Üniversal
Kazan


# INDUSTRIAL BOILERS

www.universalkazan.com

# TABLE OF CONTENT

01. Steam Boiler

02. Steam generator

03. Thermal Oil Boiler

04. Hot Water Boiler

05.Deaerator

06. Heat Recovery System

07. Hybrid Type Steam and Hot Water Boiler


# CONPANY OVERVIEW

## About Us

Founded in 1970 by the esteemed Senior Mechanical Engineer Metin Bilgiç, Üniversal Boilers has built a long-standing reputation for engineering excellence. With over five decades of experience, the company manufactures a diverse range of steam boilers, thermal oil boilers, and other energy systems for heat transfer processes across various industries

# 01 STEAM BOILER

## Definition

A steam boiler is a power generation device that generates steam by applying heat energy to water. It is in the form of a closed vessel made up of steel in which combustion of fuel occurs to produce heat energy. It is also called a steam generator.
A steam boiler is a critical part of a thermal powerplant, therefore, it's important for us to have knowledge about the steam boiler.


## Why Steam Boiler

Steam boilers are highly efficient systems for generating heat and power in various industries. They provide consistent, reliable energy for processes such as heating, sterilization, and power generation. Steam boilers offer flexibility in fuel use, enabling businesses to choose between gas, oil, or solid fuel, depending on availability and cost-efficiency. Additionally, they are environmentally friendly, with modern boilers designed to reduce emissions and optimize fuel usage. With their ability to provide high heat output and adaptability, steam boilers remain a key solution for industrial energy needs.

# SCOTCH TYPE 3 PASS FIRE TUBE STEAM BOILER SB

**DESIGN:**

**The high-pressure, 3-pass, fire-smoke tube Scotch type steam boilers are meticulously designed and manufactured in compliance with internationally recognized standards, including Lloyd's Rules, TRD, DIN, and EN norms (TSE, TRD, DIN, EN, GOST, and ASME). This ensures superior quality and reliability.**

# SCOTCH TYPE 3 PASS FIRE TUBE STEAM BOILER

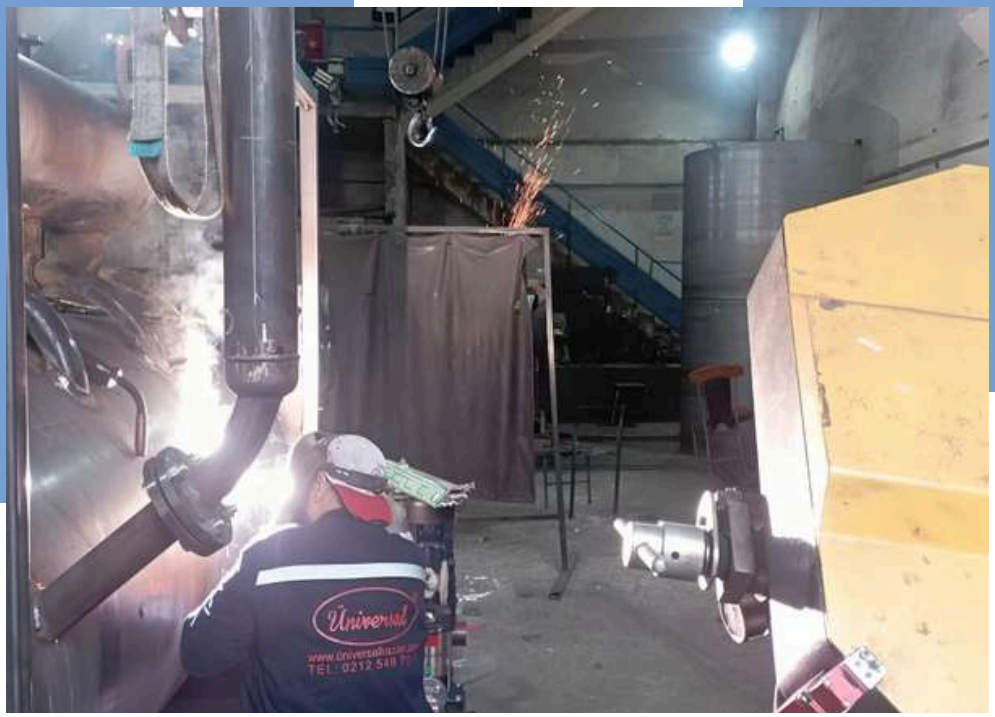
# SB

**MATERIALS:**

The cylindrical shell, flue plates, and combustion chamber are constructed from premium-grade HI-HI boiler steel (boiler sheet), which provides exceptional strength and durability. The smoke tubes are made from seamless boiler-grade tubes as per DIN 17155, ensuring long-term performance and reliability.

**HIGH EFFICIENCY:**

Engineered for maximum thermal efficiency (88 90%), the boiler's design ensures optimal heat transfer. Flue gases generated from efficient combustion pass through advanced convection surfaces and exit the system without causing low-temperature corrosion. This design maximizes heat recovery, contributing to reduced fuel consumption and operating costs. Rapid response to sudden high steam demand. Equipped with a large evaporation surface and significant steam storage capacity to handle load fluctuations efficiently. Features a generously sized corrugated combustion chamber to improve heat absorption and allow thermal expansion.




# TESTING & MAINTENANCE

**Each boiler undergoes a rigorous hydraulic pressure test at 1.5 times its operating pressure to guarantee structural integrity and safety. The boiler is designed for easy maintenance.**

- The combustion chamber can be easily accessed via the explosion door.
- Smoke tubes are accessible from the front door.
- The waterside components are reachable through strategically placed manholes and handholes, facilitating inspections and cleaning.

**This robust design ensures long-term efficiency, operational reliability, and ease of maintenance.**

# CAPACITIE & DIMENSIONS:

| | SB-5 | SB-10 | SB-15 | SB-20 | SB-25 | SB-30 | SB-35 | SB-40 |
|---|---|---|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 150 | 300 | 500 | 750 | 900 | 1100 | 1350 | 1550 |
| Length (mm) | 1950 | 2100 | 2330 | 2490 | 2625 | 2745 | 2860 | 3010 |
| Width (mm) | 1350 | 1690 | 1820 | 1850 | 1900 | 2000 | 2000 | 2000 |
| Height (mm) | 1500 | 1840 | 1970 | 2000 | 2050 | 2150 | 2150 | 2150 |
| Steam Volume ( $m^3$ ) | 0,21 | 0,44 | 0,65 | 0,71 | 0,92 | 1,17 | 1,23 | 1,32 |
| Water Volume (lt) | 430 | 1030 | 1360 | 1420 | 1520 | 1550 | 1580 | 1650 |
| Stack Dımension (mm) | 200 | 250 | 300 | 300 | 350 | 350 | 350 | 400 |
| Flue Gas Pressure Drop (mmSS) | 15 | 15 | 30 | 30 | 30 | 30 | 30 | 30 |
| Approximate weight at 6 bar | 1100 | 1750 | 2250 | 2600 | 290 | 3300 | 3700 | 4000 |
| Approximate weight at 10 bar | 1300 | 2000 | 2450 | 2900 | 3200 | 3900 | 4300 | 4600 |

# CAPACITIE & DIMENSIONS:

| | SB-50 | SB-60 | SB-70 | SB-80 | SB-90 | SB-100 | SB-125 | SB-150 |
|---|---|---|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 1900 | 2400 | 2800 | 3200 | 3800 | 4200 | 5200 | 6250 |
| Length (mm) | 3200 | 3375 | 3530 | 3680 | 3820 | 4150 | 4525 | 4820 |
| Width (mm) | 2250 | 2410 | 2500 | 2550 | 2550 | 2650 | 2650 | 2830 |
| Height (mm) | 2400 | 2500 | 2560 | 2750 | 2800 | 2900 | 2900 | 3080 |
| Steam Volume ( $m^3$ ) | 1,55 | 1,7 | 1,83 | 1,97 | 2,09 | 2,36 | 2,99 | 4,25 |
| Water Volume (lt) | 2755 | 3850 | 4450 | 5070 | 5740 | 5900 | 6180 | 7495 |
| Stack Dımension (mm) | 450 | 500 | 550 | 600 | 600 | 600 | 650 | 700 |
| Flue Gas Pressure Drop (mmSS) | 30 | 30 | 30 | 40 | 50 | 60 | 70 | 70 |
| Approximate weight at 6 bar | 5000 | 5450 | 6100 | 7100 | 7800 | 9400 | 10700 | 13200 |
| Approximate weight at 10 bar | 5800 | 6100 | 6900 | 7950 | 8650 | 11100 | 11850 | 14700 |

