ÜNMAK

GAS & LIQUID FUEL
STEEL BOILER

ÜGS & ÜGS/3G
USER MANUAL

TSE CE

INTRODUCTION

Thank you so much for choosing Unmak brand gas&liquid fuel steel boiler.

You can find the installation, usage, and maintenance information about ÜNMAK steel body central heating boilers in this manual. Please read carefully for comfortable, long-lasting, high efficiency, and economic usage.

Do not touch any part of the boiler except for operation, adjustment, and maintenance purposes.

Please make installation of the boiler by ÜNMAK authorized technical services.

Our authorized technical services and dealers give necessary usage and maintenance information about the boiler when installation and connection have been completed.

Do not hesitate to ask open items, again. Our specialists will be happy to respond to your questions.

WARNINGS

The boiler should only be installed and put into operation in a well-ventilated, frost-free place and outside the living areas.

The design, installation, commissioning, and maintenance of the heating system should be carried out by professional personnel (UNMAK authorized technical service) in accordance with this manual.

These activities must be carried out in accordance with local rules, applicable standards, and regulations, or in cases where these are absent/missing, according to EEC directives and European Norms (EN).

If the boiler is installed and used outside of the operating conditions specified in this booklet, it may cause fire, explosion, or similar accidents that may cause loss of property or life.

The boiler is designed to use only for hot water (below boiling temperature). System operating temperature and pressure are specified on the boiler label and must comply with the values specified in this manual. The heat transfer condition is water. Boilers should only be used with gaseous or liquid fuels specified in this manual and product label.

Boilers should only be used with burners with EN 676 (gas-fired) or EN 267 (liquid fuel) certificates in order to operate in accordance with the Boiler Efficiency Requirement Directive (92/42/AT) and Gas Appliances Directive (90/396/AT). This heating boiler is b23 type boiler. Due to this reason, the boiler must connect to the specific chimney that has sufficient draught without chimney loss. A proper pump should make continuous circulation during the operation of the boiler. Filling and feeding water should have the same specific values as this manual. The use of lime-free, clean and non-corrosive water is essential for the economic operation and long-lasting of the system.

Never close the boiler room for safe and efficient usage. Continuous fresh air is needed for better combustion. It is necessary to exhaust the gases that arise after combustion and leakage from the fuel to the environment. Boiler should instal on the base. The base should be placed at least 15 cm higher than ground, parallel to the surface, and non-flammable strength property.

The boiler should not operate in environments that have flammable gases and equipment. In order to prevent boilers from damage, ensure that burning air doesn't include dust or halogenous hydrocarbons (solvents, spray gases, adhesives, etc.). The humidity of the boiler room shouldn’t be high.

Ignition of liquid or gas burners is automatic and has additional safety checks. Please do not attempt manual operation by disabling burners and system controls. All safety checks must continuously work within a specific limit. Do not try to operate the system in error mode and please refer to the authorized service.

The boiler room should not be used for other purposes and should not have an open connection to the living spaces. The connecting door must be airtight, fire-resistant, and self-closing.

If the boiler temperature rises above 90ºC, do not add cold water to the system for rapid cooling. This may cause the explosion. Please wait for the cooling of the boiler until 40ºC before adding water. Do not start operation if any part of the boiler at underwater. Please immediately refer to the authorized technical service.

Do not touch observation glass, chimney, and smoke box. These parts may have high temperatures and may cause serious injuries.

It is recommended to install an emergency switchboard on the outside of the boiler room. This switchboard should have the stop burning or fuel supply functions. It will have better to have with a label.

Initial controls and commissioning must be done by Unmak authorized technical service when the system is installed.

User has maintenance responsiblity and maintenance should be done by authorized technical service.

Please refer to Unmak authorized technical service when you want to change the fuel type in the future. Some parts of the boiler may change and new settings should be done during change of the fuel type. Do not change the fuel type by non-authorized technical service or yourself.

This is not a condensing type of boiler. Please make sure condensing not happen in a longer period.

If the system will commission with fuel heavier than air (LPG) in the underground level boiler room, there will be a necessity for additional safety requirements.

The fuel that may leak into the boiler room must be automatically discharged to a safe area to the outside of the boiler room (by ventilation) with an ex-proof mechanical system. Fuel supply must automatically be stopped when it reaches a specific level.

Please do not touch the boiler and burner for adjustment and maintenance purposes except specified in the manual.

EU DECLARATION OF CONFORMITY

ÜGS-60, ÜGS-80, ÜGS-100, ÜGS-125, ÜGS-150, ÜGS-175, ÜGS-200, ÜGS-250, ÜGS-300, ÜGS-350, ÜGS-400, ÜGS-450, ÜGS-500, ÜGS-600, ÜGS-700, ÜGS-800, ÜGS-900, ÜGS-1000, ÜGS-1100, ÜGS-1250, ÜGS-1350, ÜGS-1500, ÜGS-1600, ÜGS-1750, ÜGS-2000, ÜGS-2500, ÜGS-3000

ÜGS/3G-80, ÜGS/3G-100, ÜGS/3G-125, ÜGS/3G-150, ÜGS/3G-200, ÜGS/3G-250, ÜGS/3G-300, ÜGS/3G-350, ÜGS/3G-400,ÜGS/3G-500, ÜGS/3G-600, ÜGS/3G-700, ÜGS/3G-800, ÜGS/3G-900, ÜGS/3G-1000,ÜGS/3G-1100, ÜGS/3G-1250, ÜGS/3G-1350, ÜGS/3G-1500, ÜGS/3G-1600, ÜGS/3G-1750, ÜGS/3G-2000, ÜGS/3G-2500, ÜGS/3G-3000.

We hereby declare that in compliance with the EU Declaration of Conformity for the mentioned above products to following items;

The materials used in our products have specific features that will provide safe and appropriate performance for the applications.

It has been selected to be resistant to chemical, mechanical, and thermal effects that it may encounter during its lifetime.

- Brazing did not apply in the gas contacted part.
- The settings of the replaceable parts are safe.
- No asbestos materials were used.
- No parts in contact with sanitary purposes food and/or water used.
- Used materials have CE approval.
- Installation info, username tags, and package information are written in the official language.
- The electrical materials used comply with the low voltage and electromagnetic compatibility directives.

WARRANTY AND TECHNICAL SERVICE

This boiler has 2 (two) years warranty against material and workmanship fault from starting date of selling with concerning rules, warnings, all standards of applied directives (EN norms, directives, and rules should be applied in a place where these rules are not applied).

In order to validation of warranty certificates, it should be filled and send to ÜNMAK by authorized technical services. Please follow-up in this stage.

ÜNMAK authorized technical services are ready to assist even for minor problems.

Please note that problems that arise due to wrong installation, maintenance, or improper usage are not concerned with the warranty.

The minimal life period that specified by the Ministry of Trade is 10 years. The manufacturer and its service commit to supply spare parts and service during this time.

You can call 444 35 32 Customer Contact Center whereever you are in Turkey. You may also refer from the internet via sending an e-mail to unmak@unmak.com.tr as well.

OPERATIONAL CONDITIONS

ÜGS & ÜGS/3G type boilers are designed to supply hot water.

The selection of the boiler must be done properly in order to have a better performance.

The standard operating temperature is 70-90ºC.

Standard operating temperature for ÜGS/ÜGS 3G series boilers are classified as 3-4-5 ve 6 bar.

These boilers are not suitable for direct hot water supply. A suitable closed circuit heat exchanger should be installed for the supply of potable and clean hot water.

These boilers are suitable for working with liquid and gas fuels. Please refer to authorized technical services about the fuels you can use. Contact your authorized service center when you need to change the fuel in the commissioning of the boiler.

The boiler can be used in both open and closed expansion systems. An appropriate expansion system must be actively operating in the system.

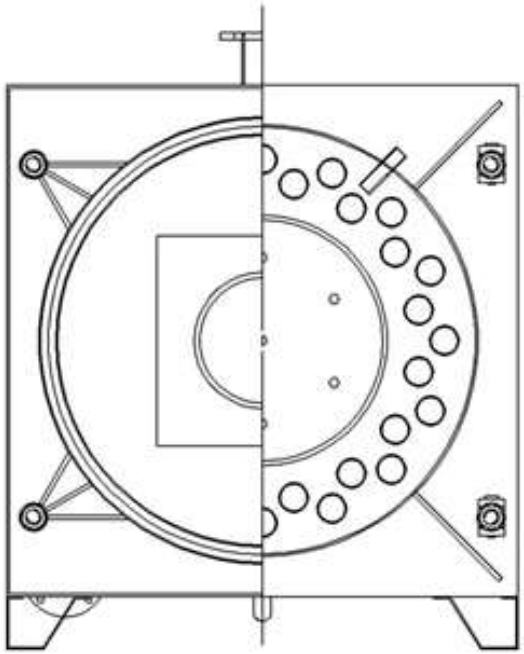
There are turbulators for increase the heat exchange of the water in the 2nd transition pipes of ÜGS and the 3rd transition pipes of ÜGS/3G. Never remove these turbulators, it may cause efficiency loss and damage to the boiler.

This is not a condensing type of boiler. Please make sure condensing not happen in a longer period.

