



# ÜKY/DUO Boiler User Manual



**ÜNLÜSOY**

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INDEX

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INDEX..... 1

INTRODUCTION ..... 2

TRANSPORT AND SHIPPING..... 3

SELECTION OF INSTALLATION PLACE ..... 4

SAFETY PRECAUTIONS ..... 6

ELECTRICAL INSTALLATION INSTRUCTIONS..... 8

INFORMATION ABOUT COMBUSTION..... 10

BOILER FEATURES..... 12

RULES FOR HEATING INSTALLATION ..... 15

CONTROL PANEL AND USER INTERFACE ..... 19

STARTING UP ..... 21

FUEL FEEDING – STAND BY ADJUSTMENT..... 23

MAINTENANCE AND BOILER CLEANING..... 24

INFORMATION ON USAGE ERRORS..... 25

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This booklet covers:

**ÜKY/DUO** 25-40-60-80-100

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## INTRODUCTION

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Thank you for choosing ÜNMAK ÜKY/DUO series solid fuel boiler. ÜNMAK ÜKY/DUO series boilers are produced with both automatic and manual feeding.

Please read the user manual carefully before installing and operating your product and keep the user manual for the life of the product. Do not touch or mix any part of the product other than the places allowed in the user manual.

The installation, maintenance and service of the boiler requires expert technical team.

These operating instructions and regulations should be considered for the installation of the boiler, the selection of the appropriate location for the installation, the installation of the boiler water installation and the design of the chimney.

ÜNMAK DUO Series boilers are high efficiency steel welded hot water boilers designed to burn solid fuel only. Coal with a diameter of 10-18 mm (sold in the market under the name of hazelnut coal), nutshell, cherry-cherry kernel, olive pomace, pellet etc. It is suitable for burning fuels. These boilers are used only for heating installations, not directly for domestic water heating. However, it can produce hot tap water with the help of a boiler or heat exchanger. The energy required for the domestic water will be taken from the boiler energy.

ÜNMAK DUO Series boilers convert the chemical energy of the fuel in the fuel loading chamber to heat energy by combustion and load it on the water that is heating fluid. Excessive fuel build-up in the combustion chamber by keeping the feed setting overstated will result in energy loss and will take longer to burn the fuel.

The combustion circuit, fan, feed auger and system pump control are carried out by the electronic control panel supplied with the boiler.

ÜNMAK DUO Series boilers can only burn granular fuels up to 25 mm in diameter. Since the powdered fuels will fly inside the combustion chamber with the system fan, there will be no efficient combustion. Since powdered fuel will collect more moisture, it will even cause spiral blockage in the feed screw. Depending on the calorific values of the fuels, the heat passing from the boiler to the water may exceed the declared values.



***Your user manual should be read carefully and kept with the warranty certificate enclosed for the lifetime of the boiler.***

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## TRANSPORT AND SHIPPING

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ÜNMAK ÜKY/DUO series boilers are manufactured from welded thick sheet metal.

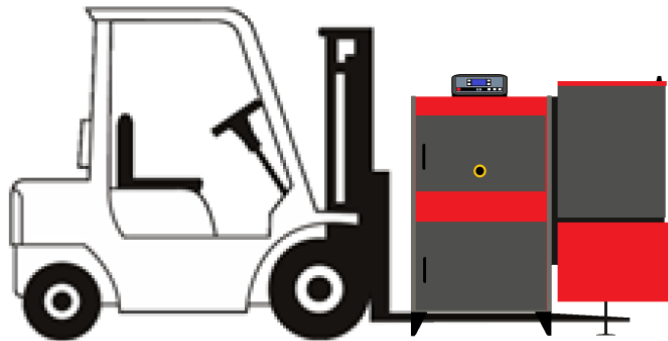
1. Boiler Group: Boiler insulation and outer jacket are shipped dressed.
2. Accessories: Control panel, pump (pump is given for capacities below 60.000 kcal/h power), warranty manual and boiler accessories are included in the boiler package.

### Safe transportation of the product

Solid fuel boilers are heavy products, so care should be taken when moving the boiler to the place where it will be installed. Therefore, the equipment to be used to lift and transport the product should be at a sufficient capacity.

In order not to damage the boiler outer sheets and the boiler during transportation;

In small boilers, while carrying the transportation rope through the forklift stands on the chassis and carrying the boiler with the help of a crane or hoist, care should be taken not to damage the painted thin sheets of the boiler and the reducer-fan group under the bunker.



In large boilers, it is also suitable to be lifted from the forklift stands or the transport ring on the boiler. If the connecting ropes are to be passed under the boiler while lifting with a crane, preventive measures should be taken to crush the upper tar of the boiler by the ropes. The boiler standing on the ground must be lifted directly without a puller. When carrying in cold weather, the boiler should not be lifted suddenly in case the rope freezes from the cold.



**Care should be taken not to damage the gearbox and fan under the bunker.**



**When removing the packaging around the boiler, hard and cutting objects should not be used in order to prevent damage to the painted boiler plates underneath the packaging.**

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## SELECTION OF INSTALLATION PLACE

The place where the boiler is installed must have enough free space for the installation, burning and maintenance of the boiler. For the service need, the gearbox and the group to which the shaft is connected should be distant from the wall to easily come out. For this, the dimensions in the paragraph titled “Mounting location dimensions” should be applied.

In addition, there should be a sufficient amount of clean air circulation for efficient combustion, the chimney design must meet the required traction values for the model used and comply with the construction criteria and related regulations given in the manual. The boiler should never be installed in open spaces, balconies, living areas (kitchen, living room, bathroom, bedroom), in places with explosive and easily flammable materials.

The door of the boiler room should not be opened directly to the escape staircase or general use stairs and must be opened to a security hall. There should be at least one door in boiler rooms with thermal capacities between 50 kW and 350 kW, and at least 2 exit doors in boiler rooms with a floor area above 100 m<sup>2</sup> or with a thermal capacity above 350 kW. The exit doors should be placed in the opposite direction of each other as much as possible, they should be resistant to fire for at least 90 minutes, smoke-tight and capable of self-closing.

At least one of the doors must open directly outside and outside the building. If it is possible to open a door directly outside the building from the boiler room, this is the most suitable solution. The door of the boiler room should not be opened directly to the escape staircase or general use staircase and must be opened to a common hall or corridor.

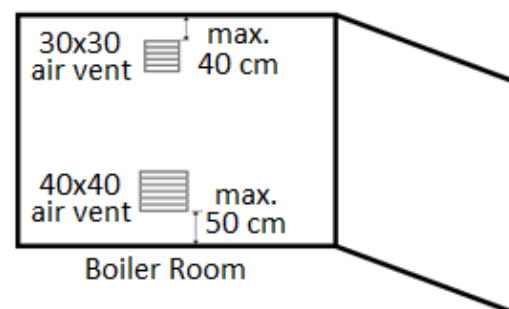
A threshold of at least 10 cm height is recommended for the doors opening from the boiler room into the building. If it is possible to illuminate the boiler room naturally, it should be noted that the lighting openings do not come under other windows of the building. If artificial lighting is made, a system that does not dazzle but brightens the apartment should be installed. The main switches and panels belonging to the boiler room should be placed around the entrance door and should be leak-proof type. A fire tube must be kept in the boiler rooms.

One of the purposes of placing the boiler on the concrete base in the boiler room is to prevent the fan from sucking dust from the floor. Ventilation can be done naturally or algebraically. It should be ensured that the fresh air inlet chimney mouth is at the ground level and the dirty air tapping chimney mouth is at the ceiling level.

At least 1 6 kg multi-purpose dry chemical powder extinguishing device should be kept in the boiler room.

If natural gas or liquid fuel boilers are also used in the same boiler room, the tear surface must be designed.

