

PRODUCTS



AKKAYA
B O I L E R S



AKKAYA HEATING INSTRUMENTS MANUFACTURING INC.

AKKAYA HEATING INSTRUMENTS MANUFACTURING INC. located in Konya / Turkey is a family owned company that has been involved in boiler production since its establishment in 1964. Activities of the company are being carried out in Konya plant having a 13000 m² open and a 10000 m² closed area. Nearly 80% of company's annual production is being exported over 50 countries all over the world.

In addition to its continuous production of conventional gas, oil or electric fired systems for more than half a century, main interest of the company has been designing, manufacturing and exporting innovative Steam, Hot Water and Thermal Oil boilers using various kinds of solid fuel including biomass/biogas from recovered wastes over the last decade.

Thanks to many years of experience in heating field and strong engineering base, AKKAYA INC. has improved valuable solutions for providing highly

effective biomass fired boiler designs, fuel combustion systems, exhaust gas filtration systems, exhaust gas heat recovery systems, overall system efficiency and safety controls.

Company R&D studies are being carried out continuously and quite a big part of its turnover is being invested at this field each year.

Regarding the global need for renewable energy systems AKKAYA INC. also aims to provide steam, hot water and thermal oil systems that are using recovered energy sources, to new age power generation plants all over the world.

Having a strong awareness for environmental concerns AKKAYA INC. is prepared to serve the world with best effort of providing relevant products.

SERVICES

AKKAYA INC. provides turnkey boiler room solutions to customers where the installed systems include all accessories and safety/control equipment necessary for systems' operation.

Company's own sales and after sales team is at customer's service regardless of the installation location. Besides at site services via our agents and solution partners all over the world is an option. Start-up and commissioning supervisions or main tasks are also provided by company's staff.

AKKAYA INC. provides up to 5 years of guarantee for its own manufacturing and boiler lifetime guarantee for spare parts supply.

Recommended lifetime for boilers must be considered as 10 years (relevant to international norms.) However, most of AKKAYA boilers have been operated for more than 10 years, as long as the user instructions that

AKKAYA has provided are followed by our loyal customers.

For all pressurized equipment manufactured by AKKAYA INC. EU norm (PED 2014/68) is followed and products are supplied with CE certification. In case of different specific norms are required, AKKAYA can provide them, too.

Welding are carried out by AKKAYA INC. staff certified according to EN9606 norm.

UT tests are carried out by AKKAYA Inc. level II certified NDT staff.

PRODUCTS

STEAM BOILERS

Liquid - Gas - Electricity - Solid Fuel - Biomass
Biogas and Waste Heat as Fuel

THERMAL OIL HEATERS

Liquid - Gas - Solid Fuel - Biomass
Biogas and Waste Heat as fuel

HOT / SUPERHEATED WATER BOILERS

Liquid - Gas - Electricity - Solid Fuel - Biomass
Biogas and Waste Heat as fuel

SOLID FUEL / BIOMASS FUEL FEEDERS AND COMBUSTION SYSTEMS

BOILER ROOM AUXILIARIES

CERTIFICATES



KYS – Quality Management
System Certificate
ISO9001:2015



Certificate of Conformity
to Turkish Standards
TS 377



HYB – Service Qualification
Certificate



European Conformity
Certificates
PED2014/68



WPQ – Welder
Performance Qualification
EN9606



WPQR – Welding Procedure
Qualification Record
EN15614



WPS – Welding Procedure
Specification - EN15609



NDT Non Destructive
Testing Personnel
Certificates - EN9712



SBK & TFB SCOTCH TYPE STEAM BOILERS

Steam Production Capacity (SBK)

320 kg/h - 18.000 kg/h

Steam Production Capacity (TFB)

20.000 kg/h - 30.000 kg/h

Operating Pressure

0,5-20 Bar

Fuel Type:

Natural Gas, LPG, Diesel, Heavy Fuel Oil





SBK & TFB model boilers are designed and manufactured according to the system which transfers more of the usable heat to the water to increase the steam production efficiency by the "3 pass" principle of fire and smoke inside the boiler. This model is also known as "SCOTCH TYPE".

SBK & TFB model boilers are suitable to be used with gas and oil burners.

TFB model boilers have larger steam generation capacities by the help of double furnace design. This type boilers that have double burner design also provide fuel saving thanks to its steam generation modulation in a wide range.

The exhaust gas temperature is decreased to an optimum level, so the operating efficiency & lifetime of the boiler is increased.

The heat transfer area of the boiler is indicated precise and it is the net area along where, the heat is transferred inside the boiler. (Approximately 40 kg steam is obtained from 1 m² of heating area.)

The design of SBK type boilers allows to obtain steam, approximately twice in amount, compared with the same heat transfer area of a solid fuel fired steam boiler.

For the high operating pressure values; the furnace is produced in corrugated form to eliminate the thermal expansions and to obtain sufficient strength. SBK model boilers can be produced for an operating pressure range of 0,5 bar – 20 bar. Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

Isolation of the boiler is specially made to minimize the thermal energy loss. Special covering plates are used on the surface, to protect the shell of the boiler from outdoor conditions and to prevent tearing.

SBK boiler body consists of: Cylindrical, 3 pass, wet back main body with fire tubes and plain or corrugated furnace at proper thickness, according to the boiler's operating pressure. EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

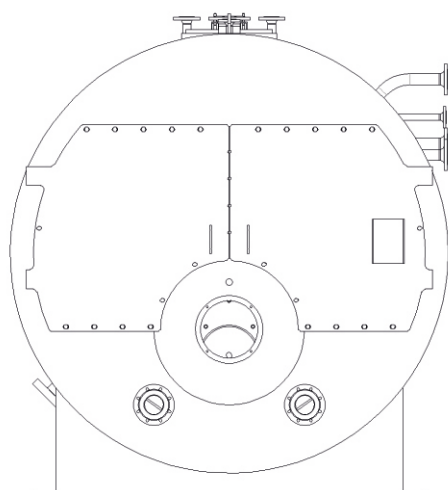
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

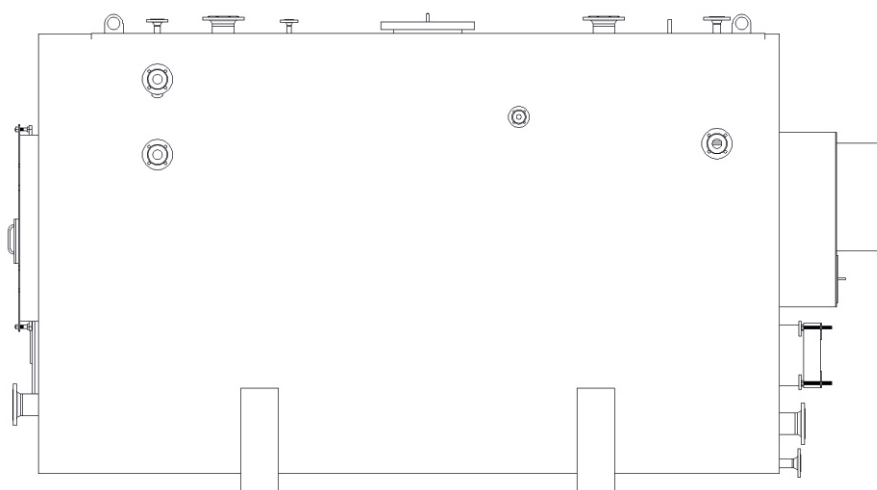




CAPACITIES AND DIMENSIONS TABLE FOR SBK MODEL BOILERS



FRONT VIEW



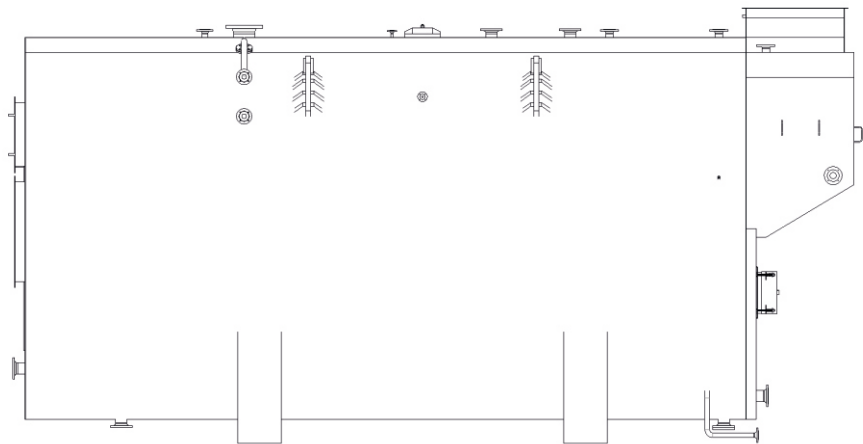
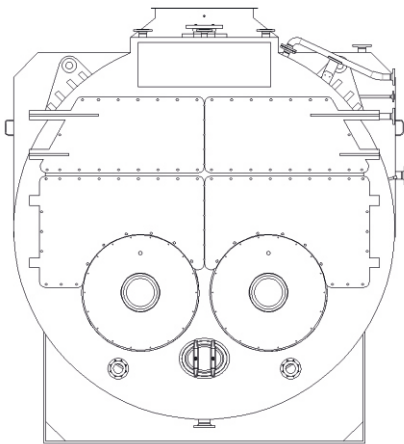
LEFT VIEW

Model	Maximum Thermal Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
SBK 8	320	200.000	2200	1500	1700	1350
SBK 10	400	250.000	2400	1500	1700	1400
SBK 15	600	375.000	2500	1900	2200	2350
SBK 20	800	500.000	3000	1900	2200	2700
SBK 30	1200	750.000	3200	2100	2400	3800
SBK 40	1600	1.000.000	3800	2100	2400	4350
SBK 50	2000	1.250.000	3900	2400	2700	5400
SBK 60	2400	1.500.000	4400	2400	2700	6200
SBK 70	2800	1.750.000	4900	2400	2700	6850
SBK 80	3200	2.000.000	4700	2400	2600	7300
SBK 90	3600	2.250.000	5200	2400	2600	7962
SBK 100	4000	2.500.000	5600	2400	2600	8573
SBK 125	5000	3.125.0000	5100	2700	3100	11100
SBK 150	6000	3.750.0000	5800	2700	3100	12500
SBK 175	7000	4.375.000	6500	3100	3300	15850
SBK 200	8000	5.000.000	7100	3100	3300	18700
SBK 250	10000	6.250.000	7000	3100	3400	19350
SBK 300	12000	7.500.000	8000	3100	3400	23000
SBK 350	14000	8.750.000	7700	3500	4100	27500
SBK 400	16000	10.000.000	8500	3500	4100	31050
SBK 450	18000	11.250.000	8700	3500	4100	33650

***10 bar & empty W/O accessories**



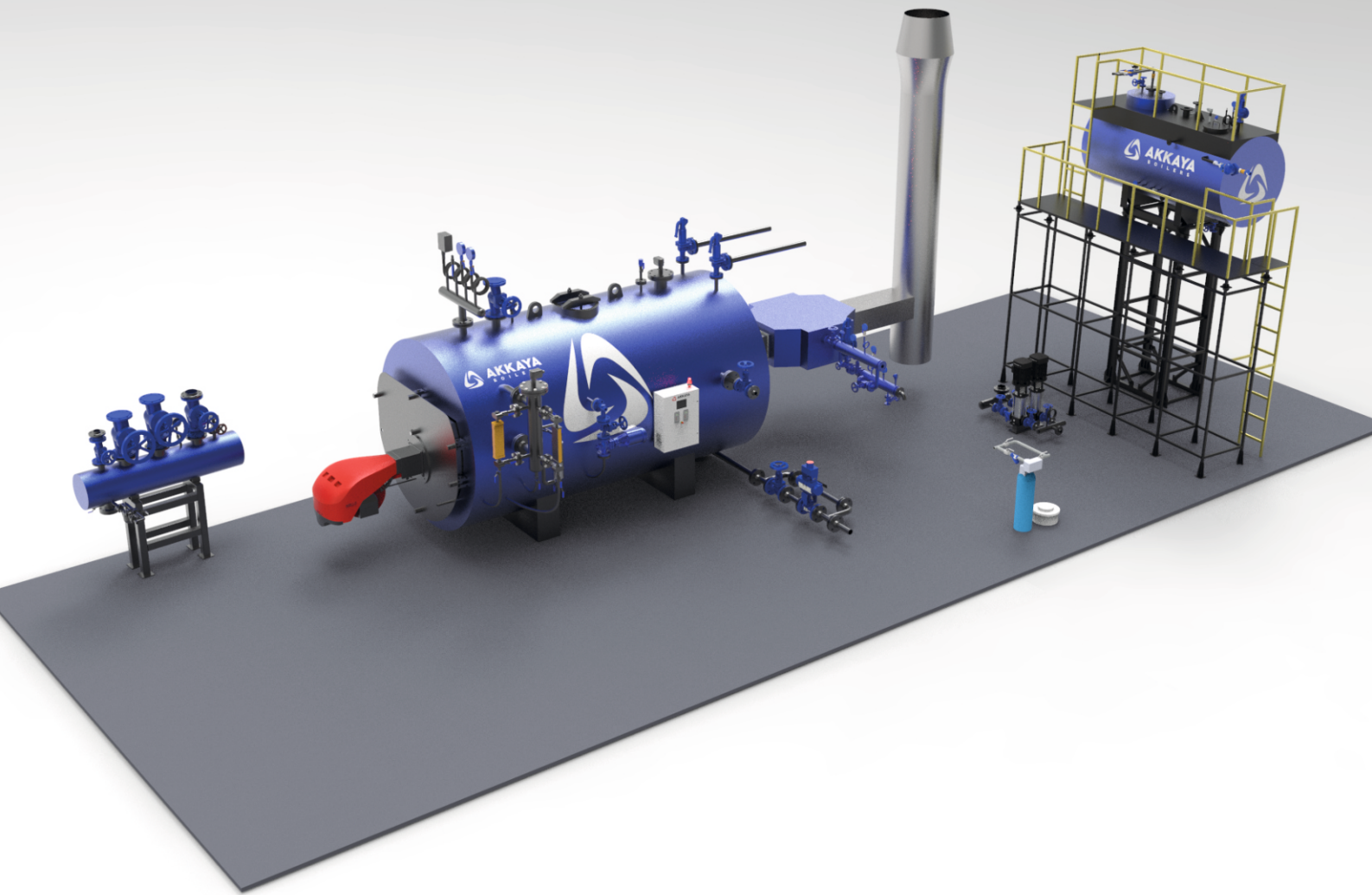
TFB MODEL BOILER



CAPACITIES AND DIMENSIONS TABLE FOR TFB MODEL BOILERS

Model	Max. Thermal Capacity FGA 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
TFB 20	20000	12.500.000	7600	4000	4700	36000
TFB 22	22000	13.750.000	8400	4000	4700	40000
TFB 24	24000	15.000.000	7750	4300	5000	44000
TFB 25	25000	15.625.000	8250	4300	5000	46000
TFB 26	26000	16.250.000	8600	4300	5000	48000
TFB 28	28000	17.500.000	8800	4300	5000	52000
TFB 30	30000	18.750.000	9200	4300	5000	54000

*10 bar & empty W/O accessories



KBB-E REVERSE FLAME STEAM BOILERS

Steam Production Capacity:

300 kg/h - 4.000 kg/h

Operating Pressure

0,5-20 Bar

Fuel Type:

Natural Gas, LPG, Diesel, Heavy Fuel Oil



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KBB model boilers are designed and manufactured according to the system which transfers the usable heat of fire and smoke inside the boiler to the water by the 2 pass principle. This model is also known as 'REVERSE FLAME'.

The size of KBB model is smaller than the same capacity 3 pass boilers which allows an easy installation and decreases the initial investment cost. To increase the boiler efficiency, stainless steel turbulators are placed inside fire tubes.

The heat transfer area of the boiler is indicated definite and it is the net area along where, the heat is transferred inside the boiler.

KBB model boilers are suitable for operating with high pressure gas and oil burners.

For the high operating pressure values. For the high operating pressure values; the furnace is produced in corrugated form to eliminate the thermal expansions and to obtain sufficient strength. KBB model boilers can be produced for an operating pressure range of 0,5 bar – 20 bar. Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

Isolation of the boiler is specially made to minimize the thermal energy loss. Special covering plates are used on the surface, to protect the shell of the boiler from outdoor conditions and to prevent tearing.