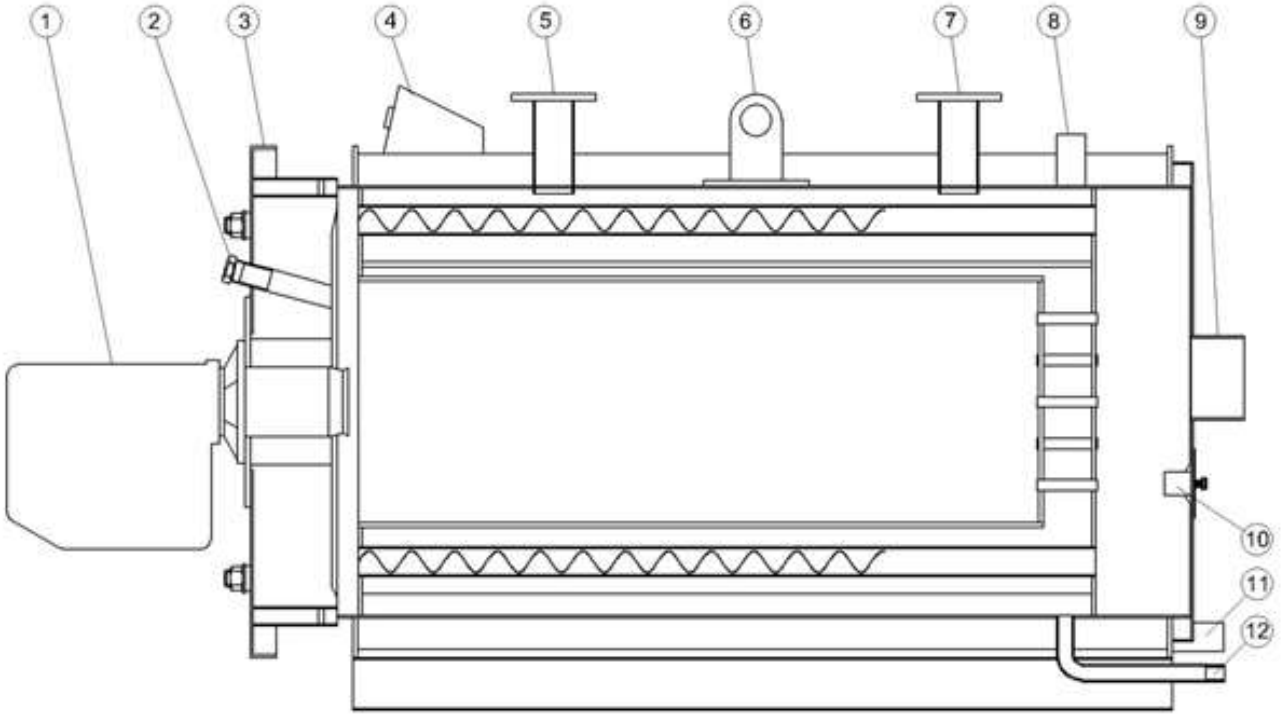
MAIN PARTS OF THE BOILER

ÜGS SERIES BOILER

1 GAS / LIQUID FUEL BURNER
2 OBSERVING GLASS
3 DOOR
4 CONTROL BOARD
5 BOILER OUTLET
6 RINGBOLT
7 BOILER INLET
8 SAFETY OUTLET
9 CHIMNEY
10 EXPLOSION COVER
11 SAFETY RETURN
12 WATER FILLING - DISCHARGE



FRONT VIEW



SIDE VIEW

ÜGS/3G SERIES BOILER

1 GAS / LIQUID FUEL BURNER
2 OBSERVING GLASS
3 DOOR
4 CONTROL BOARD
5 BOILER OUTLET
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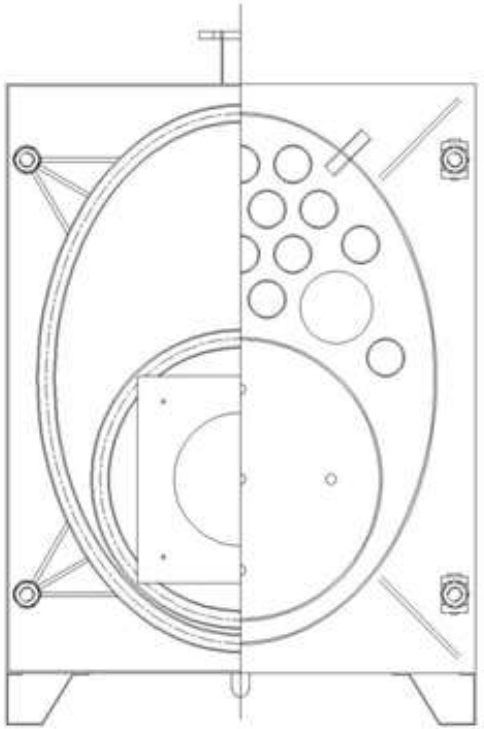
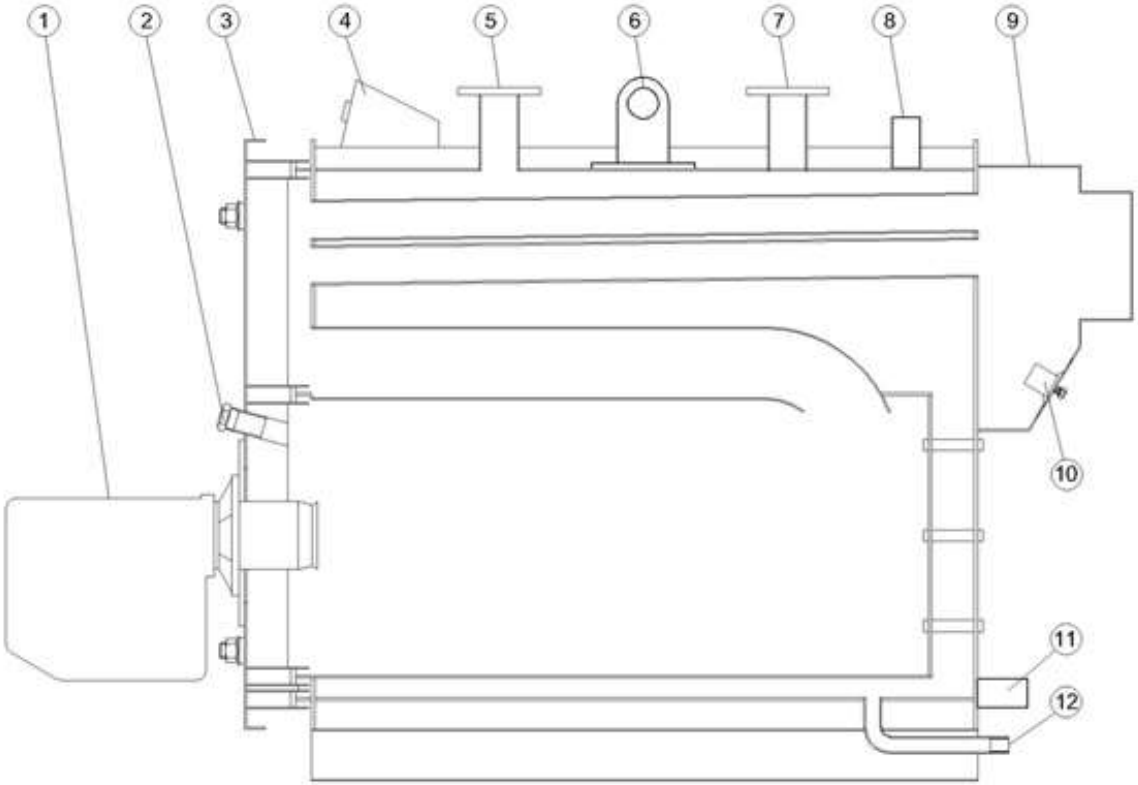
7 BOILER INLET
8 SAFETY OUTLET
9 CHIMNEY
10 EXPLOSION COVER
11 SAFETY RETURN
12 WATER FILLING - DISCHARGE





INSTALLATION INSTRUCTIONS

The projecting, installation and commissioning of the heating system must be carried out in accordance with the applicable standards, regulations, and warnings in this booklet. Local standards should be referred to the EEC directives and European norms (EN) when there are no regulations or where the regulations are inadequate.

All system control and commissioning should be done by ÜNMAK authorized technical services.

The boiler should only be installed in a closed area, except in well-ventilated and frost-free living areas. Upper and lower ventilation systems must comply with local regulations.

Boilers must only be burned with EN 676 (gas-fired) or EN 267 (liquid fuels) certified burners in order to operate in accordance with the Boiler Efficiency Requirement Directive (92/42/EC) and the Gas Burner Directive (90/396/EC).

This is a B23 type boiler. The boiler should be connected to a proper chimney that has adequate flue draught. There shouldn't gas leakage in the boiler room.

All equipment and control systems of the heating system should be able to provide the determined heating according to the external climatic conditions and the desired internal temperature. It should be able to protect the heating system against freezing and humidity when normal operating conditions (comfort temperature level) are not required.

Heating system control and safety system equipment must comply with applicable TSE standards and where insufficient, EN 12828 and the warnings in this manual must be taken into account.

There should be at least one proper circulation pump in the heating system and this pump should be kept on as long as the burner is running.

An efficient plumbing circuit must be installed to protect the boiler from flue gas condensation. The boiler return water temperature should be kept above the condensation value with a system such as a condensation by-pass pump, 3-way valve system.

Initial filing and feeding water must be the same as within the specifications specified in this manual. In order to have a long life use and economic operation, it is necessary to use water with the right properties. If the water is over-conditioned (soft) it will cause corrosion, if it is too hard it will cause limestone, so the correct water values should be used.

The heating boiler should be mount at least 15 cm above the ground, parallel to the floor and has sufficient strength to flammable.

Boilers should not be installed and put into operation in environments where flammable gases and materials are present. In order to prevent the boilers from being damaged, heavy dust or halogen hydrocarbons (solvents, spray gases, adhesives, etc.) in the combustion air must be prevented. The humidity of the boiler room should not be high.

The boiler room should not be used for other purposes and should not have an open connection to living quarters. The connection door must be airtight, fire-resistant, and self-closing.

It is recommended to install an emergency stop switch at an appropriate outside place from the boiler room. This switch must be able to stop the combustion process and fuel supply. A name tag on the emergency stop switch is recommended.

Additional precautions should be taken if the system will be operated with heavy gaseous fuels than air (such as LPG) and the heating boiler should be installed below ground level. The fuel that can be kept in the boiler room should be automatically thrown to a safe area outside the boiler (ventilation) with an ex-proof mechanical system, and the fuel line should stop automatically when the fuel leakage reaches a certain level.

All electrical connections should be done according to current standards and diagrams given in this manual. Please take attention to the grounding of all electrical appliances in the boiler room. Never use fuel or water pipes as ground connections.