The established place must have grilles which are directly connected to the external environment and allow fresh air to enter. One of the culverts should be at most 40 cm below the boiler room ceiling and the other should be at most 50 cm above the floor. These culverts should be constantly open. The lower grill must be at least 40 x 40 cm and the top grill must be at least 30 x 30 cm. Pets should not be fed in the heating area (boiler room), smoke and food and beverage that may be affected should not be stored.



All electrical and water installations must be done by authorized plumbers, in accordance with any applicable legal and technical rules, approved by the relevant legal entities.

The fuels to be burned in the boiler should be kept in a way to maintain a distance of at least 800 mm from the boiler. It is recommended to store fuels in a separate location.

Boilers should be installed on a concrete base at a height of 10 cm from the floor in order to protect from water moisture and solid fuel from ash dust. The concrete base prevents the fan from absorbing fuel or ash dust on the ground.

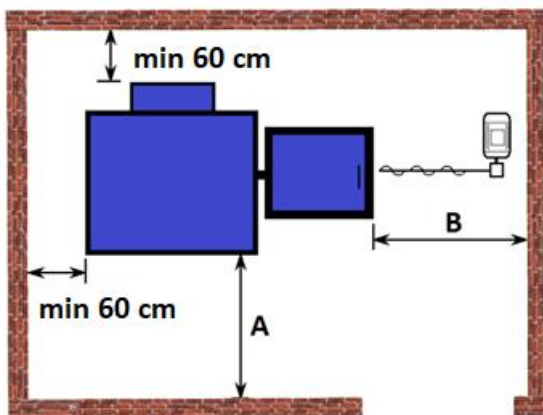
Laying the mounting place with tiles and tile stones makes cleaning easier.



**It is inconvenient to keep flammable, burning and easily flammable substances in the boiler room.**

#### Installation location dimensions:

The boiler room should be sized to provide the minimum dimensions given in the picture below. While placing the boiler, it is necessary to leave sufficient distance for the fuel to be added to the bunker easily, the reducer and the shaft under the bunker can be easily removed, and the service can work comfortably.



The boiler room must be of a size to provide the minimum dimensions given in the picture below. When the boiler is placed, it can be done easily to add to the hopper, the reducer and shaft underneath the hopper can be easily removed, enough distance should be left for the service to work comfortably.

Dimension A: 60 cm greater than the opening of the boiler door;

Measure B: Select the spindle removal distance.

If the above measurements are observed, a minimum of 8 m<sup>3</sup> of volume requirement in the regulations is ensured.



***There should be no faulty and unsafe power lines in the boiler room.***



**The 230 V electrical connection from the control panel must be connected to the mains via the W automaton.**

## SAFETY PRECAUTIONS

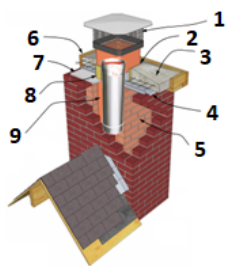


**Electrical installation of this product must be done by qualified personnel in accordance with the explanations given in this manual and applicable local or national regulations.**



**THIS PRODUCT MUST BE CONNECTED TO THE ELECTRICITY WITH EARTH LINE!**

The boiler must be connected to a chimney in accordance with the specifications specified in the user manual and the relevant regulations. The chimney must provide the traction value required by the connected boiler. The boiler must not be operated without a flue connection and there must be sufficient traction for combustion. The boiler should not be operated in the chimneys where sufficient traction is not provided. Any malfunctioning electrical installation in the place where the boiler is installed should be removed.



- 1 spark preventive
- 2 sealant
- 3 concrete chimney cover
- 4 continuation under cover
- 5 Brick or CMU filler
- 6 die
- 7 cemented support unit
- 8 insulation for bond breakage
- 9 cylindrical flue pipe

In case of changing the boiler in the boiler rooms, the old boiler must be removed or disconnected with the chimney and the cut must be sealed and insulated. Under no circumstances should more than one boiler be connected to the same chimney. The cylindrical chimney can be passed through the chimney in the figure.

Smoke shafts should not be placed on the outer wall of the building unless there is a technical requirement. The wall thickness of the chimney walls should not be less than the thickness of a brick. Hollow brick and briquette should never be used in chimney construction. It should be plastered inside and outside and cylindrical pipe inserted into the rectangular chimney.

It should be ensured that fresh air always enters the area where the boiler is installed. The dimensions mentioned in the guide should be taken as reference in this regard. The boiler must not be installed in any place directly connected to the living areas or to such a place. To reduce the risk of calcification and corrosion in old and new installations, the instructions given in the relevant section of this manual should be followed by the installer installing the boiler. In particular, if the boiler is connected to an old installation, it is necessary to completely clean the waste inside the installation before installation. The installation should be washed several times.

Avoid excessive fuel loading into the boiler and the suitability of the feeding-waiting settings given in the user manual should be checked. These settings, which indicate the working and stopping time of the reducer, the chimney features (traction difference, etc.) to which the boiler is connected, ambient conditions, the thermal comfort requirement of the space, the insulation of the space, etc. varies depending on many parameters. When the settings given in the catalog are given to operate at a lower power than they are given for the boiler to operate at maximum power, the settings are; burning should be done by observing. Making adjustments to prevent unburned coal from falling down from the ladle will be appropriate for both boiler efficiency and economy.

Since the fuel particles and fuel ashes burning and flying inside the boiler will easily come out from the open door, the covers of the boiler must not be opened while the fan is operating. While the boiler is burning, the covers should not be opened and manual loading should be done on the cooker or inside the boiler.



***The electrical connection should never be disconnected while the boiler is operating.***

For any reason, direct cold water should not be added to the overheated boiler for cooling purposes. This can lead to noise in the installation, extremely high thermal stresses in the boiler and thus permanent damage. Unless there is a risk of maintenance or freezing, water in the installation should not be drained. The system design should ensure that the proportion between the installation water flow rate and the boiler capacity and the 20°C difference between the boiler inlet and outlet water temperatures are not exceeded. To minimize the completion of water lost in the installation, the water level should be checked regularly and leaks in the system should be eliminated. Because excessive water additions to the system will cause lime accumulation on the water side of the boiler, which will cause regional overheating and this will damage the boiler.

The boiler does not burn directly, it should be installed on a flat surface. It is recommended that the height of the base on which the boiler is to be installed is at least 10 cm and its width is wider than the outer dimensions of the boiler. Thanks to the pedestal, the boiler will be protected from water that can accumulate on the floor, and the fan will be prevented from sucking dust from the floor.



***It should be added to the hopper before the fuel runs out.***



***The hopper screen should not be removed when loading fuel, the bunker cover after loading***





## ELECTRICAL INSTALLATION INSTRUCTIONS

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ÜNMAK ÜKY / DUO series boilers are fed with 230 Volt mains voltage. Where the mains voltage is less than ten percent or greater than ten percent, the regulator should be used.

The control panel should be connected to a wall panel with suitable grounding equipment, the distance between the boiler panel and this wall panel should not exceed 50 cm.

Separate grounding installation must be made from the column installation for each boiler room.

Grounding installation:

- a) 0.5 m<sup>2</sup>, 2 mm. thick copper sheet,
- b) 0.5 m<sup>2</sup>, 3 mm. thick galvanized plate (hot dip) or
- c) Solid copper rod should be made with electrodes.

Copper rod electrodes must be at least 1.5 m in diameter of  $\varnothing 16$  mm or at least 1.25 m in diameter of  $\varnothing 20$  mm and the earthing resistance of rod electrodes must remain below the limits of 20  $\Omega$ . (Neutral-Earth voltage  $\leq 3V$ )

In all three cases, copper electrodes or plates must be connected to the natural gas installation by soldering or welding, using a minimum of 16 mm<sup>2</sup> multi-stranded (braided) copper cable and conductive lug. Copper electrodes or plates should be placed completely in the ground as teeth, and the conductor remaining on the ground should be connected with the pipe casing and the main table of the boiler room.