# CAPACITIE & DIMENSIONS:

| | SB-200 | SB-250 | SB-300 | SB-350 | SB-400 |
|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 8350 | 10500 | 12500 | 14600 | 16700 |
| Length (mm) | 5340 | 5800 | 6315 | 6700 | 7055 |
| Width (mm) | 3000 | 3200 | 3350 | 3500 | 3550 |
| Height (mm) | 3250 | 3450 | 3600 | 3750 | 3800 |
| Steam Volume ( $m^3$ ) | 4,97 | 5,69 | 7,16 | 7,85 | 8,39 |
| Water Volume (lt) | 9390 | 11570 | 13740 | 16865 | 18600 |
| Stack Dımension (mm) | 700 | 800 | 1000 | 1000 | 1000 |
| Flue Gas Pressure Drop (mmSS) | 80 | 90 | 100 | 100 | 100 |
| Approximate weight at 6 bar | 16700 | 20900 | 32500 | 27250 | 31000 |
| Approximate weight at 10 bar | 18750 | 23900 | 27900 | 31000 | 34700 |

# PRESSURIZED COMBUSTION STEAM BOILER
# RB

**DESIGN:**
**This cylindrical, pressurized combustion boiler utilizes a 3-pass system for enhanced efficiency. The first and second passes occur as reverse flames within the large combustion chamber, creating turbulence that promotes an optimal air-fuel mixture and ensures efficient combustion. In the third pass, hot gases travel through the smoke tubes, where their temperature is reduced significantly before being expelled as flue gas. This system achieves a high boiler efficiency of 85-90%**

# ADVANTAGES

**Large Corrugated Combustion Chamber: Designed to enhance heat absorption and allow for thermal expansion, promoting efficient combustion and prolonged boiler life.**

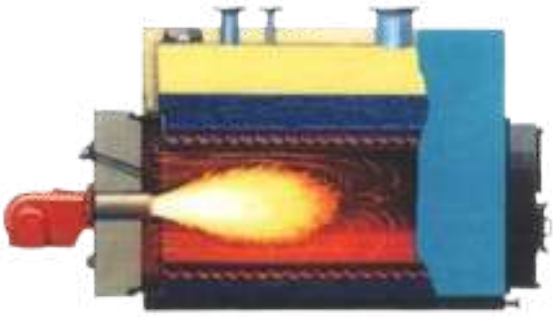
**Compact Design: With relatively small dimensions, the boiler requires minimal installation space, making it suitable for facilities with space constraints.**

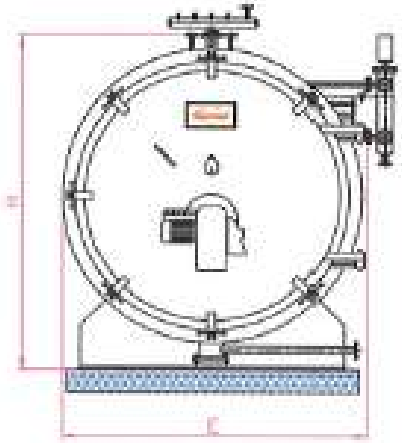
**Rapid Steam Production: The design ensures quick response to steam demand, delivering high steam generation rates in a short time.**

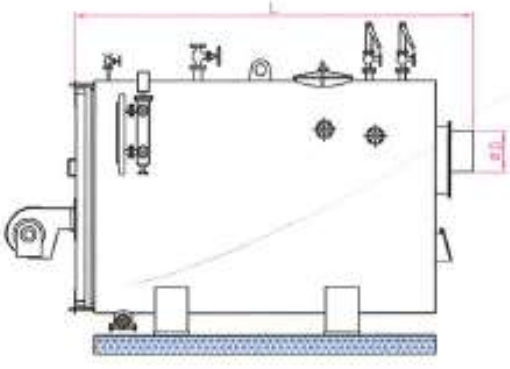
**Optimal Heat Transfer Surface: The boiler is engineered to balance heat load, ensuring no excessive heat concentration, which improves overall efficiency and reliability.**

**Minimal Heat Loss: The outer surface is designed to minimize heat loss, further improving energy efficiency.**

**Durability and Efficiency: With proper maintenance, the boiler ensures a long service life while maintaining consistently high performance.**







# EASY MAINTENANCE

**The design allows for easy access to critical components:**
**The combustion chamber and smoke tubes are accessible through the front door for routine inspection and cleaning.**
**The waterside components can be reached through manholes and handholes, ensuring straightforward maintenance procedures and efficient upkeep.**
**This combination of compact design, rapid steam production, and ease of maintenance makes the boiler an efficient, long-lasting solution for various industrial applications.**

# CAPACITIE & DIMENSIONS:

| | RB-250 | RB-300 | RB-350 | RB-400 | RB-450 | RB-500 | RB-600 | RB-750 | RB-1000 | RB-1250 |
|---|---|---|---|---|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 750 | 1000 | 5000 |
| Length (mm) | 1580 | 1680 | 1780 | 1880 | 1880 | 2100 | 2200 | 2300 | 2500 | 4400 |
| Width (mm) | 1100 | 1200 | 1250 | 1250 | 1250 | 1400 | 1450 | 1600 | 1600 | 2350 |
| Height (mm) | 1250 | 1350 | 1400 | 1400 | 1400 | 1550 | 1600 | 1750 | 1750 | 1850 |
| Steam Volume ( $m^3$) | 0,21 | 0,25 | 0,28 | 0,3 | 0,37 | 0.46 | 0.51 | 0.68 | 0,76 | 0,89 |
| Water Volume (lt) | 410 | 540 | 680 | 715 | 630 | 990 | 1180 | 1280 | 1390 | 2200 |
| Stack Dımension (mm) | 200 | 200 | 250 | 250 | 250 | 300 | 350 | 400 | 400 | 400 |
| Flue Gas Pressure Drop (mmSS) | 10 | 10 | 10 | 15 | 15 | 15 | 18 | 20 | 25 | 30 |
| Appro weight at 6 bar | 600 | 740 | 840 | 900 | 920 | 1230 | 1415 | 1765 | 1930 | 2400 |
| Appro weight at 10 bar | 700 | 850 | 950 | 1050 | 1100 | 1400 | 1600 | 2030 | 2200 | 2750 |

# CAPACITIE & DIMENSIONS:

| | RB-1500 | RB-1750 | SB-2000 | SB-2500 | SB-3000 | SB-3500 | RB-4000 | RB-5000 | RB-6000 |
|---|---|---|---|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 6000 | 1750 | 2000 | 2500 | 3000 | 3500 | 4000 | 5000 | 6000 |
| Length (mm) | 4700 | 3100 | 3200 | 3400 | 3700 | 3850 | 4100 | 4400 | 4700 |
| Width (mm) | 2550 | 1750 | 1750 | 1800 | 2000 | 2150 | 2250 | 2350 | 2550 |
| Height (mm) | 1900 | 1900 | 1950 | 2150 | 2150 | 2300 | 2400 | 2500 | 2700 |
| Steam Volume ( $m^3$) | 1.18 | 1.29 | 1.61 | 1.73 | 1.96 | 2.81 | 3.18 | 3.95 | 4.50 |
| Water Volume (lt) | 2240 | 2590 | 2860 | 2930 | 3920 | 4730 | 7350 | 7500 | 11050 |
| Stack Dımensio n (mm) | 450 | 450 | 500 | 500 | 550 | 600 | 600 | 650 | 700 |
| Flue Gas Pressure Drop (mmSS) | 40 | 50 | 50 | 55 | 60 | 70 | 80 | 90 | 100 |
| Appro weight at 6 bar | 2700 | 2970 | 3565 | 4050 | 4990 | 5880 | 7050 | 8540 | 10580 |
| Appro weight at 10 bar | 3100 | 3400 | 4100 | 4650 | 5600 | 6700 | 8000 | 9750 | 12000 |