Boiler chimney connections should be made in accordance with the standards. The distance between the chimney and the number of elbows must be minimum when boiler location is selected. Chimney ducts should never be directed downwards avoiding steep elbow turns. Thermal insulation of smoke exhaust ducts and rods must be completed.

You can find the necessary information for the selection of the height and diameter of the chimney in the attached tables. These tables can be used under the specified conditions, in systems other than these conditions, a chimney calculation should be made in accordance with the norms (TSE 2165).

There shouldn't be manual shut down (such as valves) between the boiler and safety&control systems. Only a locked valve can be placed on the connection of the closed expansion vessel for maintenance and pre-pressure checks. Accidental closing of this valve must be avoided.

After the installation of the heating system, the connections of all system equipment (water, fuel, flue gas lines, electricity) should be checked for possible failures.

There is a condensate outlet in ÜGS heating boilers. This outlet must be connected to a proper exhaust duct via a siphon to prevent liquid gas leakage. Condensate discharge must comply with current regulations.

The weight of the flue gas exhaust duct should not weigh down to the boiler flue gas connection point. The flange or leak-tight fittings should be used for easy maintenance.

Large or heavy burners should not weigh down to front door of the heating boilers. The burner must fixed to ground with a support materials.

The size of burner set screws should not exceed to total weight of burner flange, gasket, and adapter thickness.

If the burner barrel and boiler door gap is more than 10mm, please fill it with fiber materials that have resistible to 1200ºC. It will be easier to fill fiber by splitting 3 pieces.

The responsibility for the installation and commissioning of the control and safety system of the heating system according to the current standards and regulations belongs to the units that carry out the system project, installation, and commissioning.

The minimal information in line with the standards in force at the time of the assembly part of this manual is given as a preliminary reference.

SAFETY SYSTEMS

Safety measures should be taken against the maximum operating temperature and exceeding the maximum operating pressure.

Safety measures should be taken depending on the power, type, energy source, and control of the heat transfer system (for example automatic control or manual operation). Taking the necessary minimal safety precautions, selecting, installing, and adjusting the safety and operating devices correctly; is the responsibility of the project designer, installer, and commissioning units. It must comply with the current standards and regulations, if these are insufficient, it should comply with the EN 12828 standard.

Minimum Safety Requirements in Closed Expansion System

Protection against exceeding the maximum operating temperature;

There must be at least 1 piece manual reset limit thermostat in operation circuit of each heating boiler.

The water temperature of the boiler should not exceed more than 10k when the limit thermostat burner and/or fuel feeding stopped. Limit temperature thermostat should be in line with EN 60730-2-9 and/or have CE label.

All optional ÜNMAK control boards have manual rest limit thermostat. This thermostat should be taken and installed by a technician if the control board is not purchased.

Protection against exceeding the maximum operating pressure;

Each boiler control circuit must have at least 1 pressure relief valve. The pressure safety valve should protect the system due to high pressure without exceeding the boiler operating pressure. The system pressure should never exceed 10% of the operating pressure when pressure safety valves open. The pressure relief valve should be installed in such a way that the pressure drop on the inlet pipe size should not be more than 3% and the pressure drop on the outlet pipe size should not be more than 10%.

The pressure relief valve is not included in the standard supplied equipment of the boiler. The project and assembly staffs are responsible for the correct connection of the pressure relief valve within the correct diameter and pressure value to the system. The safety valve should be connected to the intersection point under the boiler water flow flange, without any closing valve in between, and the water discharge should be done in a safe area. Above 300 kW capacity boilers must have a suitable sized blow-off trap in the safety valve outlet line (see EN 12828). Safety valves must comply with EN 1268-1 standard. Safety valve diameters should be selected according to the boiler capacity, but the valve diameter can not be less than DN 15.

There must be at least 1 pressure limiting switch (pressure switch) in addition to the safety valve in the high-pressure protection system of boilers larger than 300 kW. This switch must be activated before the pressure relief valve. It should be locked by disabling the burner and/or the fuel line. The pressure switch should not reset automatically, even if the pressure drops and enters the normal range.

The pressure limiting switch not included in the standard supplied equipment of the boiler. The project and assembly staffs are responsible for the correct connection of the pressure limiting switch within the correct diameter and ampere value. The pressure limiting switch and valve may be connected to the intersection point under the boiler water flow flange without any closing valve.

Protection against low water level/pressure;

Closed expansion systems must be protected against working in low water levels.
The heat transfer surfaces of hot water boilers that continue to operate at low water levels may overheat and this may cause boiler explosions.

A low-pressure switch, water flow switch, water level switch is some of the low water level protection methods.
The low water level/pressure switch not included in the standard supplied equipment of the boiler. The project and assembly staffs are responsible for the correct equipment selection and installation.

Closed Expansion Tank;

In heating systems closed to the atmosphere, the water which is in the system as a heat carrier naturally tries to expand and increase its volume as it is heated. This may causes a pressure increase due to the unchanging volume of the closed system due to the stable volume in closed systems. An expansion tank with a capacity that will meet volume increase and hold at the minimal amount of reserve water should be connected to the system. Membrane type closed expansion tanks, which are widely used today, fulfill this function. EN 12828 standards may be useful in the selection of membrane-type closed expansion tanks. Nevertheless, calculations and installation criteria of expansion tank manufacturers have priority.

It should be selected taking into account the water expansion at the highest temperature that may occur in the system. Attention should also be paid to the volume of the expansion tank and the size of the connection pipe to the boiler, so as not to increase the system pressure (not to activate the pressure safety switch and safety valve).

The closed expansion tank is not included in the standard supplied equipment of the boiler. The project and assembly staffs are responsible for the equipment selection and installations. Safety against freezing must be taken into account in the installation of the expansion tank.

It is recommended to install a membrane-type expansion tank near the boiler return flange. Manual closing tools have been strictly recommending to use in the line between the expansion tank and the heating boiler. A locked valve is proper to use for maintenance and pressure control purposes of the expansion tank (only authorized technical service staff can do).

The closed expansion tank is not included in the standard supplied equipment of the boiler. The project and assembly staffs are responsible for the equipment selection and installations.

Requirements of the Minimum Controlling Units in Closed Expansion System

Following units should be in the system for secure and economic operation of closed expansion system.

Water Temperature Control Unit (Boiler Thermostat);

There must be a controlling unit that controls and regulates the water temperature required by the heating system. Maximum adjustable temperature of this control element can not be higher than the boiler operating temperature. Maximum operating temperature is 90ºC for standart ÜGS & ÜGS/3G heating boilers. There is water temperature control unit in optional control board (boiler thermostat). This unit should be supplied and installed by installer staff when the control board is not purchased. The boiler thermostat must comply with EN 60730-2-9 and/or have a CE label.

Water Temperature Indicator (thermometer);

The water temperature indicator should be displayed 20% higher than the boiler maximum operating temperature. It should install on the boiler inlet line. Water temperature indicator on boiler outline line is not a standard procedure but we recommend it. All of our optional control boards have water temperature indicator (boiler thermometer). Water temperature indicator should supply and install by the installer if an optional control board is not purchased.

Water Pressure Indicator (manometer);

The water pressure indicator should be displayed 50% higher than the boiler maximum operating pressure. It should install on the boiler inlet line. All of our optional control boards have water pressure indicator (boiler manometer - 6bar). Water pressure indicator should supply and install by the installer if an optional control board is not purchased or system pressure is more than 2,5 bar.

System water level and pressure regulator system;

A regulator that will keep the water level and pressure of the heating system at operating values should be installed in the system. According to EN 806-2 standard: it is sufficient to connect the boiler water filling line to the cold water line with 1 pressure reducer, 1 check valve, 1 filter, 1 cold water meter and 2 ball valves.

There must be a ventilation system appropriate for the total boiler capacity in the boiler room for efficient and low-emission combustion, and for toxic and explosive gases that may occur in the boiler room to be thrown out of the system. It should be ensured that this ventilation system works as long as the boiler is active. Calculation of ventilation systems should be done to comply with local regulations.

Requirements of the Minimum Safety Equipments in Open Expansion System

Open expansion tank;

Boilers used with open to the atmosphere expansion systems must be connected to an appropriate capacity expansion tank. It should be located to the top of the entire heating system and open to the atmosphere. It should be sized to accommodate the water expansion at the highest temperature that may occur in the system. The

dimensioning of the expansion tank pipe connection must comply with these requirements. Safety against freezing should be considered in the installation of the expansion tank and connection pipes. Open to atmosphere type expansion tanks must be connected to the line under the boiler flow and boiler return flange. Manual closing equipment should not be used on the line between expansion tank and boiler. Open to the atmosphere type expansion tanks must have non-closable ventilation and an overflow pipe. The overflow pipe should be sized to discharge the maximum flow of water entering the system. The overflow pipe diameter can be chosen practically by considering it as 1 DN larger than the filling pipe diameter. Please find sample installation layout in attachments.

Open expansion tank pipelines;

Boilers should be connected to open expansion tanks with pipes of sufficient diameter from both the safety flow(expansion) and safety return (supply) lines without any valves. Expansion tank should be open to the atmosphere. The safety flow pipe should be connected from the upper part of the expansion tank, and the safety return pipe should be connected from the lower part of the expansion tank concerning maximum expansion level and water overflow pipe. Safety pipeline or feeding and expansion pipe should not able to close.

Requirement of the open expansion system;

Following units should be in the system for secure and economic operation of open expansion system.

Water level indicator;

The water level in the heating system should be connected to a hydrometer with a water level indicator.

Water temperature indicator (thermometer);

The water temperature indicator should be displayed 20% higher than the boiler maximum operating temperature. It should install on the boiler inlet line. All of our optional control boards have water temperatue indicator (boiler thermometer). Water temperature indicator should supply and install by the installer if an optional control board is not purchased.

Water Temperature Control Unit (Boiler Thermostat);

There must be a controlling unit that controls and regulates the water temperature required by the heating system. Maximum adjustable temperature of this control element cannot be higher than the boiler operating temperature. Maximum operating temperature is 90ºC for standart ÜGS & ÜGS/3G heating boilers. There is water temperature control unit in optional control board (boiler thermostat). This unit should be supplied and installed by installer staff when the control board is not purchased.