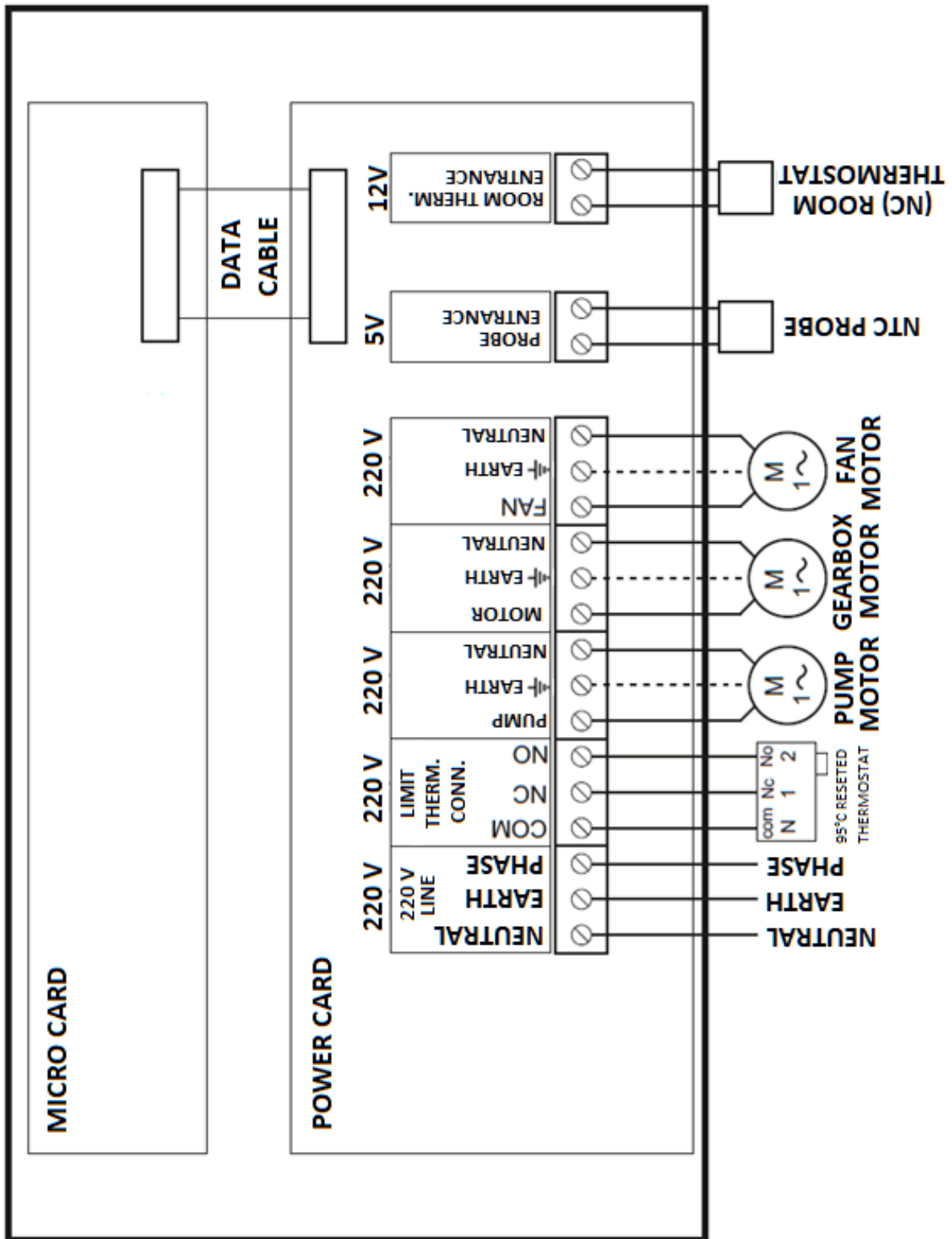
**THIS PRODUCT MUST BE CONNECTED INTO A SAFE GROUND LINE!**



***The boiler should not be installed in closed and living areas.***

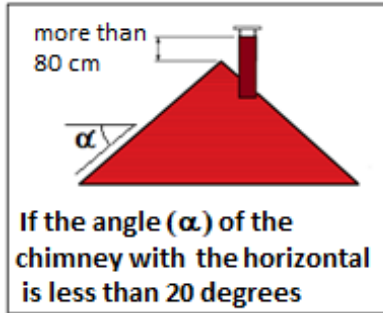
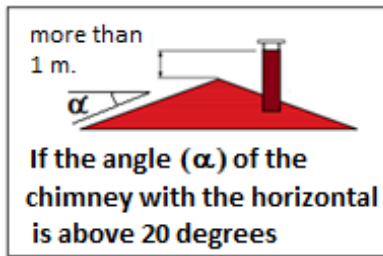
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Control panel electrical connection diagram

**INFORMATION ABOUT COMBUSTION**

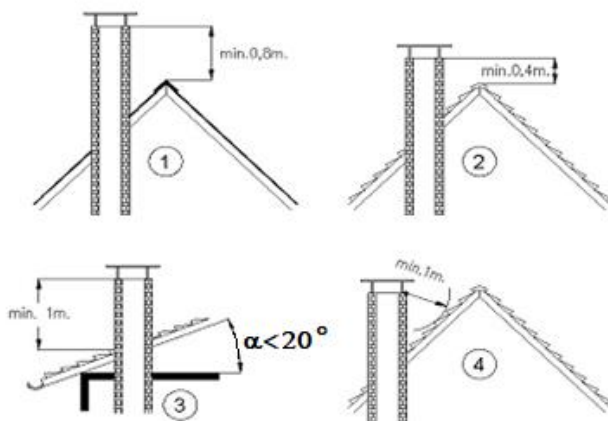


In order to ensure correct combustion, as a general rule, the air supplied to the fuel must be at a certain rate. So the fan speed should be adjusted well. The air required for a certain amount of fuel should not be too much. If the amount of air which is changed depending on the type of fuel is less than the required amount of carbon monoxide, the energy produced is reduced, the combustion starts, the combustion efficiency decreases, the air quantity is decreasing, the carbon monoxide decreases while the non-combustion air is heated from the chimney by heating in the furnace, the combustion is deteriorated and the combustion efficiency It decreases.

If the temperature of the flue gas is above the accepted values, excess energy will be ejected from the flue to the atmosphere. The material, the way of construction and the connection of the chimneys are important in terms of high combustion efficiency, low heating cost and protection of the environment.

The chimney must be good for burning to be good. It is recommended to use a high temperature resistant firebrick and stainless steel chimneys. The horizontal smoke ducts should be connected to the chimney with a slope of at least 5% and the length should never exceed 1/4 of the height of the chimney. The height of the chimney should be well determined. The chimney sections must be circular unless necessary.

Never use a hollow brick on the chimney walls. The most ideal is the creation of fire bricks.



