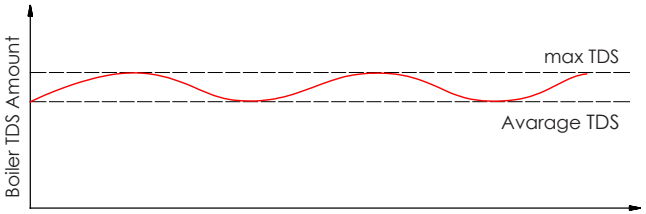
Surface blowdown and bottom blowdowns are required to ensure a continued safe transmission of the boiler. Sludge deposits are formed in the boiler and must be cleaned at regular intervals.

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

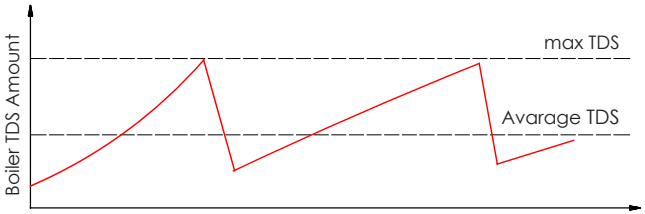
When the valve is opened, the sludge in the lower area of the boiler is effectively discharged by the high water velocity due to the pressure difference. Depending on the type of water preparation system and the dosing system, the steam boiler reaches salt and other foreign substances.

