



BETAKAZAN
BETA KAZAN Boiler Company



BSG MODEL
Liquid-Gas Fuel Three Pass Steam Boiler

Technical Specifications

Your Industrial Energy Strength



www.betakazan.com



Company Profile

With a solid 15 years' experience in the industry, **BETA KAZAN Boiler Company** offers energy solutions for domestic and industrial applications of all sizes thanks to its extensive portfolio and activities that include steam, hot water and hot oil boilers, solid fuel and waste burning systems, heat exchangers, feed water preparation systems, chimney filtration systems and dust collection.

BETA KAZAN Boiler Company is dedicated to swiftly fulfill its commitments, even amidst competitive market conditions, as well as to fully meet customers' expectations while offering top tier services thanks to its professional team, consequently establishing the company as a trusted partners in more than 500 projects both locally and internationally.

All **BETA KAZAN Boiler Company's** products are built in the capital Ankara which makes it easy to deliver at all kinds of points throughout the Middle East, Eastern Europe and Western and Central Asia.

BETA KAZAN Boiler Company is proud to be certified in TS EN ISO 9001, reflecting its commitment to quality management; TS EN ISO 14001, demonstrating its dedication to effective environmental management; and TS EN ISO 45001, showcasing its focus on maintaining a safe and healthy work environment. These certifications affirm the company's adherence to top international standards in quality, sustainability, and occupational health and safety.

BETA KAZAN Boiler Company is an honorable member of:



**Boiler and Pressure Vessel
Industrialists Association**



**Turkish HVAC&R
Exporters Association**



BSG Model Steam Boiler Technical Specifications

General Information:

BSG Model fire tube wet-back steam boiler has been **BETA KAZAN Boiler Company's** primary product line for many years. This boiler is designed for many different applications including central heating, manufacturing centers, food processing plants,

It consists of a horizontal three pass wet back design and is built according to TS EN12953 standards with independent inspection by "TÜRK LOYDU" which is a local Classification Society and a Conformity Assessment Body recognized by IACS – the International Association of Classification Societies.

In addition to that, the boiler meets the requirements of 2014/68/EU Pressure Equipment Directive with B and F modules (CE document is issued).

It has been developed for higher operational efficiency while performing reliably.

It can be liquid, gas a solid fueled depending on the demands of the customer.

This boiler has a steam output range of 600 kg/h to 30,000 kg/h (1322.77 lb/h to 66,138.68 lb/h) which corresponds to a heating capacity range of 400 kW to 19,500 kW (40.78 BHP to 1987.87 BHP) under a pressure range of 0.5 bar and 20 bar (7.25 psi to 290.07 psi) with an efficiency up to 91%.

BETA KAZAN Boiler Company apply their own quality procedures that comply with the requirements of TS EN ISO 9001.

Construction:

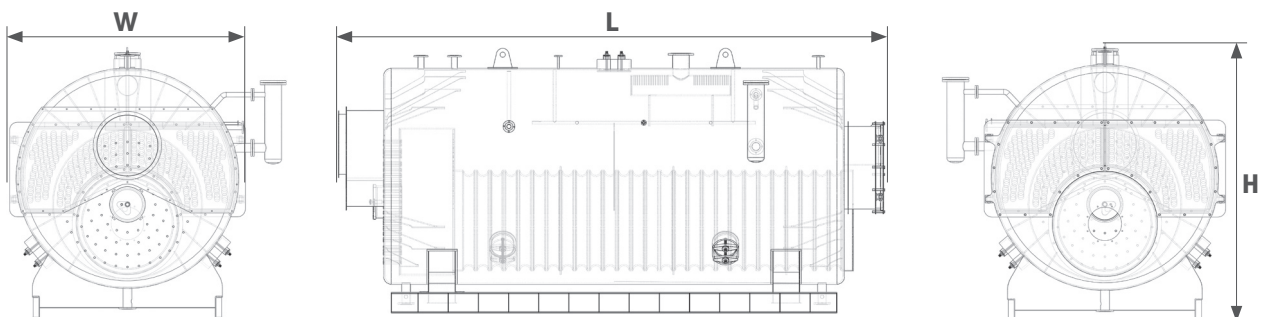
All steel plates (Outer shell, furnace, front plate, middle plate, rear plate, support plates, reversal chamber plates, doors) used in the boiler are marked, cut and profiled by a computer-controlled laser cutting machine to ensure the correct ligament and compliance with construction standard requirements. Optionally, the furnace is corrugated by an outside company using induction process. Weld preparation for the plates, fire tubes and stay bars are also undertaken by the laser cutting machine for strict tolerances.