There must be a ventilation system appropriate for the total boiler capacity in the boiler room for efficient and low-emission combustion, and for toxic and explosive gases that may occur in the boiler room to be thrown out of the system. It should be ensured that this ventilation system works as long as the boiler is active. Calculation of ventilation systems should be done to comply with local regulations.

SELECTION OF BURNER

The boilers should be operated in accordance with the regulation on boiler efficiency requirements (92/42/EEC), the regulation on gas-burning appliances (90/396/EEC). They must be commissioned with a burner complied that has EN676 (gas-fired) or EN267 (liquid-fuel) certified.

Boiler capacity, backflow pressure, combustion chamber dimensions, burner sleeve diameter, and connection flange dimensions should be considered in the selection of the burner. (TS EN 303-2 for liquid fuel, TS EN 303-3 for gas fuel)

The combustion part of the burner must resist at least 500ºC.

The dimensions of the combustion chambers of ÜGS & ÜGS/3G boilers comply with the current TS EN standards.

INSTALLATION OF BURNER

The burner should be connected to the boiler body by using the burner plate on the front cover.

The length of the burner combustion head should be at least reaches the front part of the boiler combustion chamber. please ask the boiler manufacturer's approval when the length of the burner combustion heat is too long or short. If the gap between burner combustion head and boiler front door refractories is more than 10mm, please fill it with fiber materials that send with the boiler.

The burner flange connection must always be mounted gas-tight. It may cause toxic gas leakage and may damage the front door of the boiler when it is not able to set it. The length of the burner connection bolt should not exceed the sum of the total thickness of the flange, gasket, and adaptation plate.

Burner capacity should be appropriate to the capacity of the boiler. 1st stage adjustment should be a minimum of %60 of boiler capacity when double stage or proportional type burner selected. Despite this fact, 1st stage adjustment should set to the higher level or anti-condensation system setting should be change if continuous condensation is observed.

The weight of big and heavy burner should not carry by ground with suitable support rather than boiler front door.

RECOMMENDED FUEL TYPES

ÜGS & ÜGS/3G heating boilers are only proper to use liquid and gaseous fuels.

Liquid fuels: light, medium, and heavy fuels (please refer burner manufacturer recommends and local authority restrictions)

Gaseous fuels: natural gas, LPG, gas (all suitable gases comply with TS 11395 EN 437 standards) (please refer burner manufacturer recommends and local authority restrictions)

Please refer to ÜNMAK specialist for other fuel types.

STACK GASES SYSTEM

ÜGS & ÜGS/3G series heating boilers are B21 type boilers.

Flue gases should be put into operation with a chimney system with sufficient draft so that there is no gas leakage into the boiler room. Chimney calculations should be done to comply with TS 2165. Flue interior diameter, height, materials, isolation should be selected to comply with flue gas specifications. It should not be caused to dangerously high and low pressure. It should be draught between 0 - 0,3 m bar in flue gas exhaust point of the boiler.

The tables are given in the appendices section as a reference. The effective chimney height is height differences between the boiler outlet and the final point of the flue.

The length of flue gas channels between the heating boiler and chimney should not more than ¼ of effective chimney height. In addition to this, please be careful about the length that it shouldn’t be more than 7m and less than 0.6m. The maximum allowed elbow in flue gas channels is 2 pieces 90°(please avoid sharp return).

The slope of the flue gas channels should be downward. Recommended upward angle is 10° with 45° chimney angle.

The weight of the flue gas exhaust duct should not weigh down to the boiler flue gas connection point. The flange or leak-tight fittings should be used for easy maintenance.

FILLING AND FEEDING WATER SPECIFICATIONS

According to TS EN 12953-10 (for boiler: quality of feeding and boiler water) standard;

Parameter	Unit	Boiler feeding water	Boiler filling water
Shape	-	Clean, vivid,without any solid substances and stable foam	
Conductance at 25°C	µS/cm	< 1500	
pH value at 25°C	-	> 7.0	9.0 to 11,5*
Total hardness (Ca+Mg)	mmol/l	< 0,05	
Iron concentration	mg/l	< 0,2	
Compound alkaline value	mmol/l	-	<5
Fuel oil/oil concetration	mg/l	< 1	-
Organic substances (such as TOC)	-	Please read blow notes*	

If there are parts made of materials other than steel in the heating system (eg aluminium radiator – copper pipe), these parts should have lower pH and conductivity. However, the protection of the boiler in the heating system has priority and the above values should be taken as reference.

Organic substances are often composed of a variety of different compounds. It is difficult to determine the effect of mixtures and their components on the heating boiler. Organic substances can decompose to form carbonic acid or other acidic compounds. This may cause abrasions or punctures. This can also cause a build-up of substances such as limestone and foaming, which should be as little as possible.

The amount of all feeding water used during the economic life of the boiler cannot be more than 3 times the total amount of all the water of the heating system.

Boiler failure due to corrosion or limestone formation (or similar deposits) is not covered by the warranty. These negative factors are only caused by incorrect water filling in the boiler or the use of incorrect feed water.

Special care must be taken not to constantly mix new oxygen (air) on the waterside of the heating system in order to prevent rust and corrosion. Points that may cause oxygen (air) mixture are water leakage in the system caused by additional water, open expansion tanks, negative pressure in the heating system, some gas permeable system parts (such as plastic pipes), and indirect heat exchangers.

COMMISSIONING

Installation control and commissioning should be done by ÜNMAK authorized technical services. Necessary documents should also be recorded by authorized services. Otherwise, the manufacturer and/or seller will not accept any responsibility and the product will be concerned as out of warranty.

Please check following items before commissioning the heating boiler:

All installation, commissioning, user guide, and maintenance booklets and manuals should be in the boiler room.

Compliance of system requirements and equipment with the values specified on the boiler label such as fuel type, pressure, boiler-burner capacity, electrical power value, specification of the filling water, capacity and existence of the expansion systems, operating pressure, and temperature range, etc.

Existence and capacity of boiler room ventilation. Ventilation should not be closed by any obstacles.

The capacity and correct installation of flue gas channels and the chimney.

All systems control panels and safety materials should exist and have correct technical specifications and install properly. All of them should work with the required value range.

Proper selection of fuel type must be check. The capacity of the burner should be selected appropriately and should meet the requirement of the boiler and heating system.

Ensure that 2 turbulators inside the flue pipes of the boiler are placed correctly.

Please make sure there are no foreign materials forgotten inside the boiler chambers.

Ensure that the front door, back door, burner sheet, observing glass are strong and installed properly.

The gap between the burner barel and the door refractory must be isolated. Ensure the correct length of the burner attachment bolt.

Ensure that heavy burners should be fixed to the ground with support materials and not weigh down to chimney channels or flue outlet part of the boiler.

Make sure that the precautions specified in this booklet and applicable standards and regulations are concerned in the installation criteria.

Ensure that all heating systems materials (water and flue side) should be clean from foreign matters and the system should be blow off. Please make sure any foreign matter is not forgotten.

Before filling the water into the system, check the initial pressure of the closed expansion system and make sure it is proper for system requirements.

Set all valve to open mode for filling operation.

Ensure that technical specifications of the filling water comply with the system requirement.

Please make the filling process very slow. The filling should be done until proper water level up to the pre-calculated pressure value (till the water comes from the performance pipe) in the open expansion tank system.

Please check selected low water level property before filling process and control set values if there is a low water level safety system.

Please discard the air from all possible points of the heating system.

Please run the circulation pump and check the correct circulation of the pump.

Discharge the air from the system, again. Feed the system with water again if the water/pressure level falls. Please mark lower pressure from the water level indicator in open expansion systems and inform the user about the minimal water level.

Please mark lower and upper level in closed expansion tank and inform the user.

Please set pressure control elements to the pre-calculated values if it is not able to adjust water pressure relief valves to the default set) or no valid certification in the closed expansion system. Please make sure that all pressure safety systems operate at required values.

Ensure there is no leakage at all heating system equipment. Please check and make pre-adjustment of other control units and the presence of safety items.

Please check fuel specifications (pressure, temperature according to fuel type) before activating the burner. Ensure there is no leakage observed at the fuel line. Please also discard the air in the fuel line.

Set pre-adjustment of the burner.
Before running the burner, please make sure that the system is filled with water, and control the right positions of valves. Pre-adjustment of all control units should be completed and ensure there is no air in the fuel line.

Start the burner, adjust the capacity and burning sets. The lowest burning set of 2 stage and modulating burners should not be lower than %60 of boiler capacity.

Control the flue gas values by the analyzer and please check the compliance of the chimney emission according to updated limitation. (CO, NOx, smut, Co2 or 02, temperature of flue gas must be controlled) Following values are given as a reference (updated standards and regulations have priority, these values may change)

Fuel Type	Smut Level (Ringelmann)	Heat loss with sewage gas %	% CO2	CO (mg/kWh)	NOx (mg/kWh)
Gas	(1)	(9)	>10	<100 (1070)	<170 (260)
LPG	(1)	(9)	>10	<100 (1070)	<230 (260)
Diesel fuel	(1)	(11)	>13	<110 (110)	<250 (260)

Note: Chimney emission values must comply with current regulations. Values in parentheses have been calculated by the Republic of Turkey Ministry of Environment and Urbanization within the scope of the Air Pollution Control Regulation.

Please control the proper function of 1. and (if available) 2. stage thermostats when firing of the burner continue. Ensure this control after necessary burner adjustment completed.

Please heat all the water of the heating system to 85-90°C and discard again the air of the entire system. During the first filling process, there is molten air in cold water (10-25°C) and this air can only be released when the system is heated and ejected from the system.

Check all setting and functions of all control and safety unites.

Please record the setting parameters of the system.

Please call the responsible person/staff, explain all system requirements for appropriate and safe operation. Give detailed information about necessary actions for possible emergency situations.

STARTUP AND STOPPING

Please carefully read the installation and user's manual before installation, operating, and maintenance for economical and safe use. Improper installation, commissioning, operation, and maintenance may cause accidents, fire, and explosion resulting in injuries, commodity damage, or loss of life.