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

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



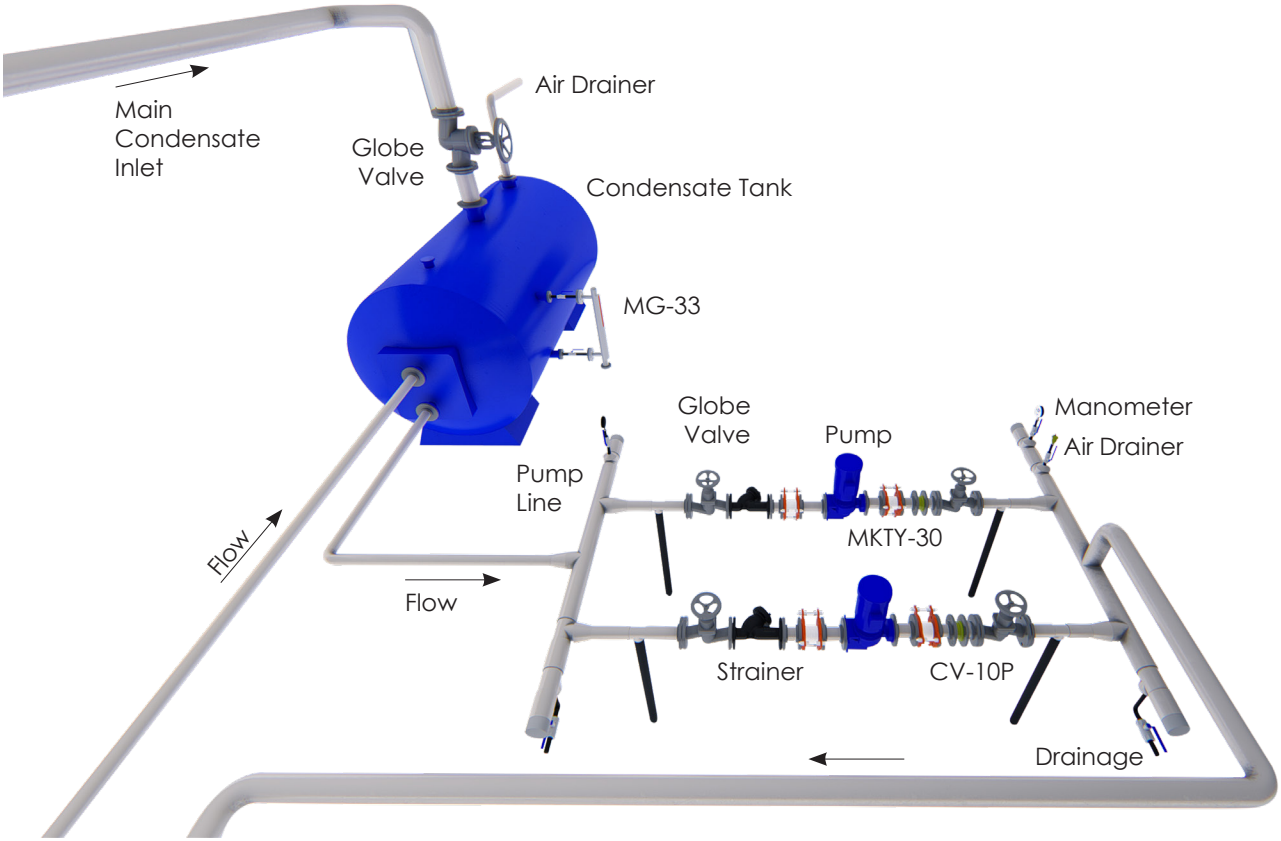
Automatic Blowdown System



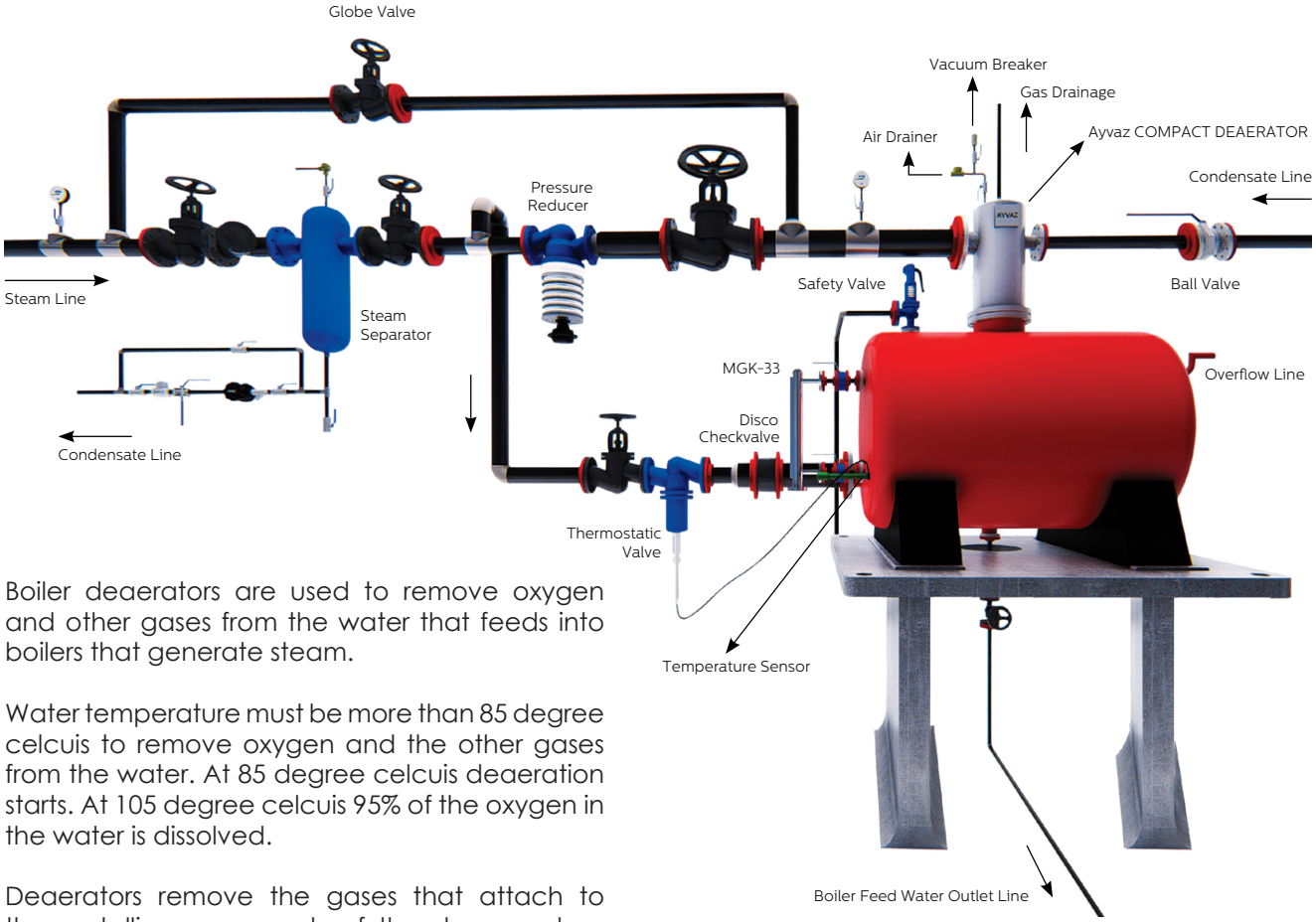
Manuel Blowdown System

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.



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.