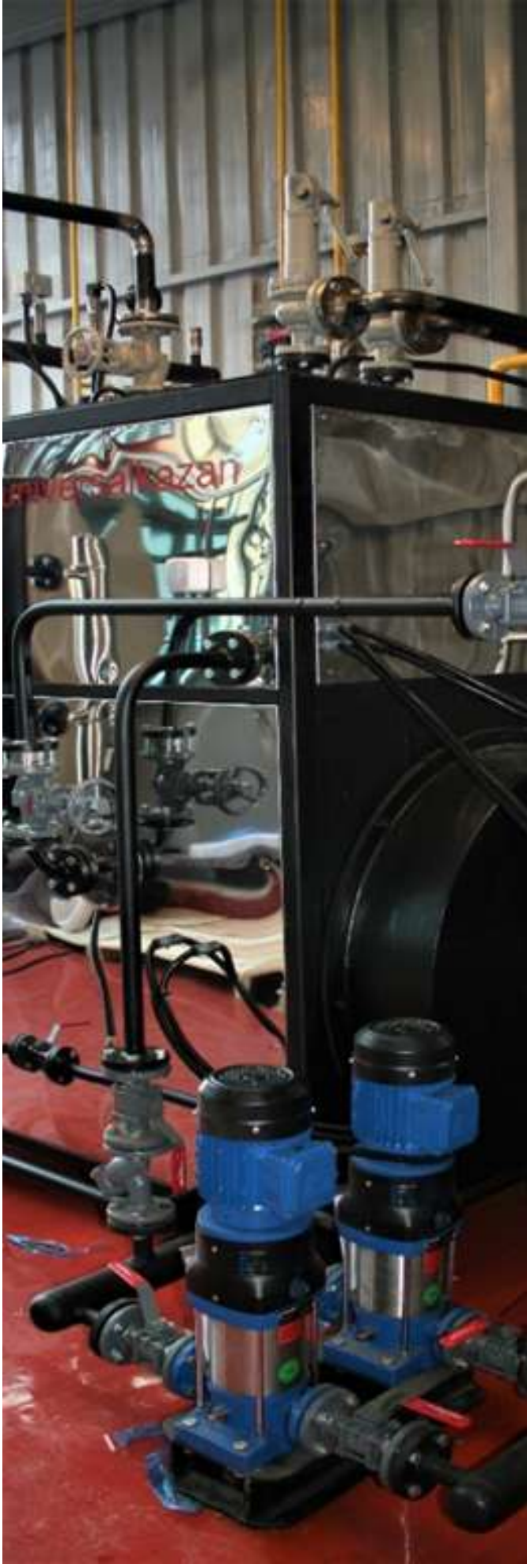
# 02 STEAM GENERATOR

## Definition

**A steam generator is a device engineered to convert water into steam through the application of heat. It is designed for various industrial applications, providing a continuous and reliable source of steam for processes such as heating, power generation, or cleaning. Unlike traditional boilers, steam generators are typically more compact, offer quicker startup times, and are highly efficient in producing steam at the required pressure and temperature levels. Their compact design makes them ideal for industries with space constraints or those requiring rapid steam production**

## Why Steam Generator

**The compact design saves valuable space, making them ideal for facilities with limited room. They provide rapid steam production, which ensures quick start-up times and immediate availability of steam, improving operational efficiency. Steam generators are also energy-efficient, consuming less fuel while delivering consistent steam output, which helps lower operational costs. Additionally, their simplified design often results in easier installation and maintenance, further reducing downtime and overall maintenance expenses. These advantages make steam generators a reliable and cost-effective**



# COMPACTED STEAM GENERATOR
## KBJ

**DESIGN:**
**The Universal Compact Steam Generators are designed with efficiency, durability, and ease of use in mind. The compact, space-saving design integrates all critical components such as the burner, feed-water pump, condensate tank, water filter, and an electric control panel into a single, fully-installed unit. This seamless integration minimizes installation time and reduces the overall footprint, making it suitable for facilities with limited space. The system is engineered for easy access to key components, ensuring simple operation and ease of maintenance.**

# ADVANTAGES

## Rapid Steam Production

**Delivers steam quickly and efficiently, making it ideal for industries that require a steady supply of steam without delays.**

## Space Efficiency

**The compact design minimizes the space required for installation, making it ideal for businesses with limited space.**

## Durability

**Built to operate under tough conditions, the generator can handle hard and untreated water without compromising its long-term performance.**

## Fully Automated Operation

**Features a full automation system that ensures safe, reliable, and hassle-free operation, reducing the need for constant manual intervention.**

## Safety Features

**Equipped with several safety mechanisms, providing a secure operation environment and preventing potential system failures.**

# TESTING & MAINTENANCE

**The design of the Universal Compact Steam Generators prioritizes user-friendliness, allowing for quick and efficient maintenance of critical components such as the burner, feed-water pump, water filter, and automatic water treatment unit. This ease of access minimizes the time and effort required for routine checks and repairs.**

**To ensure the optimal performance and longevity of the equipment, comprehensive maintenance guidelines and schedules are provided. These guidelines include:**

- Regular inspections of the burner and feed-water pump.
- Routine cleaning of the water filter.
- Scheduled checks of the automatic water treatment unit.
- Documentation of maintenance activities to track performance over time.

# CAPACITIE & DIMENSIONS:

| | KBJ-500 | KBJ-600 | KBJ-750 | KBJ-1000 | KBJ-1250 | KBJ-1500 | KBJ-1750 | KBJ-2000 |
|---|---|---|---|---|---|---|---|---|
| Steam Capacity (Kg/h) | 500 | 600 | 750 | 1000 | 1250 | 1500 | 1750 | 2000 |
| Length (mm) | 2600 | 2600 | 2600 | 2950 | 2950 | 3200 | 3500 | 3500 |
| Width (mm) | 1150 | 1650 | 1750 | 1750 | 1880 | 1880 | 1880 | 2140 |
| Height (mm) | 2520 | 2620 | 2720 | 2720 | 2900 | 2900 | 2900 | 3160 |
| Water Volume (lt) | 772 | 841 | 953 | 1101 | 1344 | 1482 | 1626 | 2400 |
| Stack Dımension (mm) | 300 | 350 | 400 | 400 | 400 | 400 | 450 | 500 |
| Appro weight | 2625 | 2900 | 3215 | 3640 | 4200 | 4500 | 4900 | 6400 |

# PACKAGE MINI STEAM GENERATOR MBÜ

**DESIGN:**

One of the standout features of the MBÜ is its space-efficient design. The unit integrates the burner, feed-water pump, condensate tank, water filter, automatic water treatment unit, and electric control panel into a single, compact package. This makes it highly suitable for installations in facilities where floor space is at a premium.

**Rapid Steam Production**

**The MBÜ produces steam quickly, making it ideal for operations needing immediate steam supply, minimizing downtime and maximizing efficiency**

**Operating Conditions**

**Like the larger KBJ Type, the MBÜ is built for tough environments, handling hard and untreated water while maintaining performance and long-lasting durability.**

**Automation**

**The MBÜ's advanced control system ensures safe, efficient, and fully automated operation, reducing labor needs and providing reliable steam generation with minimal supervision**

**Efficiency**

**he MBÜ is energy-efficient, optimizing fuel use for high-performance steam generation, reducing operating costs, and offering a cost-effective solution for smaller industries.**

# CAPACITIE & DIMENSIONS:

| | MBÜ-200 | MBÜ-300 | MBÜ-400 | MBÜ-500 |
|---|---|---|---|---|
| Steam Capacity (Kg/h) | 200 | 300 | 400 | 500 |
| Length(mm) | 2400 | 2600 | 2700 | 2840 |
| Width (mm) | 1380 | 1530 | 1530 | 1580 |
| Height(mm) | 1885 | 2170 | 2170 | 2220 |
| Water Volume (lt) | 240 | 430 | 470 | 620 |
| Stack Dimension (mm) | 200 | 250 | 300 | 300 |
| Approximate weight | 1100 | 1500 | 1650 | 1800 |