Preliminary checks before startup;

Please make sure that no fuel leakage observed before starting the system. A visual check to fuel line may enough. Various odors may indicates heavy gas leakage in system. Odor control of ground level must done if gases heavier than air such as LPG use.

If you smell gas or observe gas leakage, the following items should be done:
• Do not commission the heating system.
• Do not burn the fire.
• Do not touch any electric beaters, including plugs, lighting switch.
• Do not smoke.
• Do not use mobile phones in areas where there is a leak in the building.
• Turn off the main fuel valve on the fuel line.
• Alert other people and evacuate the building.
• Contact your local authority immediately via your neighbor's phone.

If you don’t detect fuel leakage, the following items should be done:

Please control the pressure and water level of the system. Ensure there is no handicap in front of ventilation gates. Ensure there is no leakage in water and chimney gas lines.

Check the valve positions and make sure all water valves have the correct position.

Please make sure all clean service, maintenance, replaced, disassembled parts are securely closed and/or installed correctly.

Ensure there are no flammable matters in the boiler room.

Make sure that the water in the heating system did not freeze when the heating system does not works for a long time.

STARTUP

Standard control board;

Turn on the main burner button. (if there is a button in the off position)

Turn on the control board button.

Set boiler thermostat to the desired level. (if there is 2. Stage thermostat, please set 7°C lower than 1.stage thermostat)

Run the circulation pump.

The burner will be activated when the standard automatic control process ended.

Please push to reset button when the burner is not activated and the error lamp is on.

Check visually the boiler front-rear doors and the connections if combustion gases leak out after commisioning.

STOPPING

Standard control board;

A) If your thermostat has a 2nd stage, please set the minimum value. (if the thermostat is working normally, it will switch to stage 1. This function is a practical way to control stage 2)

Please start from “b” section if control board has single stage.

B) Set boiler thermostat to minimum value.(if the thermostat is working normally, the burner will automatically stop. This function is a practical way to control stage 2)

Please turn to off in burner main control button.

Close the main fuel valve to off mode.

You can close the circulation pump in long-duration closure but please take into account of the freezing situation of the moving water. Make sure that the heating system and other parts do not freeze when the heating system is off for a long time.

Please refer to relevant instructions and the user’s manual if you use a different type of control board.

MAINTENANCE INSTRUCTIONS

Do not interfere with any part of the heating system while the system is operating.

Before starting the maintenance, service, and cleaning operations, please stop the burner, close the fuel valves, turn off the electrical energy of the system at the main switch and wait until all parts of the boiler cool down.

Natural gas is a clean energy source, it may not cause dense smoke and dust. However, in order to increase the longevity and efficiency of the boiler, please contact the ÜNMAK authorized technical service to have the following checks done.

- Cleaning of the heat transfer surfaces of the heating boiler
- Flame parameters checks and burner
- Safety and control board control
- Proper draught of the chimney and cleaning of the flue if it is necessary.
- Leakge check of the water, fuel, and chimney channels.
- Cleaning of the water and gas fuel line.

If the system works with liquid fuel, the heat transfer surface of the boiler should be clean at least once a month. The frequency of the cleaning depends on operational specifications and burning parameters. Cleaning may require in a short period due to worse burning adjustment or worse fuel usage and the insufficient draught of the chimney.

1-2 mm slag layer on the heat transfer surface may cause efficiency loss of the system. Due to this reason, please make heat transfer surfaces are always clean.

Cleaning of the heat surfaces;

- Stop the burner.
- Stop the circulation pump.
- Stop the main power supply.
- Close the fuel line, if it necessary please remove it from nipple.
- Please wait the cool down of the heating boiler (at least 2 hours).
- Open the front door of the boiler. First of all, entirely remove the clamp materials on the opening section of the front door, then loosen the clamp materials on the hinge section at 10-15 mm away from the door.
- Please make sure the cool down of the front door's refractory and turbulators
- Remove the turbulators
- Clean the burning chambers and 2. transition pass pipes via brush.
- Open to cleaning cover of the back doors and clean the spilled slag.
- Please check front door refractory.
- Check the sealing tools of front and back door
- Check the sealing tools on the cleaning section of the back door.
- Put turbulators to their place. All pipes should have turbulators without any missing items.
- Close the front door. Visually check isolation gasket and refractory.
- Please re-install if it is disassembled
- Open the fuel line.
- Check the fuel leakage in dissambled part (definitely do not use fire)
- Switch on the main power supply.
- You can take system back to operation (If the fuel tank is disconnected, it may not start in 1-2 attempts, it will activate when the air in the fuel line is empty). Please call authorized technical service at least once a year for checking of the burning parameters, safety and control board units.

Please check following items before contact the authorized technical service if burner is not working:

- Is there a necessary energy supply on the control board of the boiler and burner?
- Is the fuel valve open?
- Are the main power switches on on the boiler and burner control board?
- Is the water temperature below the temperature setting of thermostat?
- Is the fuel available within the limits? (minimum gas pressure or diesel level of fuel tank)
- Is the system water level or pressure normal?
- Did you manually reset the limit temperature thermostat?
- Please do not change any setting of the safety device
- Please refer to burner user's manual for additionaL checks
- Please reset at most 3 times the burner failure button. Please contact authorized technical service if still burning is not observed.

In closed expansion systems working with membrane expansion tanks, the pressure of the tank gas should be checked regularly by the authorized service. If the gas pressure before charging is below the limit, the system pressure will rise abnormally and this may cause an explosion.

Please refer to technical services or relevant authorities when there is a fuel, stack gases, or water leakage observed in any part of the heating system.

Please contact authorized technical services for maintenance or change of stack gases leakproof material when destruction or leakage are observed.

Please make the feeding water analysis periodically in order to prevent residues (such as limestone) and corrosion. Residues such as limestone cause a decrease in system efficiency in the short term and permanent damage to the heating boiler in the long term.

Please check the safety and control board, periodically.

It can be the result of a lock-up problem caused by rusting of wet motor pumps after a long waiting period such as the summer period. Please run the pumps for 5 minutes once a month in order to prevent wet motors from locking up in the system.

If the feeding water requirement is frequent and the system pressure/level shows the leakage in the system, the problem should be solved immediately.

Do not discharge the water of the system unless necessary. Refilling the water may cause the addition of new unexpected matters and oxygen. All these reasons can shorten the life of the boiler and cause a loss of efficiency.

Empty systems wear much faster. Refilling the water may cause the addition of new unexpected matters and oxygen. All these reasons can shorten the life of the boiler and cause a loss of efficiency.

Water level and/or pressure of the system should be control at least once a month. Please check frequently after commissioning until the system is stable. Please read the burner installation maintenance frequencies and user manual carefully.

It is recommended to put oil where the temperature sensor located. Please check the oil level at least once a year and add oil when it is low level. The oil makes the more accurate and fast reaction of the temperature sensor.

The chimney must be cleaned periodically according to local regulations.

If the system will be closed for a long time in winter, necessary precautions should be taken against freezing.

Fuel and water filters must be cleaned periodically according to the system requirements.

APPENDICES;