The shell, furnace and reversal chamber plates are then rolled, assembled, machine welded with the other plates and supported by supporting plates and stay rods in addition to the fire tubes, all according to standard specifications. After that, flame tubes access doors are installed after adding hinges and flame boxes. High temp refractory cement is added to the doors for extra protection. In addition to that, metal strips are welded to the shell of the boiler to accept insulation and outer sheets.

For inspection purposes, two elliptical manhole openings are provided on the top and in the lower quadrants toward the rear of the boiler. To permit observation and access into the furnace, a rear access door with a flame viewing sight port is provided. Also, refractory cement is added to the rear access door.

Mountings and controls are fitted to pads, standpipes and bosses welded to boiler shell.

Jacking points are provided on the support structure to assist in offloading, positioning and maneuvering the boiler.





Model	Steam Capacity (kg/h)	Heating Capacity		Heating Surface (m ²)	Width W (mm)	Length L (mm)	Height H (mm)	Weight (kg)	Chimney Outlet Diameter ø (mm)	Water Volume (lt)	Backpressure (mbar)
		(kcal/h)	(kW)								
BSG-15	675	378.000	440	15	1.600	1.900	2.900	2.500	220	1.800	5
BSG-25	1.100	615.000	715	25	1.800	2.000	3.500	3.300	300	2.500	5
BSG-30	1.350	755.000	880	30	1.900	2.150	3.700	3.600	300	3.600	5.5
BSG-40	1.800	1.008.000	1.170	40	2.100	2.400	4.000	5.200	350	4.600	6
BSG-50	2.250	1.260.000	1.465	50	2.100	2.400	4.400	5.800	400	5.500	6
BSG-60	2.700	1.512.000	1.760	60	2.200	2.500	4.400	6.300	400	6.100	6.5
BSG-70	3.150	1.764.000	2.050	70	2.300	2.600	4.450	6.700	400	6.300	6.5
BSG-80	3.600	2.020.000	2.350	80	2.400	2.700	4.600	7.500	450	7.200	7
BSG-90	4.000	2.250.000	2.600	90	2.450	2.750	4.900	8.200	500	8.500	7
BSG-100	4.500	2.520.000	2.930	100	2.500	2.800	5.000	8.900	500	8.600	7
BSG-110	5.000	2.800.000	3.255	110	2.500	2.800	5.400	10.200	530	10.000	7.5
BSG-125	5.600	3.150.000	3.660	125	2.600	2.900	5.600	10.800	600	11.200	7.5
BSG-135	6.000	3.360.000	3.900	135	2.600	2.900	5.900	12.000	600	11.800	8
BSG-155	7.000	3.920.000	4.560	155	2.800	3.100	6.050	13.500	650	12.900	8
BSG-180	8.000	4.480.000	5.120	180	2.900	3.200	6.150	15.200	700	13.800	8
BSG-200	9.000	5.040.000	5.860	200	3.000	3.300	6.500	16.200	750	15.900	8
BSG-235	10.000	5.600.000	6.510	235	3.100	3.400	6.700	1.800	800	18.000	8.5
BSG-250	11.250	6.300.000	7.325	250	3.200	3.500	7.000	18.600	850	19.800	9
BSG-275	12.000	6.720.000	7.810	275	3.300	3.600	7.075	20.300	900	21.600	9
BSG-300	13.500	7.560.000	8.790	300	3.300	3.600	7.200	21.900	900	22.500	9.5
BSG-335	15.000	8.400.000	9.765	335	3.600	3.900	7.300	27.600	900	25.200	10
BSG-350	16.000	8.960.000	10.415	350	3.700	4.000	7.400	28.400	950	26.100	10.5
BSG-400	18.000	10.080.000	11.720	400	3.750	4.050	7.600	31.800	1.000	29.500	11
BSG-450	20.000	11.200.000	13.023	450	3.800	4.100	7.750	34.300	1.000	30.500	11.5
BSG-500	23.000	12.600.000	14.650	500	4.200	4.500	7.800	38.000	1.050	32.800	12
BSG-550	25.000	14.000.000	16.280	550	4.200	5.370	8.100	43.500	1.100	33.400	13
BSG-600	27.000	15.120.000	17.580	600	4.300	5.520	8.100	50.400	1.100	36.800	14
BSG-650	30.000	16.800.000	19.535	650	4.500	5.720	8.150	53.200	1.200	38.300	14.5