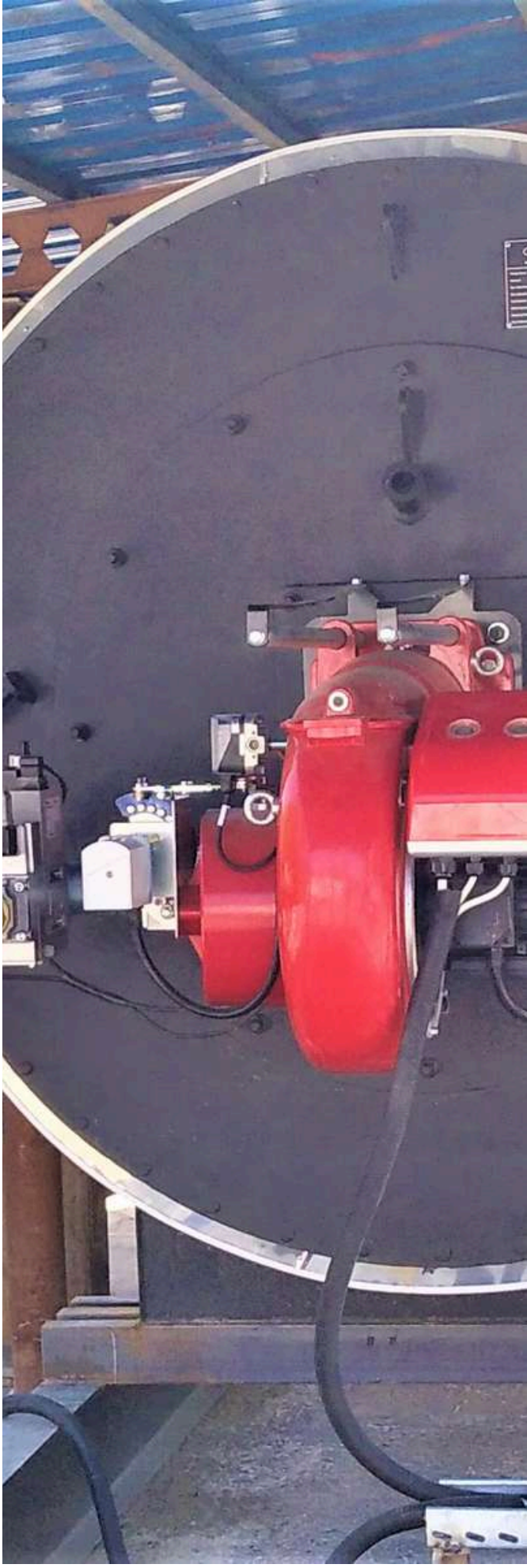
# 03 THERMAL OIL BOILER

## Definition

A thermal oil boiler is a heating system that uses a heat transfer fluid, typically oil, to deliver high-temperature heat to industrial processes. Unlike steam boilers, it operates at lower pressures, allowing for safer operation while achieving precise temperature control. These systems are ideal for applications that require consistent heat over extended periods, such as in chemical, food processing, and manufacturing industries.

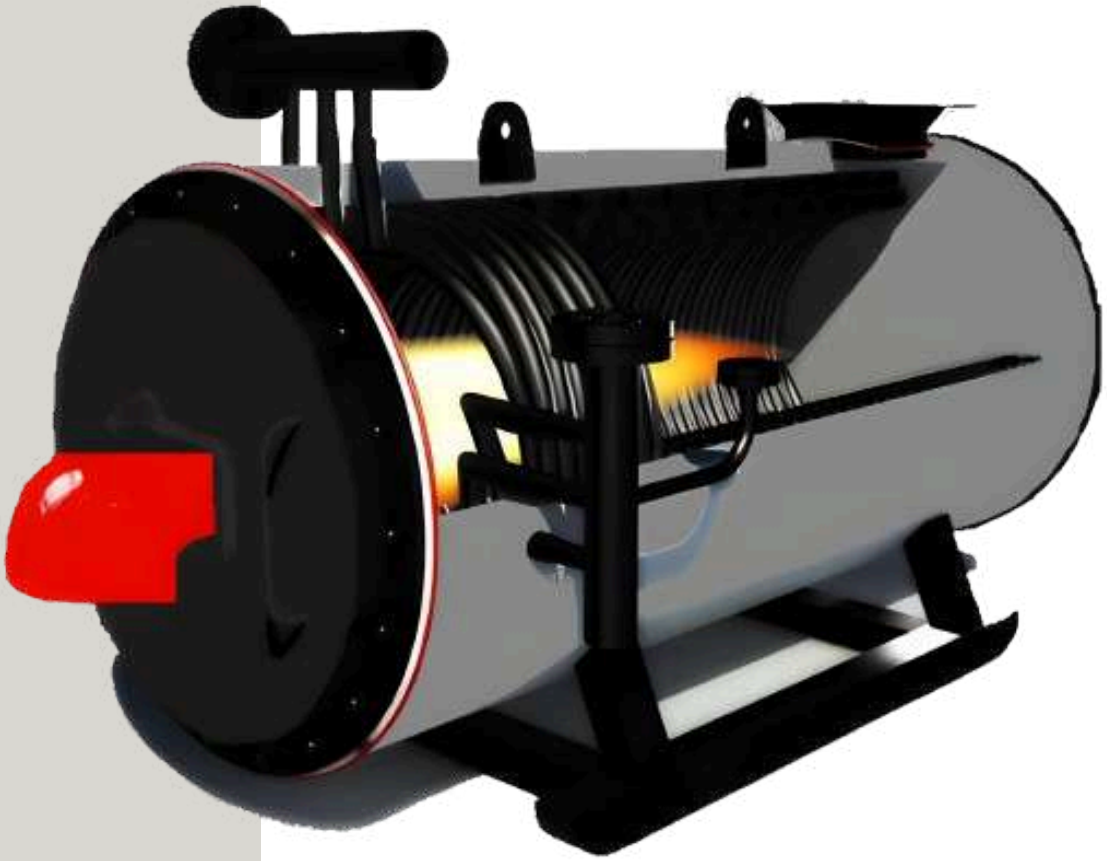
## Why Thermal Oil Boiler

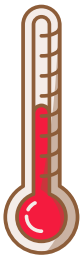
Thermal oil boilers  provides precise temperature control and can operate at high temperatures without the high pressure required by steam systems, enhancing safety. Thermal oil boilers also offer greater energy efficiency, as they reduce heat loss and don’t require water treatment. Additionally, they are low-maintenance systems, have longer lifespans, and are ideal for processes requiring continuous, reliable heat, such as in chemical plants, food processing, and manufacturing operations..



# THERMAL OIL BOILER
# KYK

**Thermal oil systems offer several distinct advantages in industrial applications where high temperatures and operational efficiency are essential. Unlike steam-based systems, thermal oil systems can achieve high temperatures without the need for high pressure, making them safer and more efficient for various heating processes.**





**Thermal oil systems can reach up to 300°C at atmospheric pressure, eliminating the need for high-pressure components, reducing the risk of failures, and making them safer and easier to maintain than steam boilers.**

**Thermal oil systems reach up to 300°C at atmospheric pressure, removing the need for high-pressure components and reducing failure risks, making them safer and easier to maintain than steam boilers.**

**Thermal oil systems reach 300°C at atmospheric pressure, reducing failure risks and making them safer and easier to maintain than steam boilers.**

# CAPACITIE & DIMENSIONS:

| | KYK-100 | KYK-125 | KYK-150 | KYK-200 | KYK-250 | KYK-300 | KYK-400 | KYK-500 |
|---|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 100 000 | 125 000 | 150 000 | 200 000 | 250 000 | 300 000 | 400 000 | 500 000 |
| Oil Outlet Tempreture (C°) | 280 | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| Oil Inlet Tempreture (C°) | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| Length (mm) | 1250 | 1350 | 1450 | 1550 | 1650 | 1880 | 2630 | 2800 |
| Width (mm) | 1150 | 1200 | 1200 | 1330 | 1300 | 1330 | 1430 | 1525 |
| Height (mm) | 1000 | 1050 | 1050 | 1150 | 1150 | 1150 | 1250 | 1400 |
| Oil Outlet Diameter (DN) | 32 | 32 | 32 | 40 | 40 | 50 | 65 | 65 |
| Oil inlet Diameter (DN) | 32 | 32 | 32 | 40 | 40 | 50 | 65 | 65 |
| Oil Contents (lt) | 20 | 31 | 36 | 50 | 56 | 68 | 91 | 133 |
| Stack Dımension (mm) | 150 | 150 | 150 | 200 | 200 | 200 | 250 | 250 |
| Resistance of oil (mbar) | 450 | 460 | 500 | 525 | 550 | 600 | 800 | 580 |
| Resistance of fuel gas (mbar) | 1.0 | 1.0 | 1.2 | 1.5 | 1.5 | 1.6 | 1.8 | 2.0 |
| Approx weight | 920 | 1025 | 1100 | 1360 | 1440 | 1875 | 2065 | 2065 |