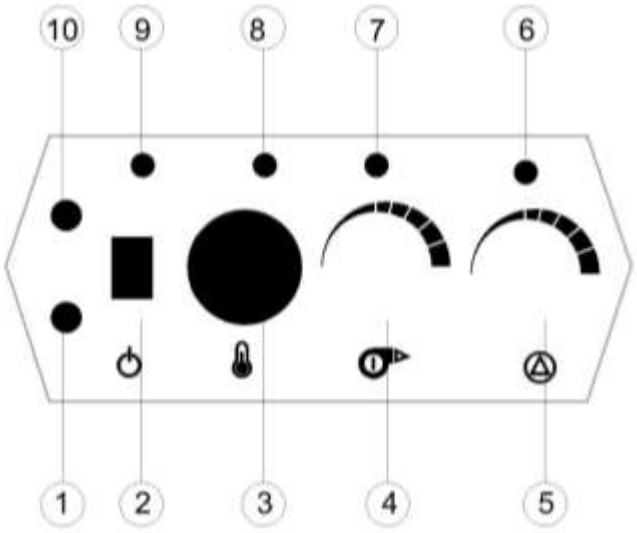
ÜGS/3G TECHNICAL SPECIFICATIONS

MODEL - SERIES	ÜGS/3G		80	100	125	150	200	250	300	350	400	500	600	700	800	900	1000	1100	1250	1350	1500	1600	1750	2000	2500	3000
Heat Output		kW	93	116	145	174	233	291	349	407	465	582	698	814	930	1047	1163	1279	1454	1570	1745	1861	2035	2326	2908	3489
		kcal/h	80.000	100.000	125.000	150.000	200.000	250.000	300.000	350.000	400.000	500.000	600.000	700.000	800.000	900.000	1.000.000	1.100.000	1.250.000	1.350.000	1.500.000	1.600.000	1.750.000	2.000.000	2.500.000	3.000.000
Efficiency		%	90 - 94																							
Stack Gases Temperature	Full Load	°C	189	192	189	189	190	190	190	190	190	186	187	187	186	191	189	188	189	191	192	188	189	189	191	192
	Partial Load	°C	129	132	129	129	130	130	130	130	130	126	127	126	131	129	129	138	132	129	129	138	129	129	129	129
CO_2		(%)	10 - 11 -																							
Counter Pressure		mbar	0,7	1	1,1	0,9	1,5	1,8	1,4	2	2,2	2,1	2,8	2,8	2,8	2,9	3	3	3,1	3,2	3,8	4	4,2	4,7	5,1	5,5
Diameter of Combustion Chamber		mm	310	410	410	480	480	550	550	550	600	600	700	700	750	800	800	950	950	950	950	950	950	950	1050	1050
Lenght of Combustion Chamber		mm	660	930	1130	1130	1150	1230	1230	1480	1480	1680	1830	1980	2130	2230	2230	2650	2650	2850	2850	2850	2850	3350	2810	3390
Volume of Combustion Chamber		dm3	5	12	15	20	21	29	29	35	42	47	70	78	94	112	112	1.877	1.877	2.019	2.019	2.019	2.019	2.373	2.432	2.934
Maximum Operating Pressure		bar	4 - 5 - 6 - 8																							
Test Pressure		bar	6 - 7,5 - 9 - 12																							
Working Pressure		°C	55 - 90																							
Weight of the boiler		kg	339	481	531	588	631	773	818	1.091	1.196	1.408	1.711	1.957	2.241	2.541	2.698	3.254	3.429	3.596	3.708	3.910	4.022	4.526	7.173	8.174
Water Volume of the boiler		lt	95	214	237	238	256	359	414	555	537	593	837	903	1.189	1.394	1.288	2.379	2.251	2.338	2.256	2.579	2.497	2.900	4.566	5.449
Dimensions	Width (a)	mm	620	750	750	785	785	910	910	960	975	1035	1120	1140	1205	1255	1255	1485	1485	1485	1485	1510	1510	1510	2200	2200
	Depth (b)	mm	1045	1515	1640	1640	1720	1830	1930	2160	2160	2300	2450	2650	2900	2900	2900	3420	3420	3620	3620	3620	3620	4120	3800	4380
	Flue Connection Height (d)	mm	980	900	925	990	945	1065	1080	1095	1130	1045	1260	1280	1300	1510	1400	1700	1700	1680	1680	1680	1680	1680	1550	1550
	Total Height (h)	mm	1100	1240	1235	1305	1305	1445	1445	1480	1525	1530	1715	1715	1760	1985	1985	2225	2220	2220	2220	2225	2225	2225	2550	2550
Dimensions of Flue Gas Connection (Chimney)		mm	130	200	200	200	200	250	250	300	300	300	400	400	450	450	450	450	450	450	450	450	450	500	500	500
Boiler Inlet - Outlet		R"	DN40	DN40	DN50	DN65	DN65	DN65	DN65	DN80	DN100	DN100	DN100	DN100	DN125	DN125	DN125	DN125	DN125	DN150	DN150	DN150	DN150	DN200	DN200	DN200
Expansion Tank Outlet		R"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	3"	3"	3"	3"	3"	4"	4"
Expansion Tank Inlet		R"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"	2"	2"	2"	2"	3"	3"
Filling - Discharge		R"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"

ÜGS TECHNICAL SPECIFICATIONS

MODEL - SERIES	ÜGS		60	80	100	125	150	175	200	250	300	350	400	450	500	600	700	800	900	1000	1100	1250	1350	1500	1600	1750	2000	2500	3000
Heat Output		kW	70	93	116	145	174	204	233	291	349	407	465	523	582	698	814	930	1047	1163	1279	1454	1570	1745	1861	2035	2326	2908	3489
		kcal/h	60.000	80.000	100.000	125.000	150.000	175.000	200.000	250.000	300.000	350.000	400.000	450.000	500.000	600.000	700.000	800.000	900.000	1.000.000	1.100.000	1.250.000	1.350.000	1.500.000	1.600.000	1.750.000	2.000.000	2.500.000	3.000.000
Efficiency		%	90 - 94																										
Stack Gases Temperature	Full Load	°C	189	189	192	189	189	189	190	190	190	190	190	188	186	187	187	186	191	189	188	189	191	192	188	189	189	191	192
	Partial Load	°C	129	129	132	129	129	129	130	130	130	130	130	138	126	127	126	131	129	129	138	132	129	129	138	129	129	129	129
CO2		(%)	42318																										
Counter Pressure		mbar	0,6	0,7	1	1,1	0,9	1,1	1,5	1,6	1,4	2	2,2	2,2	2,1	2,8	2,6	2,8	2,9	3	3	3,1	3,2	3,6	4	4,2	4,7	5,1	5,5
Diameter of Combustion Chamber		mm	310	400	400	400	450	450	500	550	550	630	630	630	670	700	740	830	830	850	835	830	835	830	890	890	1050	1050	1050
Lenght of Combustion Chamber		mm	600	700	700	950	950	950	1100	1100	1300	1300	1300	1400	1400	1400	1500	1600	1650	1650	1650	1650	2200	2200	2200	2200	2200	2700	3400
Volume of Combustion Chamber		dm3	45	88	88	119	151	151	216	261	309	405	405	436	493	539	645	865	892	936	903	892	1.204	1.190	1.368	1.368	1.904	2.337	2.943
Maximum Operating Pressure		bar	4 - 5 - 6 - 8																										
Test Pressure		bar	6 - 7,5 - 9 - 12																										
Working Pressure		°C	55-90																										
Weight of the boiler		kg	310	395	420	490	545	570	655	725	805	1100	1180	1330	1450	1530	1915	2220	2380	2605	2775	2845	3270	3365	3360	3705	4200	4750	5560
Water Volume of the boiler		kg	71	132	118	156	163	150	200	205	251	468	495	549	600	638	710	943	1142	1146	1145	1097	1526	1463	2134	2103	1997	2345	2910
Dimensions	Width (a)	mm	670	800	800	800	850	850	900	950	950	1140	1170	1190	1250	1290	1330	1450	1520	1560	1560	1560	1560	1560	1720	1720	1840	1840	1840
	Depth (b)	mm	1080	1200	1200	1470	1470	1470	1650	1700	1950	1950	1950	2070	2070	2070	2270	2380	2380	2380	2380	2380	2890	2890	2890	2890	2890	3445	4150
	Flue Connection Height (d)	mm	570	645	645	645	670	670	710	720	720	810	830	840	870	940	980	1050	1085	1115	1125	1125	1125	1125	1235	1235	1350	1350	1350
	Total Height (h)	mm	945	1080	1080	1080	1130	1130	1180	1230	1230	1415	1445	1465	1525	1565	1605	1725	1800	1830	1835	1835	1835	1835	1835	1995	1995	2105	2105	2105
Dimensions of Flue Gas Connection (Chimney)		mm	150	150	200	200	200	200	200	250	250	300	300	300	350	400	400	450	450	450	450	450	450	450	450	450	450	450	450
Boiler Inlet - Outlet		R"	DN 40	DN 40	DN 40	DN 50	DN 65	DN 65	DN 65	DN 65	DN 65	DN 80	DN 80	DN 100	DN 100	DN 100	DN 100	DN 125	DN 125	DN 125	DN 125	DN 125	DN 150	DN 150	DN 150	DN 150	DN 200	DN 200	DN 200
Expansion Tank Outlet		R"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	3"	3"	3"	3"	3"	4"	4"
Expansion Tank Inlet		R"	1"	1"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	3"	3"
Filling - Discharge		R"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"

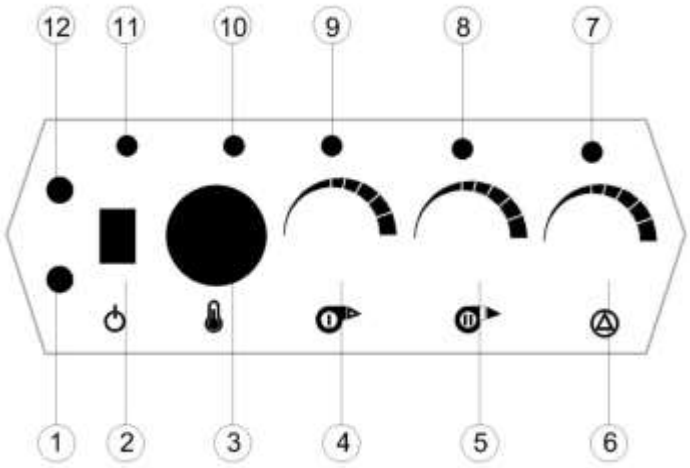
SINGLE STAGE CONTROL BOARD



1. Pompa sigortası (6 A)
2. Ana kumanda anahtarı
3. Kazan sıcaklık göstergesi (termometre 0-120°C)
4.1. Kademe termostad
5. Pompa termostad,
6. Pompa devrede lambası
7. 1. kademe devrede lambası
8. Brülör arıza ikaz lambası
9. Emniyet limit termostad (100°)
10. Kumanda panel sigortası (6 A)

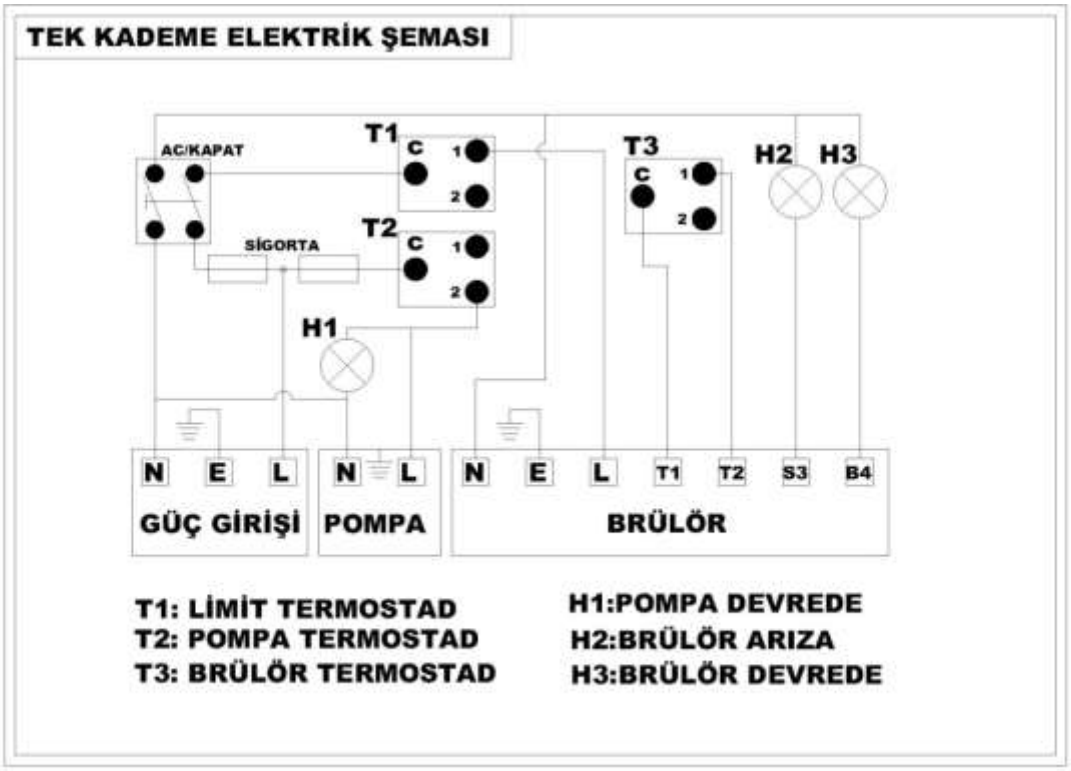
1. Pump fuse (6 A) 2. Main control switch 3. Boiler temperature indicator (termometer 0-120°C) 4. 1.Stage thermostat 5. Pump thermostat 6. Pump signal lamp 7. 1.Stage thermostat signal lamp 8. Burner warning alert lamp 9.safety limit thermostat (100°C) 10.Control board fuse (6 A)