KBB boiler body consists of: Cylindrical, 2 pass, wet back main body with fire tubes and plain or corrugated furnace at proper thickness, according to the boiler's operating pressure. EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

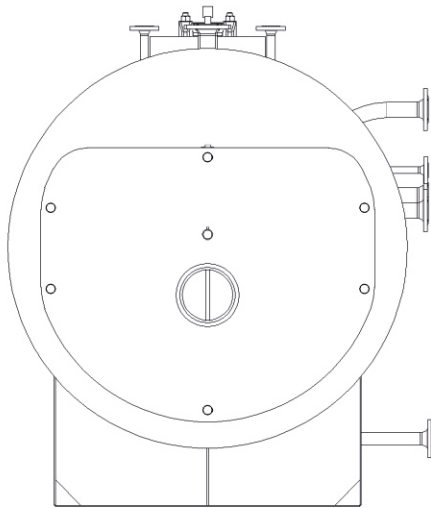
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

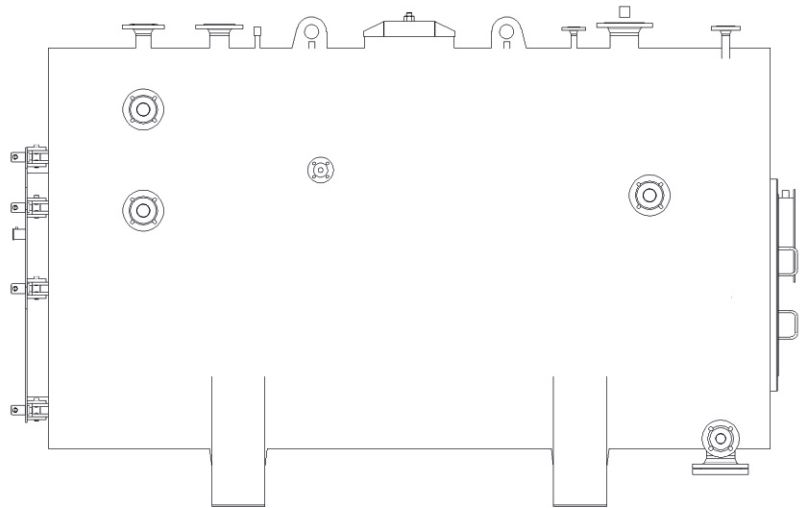




CAPACITIES AND DIMENSIONS TABLE FOR KBB MODEL BOILERS



FRONT VIEW



SIDE VIEW

Model	Maximum Steam Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
KBB 300-E	300	180.000	2250	1450	1750	2800
KBB 500-E	500	300.000	2650	1450	1750	3000
KBB 750-E	750	450.000	2650	1600	1900	3500
KBB 1000-E	1000	600.000	3250	1600	1900	3600
KBB 1250-E	1250	750.000	3250	1900	2200	4250
KBB 1500-E	1500	900.000	3650	1900	2200	4650
KBB 2000-E	2000	1.200.000	4000	2100	2400	5300
KBB 2500-E	2500	1.500.000	3650	2250	2700	5950
KBB 3000-E	3000	1.800.000	4100	2500	2700	6800
KBB 3500-E	3500	2.100.000	4000	2500	2700	7500
KBB 4000-E	4000	2.400.000	4200	2500	2750	8250

***10 bar & empty W/O accessories**



PSB SERIES

PACKAGED TYPE

KBB MODEL

STEAM BOILERS

Steam Production Capacity:

300 kg/h - 4.000 kg/h

Operating Pressure

0,5-20 Bar

Fuel Type:

Natural Gas, LPG, Diesel, Heavy Fuel Oil



AKKAYA
BOILERS



PSB series steam boilers are packaged type of KBB model boilers for easy installation and operation.

This configuration is preferred due to low investment costs.

Thanks to the customized package design, which can be produced at different operating pressures, all auxiliary equipment is pre-installed and the system is ready to use. By this way, start-up is quick and easy.

Space requirement is smaller due to their compact design and this minimizes investment cost for boiler room.

Best solution for rental applications.

Safe and stable operation thanks to high-quality safety equipments.

PLC controlled control board with touch screen provides easy operation and remote access that allows technical support to any point in the world quickly. Factory tests are carried out by completing cabling and piping between the components.

Quick and high-quality steam generation due to its high efficiency design.

The robust steel frame allows easy transport and possible damaging risks that may occur during the transportation are eliminated.



Steel Materials: P265GH – P295GH –P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

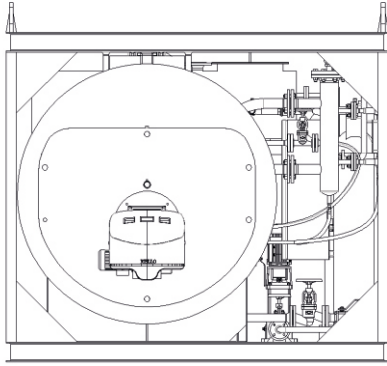
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

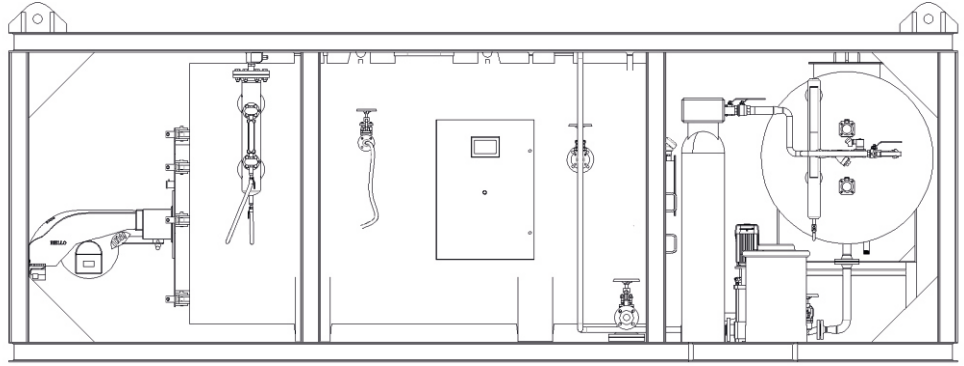




CAPACITIES AND DIMENSIONS TABLE FOR PSB SERIES BOILERS



FRONT VIEW



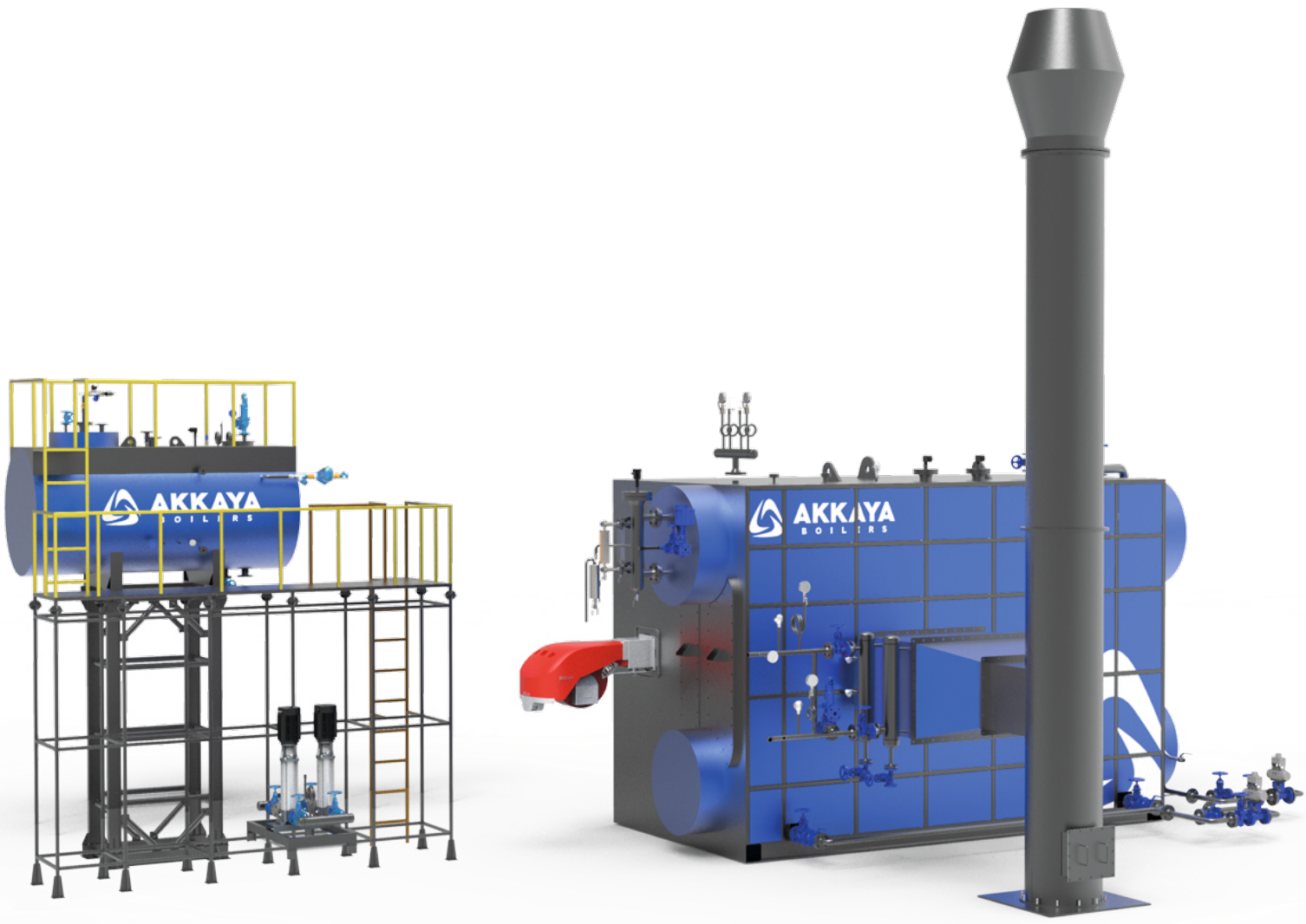
LEFT VIEW

	PSB300	PSB500	PSB750	PSB1000	PSB1250	PSB1500	PSB2000	PSB2500	PSB3000	PSB3500	PSB4000
Steam Generation Capacity (kg/h)	300	500	700	1000	1250	1500	2000	2500	3000	3500	4000
Operating pressure (bar g)	8	8	8	8	8	8	8	8	8	8	8
Thermal Capacity (kW)	209	349	523	698	872	1047	1395	1744	2093	2442	2791
Thermal Capacity (ckal/h)	180K	300K	450K	600K	750K	900K	1.2M	1.5M	1.8M	2.1M	2.4M
Burner Heating Capacity (kW)	246	410	616	821	1026	1231	1642	2052	2462	2873	3283
Steam Outlet Connection (PN16)	DN32	DN50	DN50	DN65	DN65	DN80	DN100	DN100	DN125	DN125	DN125
Electricity Consumption 380V-3Phs-50Hz (kW) **	1,22	1,70	2,70	2,70	3,10	3,50	7,60	7,90	7,90	8,50	9,00
Fuel Consumption/ Diesel (kg/h)	21	35	52	69	87	104	138	173	208	243	278
Fuel Consumption/Natural Gas @ 300 mbar (Nm3/h)	26	43	64	86	107	128	171	214	257	299	342
Fuel Consumption/LPG @ 300 mbar (kg/h)	19	32	48	64	80	96	128	160	193	222	253
Water Consumption @ 6 bar (kg/h)	300	500	750	1000	1250	1500	2000	2500	3000	3000	4000
Length (L) (mm)	4500	5000	5500	5800	6200	6700	7200	7500	8000	8200	9000
Width (W) (mm)	2300	2300	2300	2300	2300	2300	2300	2500	2500	2500	2600
Height(H)(mm)* All Accessories Assembled)	2300	2300	2400	2400	2550	2550	2800	3000	3000	3000	3000
Weight (Kg)	3000	3500	4000	4850	5500	5800	8000	9400	10250	11250	12250

Transport height can be reduced by approx. 200 mm by removing some accessories.

** Technical specifications are based on diesel burner.

Akkaya Inc reserves the right to make changes to the specifications.



WTB-D D TYPE WATER TUBE STEAM BOILERS

Steam Production Capacity:

15.000 kg/h - 120.000 kg/h

Operating Pressure

0,5-40 Bar

Fuel Type:

Natural Gas, LPG, Diesel, Heavy Fuel Oil





WTB-D D type water tube, steam boilers consist of a mud drum and an upper steam drum. The design is a well proven and reliable design for high pressure and high capacity steam producing systems.

The large and sufficient combustion chamber allows the use of different types of oil and gas fuel efficiently.

The structure of the combustion chamber consists of membrane wall type water tube sections. The flue gas travels inside the tube bundle convection heat transfer section and then leaves the boiler from the side smoke exit channel.

Super heater or economiser can be placed in the boiler system on customers' request.

The steam drum design is very important in water tube steam boilers. Akkaya has developed its own cyclone separator design with the help of computer aided analysing.

The heat transfer area of the boiler is indicated definite and it is the net area along where, the heat is transferred inside the boiler.

WTB-D model boilers can be produced for an operating pressure range of 0,5 bar – 40 bar.

Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

Isolation of the boiler is specially made to minimize the thermal energy loss. Special covering plates are used on the surface, to protect the shell of the boiler from outdoor conditions and to prevent tearing.

AKK-WTB boiler consists of: Mud drum, steam drum and water tubes at proper thickness, according to the boiler's operating pressure optional integrated superheater application can be made. EN12952 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

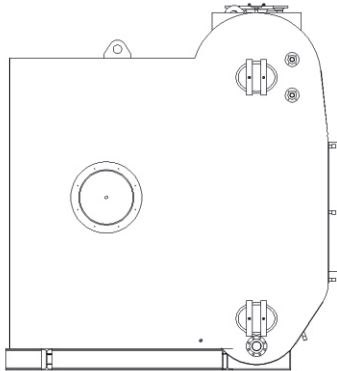
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

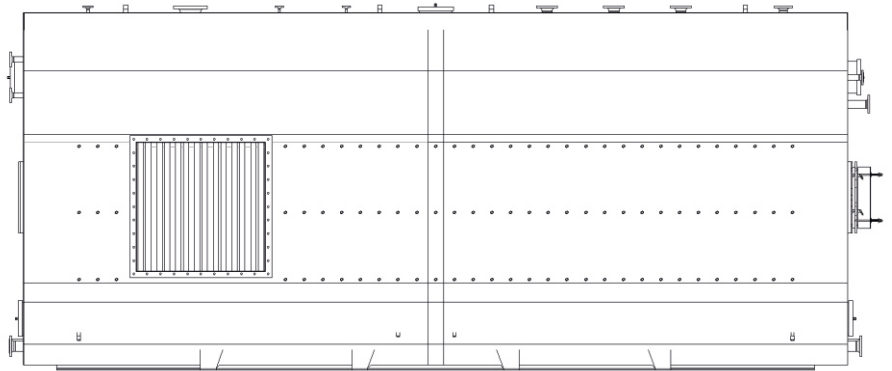




CAPACITIES AND DIMENSIONS TABLE FOR WTB-D MODEL BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
AKK-WTB 15	15000	9.000.000	6000	4000	4100	23000
AKK-WTB 20	20000	12.000.000	7000	4000	4100	26000
AKK-WTB 25	25000	15.000.000	8500	4000	4100	30000
AKK-WTB 30	30000	18.000.000	10000	4000	4100	36000
AKK-WTB 40	40000	24.000.000	11000	4000	4500	75000
AKK-WTB 50	50000	30.000.000	12000	4000	4500	81500
AKK-WTB 60	60000	36.000.000	10000	4500	5300	85500
AKK-WTB 70	70000	42.000.000	11500	4500	5300	94000
AKK-WTB 80	80000	48.000.000	12500	4500	5300	103500
AKK-WTB 90	90000	54.000.000	10000	6000	6500	149500
AKK-WTB 100	100000	60.000.000	11500	6000	6500	162500
AKK-WTB 110	110000	66.000.000	12500	6000	6500	177000
AKK-WTB 120	120000	72.000.000	14000	6000	6500	177000

Akkaya Inc reserves the right to make changes to the specifications.
Depends on operating pressure and superheater addition



YSB – SEMI CYLINDRICAL SOLID FUEL FIRED STEAM BOILERS

Steam Production Capacity:

150 kg/h - 3.750 kg/h

Operating Pressure

0,5-8 Bar

Fuel Type:

Biomass, Coal, Pellet





YSB model boilers are designed and manufactured according to the well known, three pass design that allows obtaining adequate heating surface and lower exhaust gas temperature compared with two pass design. The half cylindrical compact design brings installation and cost advantages without any sacrifice from heating surface.