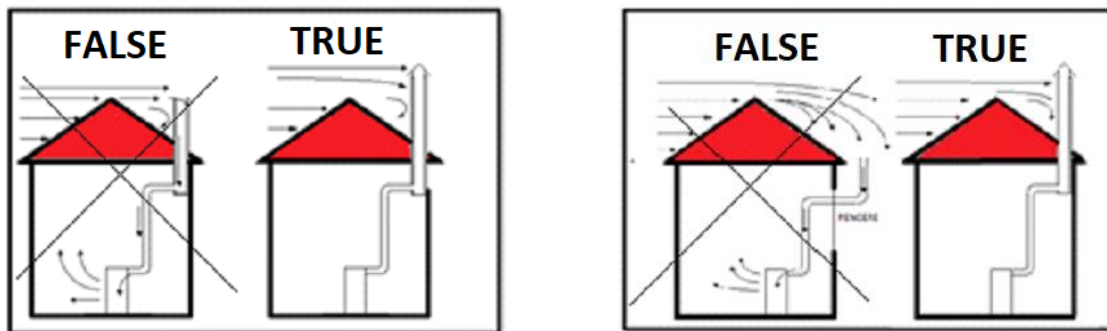
ÜNMAK boilers must be connected to an independent chimney that can provide the minimum desired minimum traction. Minimum traction is usually min. It should be measured with a manometer in 20 Pa. The part of the waste gas line between the boiler and the chimney should be insulated with glass wool. The waste gas pipe and

flue pipe shall be made of steel sheet or material which is resistant to 400 °C. All connections on the exhaust gas pipe must be sealed to obtain better combustion and efficiency. The exhaust gas pipe must be connected to the chimney in the shortest way within the dimensions given in the diagram below. Horizontal connections and equipment such as elbows should be avoided.

A vertical steel pipe should not be used as a chimney; the chimney must have an inside and an outer surface. The outer surface may be steel or brick braided. For the inner surface of the chimney, corrosion-resistant stainless steel may be preferred. In order to prevent condensation, thermal insulation should be applied to the space between the inner and outer surfaces of the chimney.

At the lowest level of the chimney, there must be a cleaning lid made of steel that is sealed. The length of the exhaust gas pipe between the chimney and the boiler must not exceed a quarter of the height of the chimney.

The size of the waste gas pipe and the chimney should be greater than the size of the waste gas outlet (fumes) of the boiler. The boiler chimney installed must be at least 1 meter above the roof of the space and at least 0.4 meter above the tiled roofs.



Chimney without flue hat and with flue hat

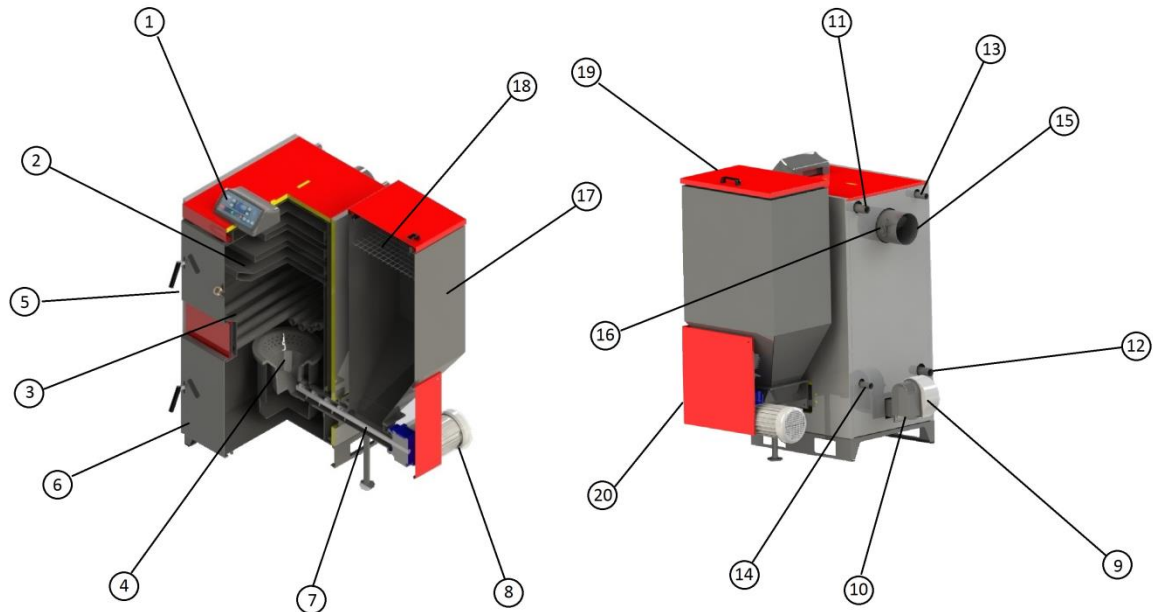
Incorrect installation chimney and correctly installed chimney hat



**Excess air at high flue temperature, high flue temperature also causes loss of combustion efficiency.**

## BOILER FEATURES

### ÜKY/DUO Boiler Features



- |                       |                       |                       |                      |
|-----------------------|-----------------------|-----------------------|----------------------|
| 1. Control panel      | 6. Ash cleaning cover | 11. Heating flow line | 16. Flue flap        |
| 2. Water jackets      | 7. Auger              | 12. Heating return    | 17. Hopper           |
| 3. Water grid         | 8. Gearmotor          | 13. Safety flow       | 18. Hopper screen    |
| 4. Fire pot           | 9. Fan                | 14. Safety return     | 19. Hopper lid       |
| 5. Wood loading cover | 10. Fan clack         | 15. Chimney hood      | 20. Motor protection |

1. Control panel: It is the electronic box that blows the boiler. Controls when reducer, motor, pump stop and when to run. The temperature values read while controlling are effective.

2. Water jackets: These are specially designed water chambers to circulate the water and circulate the smoke. As the smoke passes between them, it releases its energy and heats the water inside.

3. Water grid: They are the pipes for burning. Water passes through the pipes. In this way, both the water inside is warmed and the life of the grill is extended.

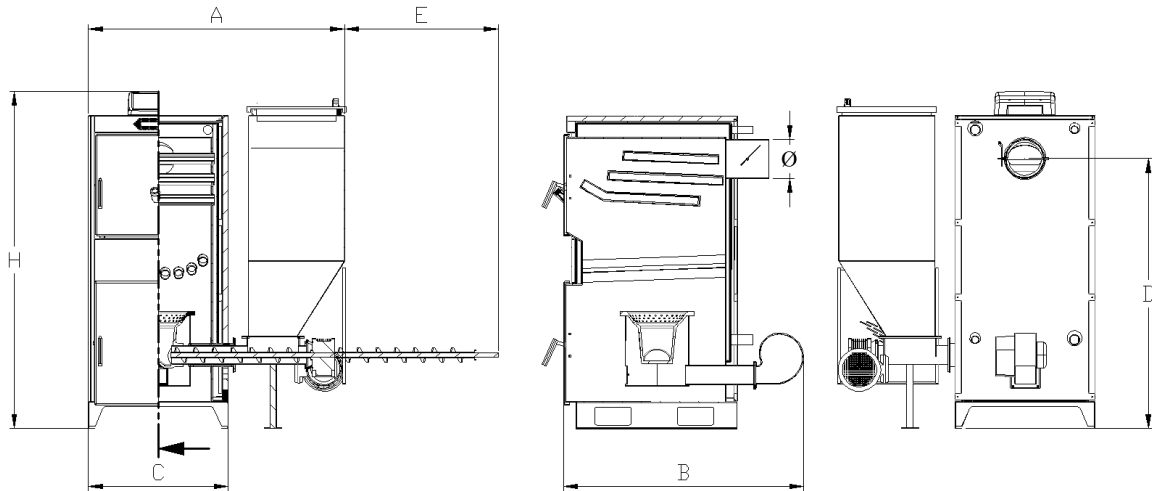
4. Fire pot: It consists of two nested chambers. Fuel from the inside chamber is driven by the helix, and the air from the outside chamber is blown by the fan. Fan air and fuel meet at the top of the crucible.

5. Wood loading cover: By opening this cover in front of the boiler, wood or coarse grained fuels can be loaded on the watered grills. It also provides cleaning of soot and ash accumulated between water jackets.