# CAPACITIE & DIMENSIONS:

| | KYK-600 | KYK-800 | KYK-1000 | KYK-1250 | KYK-1500 | KYK-2000 | KYK-2500 |
|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 600 000 | 800 000 | 1000 000 | 1250 000 | 1500 000 | 2000 000 | 2500 000 |
| Oil Outlet Tempreture (C°) | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| Oil Inlet Tempreture (C°) | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| Length (mm) | 2300 | 2500 | 2700 | 2825 | 3325 | 3825 | 4025 |
| Width (mm) | 1750 | 1900 | 2000 | 2000 | 2250 | 2600 | 2700 |
| Height (mm) | 1500 | 1660 | 1760 | 1960 | 2000 | 2350 | 2450 |
| Oil Outlet Diameter (DN) | 65 | 80 | 100 | 100 | 125 | 125 | 150 |
| Oil inlet Diameter (DN) | 65 | 80 | 100 | 100 | 125 | 125 | 150 |
| Oil Contents (lt) | 160 | 252 | 674 | 1043 | 1292 | 2175 | 2561 |
| Stack Dımension (mm) | 300 | 300 | 350 | 400 | 450 | 500 | 550 |
| Resistance of oil (mbar) | 850 | 870 | 950 | 1000 | 1100 | 1200 | 1400 |
| Resistance of fuel gas (mbar) | 2.5 | 3.0 | 4.0 | 5.0 | 5.0 | 5.5 | 6.0 |
| Approximate weight | 3100 | 3250 | 4500 | 6150 | 7200 | 10450 | 11630 |

# CAPACITIE & DIMENSIONS:

| | KYK-3000 | KYK-3500 | KYK-4000 | KYK-5000 | KYK-6000 | KYK-8000 | KYK-10000 |
|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 3000 000 | 3500 000 | 4000 000 | 5000 000 | 6000 000 | 8000 000 | 10000 000 |
| Oil Outlet Tempreture (C˚) | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| Oil Inlet Tempreture (C˚) | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| Length (mm) | 4425 | 4550 | 5050 | 5450 | 5850 | 5850 | 5850 |
| Width (mm) | 2850 | 3000 | 4075 | 3425 | 3715 | 4180 | 5350 |
| Height (mm) | 2600 | 2750 | 2800 | 3150 | 3400 | 3800 | 4000 |
| Oil Outlet Diameter (DN) | 150 | 150 | 200 | 200 | 200 | 250 | 250 |
| Oil inlet Diameter (DN) | 150 | 150 | 200 | 200 | 200 | 250 | 250 |
| Oil Contents (lt) | 3636 | 4158 | 4719 | 7122 | 8604 | 13977 | 17498 |
| Stack Dımension (mm) | 600 | 650 | 700 | 800 | 900 | 1000 | 1150 |
| Resistance of oil (mbar) | 2200 | 2500 | 2750 | 3000 | 3000 | 3000 | 3500 |
| Resistance of fuel gas (mbar) | 7.0 | 8.0 | 9.0 | 10.0 | 11.5 | 12.0 | 15.0 |
| Approximate weight | 14955 | 17150 | 19100 | 24685 | 31625 | 42275 | 54230 |

# 04 HOT WATER BOILER

## Definition

A hot water boiler is a heating system designed to produce hot water for residential, commercial, or industrial use. It operates by heating water using various energy sources, such as natural gas, oil, or electricity, and then distributing the hot water through pipes for heating spaces, providing domestic hot water, or supplying hot water for industrial processes. Hot water boilers are typically designed to operate at lower pressures compared to steam boilers, offering efficient and reliable heat without the risks associated with high-pressure steam systems.

## Why Hot water Boiler

A hot water boiler is knowing for its efficiency, lower pressure operation, and versatility in applications such as space heating and domestic hot water supply. It heats water quickly, ensuring immediate availability, and generally requires less maintenance than steam boilers, resulting in lower operating costs and a longer lifespan. These features make hot water boilers a reliable choice for various heating needs.

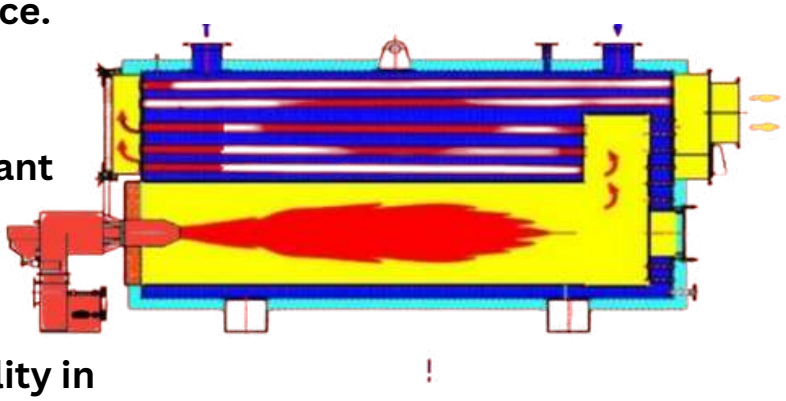
# HOT WATER BOILER
## SSK

**This hot water boiler features a 3-pass fire-tube design, ensuring optimal heat transfer and minimal flue gas temperatures. The combustion gases pass through three stages, allowing maximum extraction of heat, reducing fuel consumption, and lowering emissions. The stainless steel exterior enhances durability and provides resistance to corrosion, while the rock wool insulation minimizes heat loss, ensuring energy efficiency.**

## Advantages

**High efficiency of up to 92% reduces operational costs.**

**Turbulators in smoke tubes enhance heat transfer, improving boiler performance.**

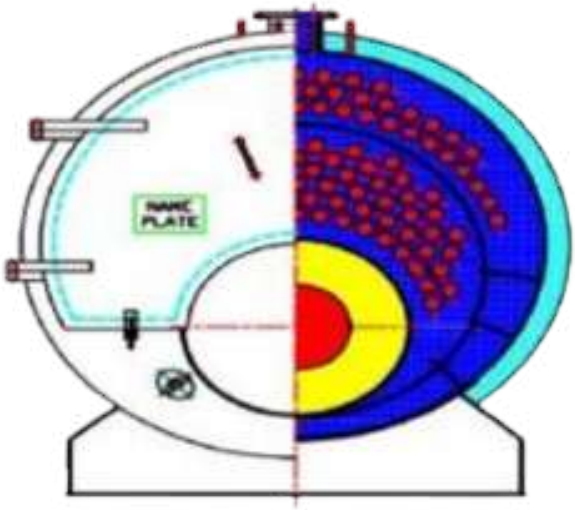


**Low NOx emissions, making it environmentally friendly and compliant with emission regulations.**

**Suitable for use with various fuels, including natural gas, offering flexibility in energy sources.**

**Long operational life with minimal wear due to advanced design and high-quality materials.**

## Ease of Maintenance




**The hot water boilers are designed for ease of maintenance, with convenient access points for inspection and cleaning. The use of high-quality materials, such as stainless steel exteriors and rock wool insulation, reduces wear and tear, extending the operational life of the boiler. Regular maintenance ensures continued high efficiency, minimal downtime, and lower long-term operational costs.**

# CAPACITIE & DIMENSIONS:

| | SSK-5 | SSK-10 | SSK-15 | SSK-20 | SSK-25 | SSK-30 | SSK-35 |
|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 120 000 | 240 000 | 360 000 | 500 000 | 600 000 | 720 000 | 840 000 |
| Length (mm) | 2100 | 2550 | 2700 | 2900 | 2900 | 2950 | 3075 |
| Width (mm) | 1200 | 1350 | 1450 | 1550 | 1700 | 1800 | 1800 |
| Height (mm) | 1450 | 1600 | 1700 | 1800 | 1950 | 2050 | 2050 |
| Stack Dımensio n (mm) | 200 | 250 | 250 | 300 | 300 | 300 | 350 |
| Water Volume (lt) | 660 | 1070 | 1420 | 1900 | 2270 | 2740 | 2820 |
| Fuel gas Pressure Drop (mmSS) | 25 | 30 | 30 | 40 | 40 | 50 | 50 |
| Weight | 1580 | 2520 | 3150 | 3990 | 4760 | 5510 | 5800 |