YSB model boilers are specially designed for high efficiency at operating pressures up to 5 bar. For higher operating pressures (up to 10 bar) special production can be carried out, upon customer's request.

The indicated heat transfer surface for each capacity is completely correct and it shows the net area along where the heat is transferred to water inside the boiler.

20-25 kg/h steam is obtained from 1 m² heating surface. Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

A wide range of fuel types such as; wood, coal, olive seeds, pellets, nut shells and other types of biomass can be used with this model along with traditional solid fuels like coal.

By implementing an automatic stoker feeding system or an automatic water cooled vibrating grate to the boiler, small sized solid fuel types are easily used for firing.

Isolation of the boiler is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

Boiler consists of a half cylindrical, 3 pass, fire tube, wet back main body and furnace at proper thickness, according to the boiler's operating pressure. EN12953 and TS497 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH – P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

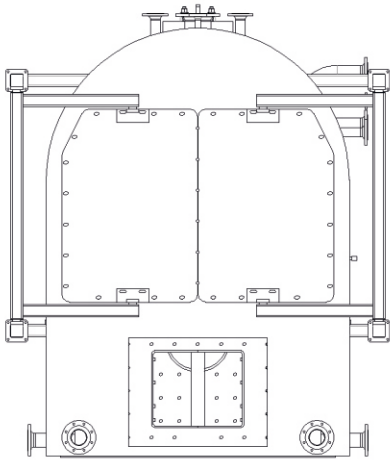
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

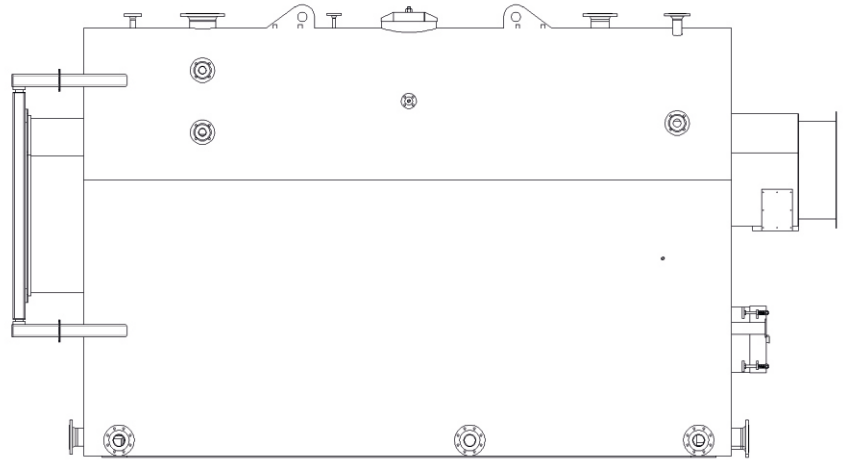




CAPACITIES AND DIMENSIONS TABLE FOR YSB MODEL BOILERS



FRONT VIEW



SIDE VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)*	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)**
YSB6	150	90.000	1700	1010	1600	1169
YSB8	200	120.000	2100	1010	1600	1412
YSB10	250	150.000	2050	1110	1680	1637
YSB15	375	225.000	1950	1210	1950	2075
YSB20	500	300.000	2370	1210	1950	2266
YSB25	625	375.000	2400	1410	2160	3118
YSB30	750	450.000	2700	1410	2160	3227
YSB40	1000	600.000	2600	1610	2300	4000
YSB50	1250	750.000	3050	1610	2300	4499
YSB60	1500	900.000	2650	1810	2700	5780
YSB70	1750	1.050.000	2950	1810	2700	5479
YSB80	2000	1.200.000	3250	1810	2700	5977
YSB90	2250	1.350.000	3250	2010	2860	8037
YSB100	2500	1.500.000	3430	2010	2860	8210
YSB110	2750	1.650.000	3680	2010	2860	8360
YSB 120	3000	1.800.000	3930	2010	2860	8449
YSB 150	3750	2.250.000	4730	2010	2860	10650

* According to solid fuel with 4500 kcal/kg LHV

**5 bar & empty W/O accessories





EBS SERIES

EASY EXPORT PACKAGED YSB MODEL STEAM BOILERS

Steam Production Capacity:

250 kg/h - 2.000 kg/h

Operating Pressure

0,5-8 Bar

Fuel Type:

Biomass, Coal, Pellet





EBS series steam boilers are packaged type of YSB model boilers for easy installation and operation.

EBS series boilers are designed for operation at 8 bar. It can be manufactured for higher operating pressures up to 10 bar or lower operating pressures upon customer's request.

This configuration is preferred to provide low investment cost.

By packaged design all auxiliary equipment is pre-installed and the system is ready to use. By this way, start up is quick and easy.

There is no need to build a refractory foundation in the boiler room which is necessary for solid fired boilers since the packaged system already has it.

Space requirement is smaller due to their compact design and this minimizes investment cost for boiler room.

Best solution for rental applications.

Safe and stable operation thanks to high-quality safety equipments.

PLC controlled control board with touch screen provides easy operation and remote access that allows technical support to any point in the world quickly.

Quick and high-quality steam generation due to its high efficiency design.

The robust steel frame allows easy transport and possible damaging risks that may occur during the transportation are eliminated.

Factory tests are carried out by completing cabling and piping between the components.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

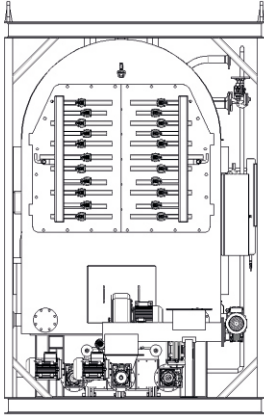
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost1

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

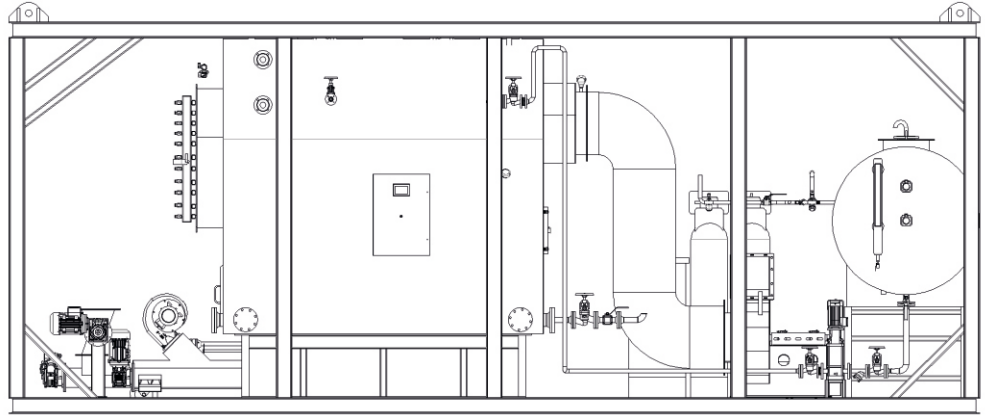




CAPACITIES AND DIMENSIONS TABLE FOR EBS SERIES BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
EBS 250	250	150.000	5800	2200	2550	4200
EBS 375	375	225.000	5800	2200	2800	4600
EBS 500	500	300.000	6100	2200	2800	5100
EBS 625	625	375.000	6500	2300	3050	6000
EBS 750	750	450.000	6850	2300	3050	6300
EBS 1000	1000	600.000	7400	2300	3150	7400
EBS 1250	1250	750.000	7850	2300	3150	8200
EBS 1500	1500	900.000	7500	2300	3550	9300
EBS 1750	1750	1.050.000	8100	2300	3550	9600
EBS 2000	2000	1.200.000	8400	2300	3550	9900

* According to solid fuel with 4500 kcal/kg LHV

**For 5 bar operating pressure

*Transport height can be reduced by approx. 200 mm by removing some accessories.

*According to the situation where all system motors are activated at the same time.

*Akkaya Inc reserves the right to make changes to the specifications.



YHYB- SEMI HYBRID SOLID FUEL FIRED STEAM BOILERS

Steam Production Capacity:

1.500 kg/h - 20.000 kg/h

Operating Pressure

0,5-20 Bar

Fuel Type:

Biomass, Coal, Pellet

(Natural Gas, LPG, Diesel, Heavy Fuel Oil - Optional)





YHYB model boilers are designed and manufactured according to the system that provides adequate heat transfer surface, sufficient steam storage and grate surface for solid fuel applications by connection of the water tube combustion chamber of the hybrid type boilers to a 2 pass fire tube shell boiler.

The water tube type combustion chamber is engineered according to the volumetric load for the solid fuels. Sufficient furnace volume and grate surface area is achieved in order to get maximum combustion efficiency. Fire tube boiler section is working as evaporation heat transfer area. This high volume water chamber allows the boiler to respond peak loads. With high steam chamber volume the boiler can supply dry steam. The flame return chamber's sides are water cooled. This brings higher life time, less refractory maintenance and increased efficiency. As the restart intervals of the boiler, after consuming the steam is increased by the design, the fuel consumption is also optimized. By the help of fire tube boiler's design, gas speed is increased and a cleaner tube surface is obtained.

The increased heating surface of the system by the front combustion chamber allows the indicated steam capacity to be relative with the indicated heating surface value. Approximately 20-25 kg/h steam is produced from 1 m² heating area of YHYB boilers.

(The steam production capacity mostly depends on the LHV of the solid fuel used.)

YHYB model boilers can be used efficiently at operating pressures up to 20 bar. Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

A wide range of solid fuel types such as; wood, coal, olive seeds, pellets, nut shells and other types of biomass can be used with YHYB boilers. By implementing an automatic stoker feeding system or an automatic water cooled vibrating grate to the combustion chamber small sized solid fuel types are easily used for firing.

Isolation of the boiler is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

YHYB boiler body consists of a cylindrical, 2 pass, fire tube, wet back main body with plain or corrugated furnace at proper thickness, according to the boiler's operating pressure and a half cylindrical, water tube front combustion chamber. EN12952 and EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12952 and EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

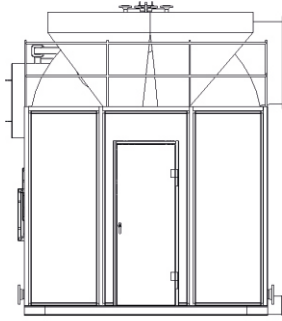
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

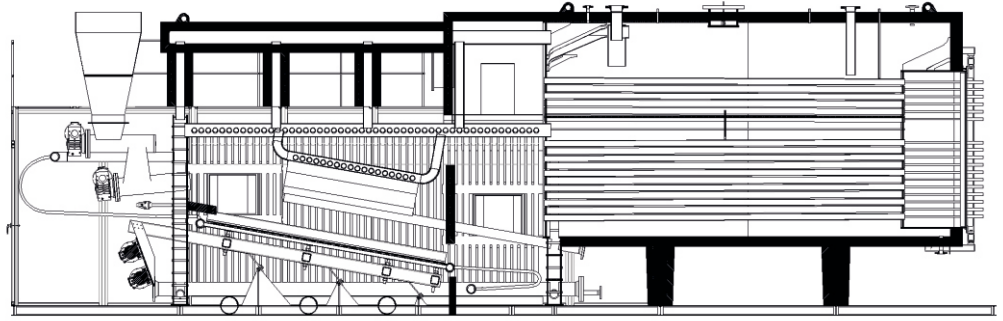




CAPACITIES AND DIMENSIONS TABLE FOR YHYB MODEL BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Max. Thermal Capacity (kcal/h)*	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)**
YHYB500	500	300.000	4500	1750	2750	6000
YHYB1000	1000	600.000	5500	1850	3000	7500
YHYB1500	1500	900.000	6000	2160	3110	9800
YHYB2000	2000	1.200.000	7500	2160	3110	11500
YHYB2500	2500	1.500.000	8850	2160	3310	13750
YHYB3000	3000	1.800.000	8500	2610	3600	18000
YHYB3500	3500	2.100.000	9000	2610	3600	19500
YHYB4000	4000	2.400.000	9500	2610	3600	20600
YHYB5000	5000	3.000.000	9500	2810	3750	27750
YHYB6000	6000	3.600.000	10100	2810	3750	30100
YHYB7000	7000	4.200.000	10900	2810	3750	32700
YHYB8000	8000	4.800.000	12100	3200	3950	39300
YHYB10000	10000	6.000.000	13200	3200	3950	45300
YHYB12000	12000	7.200.000	16250	3200	4950	53800
YHYB14000	14000	8.400.000	18450	3200	4950	60500
YHYB16000	16000	9.600.000	17000	3600	5250	70000
YHYB18000	18000	10.800.000	18300	3600	5250	75500
YHYB20000	20000	12.000.000	18000	3800	5750	82000

* According to solid fuel with 4500 kcal/kg LHV

**6 bar & empty W/O accessories





ELKBJ ELECTRICAL STEAM GENERATORS

Steam Production Capacity:

6 kg/h - 2.000 kg/h

Operating Pressure:

0,5 Bar - 20 Bar

Fuel Type:

Electric



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The system is delivered with all necessary accessories and auxiliary equipment as a package in order to provide easy installation and push button start-up.

The system configuration is selected according to the required operating pressure. For 0-3 bar range, low pressure ELKBJLP series and for 4-20 bar range ELKBJHP models are provided.

Regarding the application areas such as pharmaceutical or food industry where steam can be in direct contact with the products, complete stainless steel models are provided.

Isolation of the boiler is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

ELKBJ steam generator body consists of a: Vertical, tubeless inner body furnished with Cr-Ni, high quality, wet type, electrical resistance heaters. EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH – and S235J – S355J carbon steel for non-pressurized parts or AISI304 / AISI316 stainless steel according to EN12953 and customer requirements

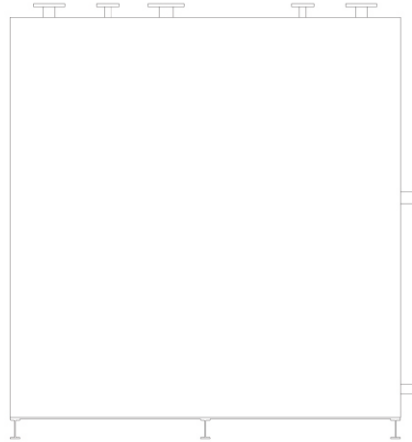
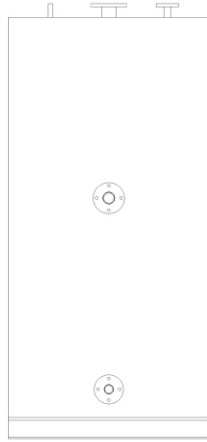
Resistance Heaters: Wet type , Cr-Ni

Isolation: 50 or 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request





CAPACITIES AND DIMENSIONS TABLE FOR ELKBJ MODEL BOILERS



ÖNDEN GÖRÜNÜŞ / FRONT VIEW

SAĞDAN GÖRÜNÜŞ / RIGHT VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Power (kW)	Length (L) (mm)*	Width (W) (mm)*	Height (H) (mm)*	Weight (kg)**
ELKBJ06	6	4,2	850	850	850	113
ELKBJ30	30	21	1060	1060	1440	153
ELKBJ50	50	36	1100	1100	1900	175
ELKBJ75	75	54	1100	1100	1900	210
ELKBJ100	100	72	1250	1250	1900	276
ELKBJ125	125	90	1250	1250	2200	315
ELKBJ150	150	108	1250	1250	2200	315
ELKBJ200	200	144	1350	1350	2200	377
ELKBJ250	250	180	1700	1700	2350	675
ELKBJ300	300	216	1700	1700	2350	675
ELKBJ400	400	288	1700	1700	2350	675
ELKBJ500	500	360	1700	1700	2350	675
ELKBJ750	750	540	2000	2000	2500	1353
ELKBJ1000	1000	720	2000	2000	2500	1353
ELKBJ1250	1250	864	2000	2000	2150	1562
ELKBJ1500	1500	1056	2000	2000	2150	1562
ELKBJ1750	1750	1248	2300	2300	2350	2220
ELKBJ2000	2000	1392	2300	2300	2350	2220
ELKBJ2500	2500	1740	**	**	**	**
ELKBJ3000	3000	2160	**	**	**	**
ELKBJ4000	4000	2880	**	**	**	**
ELKBJ5000	5000	3600	**	**	**	**
ELKBJ6000	6000	4320	**	**	**	**
ELKBJ8000	8000	5760	**	**	**	**
ELKBJ10000	10000	7200	**	**	**	**

**Empty W/O accessories

** Please ask for dimension information for these capacities.



EES SERIES

EASY EXPORT PACKAGED ELKBJ MODEL ELECTRIC POWERED STEAM GENERATORS

Steam Production Capacity:

6 kg/h - 2.000 kg/h

Operating Pressure

0,5-20 Bar

Fuel Type:

Electric





EES series steam boilers are packaged type of ELKBJ model boilers for easy installation and operation.