Materials:

Parts	Materials
Pressure Steel Plates (Outer shell, furnace, front plate, middle plate, rear plate, support plates and reversal chamber plates) + Jacking Points	TS EN 10028-2 P265GH or P355GH (Depending on the design)
Doors and Flame Boxes	TS EN10025-2 S235JR
Fire Tubes	TS EN 10216-2+A1 P235GH Normalized Seamless Boiler Tubes
Stay Rods	TS EN10025-2 S275JR
Flanges	TS EN1092-1 P235GH
Nozzles	TS EN10216-2 P235GH



Isolation	Outer Insolation	TS EN 13167+A1 100 mm thick 80 kg/m ³ density rock wool covered with 0.8 mm embossed aluminum sheet coating	
	Joints	Doors	E-Glass Fiberglass Braided Rope
		Manholes	Graphite Laminate Gasket
		Rear Access Door's Viewing Sight Port	Graphite Laminate Gasket + Silicone Sealant
Refractory	ATB50 Refractory Cement		

Boiler's Accessories:

- Steam & Water Fittings:

As standard, the valves and gauges we offer comply with TS EN 12953 and are fitted to the boiler with suitable nozzles according to TS EN10216 standards and flanges according to TS EN1092 standards. Flange fixing is by metric studs and nuts or bolts. Standard valves and fitting are as below:

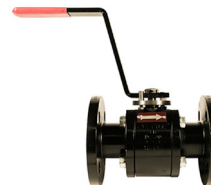
Fittings	Brand	Qty.
Steam Main Outlet Valve (Globe)	BONETTI	1
Feed Water Inlet Valve (Globe)	BONETTI	1
Feed Water Inlet Check Valve (Disco)	VALFTEK	1
Level Column Blowdown Valve (Globe)	BONETTI	2
Air Discharge Valve (Globe)	BONETTI	1
Bottom Manual Blowdown Valve (Full Bore Ball)	VALFTEK	1
Secondary Bottom Blowdown Valve (Full Bore Ball)	VALFTEK	1
Upper Blowdown Valve (Globe)	BONETTI	1
Upper Blowdown Check Valve (Disco)	VALFTEK	1
Full Lift Spring Loaded Safety Relief Valve	TERMO	2



Globe Valve
Brand: BONETTI



Disco Check Valve
Brand: VALFTEK



Full Bore Ball Valve
Brand: VALFTEK



Full Lift Spring Loaded Safety Relief Valve
Brand: TERMO



Feedwater Fittings:

Fittings	Brand	Qty.
Mechanically Sealed Vertically Mounted Stainless Centrifugal Feedwater Pump	MASDAF	2
Pump Inlet Valve (Full Bore Ball)	VALFTEK	2
Pump Outlet Discharge Valve (Full Bore Ball)	VALFTEK	2
Column Discharge Valve (Full Bore Ball)	AYVAZ	2
Pump Inlet Strainer	VALFTEK	2
Pump Outlet Check Valve (Disco)	AYVAZ	2
Manometer	PAKKENS	1
Three-Way Manometer Tap	PAKKENS	1
Manometer Syphon	PAKKENS	1
Pump Inlet - Outlet Connection Column	BETA KAZAN	1



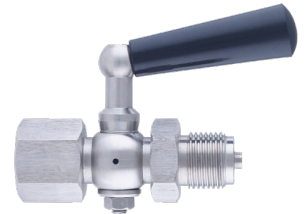
Feedwater Pump
Brand: MASDAF



Strainer
Brand: VALFTEK



Manometer
Brand: PAKKENS



Manometer Tap
Brand: PAKKENS



Manometer Syphon
Brand: PAKKENS

Water Level Control:

Standard Control

Control Instruments	Brand
Water Level Indicator with Reflex Glass	AYVAZ
On-Off Level Control System Signals: <ul style="list-style-type: none"> ▪ Pump On/Off ▪ High Level Alarm ▪ Low level Alarm 	ATECH