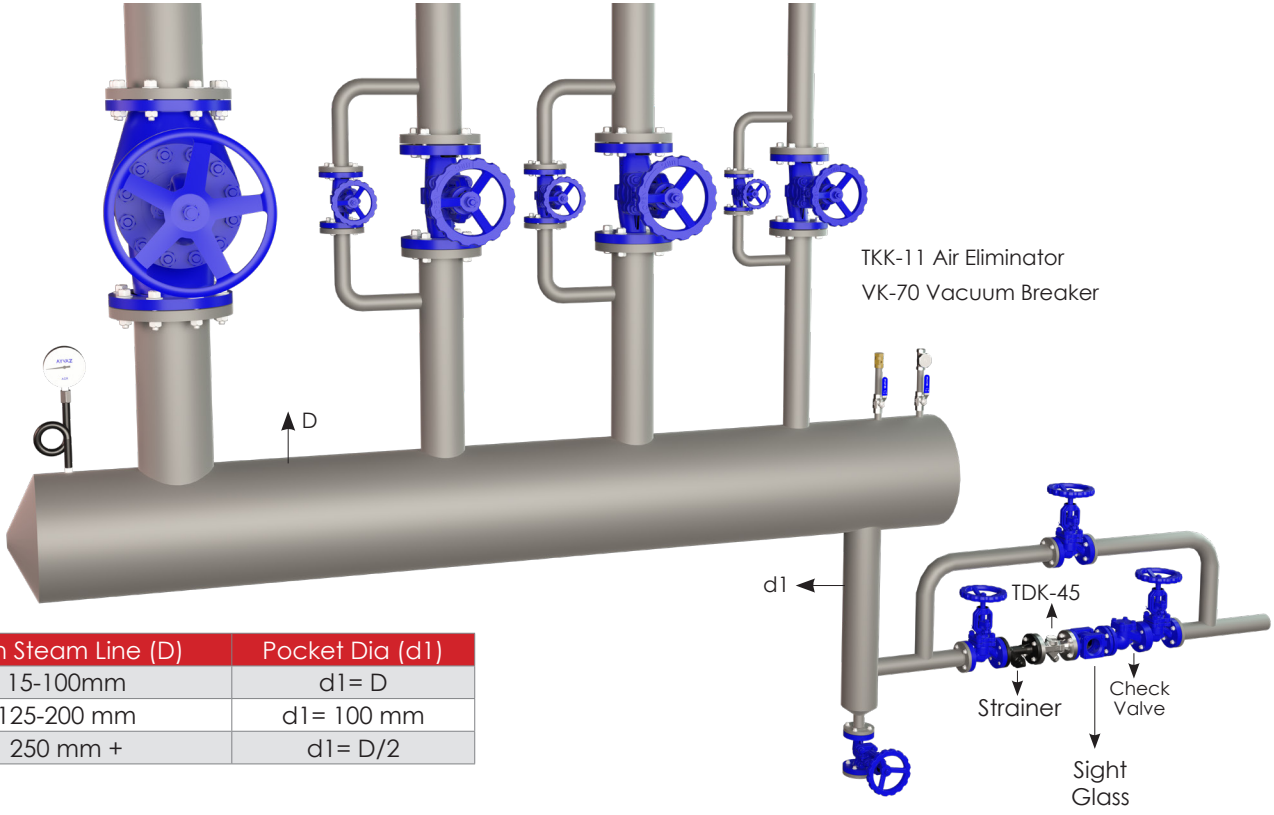
Deaerators remove the gases that attach to the metallic components of the steam system and cause corrosion by forming oxides, or rust. Oxygen and carbon dioxide are responsible for corrosion(pitting). There are two types of boiler deaerators: Tank model or compact deaerators.