EES series boilers are designed for operation at 8 bar. It can be manufactured for higher working pressures up to 18 bar or lower operating pressures upon customer's request.

This configuration is preferred due to low investment cost.

Thanks to packaged design customized for the plants that require a relatively lower amount of steam, all auxiliary equipment is pre-installed and the system is ready to use. By this way, start-up is quick and easy. This type of boilers can also be used in different processes by being manufactured at different operating pressures.

It has sufficient steam and water volume designed for continuous and reliable steam generation.

Space requirement is smaller due to compact design and this minimizes investment cost for boiler room. Best solution for rental applications.

Safe and stable operation thanks to high-quality safety equipments.

PLC controlled control board with touch screen provides easy operation and remote access that allows technical support to any point in the world quickly.

Factory tests are carried out by completing cabling and piping between the components.

The robust steel frame allows easy transport and possible damaging risks that may be happened during the transportation is eliminated by the help of this frame.



Steel Materials: P265GH – P295GH -P355GH - and S235J – S355J carbon steel for non-pressurized parts or AISI304 / AISI316 stainless steel according to EN12953 and customer requirements

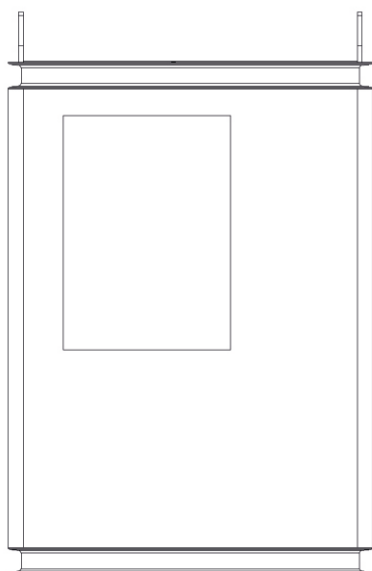
Resistance Heaters: Wet type , Cr-Ni

Isolation: 50 or 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

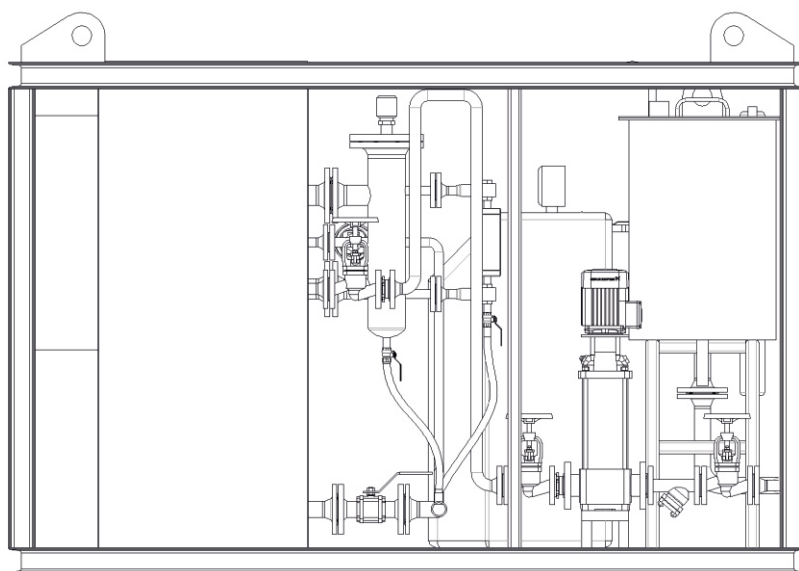




CAPACITIES AND DIMENSIONS TABLE FOR EES SERIES BOILERS



FRONT VIEW



LEFT VIEW

Model	Max. Steam Capacity F&A 100 °C (kg/h)	Power (kW)**	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)*	Weight (kg)
EES06	6	5	1750	850	850	383
EES30	30	22	1960	1060	1440	484
EES50	50	36	2440	1100	1900	575
EES75	75	53	2440	1100	1900	610
EES100	100	71	2640	1250	1900	790
EES125	125	88	3090	1250	2200	895
EES150	150	106	3090	1250	2200	895
EES200	200	141	3290	1350	2200	1010
EES250	250	176	3690	1700	2350	1450
EES300	300	211	3800	1700	2350	1478
EES400	400	281	3900	1700	2350	1506
EES500	500	350	4000	1700	2350	1523
EES750	750	525	5600	2000	2500	2536
EES1000	1000	700	5700	2000	2500	2580
EES1250	1250	874	6660	2000	2150	2899
EES1500	1500	1049	6760	2000	2150	2948
EES1750	1750	1223	7200	2300	2350	3834
EES2000	2000	1398	7300	2300	2350	3877

* The transportation height can be reduced about 200 mm by disassembly of some accessories

** For the case when all the motors on the system run



KYK H HORIZONTAL THERMAL OIL HEATERS

Thermal Capacity:

300 kW - 8.720 kW

Max. Oil Output Temperature:

350°C

Fuel Type:

Natural Gas, LPG, Diesel, Heavy Fuel Oil



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KYK H model horizontal thermal oil heaters are designed to obtain adequate heat transfer surface by using spiral shaped oil tubes inside which can be single or double sectors according to the required capacity.

The design calculations are carried out to provide correct circulation velocity for the thermal oil inside the heater which is vital to prevent overheating of the oil, cracking and deformation in the heater tubes, heat transfer property loss of the thermal oil and overall efficiency loss.

To increase the heater efficiency, hot smoke / fire circulates by 3 pass system around the spiral oil tubes and so stack temperature is decreased and the useful heat is transferred more.

KYK H model heaters are suitable to be used with gas and oil burners. Boiler is supplied with all necessary accessories, control devices and auxiliary equipment on customer's request.

Heater capacity, total heat transfer surface, used tube length, thermal oil flowrate and pressure loss are precisely calculated during design stage.

(Approximately 25000 kcal/h heat is obtained from 1 m² heating surface)

Isolation of the heater is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

KYK H boiler body consists of a horizontal cylindrical body including spiral shaped single or double coil oil tubes. EN12952 is taken as reference for design calculations where applicable.



Steel Materials: S235J – S355J carbon steel according to EN12952 requirements

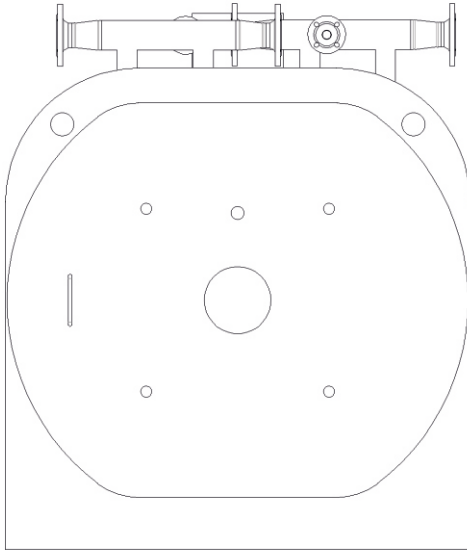
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

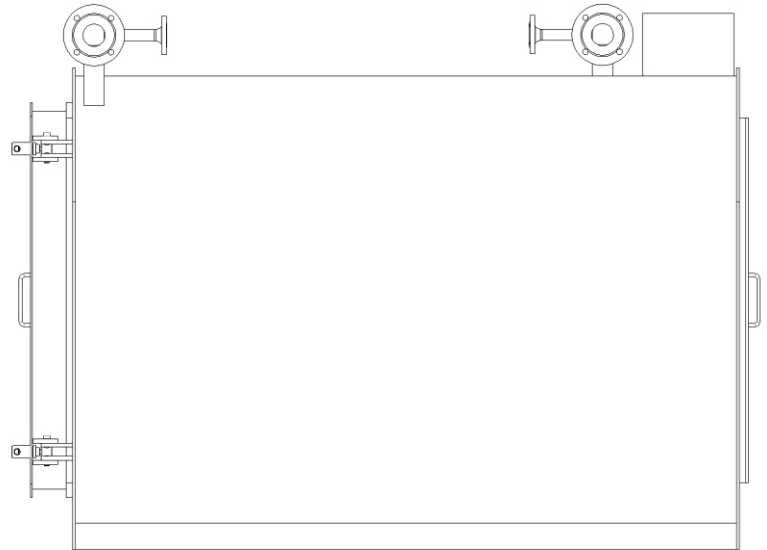




CAPACITIES AND DIMENSIONS TABLE FOR KYKH MODEL BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Thermal Capacity F&A 100 °C (kg/h)	Min. Oil Flow Rate (m³/h)*	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)**
KYKH300	258.000	35	1950	1100	1350	1400
KYKH500	500.000	50	2250	1400	1600	2500
KYKH750	750.000	75	2700	1650	1750	3000
KYKH1000	1.000.000	100	3000	1600	1800	3500
KYKH1250	1.250.000	130	3200	1800	2000	3800
KYKH1500	1.500.000	160	3800	1900	2100	4200
KYKH1750	1.750.000	185	4100	1900	2100	4700
KYKH2000	2.000.000	210	4300	2000	2200	5000
KYKH2500	2.500.000	260	4700	2200	2400	5200
KYKH3000	3.000.000	300	4800	2250	2450	5400
KYKH3500	3.500.000	370	4000	2700	2900	5600
KYKH4000	4.000.000	420	4300	2800	3000	5800
KYKH4500	4.500.000	475	6000	2700	2900	6000
KYKH5000	5.000.000	525	6400	2700	2900	6200
KYKH5500	5.500.000	580	5100	3100	3300	6400
KYKH6000	6.000.000	630	5300	3200	3400	6600
KYKH6500	6.500.000	685	5500	3200	3400	6800
KYKH7000	7.000.000	735	5700	3300	3500	7000
KYKH7500	7.500.000	790	5850	3350	3550	7300

*For $\Delta T = 20^\circ \text{C}$

**Empty W/O accessories



KYK-HLZ HELICOIDAL THERMAL OIL HEATERS

Thermal Capacity For Oil/Gas Fuel:

233 kW - 8721 kW

Thermal Capacity For Biomass Fuel:

116 kW - 4360 kW

Max. Oil Output Temperature:

350°C

Fuel Type:

Biomass, Coal, Pellet

(Natural Gas, LPG, Diesel, Heavy Fuel Oil - Optional)





KYK HLZ model helicoidal thermal oil heaters are designed to obtain adequate heat transfer surface by using wet type helicoidal tube bundles connected at sufficient number of groups according to the required capacity.

To increase the heater efficiency, hot smoke / fire circulates around the helicoidal oil tubes to travel a longer distance and so stack temperature is decreased and the useful heat is transferred more.

KYK HLZ model heaters are suitable to be used with gas / oil burners and with a wide range of solid fuel types such as; wood, coal, olive seeds, pellets, nut shells, seeds of various plants, dried manure, dried pomace and other types of biomass. Boilers designed specially for higher capacity requirements of our customers can be provided. Boiler is supplied as packaged with all necessary accessories, control devices and auxiliary equipment on customer's request.

Heater capacity, total heat transfer surface, used tube length, thermal oil flowrate and pressure loss are precisely calculated and during design stage. (Approximately 25000 kcal/h heat is obtained from 1 m² heating surface with oil/gas

fuel types and 12500 kcal/h with solid fuel types).

Isolation of the heater is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

KYK HLZ boiler body consists of a vertical body including helicoidal shaped oil tubes. EN12952 is taken as reference for design calculations where applicable.



Steel Materials: S235J – S355J carbon steel according to EN12952 requirements

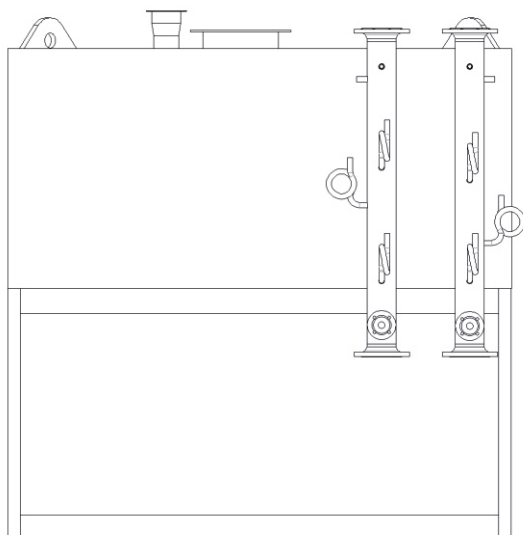
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

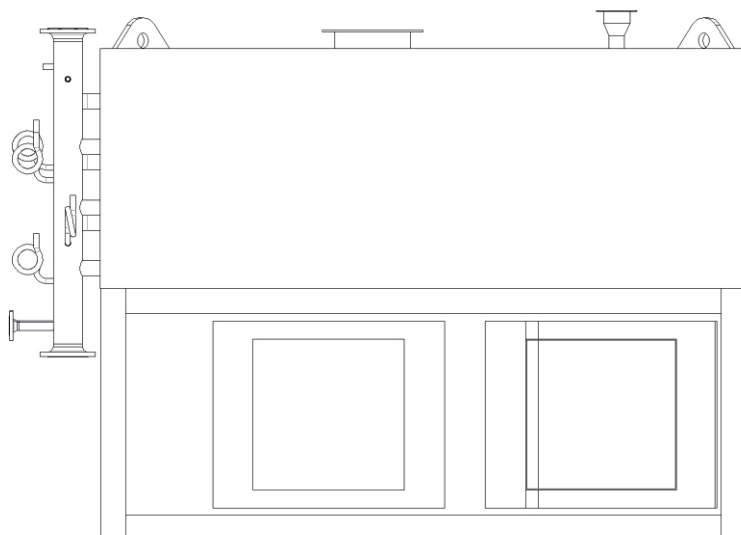




CAPACITIES AND DIMENSIONS TABLE FOR KYK HLZ MODEL BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Thermal Capacity for Oil / Gas (kg/h)	Max. Thermal Capacity For Solid Fuel (kg/h)*	Min. Flow Rate Rate for Oil/Gas (m/h)**	Min. Flow Rate Rate for Solid Fuel (m/h)**	Length L) (mm)	Width W) (mm)	Height H) (mm)	Weight (kg)***
KYKHLZ 20-10	200.000	100.000	20	18	2000	1600	1750	1500
KYKHLZ 25-12	250.000	125.000	30	18	2000	1600	2000	1700
KYKHLZ 50-25	500.000	250.000	55	50	2500	2000	2000	2750
KYKHLZ 75-37	750.000	375.000	80	70	2750	2000	2250	3000
KYKHLZ 100-50	1.000.000	500.000	110	100	2750	2000	2700	3800
KYKHLZ 125-62	1.250.000	625.000	130	100	3400	2500	2250	4300
KYKHLZ 150-75	1.500.000	750.000	160	100	3400	2500	2500	4700
KYKHLZ 200-100	2.000.000	1.000.000	210	120	3400	2500	2750	5100
KYKHLZ 250-125	2.500.000	1.250.000	180	130	4600	2500	3000	5800
KYKHLZ 300-150	3.000.000	1.500.000	205	160	5600	2500	3250	6500
KYKHLZ 350-175	3.500.000	1.750.00	240	180	5600	2500	3500	7500
KYKHLZ 400-200	4.000.000	2.000.000	280	205	6400	2500	3700	8500
KYKHLZ 500-250	5.000.000	2.500.000	350	260	6400	2500	4400	10000
KYKHLZ 750-375	7.500.000	3.750.000	510	400	6400	2500	5900	14000

* According to solid fuel with 4500 kcal/kg LHV

**For $\Delta T = 20^{\circ}C$ and $30^{\circ}C$ (for the oil/gas boiler with capacities higher than model 250-125)

***Empty W/O accessories





SKK – SCOTCH TYPE HOT/SUPERHEATED WATER BOILERS

Thermal Capacity:
232 kW - 14.535 kW

Fuel Type:
Natural Gas, LPG, Diesel, Heavy Fuel Oil





SKK model boilers are designed and manufactured according to the system which transfers more of the usable heat to the water to increase the hot water production efficiency by the "3 pass" principle of fire and smoke inside the boiler. This model is also known as "SCOTCH TYPE".