Optional Control

Control Instruments	Brand
Second Low - High Water Level Alarm System	ATECH
Magnetic Water Level Indicator	AYVAZ
Modulating Level Control	ATECH
Combined Surface & Bottom Blowdown Control System Components: <ul style="list-style-type: none"> ▪ Controller ▪ Conductivity Sensor ▪ Corner Sensor + Elbow ▪ Surface + Bottom Control Valve 	ATECH
Sampling Container	ATECH



Reflex Glass Level Indicator
Brand: AYVAZ



On-Off Level Control System
Brand: ATECH



Magnetic Level Indicator
Brand: AYVAZ



Modulating Level Control
Brand: ATECH



Sampling Container
Brand: ATECH



Combined Blowdown Control System
Brand: ATECH

■ Pressure Control:

Control Instruments	Brand
Manometer	PAKKENS
Three-Way Pressure Gauge Tap	PAKKENS
Pressure Gauge Syphon	PAKKENS
Vacuum Breaker	AYVAZ
High Pressure Alarm Pressure Switch	DANFOSS



High Pressure Alarm Pressure Switch
Brand: DANFOSS



Vacuum Breaker
Brand: AYVAZ

Notes:

- Fittings' materials are provided for the rating, pressure and temperature requirements.
- Different brands and additional fittings can be provided according to the customer's wishes.

Combustion Equipment:

The preferred brand for BETA KAZAN Boiler Company is **elco**. “ELCO”, a German manufacturer with more than 90 years of experience in the design and production of burners and part of the Ariston Group, is a leading brand in the development of innovative combustion technologies, especially in the industrial sector. ELCO offers a wide range of power as well as fuels (Gas, light oil, heavy oil and dual fuel) and modulation types (electronic, mechanical and pneumatic).



Note:

BETA KAZAN Boiler Company is burner neutral, that is a wide variety of manufacturers of burners can be adapted depending on the wishes of the customer.

Electrical Control Panel:

The panel will have a cabinet type construction with necessary electrical components to ensure combustion, operation and safety controls by centrally controlling all devices used in the steam boiler and feed water pump system.

Elements such as fuses, thermals, contactors, signal lamps, etc. of all motors and electrical devices are included in the panel while providing safe connections between the panel and the devices. On the panel, boiler saturated steam pressure, saturated steam temperature, flue gas temperature can be visually monitored instantly on a screen with the help on pressure and temperature transmitters.

Paint Colors:

Surfaces are degreased prior to painting and one coat of primer, one coat of undercoat and one finishing coat is applied.

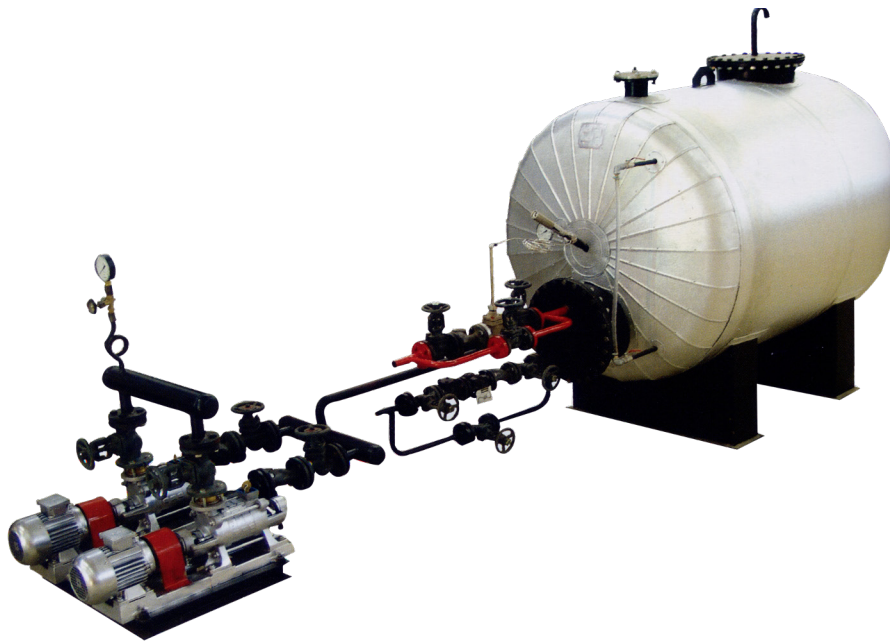
Standard colors are as follows:

Section	Color
Base frame, all Valves, Platform and Ladder (when fitted)	Black
Front and Rear Casings	Black
Doors	Red
Sheeting	Embossed Aluminum
Burner	Manufacturer's Standard
Control Panel	Light Grey / White

Optional Adds-Ons:

- Condensate Tank:

It is manufactured as a horizontal or vertical type with a capacity suitable for the boiler with a design pressure of 0.2 bar and a test pressure of 0.8 bar. Manufacturing will be in accordance with DIN 6616 norm. St37 quality black sheet metal will be used in accordance with DIN 17100 norm in addition to condensate water inlet and outlet flanged connections. The tank will be insulated by 50 mm thick glass wool having density of 14 kg/m³ and covered with galvanized, aluminum, cold rolled steel or stainless sheet, according to the customer's preference. In cases where it is necessary to heat the water in the tank, heating coils are added.



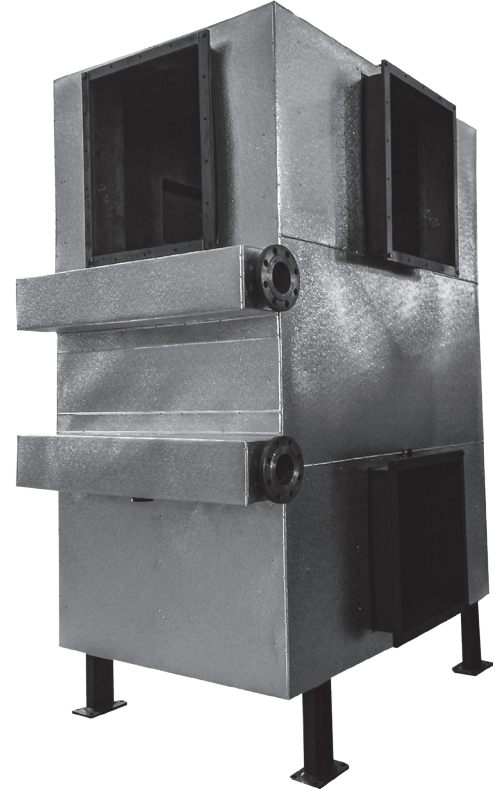
Fittings	Brand	Qty.
Magnetic Water Level Indicator	AYVAZ	1
Level Control Unit and Probe <i>Signals:</i> <ul style="list-style-type: none"> Solenoid On/Off High Level Alarm Low level Alarm 	AYVAZ	1
Magnetic Water Level Indicator Connection Valves (Full Bore Ball)	VALFTEK	2
Magnetic Water Level Indicator Blowdown Valve (Stainless Full Bore Ball)	AYVAZ	1
Solenoid Valve	KONSAN	1
Solenoid Connection Valves (Brass Full Bore Ball)	KONSAN	3
Solenoid Inlet Strainer	KONSAN	1
Solenoid Outlet Check Valve	KONSAN	1
Deaerator Bypass Valve (Full Bore Ball)	VALFTEK	1
Condensate Tank Discharge Valve (Full Bore Ball)	VALFTEK	1
Water Sampling Valve (Full Bore Ball)	KONSAN	1
Ø100 mm, 0-120 °C Rear Entry Thermometer	PAKKENS	1

- Economizer:

Waste flue gas is reused to obtain hot water, hot air fed to the boiler. It is calculated to bring fuel savings of 3 - 8% and pays for themselves in a short time.

The economizer will have St 37 quality steel drawn pipes, while its body and coil's mirror will be manufactured from St 37 quality steel with elbow rotation in appropriate size to provide sufficient heating surface. Flue gas path and feed water connection flanges will be installed with cleaning covers. The serpentine section will be insulated with 50 mm thick rockwool covered 0.80 mm embossed aluminum sheet.