# CAPACITIE & DIMENSIONS:

| | SSK-50 | SSK-60 | SSK-70 | SSK-80 | SSK-90 | SSK-100 | SSK-125 |
|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 1200 000 | 1440 000 | 1680 000 | 1920 000 | 2160 000 | 2400 000 | 3000 000 |
| Length (mm) | 3715 | 3775 | 4175 | 4200 | 4400 | 4500 | 4800 |
| Width (mm) | 1950 | 2100 | 2100 | 2200 | 2200 | 2300 | 2400 |
| Height (mm) | 2200 | 2350 | 2350 | 2450 | 2450 | 2550 | 2650 |
| Stack Dımensio n (mm) | 400 | 400 | 450 | 500 | 500 | 550 | 600 |
| Water Volume (lt) | 4150 | 4850 | 5490 | 6070 | 6310 | 7470 | 8490 |
| Fuel gas Pressure Drop (mmSS) | 50 | 60 | 60 | 60 | 60 | 60 | 70 |
| Weight | 7960 | 9870 | 77010 | 12100 | 12840 | 14560 | 17240 |

# CAPACITIE & DIMENSIONS:

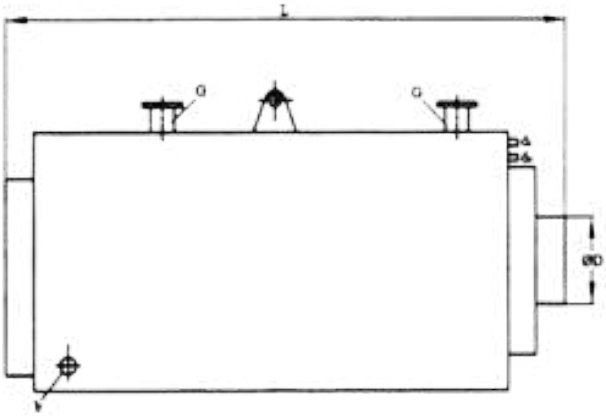
| | SSK-150 | SSK-175 | SSK-200 | SSK-250 | SSK-300 | SSK-350 | SSK-400 |
|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 3600 000 | 4200 000 | 4800 000 | 6000 000 | 7200 000 | 8400 000 | 9600 000 |
| Length (mm) | 5150 | 5350 | 5550 | 6200 | 6700 | 5600 | 5800 |
| Width (mm) | 2600 | 2600 | 2750 | 2950 | 3100 | 3850 | 3850 |
| Height (mm) | 2850 | 2850 | 3050 | 3250 | 3400 | 4150 | 4150 |
| Stack Dımensio n (mm) | 650 | 700 | 750 | 850 | 900 | 950 | 1000 |
| Water Volume (lt) | 11550 | 11770 | 13680 | 18360 | 21360 | 29410 | 30080 |
| Fuel gas Pressure Drop (mmSS) | 70 | 70 | 70 | 80 | 80 | 90 | 100 |
| Weight | 22070 | 22950 | 27360 | 34660 | 41040 | 54730 | 57030 |

# HOT WATER BOILER
# ÜRK

**The Hot Water Boiler is designed for optimal performance in a compact form. The pressurized combustion chamber enhances heat transfer. This results in higher output while maintaining a small footprint. Additionally, the option for automatic control units gives operators more control over temperature settings, improving ease of use and reducing the need for manual adjustments.**

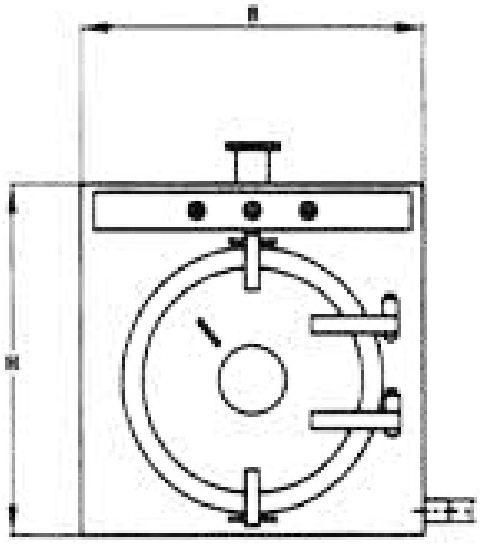
**Compact Design:**
**Features small dimensions, requiring minimal installation space, making it ideal for areas with limited room.**

**Rapid Start-Up:**
**Achieves stable operating conditions in a very short time after start-up, providing immediate and consistent heating.**



**High Efficiency:**
**Engineered for maximum efficiency, optimizing fuel usage and reducing operational costs while delivering excellent heating output.**

**Environmentally Friendly:**
**Designed to operate with minimal emissions, ensuring environmental sustainability while meeting high-performance demands.**



**Advanced Design:**
**Includes a pressurized combustion chamber and a 3-pass heat exchange system, maximizing heat transfer for better efficiency and performance.**

**Optional Automation:**
**Automatic control units and additional elements can be installed upon request, allowing for precise temperature control and ease of operation.**

# CAPACITIE & DIMENSIONS:

| | ÜRK-40 | ÜRK-50 | ÜRK-60 | ÜRK-80 | ÜRK-100 | ÜRK-125 | ÜRK-150 | ÜRK-175 | ÜRK-200 |
|---|---|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 40000 | 50000 | 60000 | 80000 | 100000 | 125000 | 150000 | 175000 | 200000 |
| Length (mm) | 1250 | 1350 | 1450 | 1550 | 1550 | 1550 | 1750 | 1850 | 1850 |
| Width (mm) | 800 | 800 | 800 | 800 | 900 | 900 | 900 | 900 | 1010 |
| Height (mm) | 1150 | 1150 | 1150 | 1150 | 1250 | 1250 | 1250 | 1250 | 1360 |
| Stack Dimension (mm) | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Water Inlet-Oulet (DN) | 40 | 40 | 40 | 50 | 50 | 50 | 65 | 65 | 65 |
| Expansion Connection (inc) | 1" | 1" | 1" | 1" | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/2" | 1 1/2" |
| Drain (inc) | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 3/4" |
| Pressure Drop (mmSS) | 3 | 3 | 4 | 4 | 5 | 7 | 10 | 10 | 10 |
| Water Volume (lt) | 189 | 190 | 211 | 231 | 285 | 285 | 334 | 358 | 444 |

# CAPACITIE & DIMENSIONS:

| | ÜRK -250 | ÜRK -300 | ÜRK -350 | ÜRK-400 | ÜRK-450 | ÜRK-500 | ÜRK-600 | ÜRK -700 | ÜRK-800 |
|---|---|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 250 000 | 300 000 | 350 000 | 400 000 | 450 000 | 500 000 | 600 000 | 700 000 | 800 000 |
| Length (mm) | 2150 | 2150 | 2250 | 2500 | 2560 | 2660 | 2760 | 300 0 | 300 0 |
| Width (mm) | 1010 | 1100 | 1100 | 1200 | 1200 | 1200 | 1200 | 1200 | 1300 |
| Height (mm) | 1360 | 1450 | 1450 | 1550 | 1550 | 1550 | 1550 | 1550 | 1650 |
| Stack Dimension (mm) | 250 | 300 | 300 | 350 | 350 | 350 | 350 | 350 | 350 |
| Water Inlet-Oulet (DN) | 65 | 65 | 65 | 80 | 80 | 80 | 100 | 100 | 125 |
| Expansion Connection (inc) | 1 1/2" | 1 1/2" | 2" | 2" | 2" | 2" | 2" | 2 1/2" | 2 1/2" |
| Drain (inc) | 3/4" | 3/4" | 1" | 1" | 1" | 1" | 1" | 1" | 1" |
| Pressure Drop (mmSS) | 15 | 15 | 15 | 18 | 20 | 25 | 25 | 28 | 30 |
| Water Volume (lt) | 534 | 738 | 781 | 1015 | 1015 | 1030 | 1135 | 1256 | 1414 |