SKK model boilers are suitable to be used with gas and oil burners.

The exhaust gas temperature is decreased to an optimum level, so the operating efficiency & lifetime of the boiler is increased.

The heat transfer area of the boiler is indicated precise and it is the net area along where, the heat is transferred inside the boiler. (Approximately 25000 kcal/h heat is obtained from 1 m² of heating area.)

For the high operating pressure values; the furnace is produced in corrugated form to eliminate the thermal expansions and to obtain sufficient strength. SKK model boilers can be produced for an operating pressure range of 0,5 bar – 20 bar. Boiler is supplied as packaged with all necessary accessories, control devices and auxiliary equipment on customer's request.

Isolation of the boiler is specially made to minimize the thermal energy loss. Special covering plates are used on the surface, to protect the shell of the boiler from outdoor conditions and to prevent tearing.

SKK boiler body consists of: Cylindrical, 3 pass, wet back main body with fire tubes and plain or corrugated furnace at proper thickness, according to the boiler's operating pressure. EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

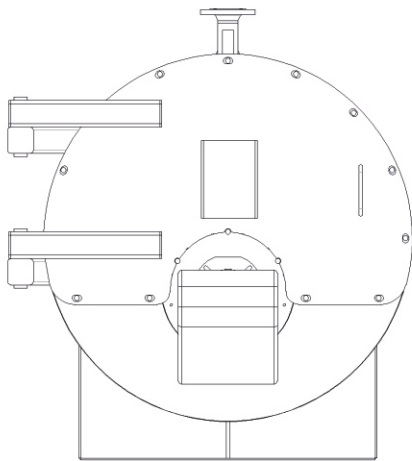
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

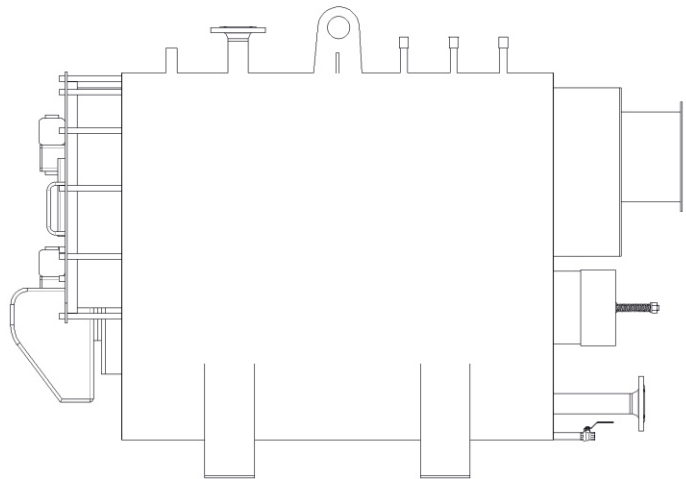




CAPACITIES AND DIMENSIONS TABLE FOR SKK MODEL BOILERS



FRONT VIEW



RIGHT VIEW

Model	Max. Thermal Capacity (kcal/h)	Min. Water Flow Rate (m/h)*	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)*
SKK 8	200.000	10	1900	1150	1500	1350
SKK 10	250.000	13	2150	1150	1500	1450
SKK 15	375.000	19	2450	1400	1750	2350
SKK 20	500.000	25	3050	1400	1750	2800
SKK 30	750.000	38	2950	1750	2100	4400
SKK 40	1.000.000	50	3650	1750	2100	5250
SKK 50	1.250.000	63	3650	1950	2300	6700
SKK 60	1.500.000	75	4200	1950	2300	7500
SKK 70	1.750.000	88	4750	1950	2300	8250
SKK 80	2.000.000	100	4600	2200	2550	10550
SKK 90	2.250.000	113	5050	2200	2550	11350
SKK 100	2.500.000	125	5450	2200	2550	12100
SKK 125	3.125.000	157	5100	2400	2850	14050
SKK 150	3.750.000	188	5850	2400	2850	15580
SKK 175	4.375.000	219	6300	2600	3050	20650
SKK 200	5.000.000	250	7000	2600	3050	22700
SKK 250	6.250.000	313	7300	2750	3250	26450
SKK 300	7.500.000	375	8450	2750	3250	30250
SKK 350	8.750.000	438	7650	3150	3700	36150
SKK 400	10.000.000	500	8500	3150	3700	39900
SKK 450	11.250.000	563	8950	3150	3700	41200
SKK 500***	12.500.000	625	9700	3150	3700	44650

*Approximate flow rate for $\Delta T = 20^\circ \text{C}$

**10 bar & empty W/O accessories

***This model has a double furnace to obtain sufficient and safe heat transfer surface



YS-SEMI CYLINDRICAL SOLID FUEL FIRED HOT/SUPERHEATED WATER BOILERS

Thermal Capacity:

70 kW - 1.744 kW

Fuel Type:

Biomass, Coal, Pellet



AKKAYA
BOILERS



YS model boilers are designed and manufactured according to the well-known, three pass design that allows obtaining adequate heating surface and lower exhaust gas temperature compared with two pass design. The half cylindrical compact design brings installation and cost advantages without any sacrifice from heating surface.

YS model boilers are specially designed for high efficiency at operating pressures up to 5 bar. For higher operating pressures (up to 10 bar) special production can be carried out, upon customer's request.

The indicated heat transfer surface for each capacity is completely correct and it shows the net area along where the heat is transferred to water inside the boiler.

Approximately 10000 kcal/h heat is obtained from 1 m² heating surface. Boiler is supplied as packaged with all necessary accessories, control devices and auxiliary equipment on customer's request.

YS model boilers are suitable to be used with gas / oil burners and with

a wide range of solid fuel types such as; wood, coal, olive seeds, pellets, nut shells, seeds of various plants, dried manure, dried pomace and other types of biomass. By implementing an automatic stoker feeding system or an automatic water cooled vibrating grate to the boiler, small sized solid fuel types are easily used for firing.

Isolation of the boiler is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

Boiler consists of a half cylindrical, 3 pass, fire tube, wet back main body and furnace at proper thickness, according to the boiler's operating pressure. EN12953 and TS497 are taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12953 and TS497 requirements and S235J – S355J carbon steel for non-pressurized parts

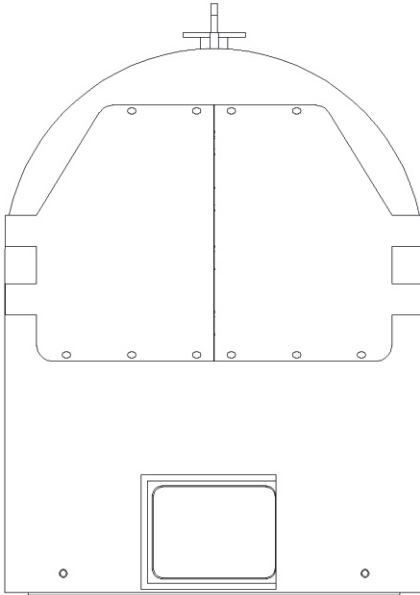
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request

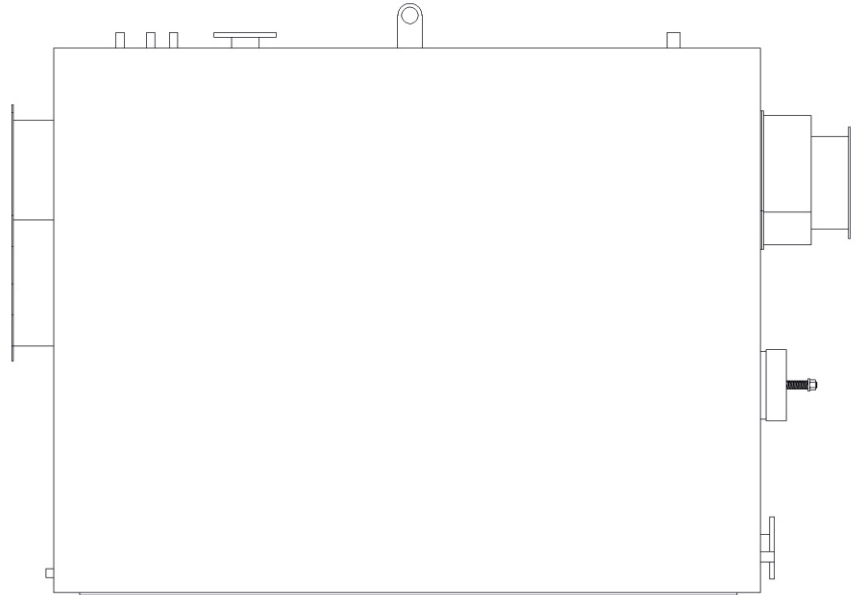




CAPACITIES AND DIMENSIONS TABLE FOR YS MODEL BOILERS



FRONT VIEW



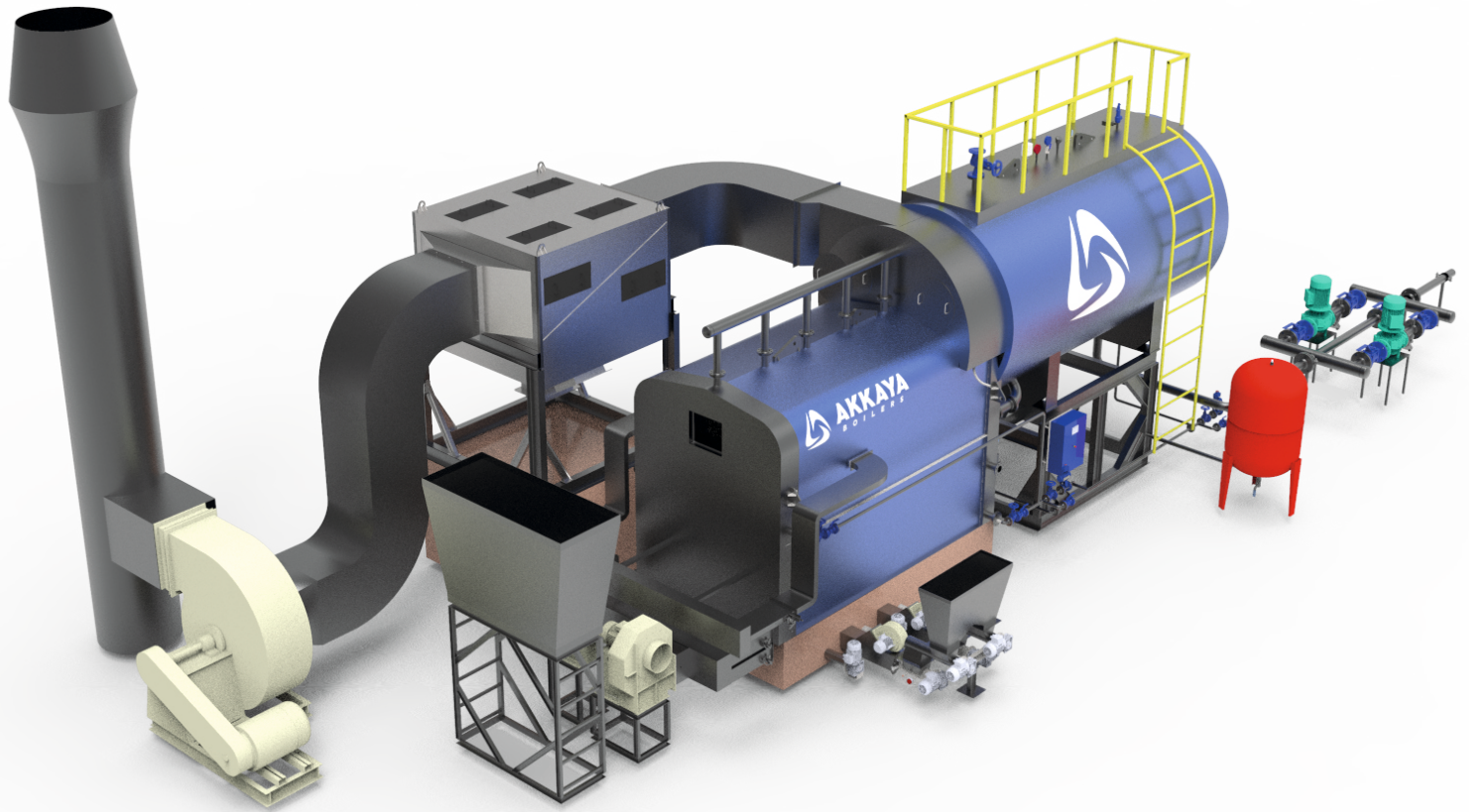
RIGHT VIEW

Model	Max. Thermal Capacity (kcal/h)*	Min. Water Flow Rate (m/h)**	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)***
YS6	60.000	3	1700	960	1400	800
YS8	80.000	4	2100	960	1400	950
YS10	100.000	5	2050	1060	1480	1050
YS15	150.000	8	1950	1160	1750	1400
YS20	200.000	10	2370	1160	1750	1650
YS25	250.000	13	2400	1360	1900	2100
YS30	300.000	15	2700	1360	1900	2350
YS40	400.000	20	2600	1560	2040	3000
YS50	500.000	25	3050	1560	2040	3500
YS60	600.000	30	2650	1760	2460	3900
YS70	700.000	35	2950	1760	2460	4350
YS80	800.000	40	2950	1760	2460	4850
YS90	900.000	45	3250	1960	2460	5500
YS100	1.000.000	50	3430	1960	2570	6300
YS110	1.100.000	55	3680	1960	2570	6650
YS120	1.200.000	60	3930	1960	2570	7000
YS150	1.500.000	75	4730	1960	2570	10650

* According to solid fuel with 4500 kcal/kg LHV

** Approximate flow rate for $\Delta T = 20^\circ C$

*** 5 bar & empty W/O accessories



YHYBWB

SEMI HYBRID SOLID FUEL FIRED HOT/SUPERHEATED WATER BOILERS

Thermal Capacity:

737 kW - 11671 kW

Fuel Type:

Biomass, Coal, Pellet

(Natural Gas, LPG, Diesel, Heavy Fuel Oil - Optional)



AKKAYA
BOILERS



YHYBWB model boilers are designed and manufactured according to the system that provides adequate heat transfer surface, and grate surface for solid fuel applications by connection of the water tube combustion chamber of the hybrid type boilers to a 2 pass fire tube shell boiler.

The water tube type combustion chamber is engineered according to the volumetric load for the solid fuels. Sufficient furnace volume and grate surface area is achieved in order to get maximum combustion efficiency. Fire tube boiler section is working as heat transfer area. This high volume water chamber allows the boiler to respond peak loads. The flame return chamber's sides are water cooled. This brings higher life time, less refractory maintenance and increased efficiency. By the help of fire tube boiler's design, gas speed is increased and a clean-er tube surface is obtained.

The increased heating surface of the system by the front combustion chamber allows the indicated capacity to be relative with the indicated heating surface value. Approximately 10000 kcal/h heat is obtained from 1 m² heating area of YHYBWB boilers.

YHYBWB model boilers can be used with high efficiency at operating pressures up to 20 bar.

Boiler is supplied as packaged with all necessary accessories, control devices and auxiliary equipment upon customer's request.