Fittings	Brand	Qty.
Economizer Inlet-Outlet Bypass Valves (Globe)	BONETTI	3
Economizer Inlet Check Valve (Disco)	VALFTEK	1
Economizer Air Discharge Valve (Stainless Full Bore Ball)	AYVAZ	1
Economizer Discharge Valve (Stainless Full Bore Ball)	AYVAZ	1
Full Lift Spring Safety Valve (Opening Pressure at 9 Bar)	TERMO	1
Ø160 mm, 0-16 Bar Manometer	PAKKENS	1
Ø100 mm, 0-160 °C Rear Entry Thermometer	PAKKENS	2
Manometer Syphon	PAKKENS	1
Three-Way Manometer Tap	PAKKENS	1



- Deaerator:

Deaerator feedwater tank will be manufactured according to DIN 6616 and TS EN 12285-2 horizontal steel tank standards with a construction suitable to accommodate the sprinkler system in order to remove corrosive gases such as free Oxygen (O₂) and Carbon Dioxide (CO₂) dissolved in the steam boiler feed water, which cause corrosion on metal surfaces. It will be made from EN 10025-P2-04 S235JR quality black sheet metal. There will be a manhole, dome connection flange, heater steam inlet, condensate water outlet, boiler feed outlet, blowdown connections, level indicator and control, thermometer, vacuum breaker, 2 (two) eye bolts, coil pipe installation and pipe support on the tank. Storage heater coil pipes will be manufactured from B-P235GH pipes conforming to EN 10216-3.1 norms. After the hydrostatic test control is carried out, the insulation sheets will be mounted and will be covered with 50 mm thick stone wool and then with 0.80 mm thick embossed aluminum sheet.



Deaerator Dome Fittings

Fittings	Brand	Qty.
Deaerator Dome Condensate Water Inlet Check Valve	VALFTEK	3
Deaerator Dome Low Pressure Steam Inlet Valve (Globe)	BONETTI	1
Deaerator Dome Low Pressure Steam Inlet Check Valve (Disco)	VALFTEK	1
Ø160 mm, 0-2.5 Bar Manometer	PAKKENS	1
Manometer Syphon	PAKKENS	1
Three-Way Manometer Tap	PAKKENS	1

Deaerator Feedwater Tank Fittings

Fittings	Brand	Qty.
Magnetic Water Level Indicator	AYVAZ	1
Level Control Unit and Probe <i>Signals:</i>	AYVAZ	1
▪ Solenoid On/Off		
▪ High Level Alarm		
▪ Low Level Alarm		
Magnetic Water Level Indicator Connection Valves (Full Bore Ball)	VALFTEK	2
Magnetic Water Level Indicator Blowdown Valve (Stainless Full Bore Ball)	AYVAZ	1
Feedwater Tank Discharge Valve (Full Bore Ball)	VALFTEK	1
Feedwater Tank Inlet Valve (Full Bore Ball)	VALFTEK	1
Vacuum Breaker Disco Check Valve	VALFTEK	2
Sampling Container Valve (Brass Full Bore Ball)	KONSAN	1
Ø100 mm, 0-120 °C Rear Entry Thermometer	PAKKENS	1

Low Pressure Line Accessories Fittings

Fittings	Brand	Qty.
Pressure Reducer Inlet Valve (Globe)	BONETTI	1
Pressure Reducer Inlet Strainer	VALFTEK	1
Pressure Reducer Valve	SAMSON	1
Full Lift Spring Safety Valve (Opening Pressure at 1 Bar)	CEMKA	1
Ø160 mm, 0-16 Bar Manometer	PAKKENS	1
Ø160 mm, 0-2.5 Bar Manometer	PAKKENS	1
Three-Way Manometer Tap	PAKKENS	2
Manometer Syphon	PAKKENS	2
Condensate Collection Line in Front of Pressure Reducer	AYVAZ	1

Feedwater Tank Heating Line Fittings

Fittings	Brand	Qty.
Thermostatic Valve's Inlet, Outlet, Bypass, Valves (Globe)	AYVAZ	1
Steam Trap Inlet, Outlet, Bypass Valves (Full Bore Ball)	AYVAZ	3
Thermostatic Valve Inlet Strainer	AYVAZ	1
Steam Trap Inlet Strainer	AYVAZ	1
Steam Trap Inlet Check Valve (Swing)	AYVAZ	1
Feedwater Temperature Control Valve (Thermostatic)	SAMSON	1
Feedwater Condensate Line's Heating Section's Steam Trap (Float)	AYVAZ	1