# CAPACITIE & DIMENSIONS:

| | ÜRK -900 | ÜRK-1000 | ÜRK-1250 | ÜRK-1500 | ÜRK-1750 | ÜRK-2000 | ÜRK-2500 | ÜRK-3000 |
|---|---|---|---|---|---|---|---|---|
| Heating Capacity (Kcal/h) | 900 000 | 1000 000 | 1250 000 | 1500 000 | 1750 000 | 2000 000 | 2500 000 | 3000 000 |
| Length (mm) | 3250 | 3250 | 3550 | 3750 | 3950 | 4150 | 4550 | 4950 |
| Width (mm) | 1300 | 1400 | 1530 | 1530 | 1630 | 1770 | 1880 | 2030 |
| Height (mm) | 1650 | 1750 | 1880 | 1880 | 1980 | 2125 | 2230 | 2380 |
| Stack Dimension (mm) | 350 | 350 | 450 | 450 | 500 | 500 | 550 | 600 |
| Water Inlet-Oulet (DN) | 125 | 125 | 150 | 200 | 200 | 200 | 250 | 250 |
| Expansion Connection (inc) | 2 1/2" | 2 1/2" | 2 1/2" | 2 1/2" | 3" | 3" | 3" | 3" |
| Drain (inc) | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/2" | 1 1/2" | 1 1/2" |
| Pressure Drop (mmSS) | 40 | 50 | 50 | 60 | 60 | 60 | 60 | 60 |
| Water Volume (lt) | 1548 | 1723 | 2700 | 2878 | 3336 | 3935 | 4739 | 4749 |

# 05 DEAERATOR

## Definition

A deaerator is a mechanical device used to remove dissolved gases, primarily oxygen and carbon dioxide, from water, typically in steam generation systems. By heating the water and creating a vacuum or using steam, the deaerator reduces the concentration of these gases, which can cause corrosion and other issues in boilers and piping systems. This process enhances the efficiency and longevity of the steam system by ensuring the water quality is optimal for operation. Deaerators are commonly used in power plants, industrial facilities, and heating systems.

## Why deaerator

In steam boiler systems, maintaining the integrity and efficiency of equipment is crucial for long-term operation and cost-effectiveness. One of the most critical factors in ensuring optimal performance is the removal of dissolved gases, such as oxygen ($O_2$) and carbon dioxide ($CO_2$), from the feed water.

If not properly treated, these gases can lead to corrosion, compromising the structural integrity of the boiler and steam lines, and significantly reducing the system's lifespan.

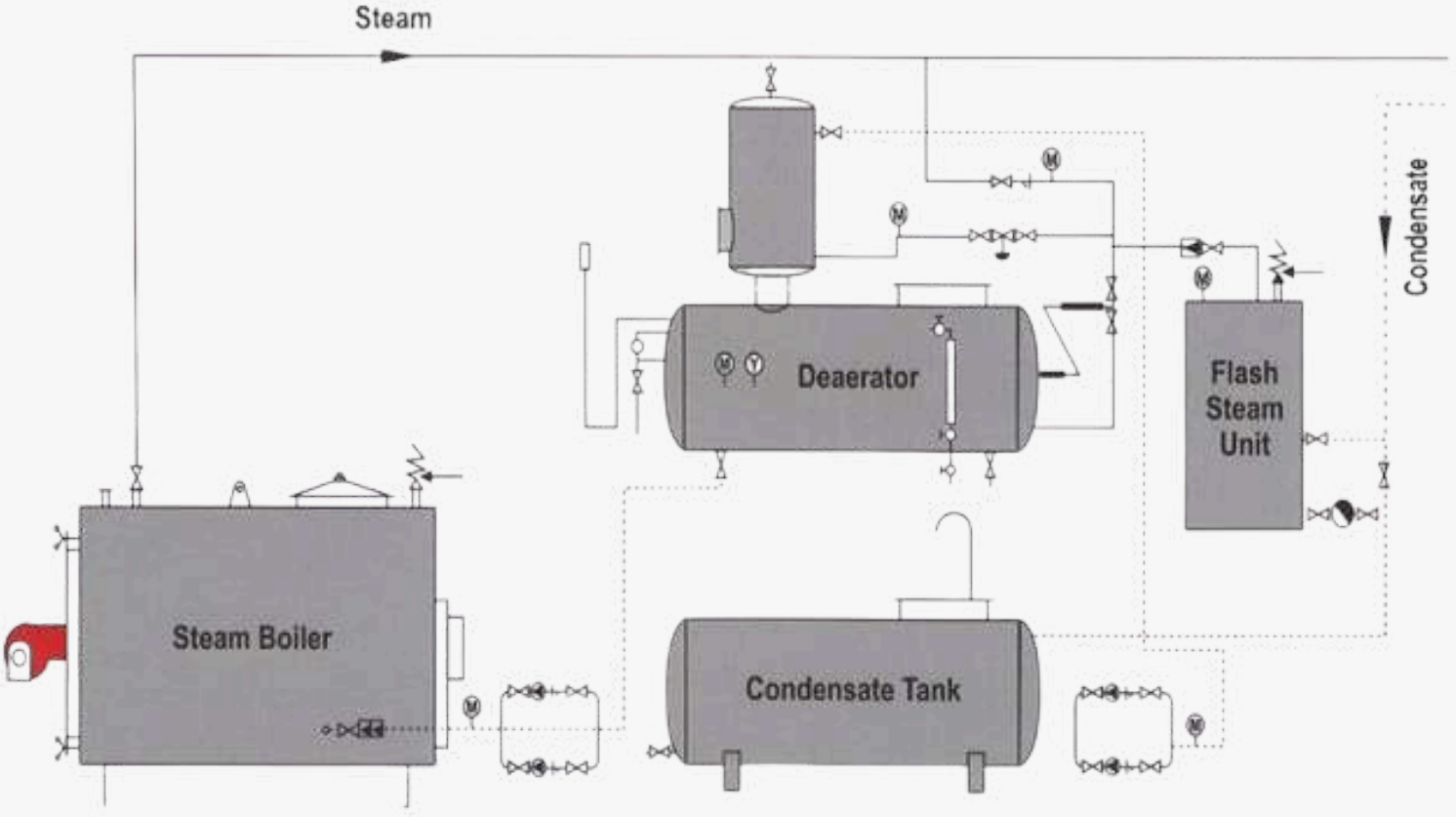
Effective deaeration is, therefore, essential to prevent this damage and maintain operational efficiency.

To address this, feed water is atomized and heated using steam, causing $CO_2$ and $O_2$ to dissolve at 60°C and 100°C. The atomization process is typically performed with a sprinkler system in conventional deaerators

# CHALLENGES OF CONVENTIONAL DEAERATION SYSTEMS

**However, conventional deaeration systems present certain limitations. For instance, the water level inside the deaerator must be at least 6 meters above the suction side of the feed water pump to prevent evaporation and cavitation.**

**This requirement dictates a boiler room height of at least 10 meters, along with the need for a supporting platform for the deaerator, both of which drive up construction costs.**



# 06 HEAT RECOVERY SYSTEM

## Definition

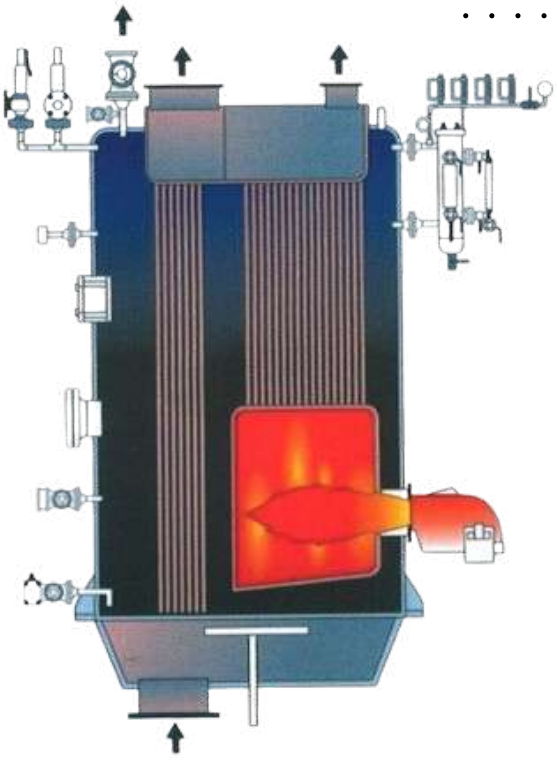
Heat recovery systems or wasted heat recovery systems capture and reuse waste heat from various sources, such as steam boilers, thermal oil boilers, and furnaces used for glass melting or drying.
This recovered heat can be utilized for heating boiler feed water, providing hot water for radiators, domestic use, or industrial processes. Additionally, it can serve to preheat combustion air or process air, enhancing both environmental and industrial efficiency.