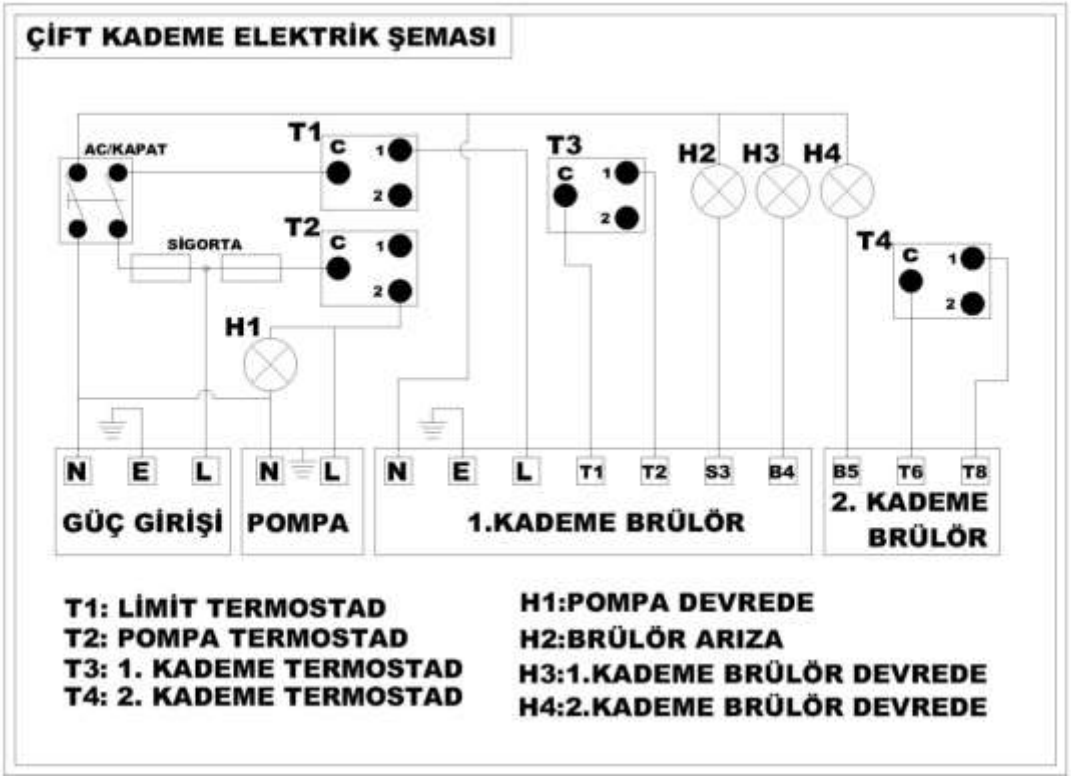
DOUBLE STAGE CONTROL BOARD



1. Pompa sigortası (6 A)
2. Ana kumanda anahtarı
3. Kazan sıcaklık göstergesi (termometre 0-120°C)
4.1. Kademe termostad
5. 2. Kademe termostad
6. Pompa termostad,
7. Pompa devrede lambası
8. 2. Kademe devrade lambası
9. 1. kademe devrede lambası
10. Brülör arıza ikaz lambası
11. Emniyet limit termostad (100°)
12. Kumanda panel sigortası (6 A)

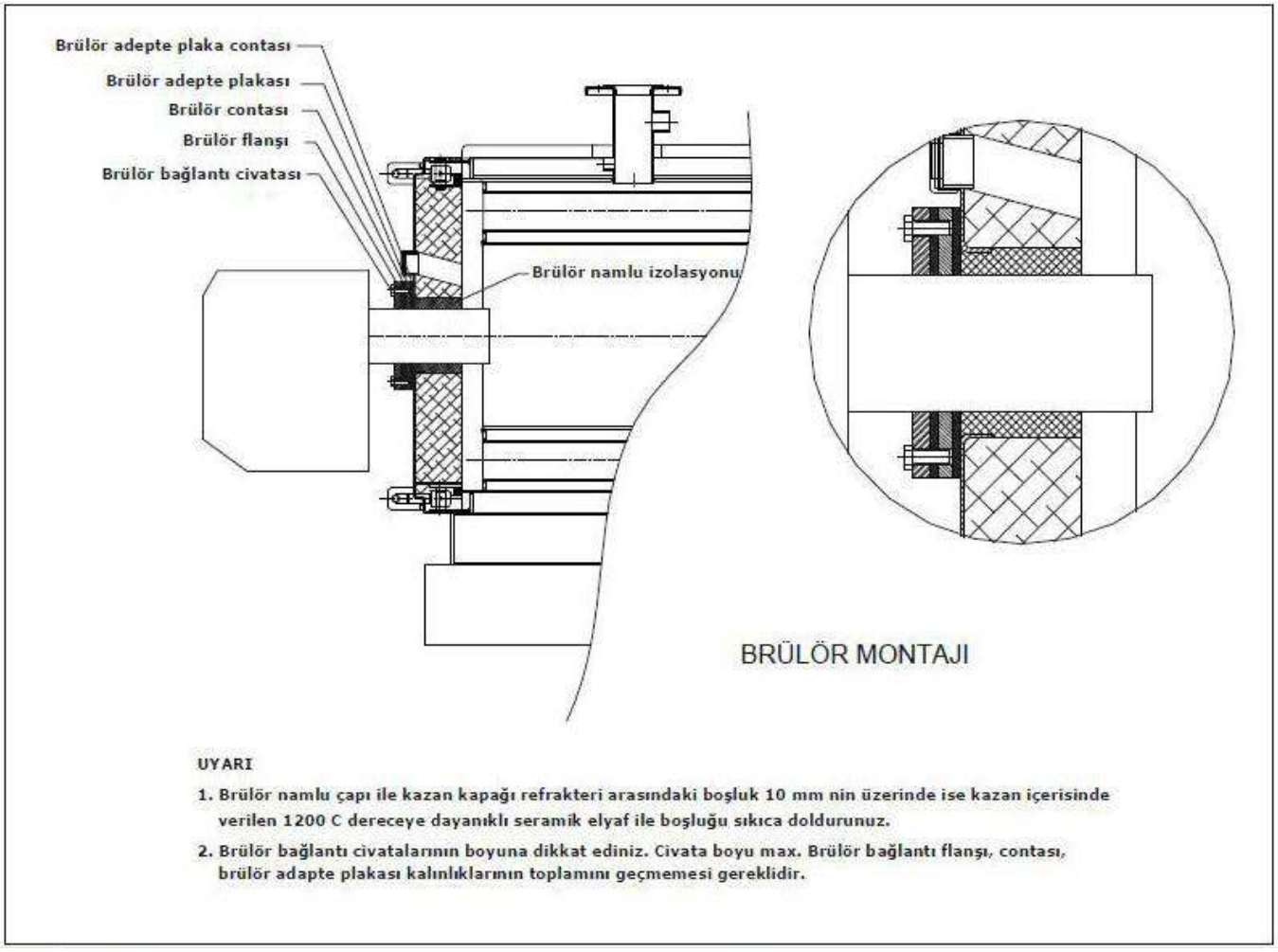
1. Pump fuse (6 A) 2. Main control switch 3. Boiler temperature indicator (termometer 0-120°C) 4. 1.Stage thermostat 5. 2.Stage thermostat 6. Pump thermostat 7. Pump signal lamp 8. 2.Stage thermostat signal lamp
9. 1.Stage thermostat signal lamp 10. Burner warning alert lamp 11.safety limit thermostat (100°C) 12.Control board fuse (6 A)





Aç/Kapat: On/Off, Sigorta:Fuse, Güç Girişi:Power Entrance, Pompa:Pump, 1.Kademe Brülör:1.Stage Burner, 2.Kademe Brülör:2.Stage Burner, Tek Kademe Elektrik Şeması: Single Stage Circuit Diagram, Çift Kademe Elektrik Şeması: Double Stage Circuit Diagram, Limit Termostad: Limit Thermostat, Pompa Termostad: Pump Thermostat, Brulör Termostad: Burner Thermostat, Pompa Devrede: Pump Signal Lamp, Brülör Arıza : Burner warning light, Brülör Devrede: Burner Signal Lamp, 1.Kademe termostad : 1.Stage Thermostat, 2.Kademe termostad : 2.Stage Thermostat, 1.Kademe Brülör Devrede: 1.Stage Burner Signal Lamp 2.Kademe Brülör Devrede: 2.Stage Burner Signal Lamp