6. Ash cleaning cover: It is the cover used to clean the wastes such as ash and slag formed after combustion.

7. Auger: It is a spiral auger with a shaft in the middle, which provides the fuel in the bunker to be transferred into the furnace. The fuel feed standby settings are the helical stop and stop settings.
  8. Gearmotor: It is used with the motor. It serves to increase the power by decreasing the speed of the engine. The movement of the auger gives the gearmotor.
  9. Fan: It is the fan that provides the combustion air. It can be adjusted to operate at the desired speed from the control panel.
  10. Fan clack: It is the mechanism used to prevent air from entering when the fan stops when there is no burning. The metal cover inside the valve prevents the air inlet by falling automatically when the fan air does not draw.
  11. Heating flow line: It is the flow pipe to the radiators or heating installation. The water heated in the boiler is sent to the radiators or heating installation from this pipe.
  12. Heating return line: It is the pipe through which the water returned from the radiators or heating installation returns to the boiler. It can also be called return pipe or return line.
  13. Safety flow line: it can also be called expansion or embankment line. It is the line where the expanded water is sent as a safety due to heating in the boiler.
  14. Safety return line: It is the line where the water sent to the expansion tank is taken back to ensure safety from the boiler.
  15. Chimney hood: It is the boiler section that discharges the poisonous gases inside the boiler with the flue assembly to be connected. It is the biggest factor in the good burning of the boiler.
  16. Flue flap: It is used to decrease the traction in case of chimney traction. It can be gradually dimmed. It is also used in case of accident sleeping.
  17. Hopper: It is the place where the fuel is stored. The capacity it can take depends on the fuel size.
  18. Hopper screen: It is the sieve that provides the holding of large pieces that may come out of the fuel during the loading of the bunker. The removal of the sieve is inconvenient because the large pieces of fuel fall into the bunker during fuel loading and these parts can come together to prevent fuel from passing through the throat on the helix.
  19. Hopper lid: If the bunker cover remains open during combustion, there may be a problem in boilers that do not pull the chimney sufficiently. Combustion wastes that cannot go through the chimney can go through the shortest route, through the feeding spiral and out of the hopper that remains open. Although we call this situation, it can have dangerous consequences until the fire.
  20. Motor protection: It is a sheet made to protect people or pets from the engine and reducer.
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ÜKY/DUO Technical Features



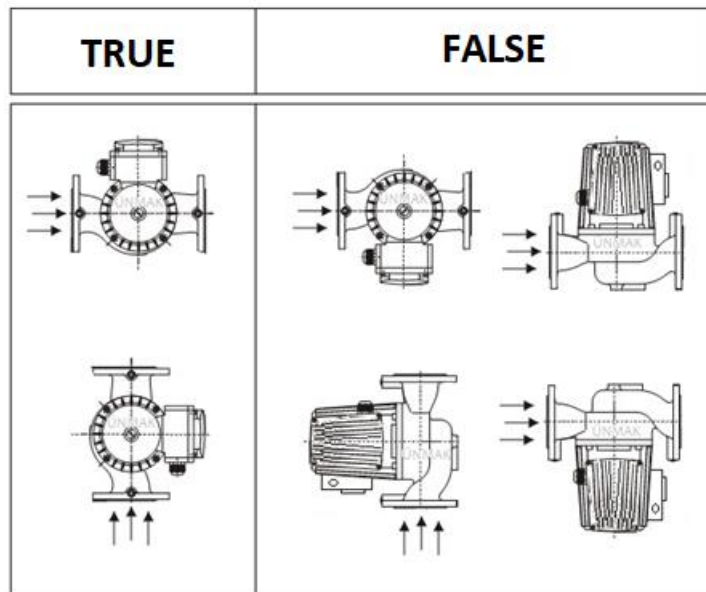
TECHNICAL FEATURES							
MODEL	ÜKY/DUO	25	40	60	80	100	
Fuel Type	Log Wood or Coal						
Power	kW	29	52	70	93	116	
	kcal/h	25.000	40.000	60.000	80.000	100.000	
Fire Pot Diameter	mm	330	400				
Hopper Volume	Lt	265					
Water Volume	Lt	80	115	150	210	255	
Boiler Weight	kg	320	410	435	520	595	
Draft	Pa	25-28	31-33	33-35	35-40		
Temperature Control Range	°C	40-90					
Return Temperature (Recommended)	°C	40					
Maximum Operating Pressure	bar	3					
Test Pressure	bar	5					
Dimensions	Boiler Width (A)	mm	1090		1185	1272	
	Depth (B)	mm	975	1075		1375	
	Body Width (C)	mm	550	645			
	Flue Connection Height (D)	mm	1165	1265			
	Auger Disassembling Distance (E)	mm	1410		1750	1860	
	Boiler Height (H)	mm	1475	1575			
Flue Diameter	mm	130	160	180	220		
Min-Max Flue Temperature	°C	170 - 210					
Boiler Flow - Return	R"	1"	1 ¼"	1 ½"	2"		
Safety Flow - Return	R"	1"			1 ½"		
Filling – Discharging	R"	½"					
Electricity Connection	V/Hz	230/50					

## RULES FOR HEATING INSTALLATION

### Circulation pump:

A pump with sufficient capacity is recommended. The capacity of the required pump is determined by taking into account the resistance in the installation. Refer to the wiring diagrams in the manual to determine the correct position of the pump in the system. The pump stage must be adjusted according to the resistances in the installation.

In addition to the schematic installation connection shown in high-capacity boiler installations, a backup pump system must be installed. The by-pass line must be connected directly to the spare pump line as a primary pump. Boiler inlet and outlet lines must be connected with collectors. For open expansion installations, the head of the pump must be less than the height of the expansion, so that the system does not make air.



When the circulation pump is installed, the failure of the electrical connections to come down will eliminate the problem of entering the water into the pump. Perpendicular installation of the shaft should also be avoided in order to prevent the pump shaft from pressing the housing or the outer cover during operation.

When the circulation pump is installed, the failure of the electrical connections to come down will eliminate the problem of entering the water into the pump. Perpendicular installation of the shaft should also be avoided in order to prevent the pump shaft from pressing the housing or the outer cover during operation.

### Expansion tank:

In hot water heating systems, when the water is heated from 10°C to 90°C, its volume increases by 3.55% of its initial volume. "Expansion tanks" are used to get this expansion depending on the temperature in the water. Expansion tanks also fulfill the safety of the system, that is, the pressure does not rise, and the necessary water supply duties to the system. Since DUO series boilers can also be loaded manually, an open expansion tank is mandatory.

### Open expansion tank systems:

It is placed at the top of the system that is, on the roof, works with a level difference and open to the atmosphere. The expansion tank is placed at a slightly higher point than the highest point of the dispensing system to collect the expanding water volume. The water expanding in the boiler is stored in the expansion tank through the flow safety pipe. When the water in the installation cools, the reduced water of the installation is completed by the expansion tank through the return safety pipe. Since the expansion tank opens the system to the atmosphere, it ensures the safety of the system by preventing the pressure in the heating installation from rising above the atmospheric pressure. Air



pipes in the system are evacuated by opening the air pipes to the atmosphere from the expansion tank. It is recommended to use separate expansion tanks for each boiler in the installation, according to their capacities. So it is not right to connect two boilers to one expansion tank. There are flow and return safety pipes for each boiler and expansion tank. Valves, check valves etc. on these safety pipes. No fittings such as material should be installed. The safety pipes should reach the nearest point of the boiler inlet and outlet from the shortest vertical path. Horizontal movement is permitted only at the level of the expansion tank and the minimum length.