**Notably, every 20°C reduction in flue gas temperature can improve device efficiency by approximately 1%.**

**DESGIN**

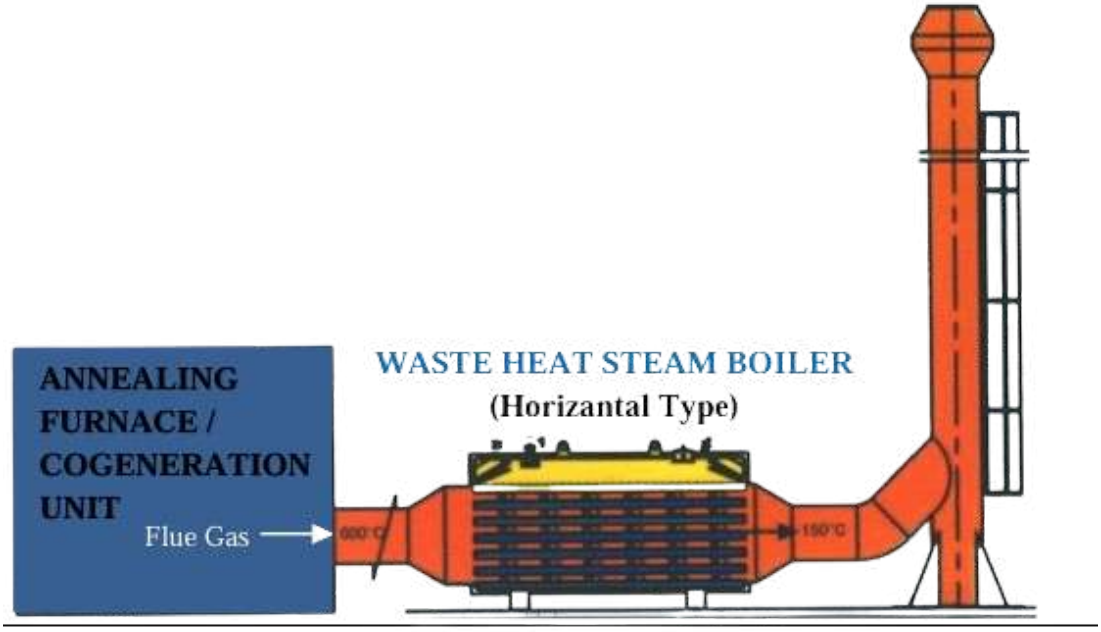
**Heat recovery devices are custom-designed based on the specific operating conditions and the type of fuel used.**

**They can be manufactured using different materials, such as straight seamless tubes, finned tubes, or 316L stainless steel tubes, depending on the application.**



500-600°C Waste Gasses

**Vertical Type Waste Heat Boiler**
**Reinforced with burner.**



## Heat Recovery via Economizer

**Fuel Savings: 2-5%**

**Condensing Economizer (Natural Gas): Achieves up to 15.7% efficiency.**

**Example Calculation for Usable Heat:**

$$\frac{(258°C - 160°C)}{20°C} = 4.9\% \text{ fuel savings}$$

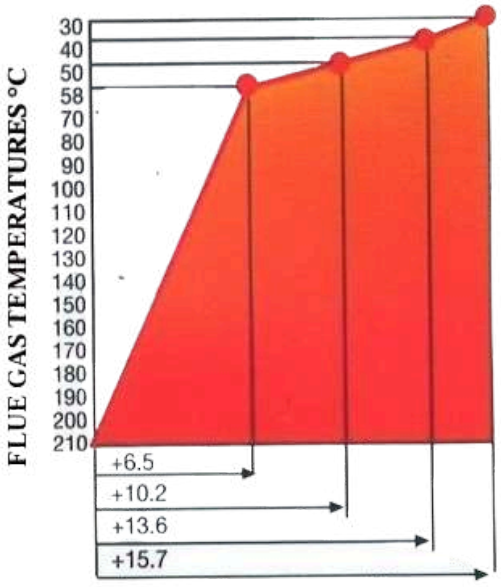
**Optimal Temperatures**

**Flue gas temperatures entering the economizer = Steam Temp + (50-70°C)**

**Minimum feed water temperature: 70°C for coal-fired systems to prevent corrosion.**

**Flue gas exit temperatures:**

- **180°C for coal (high sulfur content)**
- **160°C for heavy fuel oil (HFO)**
- **120°C for natural gas (non-condensing).**




The graph shows fuel saving values for a boiler working on full load at 6 bar and the effect of economizer at the back of boiler.

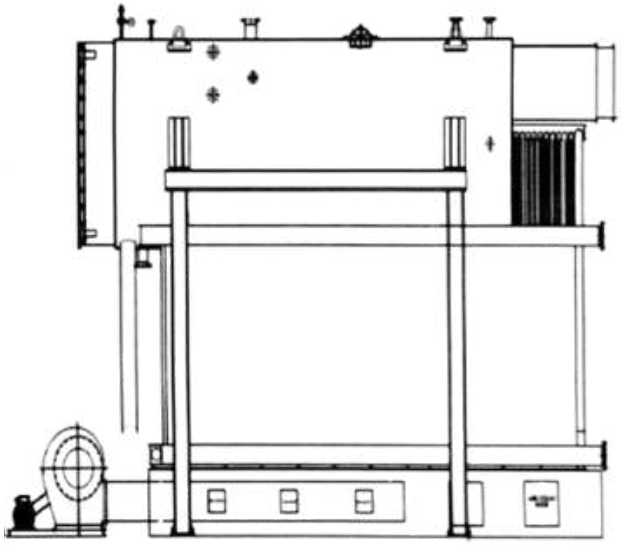
# 07 HYBRID TYPE STEAM AND HOT WATER BOILER

## Definition

A hybrid type steam and hot water boiler is a versatile heating system designed to generate both steam and hot water simultaneously or alternately, depending on the operational requirements. This type of boiler typically combines features of traditional steam boilers and hot water boilers, allowing for efficient energy use and flexibility in applications. Hybrid boilers can utilize various fuel sources, such as natural gas, oil, or electricity, and are equipped with advanced controls to optimize performance. They are commonly used in industries where both steam and hot water are needed, such as in food processing, chemical manufacturing, and building heating systems.

## Why Hybrid TYPE

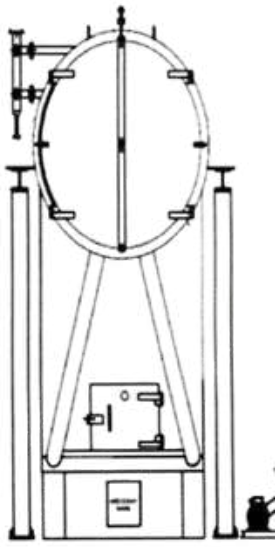
Hybrid Type Fixed Grate Solid Fuel-Fired Boilers are becoming increasingly important for generating energy in the form of steam and hot water for various production industries, including textiles, paper, agriculture, sugar, oil, dyeing, leather, and rubber.
ÜNİVERSAL specializes in manufacturing these boilers, with capacities ranging from 3 ton/h (1,800,000 kcal/h) to 10 ton/h (6,000,000 kcal/h).



**Our boilers are designed for thermal efficiency, fuel consumption, and cost-effectiveness, accommodating various solid fuels (1400–8200 kcal/kg) with different moisture and volatile matter contents. Solid fuels like waste fabric, wood, corncobs, and biomass can be fed through multiple doors, with combustion managed automatically via a main control panel. The hybrid fire-tube design ensures durability against hard water, while the accessible water-tube section simplifies cleaning and maintenance.**

**<u>Key features of ÜNİVERSAL Hybrid Type Boilers:</u>**

**Rapid start-up time.**
**Safe and reliable operation.**
**Low operational costs and long service life.**
**Compact dimensions with easy repair and maintenance.**
**Quick response to peak steam demands.**
**High dryness value of saturated steam.**
**Low flue gas resistance.**
**Advanced automatic control systems.**
**Flexible design for multiple fuel types.**
**These features, combined with a low initial investment cost, make ÜNİVERSAL Hybrid Boilers an economical and efficient solution for various industrial applications.**




+90 (212) 549 70 70

Örnek Mah. Ercüment Batanay Sk.No:14
Dumankaya İkon Rezidance A3 Blok K:32/33
D:170 Ataşehir/İSTANBUL

info@universalkazan.com

www.universalkazan.com