BURNER INSTALLATION



Brülör adepte plaka contası : Burner adapter plate gasket

Brülör adepte plakası: Burner adapter plate

Brülör contası: Burner gasket

Brülör flanşı: Burner flange

Brülör bağlantı civatası: Burner connection bolt

Brülör namlu izolasyonu: Burner barrel isolation

Brülör montajı: Burner Installation

Uyarı: Warning

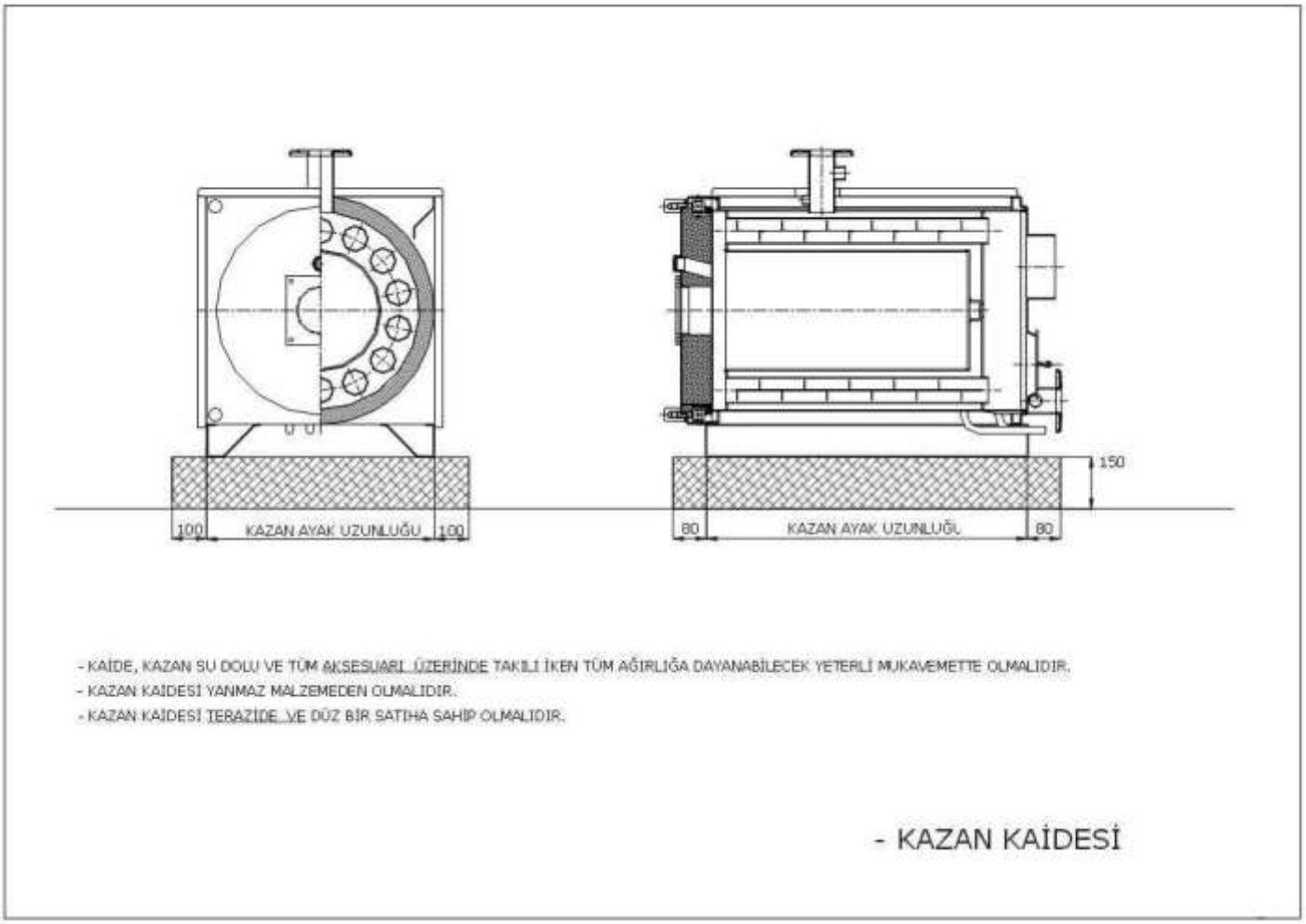
1. If the burner barrel and boiler door gap is more than 10mm, please fill it with fiber materials that have resistible to 1200ºC.

2. The size of burner set screws should not exceed to total weight of burner flange, gasket, and adapter thickness.

BURNER SELECTION

BÜRNER TYPE	BOILER CAPACİTY	BURNER CAPACITY	WORKING PRINCIPLE
	K.cal/h(1.000)	kW	
Gulliver BS 2	60	35-91	Single Stage Low Nox
Gulliver BS 3	80-100-125	65-189	Single Stage Low Nox
Gulliver BS 4	150-175	110-246	Single Stage Low Nox
RS 34 1 TL	250	70-390	Single Stage
RS 34 TL	250	130-390	Double Stage
RS 44 TL	300-350	203-535	Double Stage
RS 50 TL	400	290-580	Double Stage
RS 70 TL – 412	450-500	465-814	Double Stage
RS 70 TL – 415	600	465-814	Double Stage
RS 100 TL	700-800	698-1163	Double Stage
RS 130 TL	900-1.000	930-1512	Double Stage
RS 130 E MZ TL	900-1.000	160-1512	Proportional
RS 190 E TC	1.250-1.500	470-2290	Proportional
RS 250 E MZ TC	1.750-2.000	600-2650	Proportional

BOILER BASE

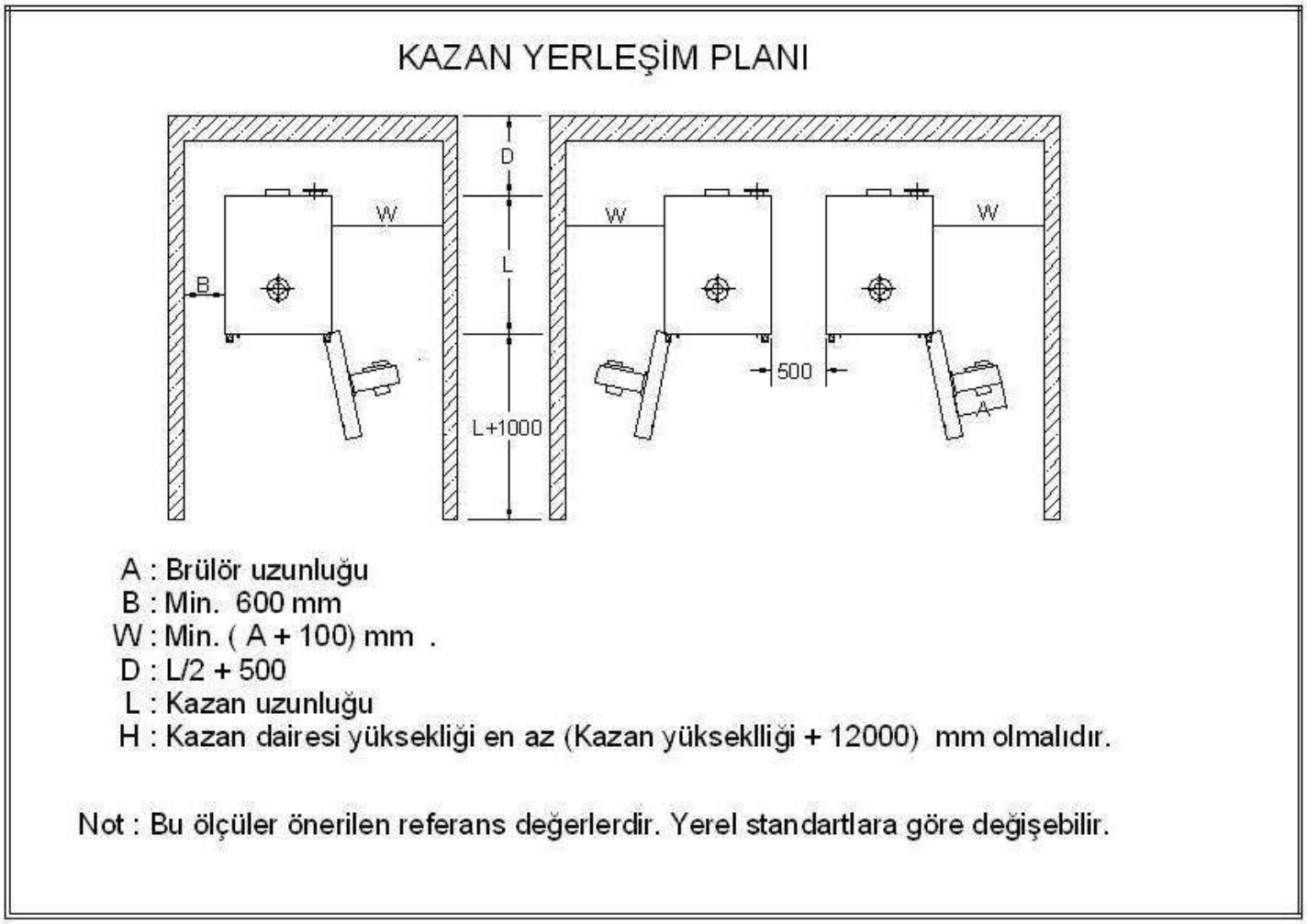


1.resimdeki Kazan Ayak Uzunluğu: Width of the Boiler 2.resimdeki Kazan Ayak Uzunluğu: Length of the Boiler

- The boiler base must have sufficient strength to carry all the equipment of the fully water-filled heating boiler.
- Boiler base must have non-flammable property.
- Boiler base must place on the smooth ground.

-KAZAN KAİDESİ : BOILER BASE

BOILER ROOM LAYOUT



KAZAN YERLEŞİM PLANI: BOILER ROOM LAYOUT

A: Brulör Uzunluğu : Length of the Burner
L: Kazan Uzunluğu: Length of the Boiler

H: Kazan dairesi yüksekliği en az kazan yüksekliği + 1200 mm olmalıdır.
The height of the boiler room should have at least the heating boiler + 1200 mm.

Not: Bu ölçüler önerilen referans değerlerdir. Yerel Standartlara göre değişebilir.
Note: These dimensions are reference values. These values can be changed according to local regulations.

MANUFACTURER:

ÜNLÜSOY Yapı Malz. San. Ve Tic. LTD. ŞTİ.

Main Factory: Sanayi Mah. 104 cd. No: 111 Eğirdir Yolu 1. KM ISPARTA

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