Deaerator Pump & Related Fittings

Fittings	Brand	Qty.
Mechanical Sealed Vertical Stainless Centrifugal Pump	MASDAF	2
Pump Inlet Valve (Full Bore Ball)	VALFTEK	2
Pump Outlet Discharge Valve (Full Bore Ball)	VALFTEK	2
Column Discharge Valve (Full Bore Ball)	AYVAZ	2
Pump Inlet Strainer	VALFTEK	2
Pump Outlet Check Valve (Disco)	AYVAZ	2
Ø100 mm, 0-16 Bar Manometer	PAKKENS	1
Three-Way Pressure Manometer	PAKKENS	1
Manometer Syphon	PAKKENS	1
Pump Inlet - Outlet Connection Column	BETA KAZAN	1



Deaerator head will be made from DIN EN SS 304 stainless steel. A manhole on the dome, connection flanges to the deaerator tank on the lower dome, a condensate water inlet, a vent and a manometer will be included as well as other flanges, sleeves, strainers and demisters. The deaerator will have a ladder of appropriate size and construction to be able to intervene in the dome. The latter will be insulated with 50 mm thick stone wool covered it with 0.80 mm thick embossed aluminum sheet.

- Steam Collector:

The Steam Collector will be constructed from TSE 346/1 compliant St37 quality pipe, closed on both sides with a curved shape of appropriate size with condensate pocket and all necessary connection ports.

Fittings	Brand	Qty.
Steam Boiler Connection Valve (Globe)	BONETTI	1
Deaerator Steam Inlet Valve (Globe)	BONETTI	1
Thermostatic Steam Trap	AYVAZ	1
Steam Trap Inlet, Outlet, Bypass Valves (Stainless Full Bore Ball)	AYVAZ	3
Collector's Water Inlet & Discharge Valves (Stainless Full Bore Ball)	AYVAZ	1
Steam Trap Inlet Strainer (Stainless)	AYVAZ	1
Steam Trap Outlet Check Valve (Stainless Swing)	AYVAZ	1
Ø160 mm, 0-250 °C Bottom Entry Thermometer	PAKKENS	1
Ø160 mm, 0-16 Bar Manometer	PAKKENS	1
Manometer Syphon	PAKKENS	1
Three-Way Manometer Tap	PAKKENS	1

- Steel Chimney & Horizontal Ducts:

The chimney and ducts are self-supporting type, manufactured from St 37.2 quality black sheet metal, and the required height is achieved by combining the parts with electric arc welding as a flanged connection.

The chimney will be manufactured with a base plate, rain cap and cleaning cover, and a horizontal ducting connection of appropriate size and diameter will be made. The outer surface will be painted with a heat-resistant paint.



Additional Notes:

BETA KAZAN Boiler Company prioritizes seamless operation by building with non-proprietary parts. Most of the time, a ready stock of necessary parts is maintained with very competitive price rates in order to eliminate downtime. However, in case providing the parts in a timely manner is not possible, the customer is able to service and source them from other vendors at their convenience.

Products produced by **BETA KAZAN Boiler Company** or by other manufacturers will comply with EN - DIN - TSE norms and standards.

The boiler's manufacturing and assembly (without add-ons) is expected to last at most **8 (eight) weeks**.

Boiler General Arrangement Drawing and **Electrical Wiring Diagrams** are provided.

Certificate of Compliance is provided, certified by independent Inspection Authority (TÜRK LOYDU).

Operation and Maintenance Manual is provided.

In addition to the commissioning of the steam system, including the electrical and mechanical installation connections between the units, ensuring the system is in working order is the responsibility of **BETA KAZAN Boiler Company**.

After the system is commissioned, the warranty duration is **2 (two) years** against manufacturing and workmanship defects. The warranty does not cover damages that may occur due to the cessation of the system's operation, except those related to material defects and workmanship errors. Materials/accessories sourced from abroad (outside Turkey) are under the warranty of the manufacturers and importers.



BETAKAZAN

BETA KAZAN Boiler Company

Your Industrial Energy Strength

Saray Mahallesi Saraykent Sanayi Bölgesi, 64. Cad., No: 17/A, 06980 Kahramankazan / Ankara / TÜRKİYE
Tel.: +90 312 815 25 25 • Fax: +90 312 815 25 40

www.betakazan.com
info@betakazan.com