BOILER ROOM

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

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

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



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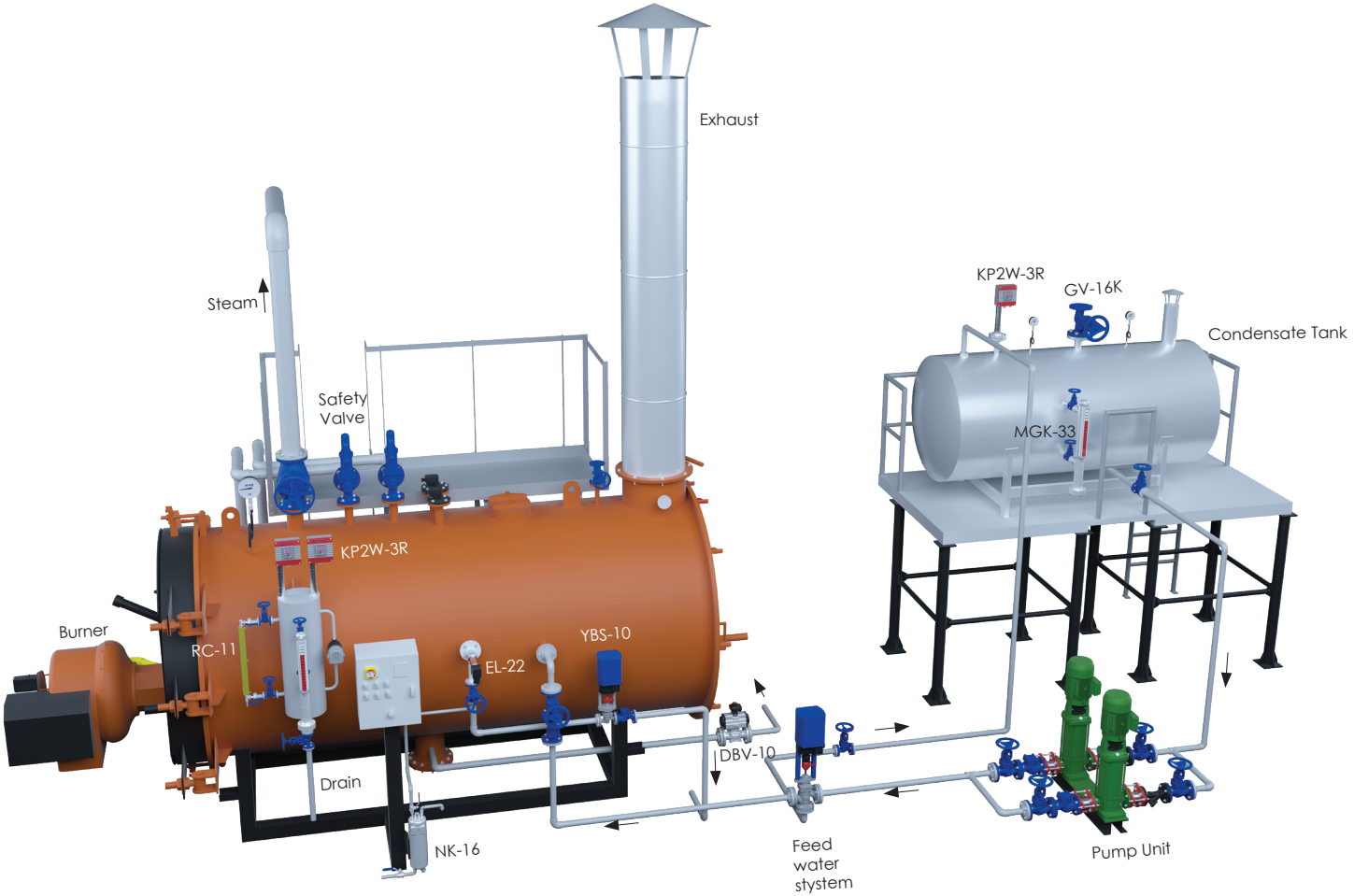
250 mm +	d1= D/2


Exhaust
Steam
Safety Valve
KP2W-3R
Burner
RC-11
EL-22
YBS-10
Drain
NK-16
DBV-10
Feed water stystem
KP2W-3R
GV-16K
Condensate Tank
MGK-33
Pump Unit

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AYVAZ

HEAD OFFICE - MAIN FACTORY
Atatürk Sanayi Bölgesi Hadımköy Mahallesi
Mustafa İnan Caddesi No: 44 Arnavutköy - İSTANBUL
Tel: +90 212 771 01 45 (pbx) | Fax: +90 212 771 47 27
info@ayvaz.com www.ayvaz.com

Cona
Caserta / Italy
Tel : +39 0823 187 3988
rmolaro@ayvaz.com

Ayvaz Ukraine
Kiev / Ukraine
Tel : +380 44 390 57 57
info@ayvaz.com.ua

Tricorr
Warsaw / Poland
Tel : +48-32-783-295-1
tricorr@tricorr.eu

Ayvaz Germany
Viernheim / Germany
Tel : +49 62046014399
germany@ayvaz.com

Ayvaz Serbia
Belgrade / Serbia
Tel : +381 61 658 70 52
yakbiyik@ayvaz.com

Ayvaz Azerbaijan
Baku / Azerbaijan
Tel : +99(455)579-84-32
ahayatov@ayvaz.com

Ayvaz Kazakhstan LLP
Almaty / Kazakhstan
Tel : +7 (727) 327 97 57
www.ayvaz.kz

Ayvaz N
Isperih / Bulgaria
Tel : +359 8431 27 32
office@ayvaz-n.eu

Ayvaz Vietnam
HCMC / Vietnam
Tel : +84 89 8508345
ggursoy@ayvaz.com

Ayvaz China
Ningbo / China
Tel : +86 152 5830 7361
msahin@ayvaz.com

Ayvaz Egypt
Cairo / Egypt
Tel : +20 122 819 78 29
andrew.eid@ayvaz.com

Ayvaz Gulf
Dubai / U.A.E.
Tel : +971 563550822
+971 501306871
mideast@ayvaz.com

Ayvaz Americas
Rhode Island
Tel : +1 401 737 8380
americas@ayvaz.com