YHYBWB model boilers are suitable to be used with gas / oil burners and with a wide range of solid fuel types such as; wood, coal, olive seeds, pellets, nut shells, seeds of various plants, dried manure, dried pomace and other types of biomass. By implementing an automatic stoker feeding system or an automatic water cooled vibrating grate to the boiler, small sized solid fuel types are easily used for firing.

Isolation of the boiler is specially made to minimize the thermal loss. On the surface; special covering plates are used to protect the outer shell from weather conditions and tearing at maximum level.

YHYBWB boiler body consists of a cylindrical, 2 pass, fire tube, wet back main body with plain or corrugated furnace at proper thickness, according to the boiler's operating pressure and a half cylindrical, water tube front combustion chamber. EN12952 and EN12953 is taken as reference for design calculations where applicable.



Steel Materials: P265GH – P295GH -P355GH according to EN12952 and EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

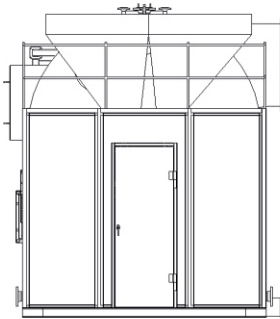
Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request





CAPACITIES AND DIMENSIONS TABLE FOR YHYBWB MODEL BOILERS



FRONT VIEW



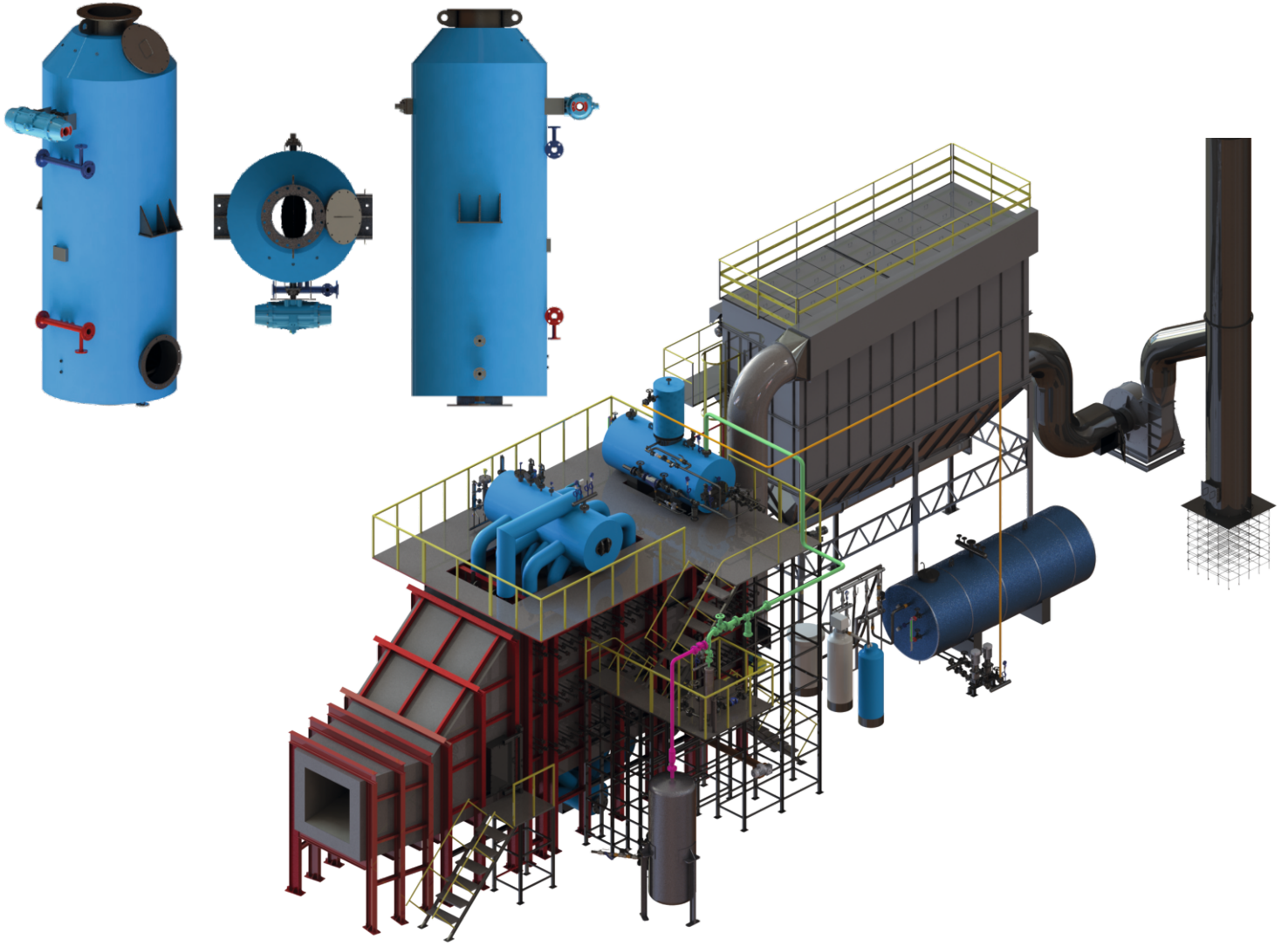
RIGHT VIEW

Model	Max. Thermal Capacity (kcal/h)*	Min. Water Flow Rate (m/h)**	Length (L) (mm)***	Width (W) (mm)***	Height (H) (mm)***	Weight (kg)***
YHYBWB1500	633.900	32	6000	2160	3110	9800
YHYBWB2000	854.400	43	7500	2160	3110	11500
YHYBWB2500	1.100.800	55	8850	2160	3310	13750
YHYBWB3000	1.511.600	76	8500	2610	3600	18000
YHYBWB3500	1.736.000	87	9000	2610	3600	19500
YHYBWB4000	1.946.200	98	9500	2610	3600	20600
YHYBWB5000	2.634.200	132	9500	2810	3750	27750
YHYBWB6000	3.021.800	151	10100	2810	3750	30100
YHYBWB7000	3.538.500	177	10900	2810	3750	32700
YHYBWB8000	4.088.500	205	12100	3200	3950	39300
YHYBWB10000	5.101.600	255	13200	3200	3950	45300
YHYBWB12000	6.113.600	306	16250	3200	4950	53800
YHYBWB14000	7.178.100	359	18450	3200	4950	60500
YHYBWB16000	8.025.400	402	17000	3600	5250	70000
YHYBWB18000	9.024.800	452	18300	3600	5250	75500
YHYBWB20000	10.037.090	502	18000	3800	5750	82000

* According to solid fuel with 4500 kcal/kg LHV

** Approximate flow rate for $\Delta T = 20^{\circ} C$

*** 6 bar & empty W/O accessories and with WCVG type fuel feeding system. Weight without burner



HRTOH, HRSG & HRHWP WASTE HEAT RECOVERY BOILERS



HRTOH model boilers are designed and manufactured for the systems which the process exhaust gases, biogas/syngas obtained from gasifiers or similar burners are used as the fuel source to produce heat.

The wet type helicoidal tube bundles are connected at adequate number of groups in parallel connected towers to obtain necessary heat transfer surface. Towers are combined with sufficient number of cyclones that has wet tube parts to let the gas enter to the heater as clean as possible and to contribute to the heat transfer surface at the same time.

As the heat transfer tube bundles can be combined to each other as many as required, the capacity design of the heat recovery systems is quite flexible. Special designed system are offered to the customers according to their heat source amount to be recovered and their need for steam, thermal oil or hot water amount.

Each tower has an automatic ash distractor auger system installed at the bottom. There is a pneumatic boiler cleaning system with which the gaps between tube bundles can be cleaned by pressurized air blowing.

The system guarantees a continuous operation. In case there is a problem (like leakage or corrosion) in any of the independent bundles, the damaged bundle can be blinded and the system can continue to operate until that bundle is replaced with a new one during general service period

Helicoidal type design patented (TPE-2006-00598) – especially has some advantages for thermal oil heating applications. Design prevents the oil to be stable in the boiler for a long period so the cracking or corruption of the oil can hardly occur. Due to the design properties, the length of the tubes that the oil circulates in is obtained exactly the same with the calculated size.

HRTOH boilers body consists of parallel connected towers with serially connected tube bundles inside and wet cyclones. EN12952 and EN12953 is taken as reference for design calculations where applicable.

HRSG-WT type are designed and manufactured for saturated or superheated steam generation by utilizing waste heat at your plant. It is also preferred with the purpose of power (electricity) generation from the waste in addition to industrial heating. Limit emission values specified by the regulations can be achieved easily by the help of filtration system selected properly according to the chemical composition of the waste gas. By the help of modular design structure; it can be designed for desired capacity and features, it reduces installation time on the site, it eliminates possible damaging risks that may occur during transportation. The refractory material which is determined in accordance with operating temperature provides long life and minimum maintenance cost as a result of high-quality material usage and correct application.

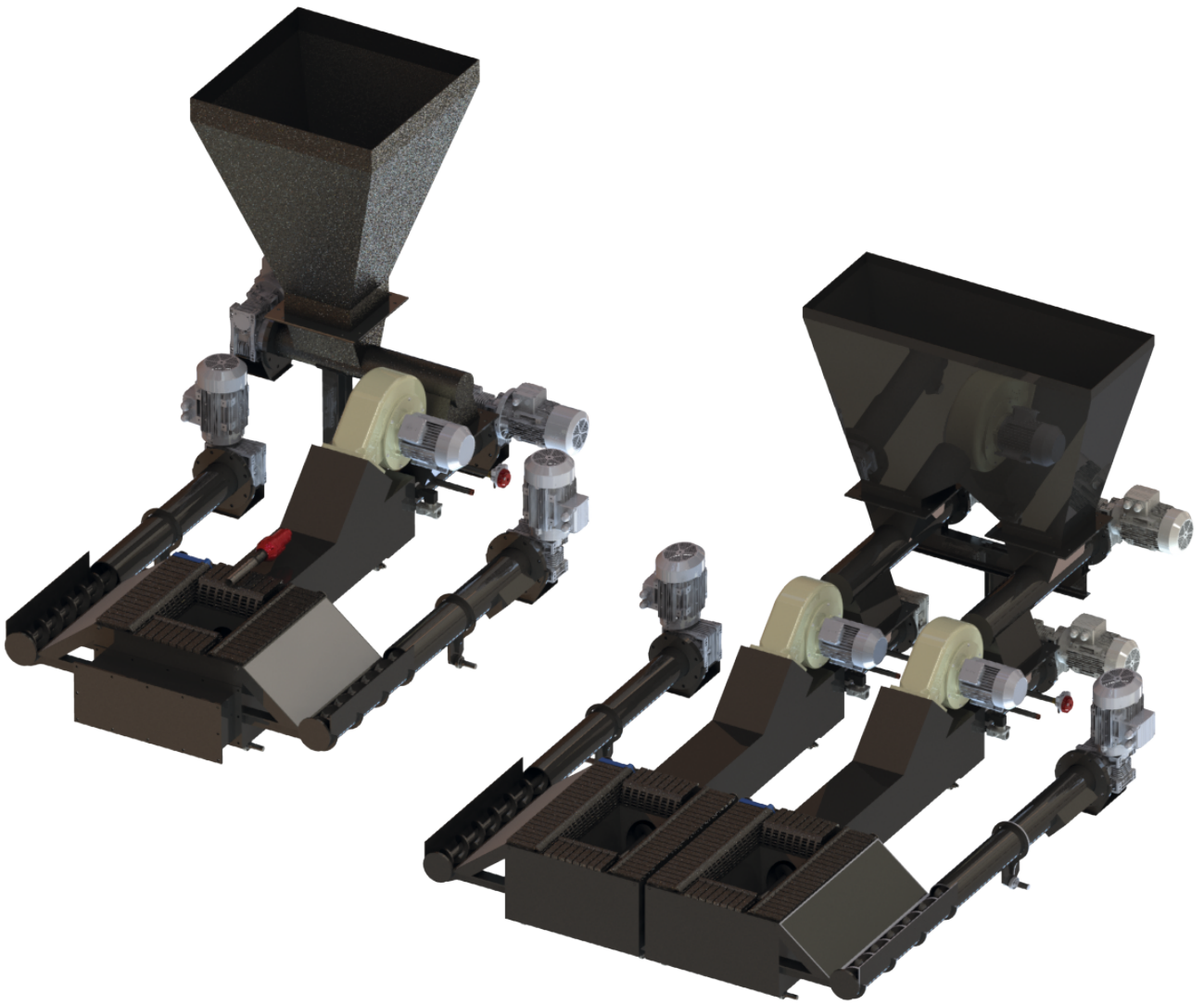


Steel Materials: P265GH – P295GH -P355GH according to EN12952 and EN12953 requirements and S235J – S355J carbon steel for non-pressurized parts

Tubes: Seamless tubes (EN10216, ASTM A106 Gr.B or St35.8 & Gost10)

Isolation: 100 mm thick and 80 kg/m³ rock wool is covered with PVC coated galvanized steel, aluminum or stainless steel according to Customer's request





STOKER AUGER TYPE SOLID FUEL FEEDERS



Stoker is an equipment with which the solid fuel is transported into the combustion pot by an auger and burning is obtained on the upper side of the pot.

The system can be used with YSB, YHYB model steam boilers, KYK HLZ model thermal oil heaters and YS, YHYBWB model hot water boilers. The size and number of the stoker can be selected and produced according to the boiler model and capacity.

Minimum 5 mm and maximum 50 mm sized solid fuel, with a maximum humidity level of 20% and having low ash formation is recommended to be used in stoker systems.

Stoker body is manufactured of cast material which is durable for high temperatures.

Auger leaves are made of thick material and the shaft mill is of full material.

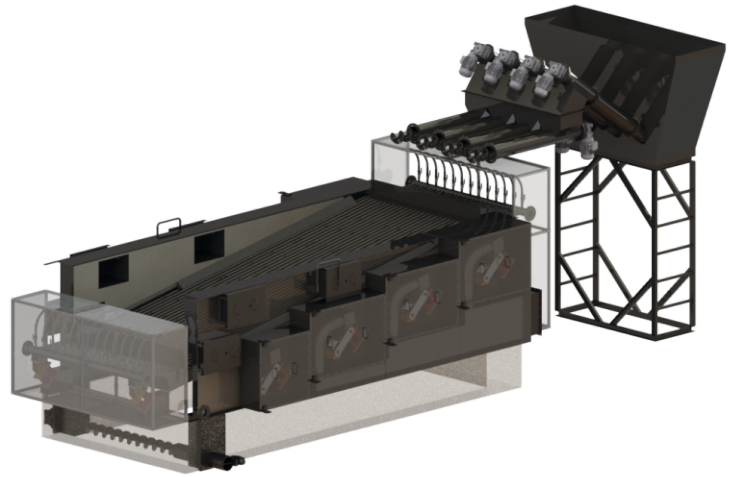
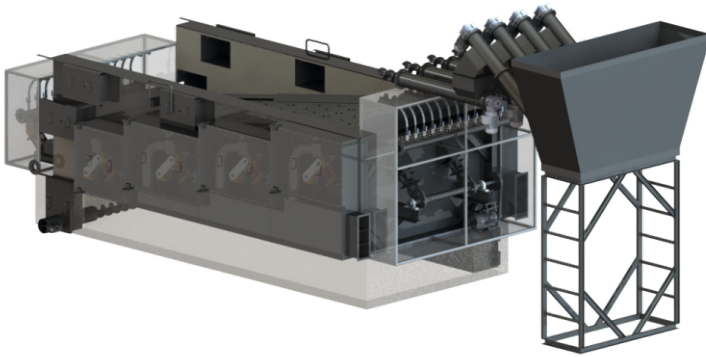
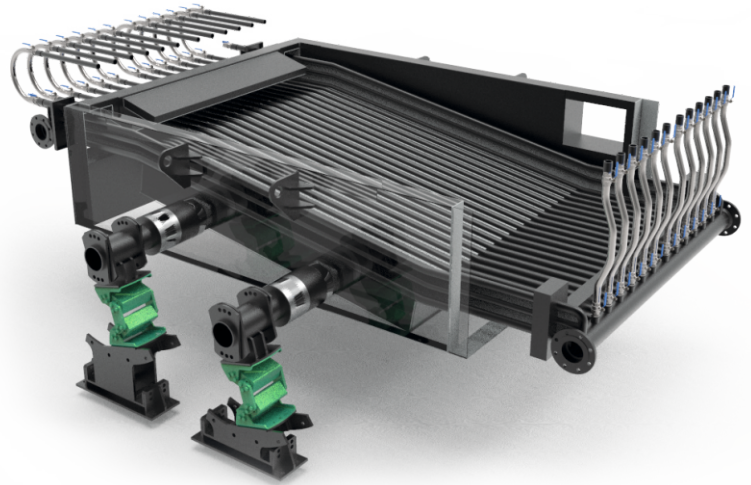
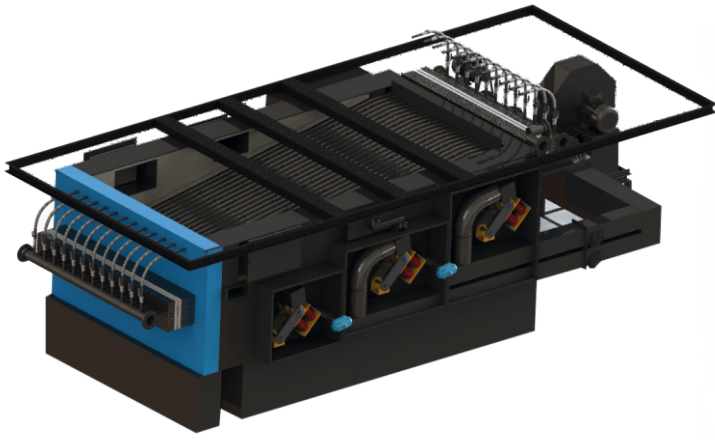
Problem free operation is obtained by using a reducer with proper capacity.