ÜNMAK DUO series solid fuel boilers must be connected to an installation with an open expansion tank in accordance with the installation scheme shown below. The circulation pump can be connected on the flow or return line. In case the pump is at the return of the boiler; open expansion tank should be higher than the head of the pump.

**Warning about water level:**

After the first water is pumped into the system, the minimum water level should be marked on the hydrometer. The water level should be checked daily, and water should be added to the installation when it falls below the minimum value.

*Open expansion tank volumes that should be according to Ünmak boiler power*

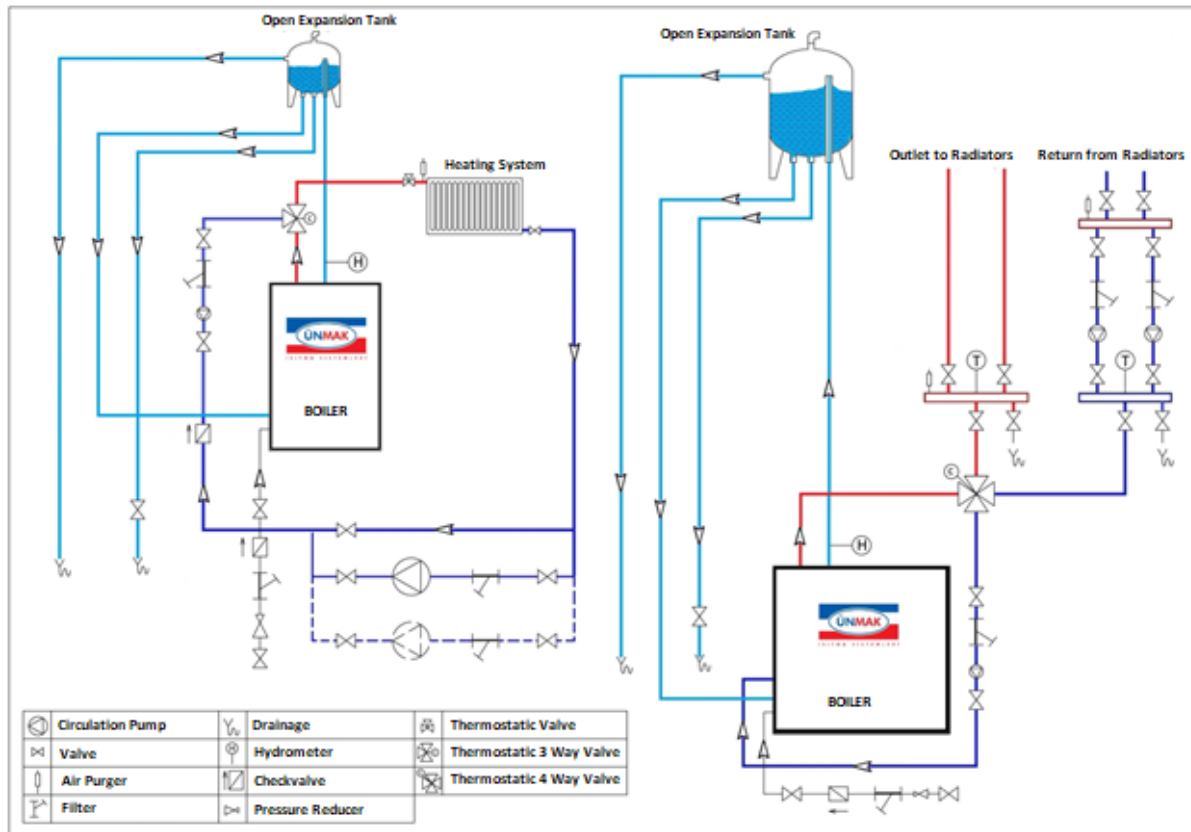
<b>BOILER POWER (Mcal/h)</b>	<b>OPEN EXPANSION TANK VOLUME (lt)</b>
25	50
40	90
60	90
80	110
100	210

*Open expansion tanks are selected by assuming Ünmak brand open expansion volumes and panel radiators in the system.*



**Adding fresh water to the installation should be done only when the installation is cold.**

### Open expansion tank installation scheme



#### Warning of corrosion in installation:

ÜNMAK boilers are extremely resistant to corrosion and therefore corrosion. However, all iron-based components in the heating installation (including installation pipes and radiators) must be protected against corrosion. Oxygen in the heating water causes oxidation of the iron surfaces resulting in rust and thus loss of material.

During the initial filling of the installation, the accumulated air must be evacuated. Usually, if the necessary measures are taken after the first filling, there is no damage caused by the oxygen in the water. Oxidation is mostly caused by oxygen which is involved in the heating water during operation.

The main reasons are:

1. In systems with open expansion tank, oxygen is added to the system because the tank is open to the atmosphere. For this reason, the information given in this manual must be strictly observed in the open expansion tank dimensions, the position in the system and the safety connections.
2. Leaks in the system cause oxygen to be added to the heating water. Therefore, the lowest water pressure in the closed expansion tank system must be higher than the atmospheric pressure and periodic control of the operating pressure is required.

**Warning against frost protection:**

The heating installation must be completely isolated. Outdoor parts of the installation should be isolated more than the interior parts. If operating with an open expansion tank, the return and return pipes to the expansion line must be isolated or even the expansion tank must be isolated.

**Considerations in new installations:**

To minimize the addition of fresh water system design and sizing should be done correctly. None of the materials used in the installation must have a gas permeability. A maximum of 50 micron filters of synthetic or metal porous must be placed on the fresh water splicing line. In closed expansion systems, the pressure must be above atmospheric pressure throughout the installation.

**Considerations for heating connected to old installations:**

A long-term heating system produces a protective layer (black magnetite) on metal surfaces in contact with water. When a new boiler is installed in the old system, the clean surfaces of the boiler will be the first place to start corrosion. Therefore, when a new boiler is connected to the old heating system, in addition to the measures to be taken for new systems, the following issues should be considered:

1. The old system must be thoroughly rinsed to remove any impurities and sediments from the boiler before connecting.
2. A manual valve air separator must be installed at the top of the system.



***Before installing a new boiler in the old heating installation, the installation must be washed several times with water.***



***The chimney must be cleaned before installation into the old chimney installations.***














***Each boiler chimney must be detached. Never connect more than one boiler to the same flue system.***

## CONTROL PANEL AND USER INTERFACE



### Buttons and Explanations

ON/OFF button		Used to open and close the control panel.
(+) (-) button		Used to input new value to the device. "Fan Adjustment", "Temperature Adjustment", "Fuel Feeding", "Fuel Standing"
ENTER		Used to store set values and to access submenus from menu.
ESC		Used for output from the menu or submenu.
Fan Adjustment		Used to determine fan speed.

Temperature Adjustment		It ensures that the boiler water temperature stops when it reaches the set value.
Fuel Feeding		It is used to determine the time it takes to drive the fuel into the fire pot.
Fuel Standing		It is used to determine the waiting time after the fueling time.
Gearbox On/Off		The gearbox motor (fuel loading engine) of the boiler is switched on and off with this button.
Fan On/Off		The fan of the boiler is switched on and off with this button.
Manual Fuel Feed		It is used to load manual (manual) fuel into the boiler. As long as the button is pressed, fuel continues to drive.

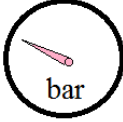




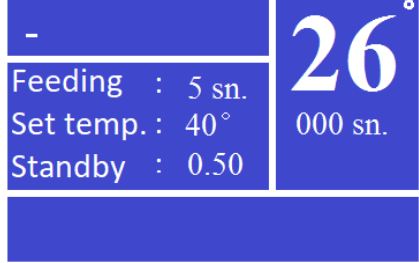





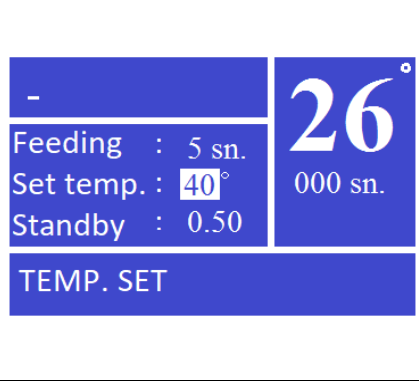



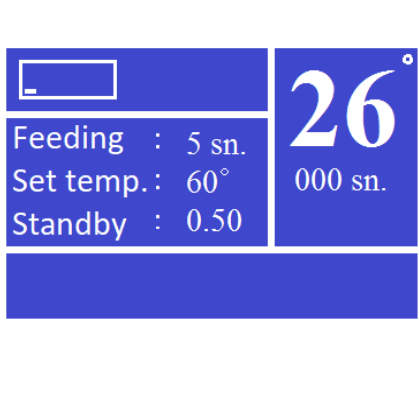










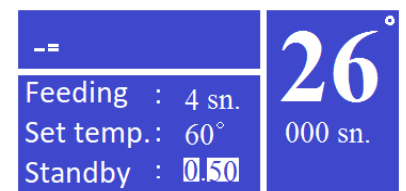


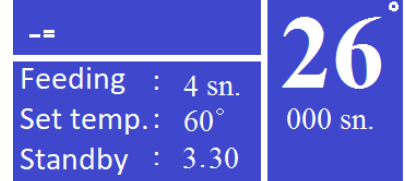




- Fan
- Pump
- Gearbox
- No Fuel
- Fuel Stuck

Warning and error messages are located on the top right of the panel. When the fan, pump and gear unit are running, the lights on the sides of the vehicle are illuminated. When the fuel is exhausted in the hopper or when the fuel is squeezed in the ladle, the lights next to them are lit to indicate an error.

## STARTING UP

The following steps should be followed for the initial start of the boiler:

<p>Check the installation for any obvious defects. If there is a fault, remove information from the "Information on Usage Errors İlişkin page.</p>	
<p>In closed systems, observe that the water is not removed from the manometer and the hydrometer in open systems. Add water if it is minimized.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>bar</p> <p>Manometer</p> </div> <div style="text-align: center;">  <p>mWS</p> <p>Hydrometer</p> </div> </div>
<p>Check the power line of the boiler for any obvious defects. If there is a fault, look at information from the Information on Usage Errors page.</p>	
<p>Fill the hopper with fuel and close the cap tightly.</p>	
<p>Open the control panel by pressing the button  for 2 seconds. When turned on, the blue graph will display values next to the Feed, Set Temperature, Standby variables.</p> <p>Since the buttons  and , HEATING is not seen because the buttons are not pressed and the boiler does not work.</p>	
<p>Open the boiler lower cover and hold the finger  on the Manual Fuel Feed button on the control panel to allow the fuel to fill into the crucible, into the holes.</p> <p>When pressing the button, you will see the Reducer light in the upper right corner of the panel illuminate.</p>	
<p>It is useful to set the boiler water temperature to 60°C at the first start.</p> <p>To do so, press the  Temperature Adjustment button on the panel. The display shows TEMPERATURE SET. You can press and hold the   buttons until the desired temperature is set.</p> <p>You can store them by pressing the  ENTER button.</p>	
<p>Press the  Fan Setting button of the panel. A rectangle will appear around the line in the upper left corner.</p> <p> press the button once to increase the fan stage once again and the second shape.</p> <p>When you press the  ENTER button, the setting of the fan you have set will be memorized and the display will be as in the third figure.</p>	

	
<p>Find the  Fuel Feed and  Fuel Waiting settings in the "Fuel Waiting - Feed Settings" section of your manual, according to the boiler capacity and fuel type.</p> <p>  Press the Fuel Feed button to set the amount of fuel to be fed into the boiler. Press the ENTER button after setting the power supply setting.</p> <p>Press the Fuel Waiting button for the standby setting. Press the  ENTER button after setting the standby setting.</p>	   
<p>Set some materials to easily ignite and then ignite the boiler. Later</p> <p>Close the boiler doors and press the  Fan On / Off button on the panel. The Fan lamp on the upper right side of the control panel will illuminate and HEAT will appear on the display.</p>	 
<p>If the ignition aids in the boiler ignite the fuel, press the  Reducer On / Off button to switch on the gear unit. The on / off button on the gear unit will light up. The gearbox lamp in the upper right corner of the control panel will only be activated when the gear unit is running.</p> <p>The countdown timer at the right-hand corner of the display counts down from the minute value set for standby to seconds in which the text WAIT is displayed.</p>	 



**Overheating of the fan speed will cause some heat to be discharged from the chimney. In the case of combustion, one to one and a large amount of air will cause adhesion to the slag. It can be played with feed and standby settings to prevent the unburned fuel from falling off the pot.**

## FUEL FEEDING – STAND BY ADJUSTMENT

The following table can be used for feeding and standby settings that can be set from the control panel of the ÜNMAK automatic feed boilers.

Fuel Feeding & Standby Duration						
Coal Types		25.000 kcal/h	40.000 kcal/h	60.000 kcal/h	80.000 kcal/h	100.000 kcal/h
6.000 kcal/kg.h	Feeding (dk)	3,40	3,20	2,80	2,70	2,70
	Standby (sn)	3	5	6	8	10
4.000 kcal/kg.h	Feeding (dk)	3,80	3,40	3,00	2,60	2,60
	Standby (sn)	5	8	10	15	15
3.500 kcal/kg.h	Feeding (dk)	3,30	1,90	2,60	1,80	1,50
	Standby (sn)	5	5	10	10	10

The above settings are given for different types of coal fuel. Hazelnut charcoal type can burn in an automatic combustion pot. By changing the supplied feeding and waiting settings for this, you can catch the most suitable burning setting for the boiler.

When there is no coal in the fire pot, the top cover can be opened and wood can be used. Since the wood is thrown by hand, it is necessary to be careful against the risk of burning hands while throwing wood into the boiler. It is important not to fill the entire chamber with fuel in manual wood feeding. If the entire chamber is filled with wood, as the heat transfer areas will be covered with fuel, a decrease in boiler efficiency can be observed.



***The values given according to the capacities in the table will vary depending on the degree of insulation in the environment where the boiler is heated, the chimney pull, and the thermal comfort of the space.***



## MAINTENANCE AND BOILER CLEANING

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Regular maintenance is required by expert teams according to the manufacturer's instructions for the efficient operation of your system.

### Regular checks:

- The water level should always be checked. Hydrometer (water level indicator) should be marked after open filling system and pressure gauge shall be marked after the first filling of the system. The water pressure level indicated when the water is cold in the manometer should be checked when the water is cold, as the water pressure will increase as the water heats up. If the water level or pressure has fallen below the static pressure or system setting, water should be added to the system (when the boiler is cold). To protect the system and the boiler from corrosion, the water to be fed into the system must be softened according to the local settings.
- Check that the front doors are closed properly, if necessary, the door seals should be replaced.
- Check for gas leaks from the flue connection. If there is a leak, it should be repaired.
- The boiler heating surfaces must be checked. The establishment of the institution depends on the type of fuel used and the amount of combustion air. If it is understood that the leaving water temperature does not rise to the values that are generally in the usual conditions, the boiler surfaces are processed, the heat transfer surfaces of the boiler should be cleaned.
- Check that the fan is working properly. Unbalanced, balanced fan makes periodic noises. If there are dust or ash collected between the fins of the fan, it is necessary to clean it by blowing it without disturbing the blade structure or holding the dryer.