In our stokers there is a 2 stages fire extinguishing system, mechanical water cooled fire return prevention system and fuel bunker discharging system operating with electrical temperature controller and fire pushing system. The system is protected by the help of fire return prevention system even at power cut occasions.

Fuel level control automation can be provided for the bunker on request.

There are primary and secondary air fans to provide homogenous and proper combustion.





WCVG WATER COOLED VIBRATING GRATE



AKKAYA
BOILERS



WCVG system is a new technology for combustion of various solid fuels. With its water cooled grate area, higher furnace temperatures can be obtained without damaging the system. System brings flexibility for using various kinds of solid fuel and biomass. Also, WCVG provides low maintenance costs and longer periodical service intervals due to its decreased mechanical hardware compared with similar systems.

The vibrating grate system has been developed by AKKAYA Inc. for high efficiency and reliable operation.

The system can be used with YSB, YHYB model steam boilers and YS, YHYBWB model hot water boilers. The size of the system can be selected and produced according to the boiler model and capacity.

Minimum 5 mm, maximum 50 mm sized solid fuel with a maximum 20-55% humidity (depending on the fuel structure) and low ash formation is recommended to be used in WCVG systems. Fuel is transferred from bunker on to the grate with the help of auger system, pneumatic conveying or hydraulic push pull systems. There is primary and secondary air fans and dampers in the pre-combustion chamber of the boiler.



SOME BIOMASS TYPES CAN BE BURNT IN AKKAYA WATER COOLED VIBRATING GRATE SYSTEMS



Woodchips



Apple Pomace



Wood Pallet



Seed Husk



Coconut Shell



Sawdust



Forest Residues



Corn Cop



**Palm Kernel
Shell**



Wood Waste



Wheat Straw



Manure



**Paper Mill
Waste**



Olive Pits



Olive Pomace



Energy Crops



Wood Briquette



Rice Straw



Bamboo Waste



RDF - Pellet





AKK-MC MULTI CYCLONES



AKK-MC model multicyclones are manufactured for the exhaust gas line of boilers, to hold +10 micron sized, heavy particules inside the exhaust gas.

AKK-MC Multicyclones are made of small cyclones which are brought together in one body and are made of heat and corrosion resistant material.

Its smoke inlet has special shaped wings. These wings help to give direction to the smoke flow. By this way efficiency is increased.

AKK-MC multicyclones are supplied with a pneumatic cleaning system to provide longer operation life for the equipment.

The size of the multicyclones are calculated and manufactured according to each boiler model and capacity.





AKK-KT CONDENSATE TANKS



Condensate tank is necessary to feed initial water to the boiler by feed pumps and to store the returning condensate from the condensate line of the consumer plant. Maintaining a closed circle with a condensate tank by circulating a certain amount of hot, de-calcinated, boiler water increases the fuel consumption efficiency.

AKK-KT condensate/ feed water tanks are made of St37 carbon steel with adequate thickness and perfectly isolated with 50 mm thick glasswool and PVC coated galvanized steel after painting with corrosion durable dye.

Condensate tank is furnished with a magnetic water level indicator, electrical water level controller and water inlet line with solenoid valve.

AKK-KT tanks can be manufactured and supplied according to the boiler model and capacity for all types of Akkaya hot water and steam boilers.





AKK-TDG THERMIC DEAERATORS



For the systems where boiler water stays uncirculated for minimum 15 minutes (which is enough time for the corrosive gasses to be dissolved in feed water) a thermic deaerator system is recommended to be installed on top of the feed water tank.

AKK-TDG thermic deaerator consists of a deaerator dome and a deaerator water tank. Deaerator tank is made of St37 steel and perfectly isolated with 100 mm thick rockwool covered with PVC coated, galvanized steel. The deaerator dome is made of stainless steel and it is also perfectly isolated with 100 mm thick rockwool covered with PVC coated, galvanized steel.

System is supplied together with pressure reducing group, pump group and thermostatic valve groups as a package.

Various capacities according to the boiler model and capacity can be manufactured and supplied.





SSD SERIES SPRAY-SCRUBBER TYPE COMPACT DEAERATOR SYSTEM



Akkaya AKK-SSD (Spray-Scrubber Type Compact Deaerator System) is designed to remove the dissolved gases and oxygen from the boiler feed water by properly mixing condensate, steam and cold feed water.

The main elements of AKK-SSD system are; deaerator tank, deaerator dome, steam injection elements, pressure reducing valve group and water inlet valve group.

AKK-SSD systems are offered as a package with all accessories .

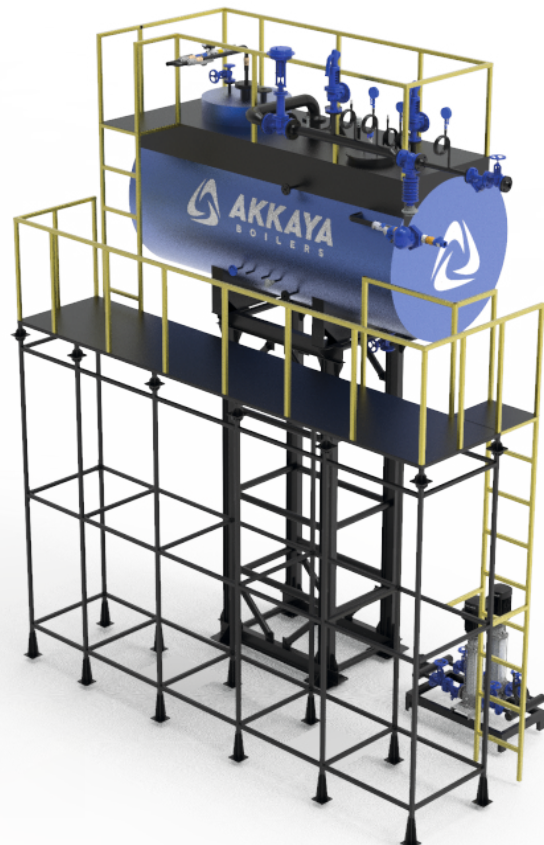
Deaerator systems are produced at proper capacity according to selected boiler's capacity.

While an external condensate tank, deaerator dome and pump group are needed in thermic deaerator systems, there is no need for these additional equipments in the compact deaerator system. In this way, compact deaerator systems do not occupy much space in boiler rooms and reduce additional equipment costs.



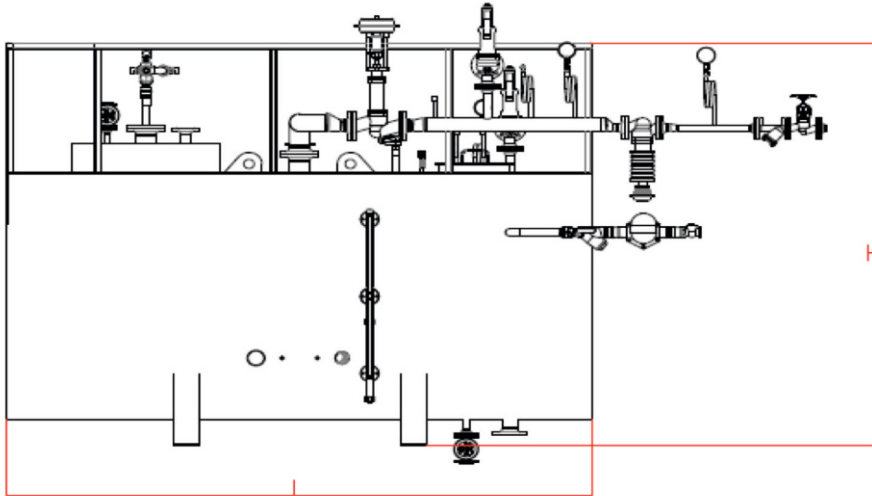
SYSTEM ELEMENTS

- Akkaya Compact Deaerator System AKK-SSD
- Compact Deaerator Tank
- Compact Deaerator Spray Section
- Compact Deaerator Magnetic Water Level Indicator
- Compact Deaerator Drain Valve
- Compact Deaerator Air Vent Valve
- Compact Deaerator Steam Injection Inlet Valve
- Compact Deaerator steam Injection Inlet Filter
- Compact Deaerator Water Level Controller & Water level Probe ((On-off or Proportional Water Level Control)
- Compact Deaerator safety valve
- Compact Deaerator Pressure Transmitter
- Compact Deaerator Temperature Transmitter
- Pressure Control Valve
- Temperature Control Valve
- Steam Trap Group
- Water Inlet Solenoid Valve Group
- Walking platform, stairs, catwalk

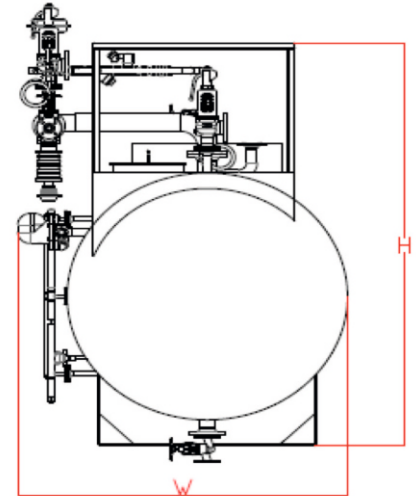




CAPACITIES AND DIMENSIONS TABLE FOR SSD MODEL SPRAY-SCRUBBER TYPE COMPACT DEAERATOR



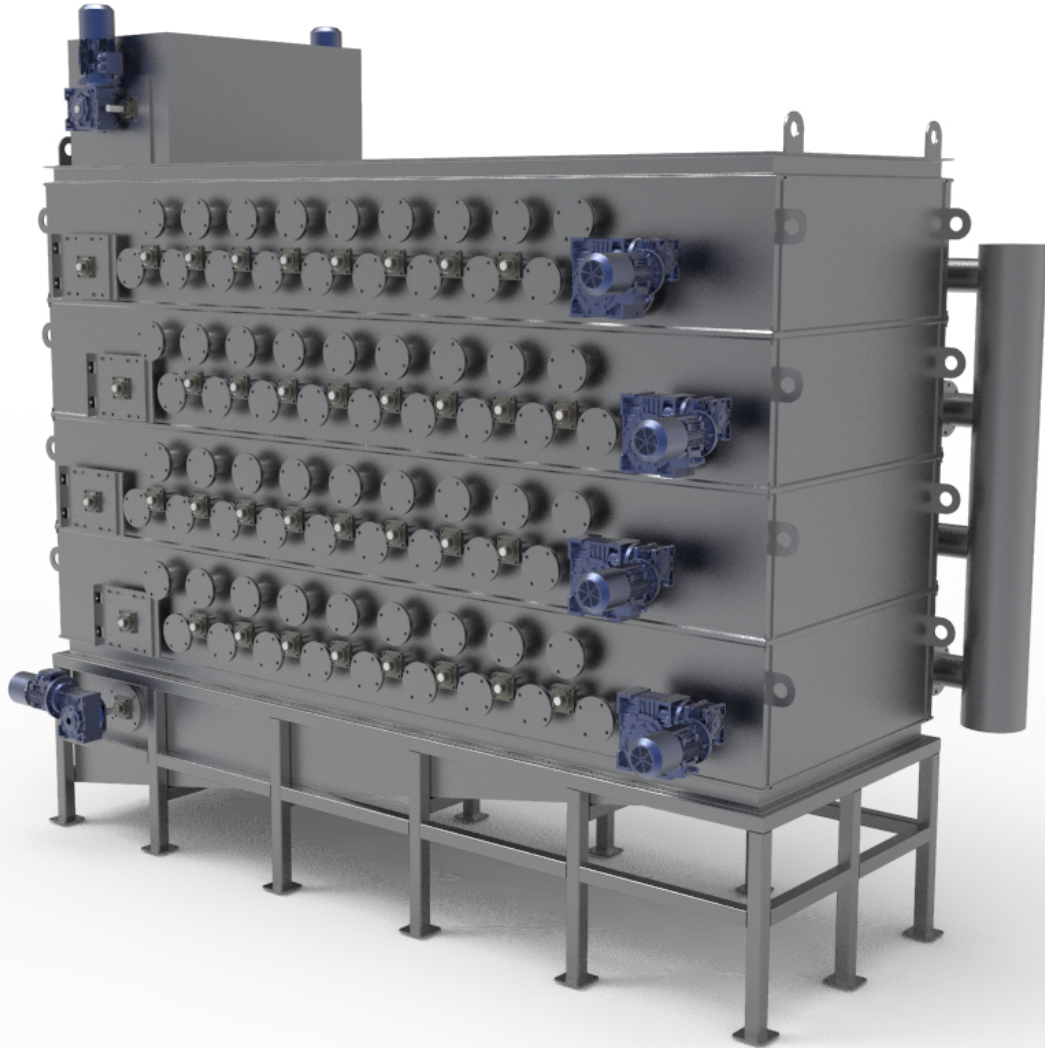
SIDE VIEW



FRONT VIEW

Model	Capacity (kg / h)	Deaerator Tank Volume (lt)	Length (L) (mm)	Width (W) (mm)	Height (H) (mm)	Weight (kg)***
SSD2000	2000	2000	3300	1200	2500	1500
SSD2500	2500	2500	3000	1450	2750	1650
SSD3000	3000	3000	3350	1450	2750	1850
SSD4000	4000	4000	3600	1600	2900	2200
SSD5000	5000	5000	4300	1600	2900	2600
SSD6000	6000	6000	4100	1800	3100	2900
SSD7000	7000	7000	4600	1800	3100	3250
SSD8000	8000	8000	5100	1800	3100	3600
SSD10000	10000	10000	5200	2000	3800	4100
SSD12000	12000	12000	5950	2000	3800	4750
SSD13000	13000	13000	5400	2200	4000	4750
SSD15000	15000	15000	6100	2200	4000	5400
SSD16000	16000	16000	5600	2400	4200	5450
SSD20000	20000	20000	6700	2400	4200	6500
SSD25000	25000	25000	7500	2500	4300	7650
SSD30000	30000	30000	8100	2600	4400	8600
SSD40000	40000	40000	9100	2800	4600	10500

Akkaya Inc reserves the right to make changes to the specifications.
Please contact to our sales department for higher capacities.



BFD SERIES BIOMASS FUEL DRYER

Fuel Types:

All desired products and raw materials, especially wood chips, pomace, chicken manure, fruit pulp, cotton stalk, pulp can be dried.



Akkaya Biomass Fuel Dryer is developed to meet the needs of the industry for utilizing waste heat in flue gases from boilers.

Our dryers are custom designed to suit the unique processing needs of your material. Regardless of your fuel type, AKKAYA's design team can design a fuel dryer for your own application.

With Akkaya-BFD, all desired products and raw materials, especially wood chips, pomace, chicken manure, fruit pulp, cotton stalk, pulp can be dried.