### Cleaning the boiler:

The boiler should be done when it is cold. Before cleaning the boiler, the pump and electrical devices connected to the system must be switched off.

To clean the boiler:

- Smoke pipes of the boiler should be cleaned with cleaning brush supplied with the boiler. When the brush is inserted into the pipes, it must be fully pushed and retracted. Otherwise, the wire brush's wires will not return in the pipe and will not allow you to retract the brush.
- The pitch of the boiler will form a layer and it will prevent the energy released in the boiler from passing into the water and will cause a decrease in productivity. To prevent this situation, all heating surfaces of the boiler should be cleaned at regular intervals or as required by the aid of squeegee.
- The ashes accumulated in the smoke hood under the chimney and in the front of the furnace ash cleaning door in the front of the casting hob should be cleaned periodically or as needed.
- The control panel must be protected from dust and moisture. The terminals behind the panel must remain dust-free.
- The boiler can be cleaned as necessary.

### Maintenance:

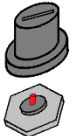

The contracted service of the system before each working season; boiler, installation, electrical connections, chimneys, we strongly recommend that you call our authorized service. Do not do any maintenance work without the help of an expert.

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## INFORMATION ON USAGE ERRORS

PROBLEM	CAUSE	SOLUTION
Insufficient heating	<ul style="list-style-type: none"> <li>Boiler heat transfer surfaces can be covered with work and soot</li> <li>Used fuel may be of poor quality</li> <li>Pump may not be running</li> <li>Insufficiency of insulation</li> <li>Feed - Standby settings may be incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>Clean with cleaning rod (the boiler should not burn)</li> <li>Change your fuel and take a little before refueling.</li> <li>Call service, make sure that the control panel is plugged in.</li> <li>Increase the heat insulation of the space where the boiler is installed</li> <li>Enter the correct settings from the Feed - Standby settings page. Or correct the settings by observing the flame.</li> </ul>
Burning is not good	<ul style="list-style-type: none"> <li>Combustion air may be low</li> <li>Chimney extraction may be low</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that the fan is working and that the valve is not closed.</li> <li>Check that there are no holes or cracks in the chimney. If you still can't, consult your leg.</li> <li>Isolate your chimney.</li> </ul>
Smoke from the hopper	<ul style="list-style-type: none"> <li>The wick on the hopper cover may not be well pressed or worn on the surface.</li> <li>Chimney extraction may be low</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that the roving on the cover is fully pressed against the surface, and replace if necessary.</li> <li>Check that there are no holes or cracks in the chimney. If you still can't, consult your leg. Have your chimney sealed.</li> </ul>
Smelting of smoke pipes	<ul style="list-style-type: none"> <li>Burning of plastics-derived fuels in the boiler</li> <li>The chimney may not heat up</li> </ul>	<ul style="list-style-type: none"> <li>Do not dispose of wastes of plastic derivative into the boiler or fuel reservoir (hopper).</li> <li>Check that there are no holes or cracks in the chimney. If you still can't, consult your leg. Have your chimney sealed.</li> </ul>
Excessive fuel consumption	<ul style="list-style-type: none"> <li>Poor use of fuel may be</li> <li>High chimney traction</li> <li>Air may be too high</li> <li>Space isolation may be insufficient</li> <li>Feed - Standby settings may be incorrect</li> </ul>	<ul style="list-style-type: none"> <li>Change your fuel</li> <li>Check that there are no holes or cracks in the chimney. If you still can't, consult your service.</li> <li>Reduce fan speed.</li> <li>Increase the heat insulation of the space where the boiler is installed</li> <li>Enter the correct settings from the Feed - Standby settings page. Or correct the settings by observing the flame.</li> </ul>
Smoke gas leak from the boiler front doors	<ul style="list-style-type: none"> <li>Cover seals may be worn</li> <li>Covers may be deformed</li> </ul>	<ul style="list-style-type: none"> <li>Replace the seals.</li> <li>Ensure that combustion does not withstand the covers. Consult the authorized service center for deformed caps.</li> </ul>
Failure of the boiler to reach the set temp.	<ul style="list-style-type: none"> <li>Temperature sensor tip may be pulled out of the slot</li> <li>The control panel may not be receiving power</li> </ul>	<ul style="list-style-type: none"> <li>Replace the temperature sensor end of the control panel board by lifting the boiler top cover. Pour the heat transfer oil into the housing.</li> <li>Connect the control panel to the mains. If not, call for service.</li> </ul>
Heating of the expansion tank	<ul style="list-style-type: none"> <li>Expansion tank may be affected by pump</li> </ul>	<ul style="list-style-type: none"> <li>Increase the expansion tank or lower the pump speed.</li> <li>In case of open expansion, if the pump is rotating, take it to the outgoing line.</li> </ul>
Partial heating of radiators	<ul style="list-style-type: none"> <li>Air in the radiator</li> </ul>	<ul style="list-style-type: none"> <li>Remove air from radiator purifiers. Make sure that the line to the expansion tank is constantly upward.</li> <li>For closed expansion systems, make sure that the automatic valve plug is not tightened.</li> </ul>

PROBLEM	CAUSE	SOLUTION
Burn out	<ul style="list-style-type: none"> <li>Air may be supplied by the fan at very high flow rate without full ignition</li> <li>Very high fuel supply</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the fan air setting.</li> <li>Reduce the feed setting from the fuel supply setting.</li> </ul>
Noise of noisy water from the boiler	<ul style="list-style-type: none"> <li>There may be air left in the boiler to fill the first water</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the initial start-up.</li> </ul>
Problems with the use of fuels such as fruit kernels and nut shell	<ul style="list-style-type: none"> <li>Flammable fuel in the combustion chamber</li> <li>Burning out too quickly</li> </ul>	<ul style="list-style-type: none"> <li>Reduce fan air.</li> </ul>
Fast burning of fuels such as fruit kernels and nut shell	<ul style="list-style-type: none"> <li>Fast burning of fuels such as fruit kernels and nut shell</li> </ul>	<ul style="list-style-type: none"> <li>Reduce fan air.</li> </ul>
Boiler water temperature was too high, now dropped but boiler not working	<ul style="list-style-type: none"> <li>Limit thermostat may be switch off</li> </ul>	<ul style="list-style-type: none"> <li>Tear off the black plastic cover on the back of the control panel. Activate the limit thermostat by pressing the red pin. </li> <li>Turn the control panel off and on.</li> </ul>  <p style="text-align: center;"><b>Limit Thermostat</b></p>
Panel over-fuel warning is on	<ul style="list-style-type: none"> <li>Fuel in hopper</li> <li>The probe may be displaced</li> <li>The probe may not feel</li> </ul>	<ul style="list-style-type: none"> <li>Add fuel to hopper</li> <li>Insert the probe into its slot</li> <li>Replace the probe</li> </ul>
Fuel slammed warning light on panel	<ul style="list-style-type: none"> <li>A hard object may be stuck in the fuel coil</li> </ul>	<ul style="list-style-type: none"> <li>Contact Service</li> <li>Do not remove the sieve when pouring fuel into the hopper</li> </ul>
There is no power to the control panel.	<ul style="list-style-type: none"> <li>The mains plug may not be plugged in.</li> <li>Electricity may be interrupted</li> <li>The glass fuse on the control board may have blown.</li> </ul>	<ul style="list-style-type: none"> <li>Plug in the power plug.</li> <li>Try again when electricity</li> <li>Replace the glass fuse on the control board inside the control panel.</li> </ul>



**Do not open the boiler covers and the hopper cover during power cuts, do not add water to the boiler.**

## ÜNLÜSOY YAPI MALZEMELERİ SANAYİ ve TİCARET LİMİTED ŞİRKETİ

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