It maximizes the energy efficiency of your system by using the waste heat from the flue gases as drying energy.

Reduces fuel consumption.

Low maintenance cost.

Decreases biomass humidity below 35% or less and increases the heating value of your biomass

Reduces boiler combustion air requirements.

Improve boiler combustion efficiency by 20% or more.

Reduces greenhouse gas emissions.

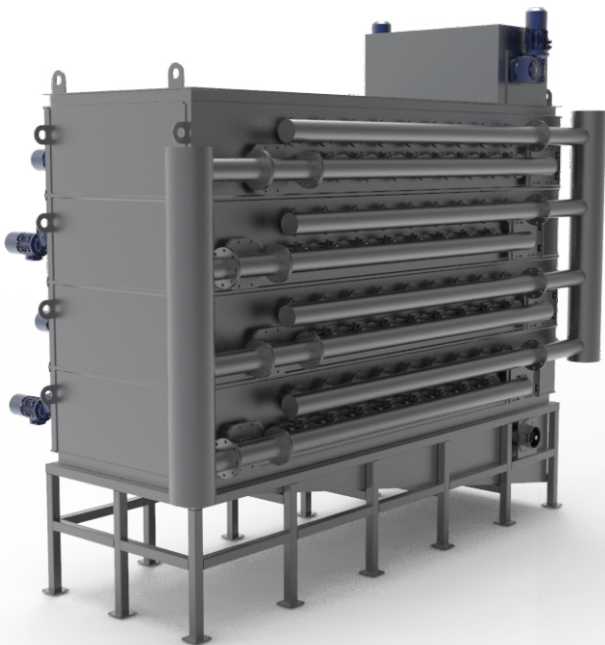
It provides reduced environmental impact with lower energy costs and significantly increased profitability.

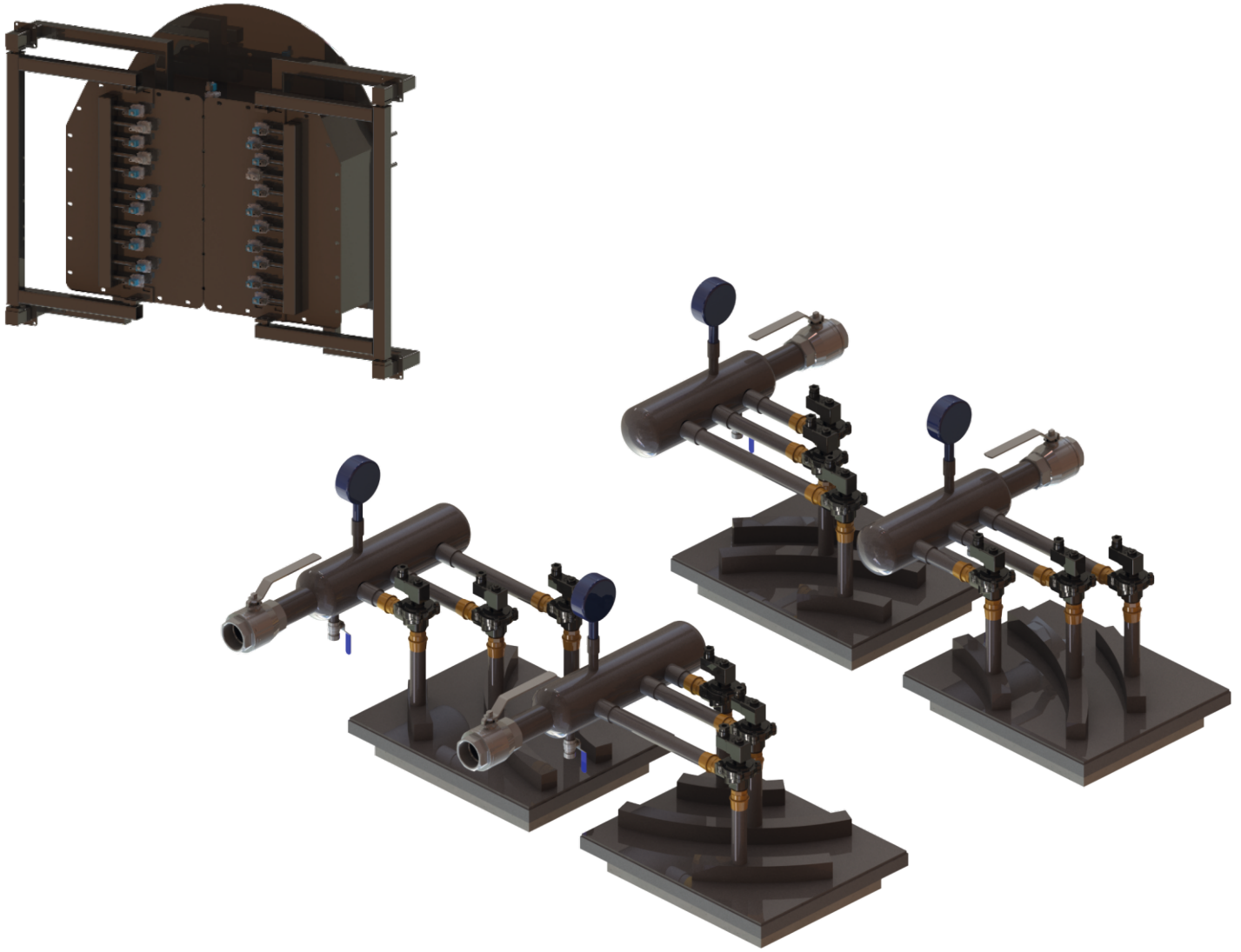


SYSTEM ELEMENTS

- Exhaust Gas Heat Recovery Fuel Dryer / Akkaya BFD (Biomass Fuel Dryer)
- Fuel inlet bunker and exit port

- Flue gas inlet & outlet ports
- Fuel transfer mechanism inside the drier
- Control board and its instruments





AKK-ATC AUTOMATIC TUBE CLEANING SYSTEM



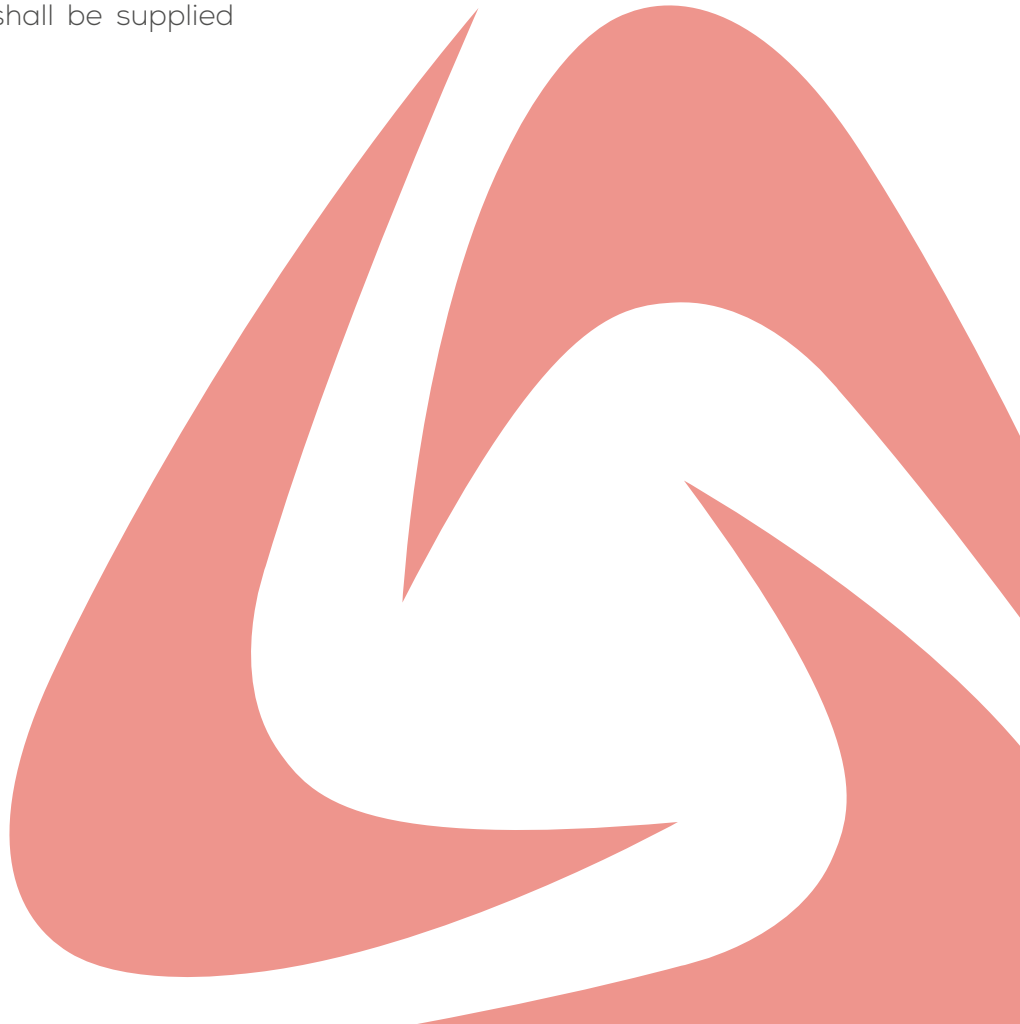
The fire-smoke tubes inside the boiler shell are filled by fume and soot in time and must be cleaned occasionally. This cleaning operation is usually neglected when done manually. With AKK-ATC automatic tube cleaning system this operation can be realised automatically and without human care need.

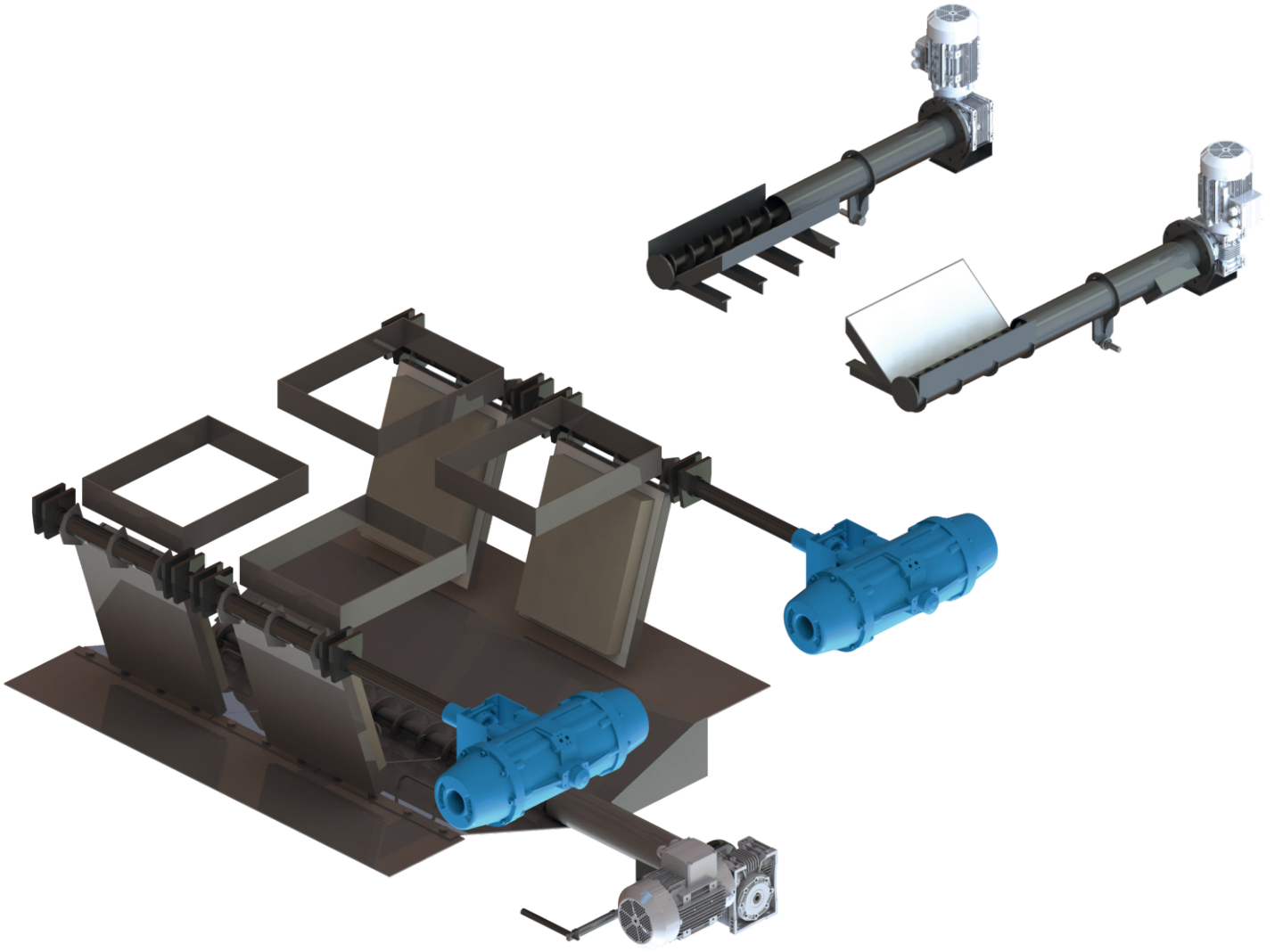
The system consists of cleaning tubes mounted on the boiler door and placed relative with the boiler tubes and pneumatic solenoid valves to control the cleaning air inlet.

In AKK-ATC system, pressurized air is collected by a collector to be distributed through the boiler smoke tubes. Collected pressurized air is transported from collector to double diaphragms solenoid valve through cleaning tubes installed on the boiler door. Residual water content in the air flow is discharged with a valve. Pressurized air coming from compressor enters the collector from a nozzle. (Sufficient compressor shall be supplied by the customer).

A Pressure indicator is installed to show the pressure value in the air system. A pulse solenoid valve is used to transport the pressurized air flow through smoke tubes by open and close operation. A digital time controller (AKTCO) is used to control the system for pneumatic cleaning of fire tubes of the boilers. This device is capable of 25 signal outputs with adjustable time intervals.

The system is manufactured together with the boiler and all Akkaya boiler models can be supplied with an AKK-ATC.





AKK-AAR AUTOMATIC ASH REMOVING



For a fully automatic operation, ash that is formed as a result of combustion, are carried out of the boiler by the help of auger type transporters. By automatic ash remover installation, labour need and cost is reduced for boiler operation.

Formed ash of the fuel is collected under the boiler and/or cyclone after combustion is completed. Then the ash is taken out from the ash holes by the auger type transporters. (After ash extraction there must be a storage and take away system that shall be supplied by the customer.)

Ash removers are manufactured and supplied for the suitable boiler models according to the boiler capacity and fuel properties.





AKK-WF WET FILTER SYSTEM FOR EXHAUST GAS TREATMENT



A Wet filter system can be provided with the Akkaya boilers, aiming to lower the flue gas emissions at the exit of the heater.

The system consists of a water storage tank with water level and temperature controlling automatic valves, a tower at adequate height and dimension according to the exhaust gas amount, proper water spraying nozzles, trays, mist holders water pumping group of 2 pumps (one stand by) with proper valves, filters and check valves and a control panel for the level, temperature and pump control.

The water storage, tower, trays and mist holders are made of AISI316 stainless steel.

During the operation of wet filter; flue gas passes through the water spray tower. Tower has trays with water holding filters. At the same time water circulates from water storage to the tower to have the particles and dirt dissolved. Some amount of water evaporates during circulation so fresh water at evaporated amount is fed to the water storage by the help of level controller.



COGENERATION SYSTEMS

Cogeneration can be described as the conversion of the heat -which is obtained by burning of the solid fuel, biomass or gases- into different types of energy, especially electricity.

Akkaya Inc. with its European suppliers provides solutions for ORC (Organic Rankine Cycle) or steam-operated cogeneration plant investments with solid fuel/biomass fired or waste heat recovery boilers.



 1. OSB Yerli Su Sokak No: 2
Selçuklu /Konya / Turkey

 **+90 332 248 92 21**
+90 332 248 91 45

 **+90 332 248 77 10**

 **akkaya@akkaya.com.tr**

 **akkaya.com.tr**

   **/akkayaboilers**