



# Automatic Feeding, Solid Fuel Boiler User Manual

ÜKY/Y 25-34-40-60-80-100



ÜKY/Y-KB 25-34-40-60-80-100



ÜKYP/Y 130-160-180-200-250



ÜKYP/Y 300-350-400-450-500-600



ÜKYS/Y 200-...-800



ÜKYS/3G-Y 120-...-2000

**ÜNLÜSOY**

Yapı Malzemeleri Sanayi ve Ticaret Ltd. Şti.  
Pancar Organize Sanayi Bölgesi, 2. Etap No:2, Torbalı - İZMİR/TURKEY  
Tel: +90 444 35 32, Fax: +90 232 469 2412  
[www.unmak.com](http://www.unmak.com)



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KK-07EN Rev: 230817

This booklet covers the following models:

<b>ÜKY/Y</b>	25-34-45-60-80-100
<b>ÜKY/Y-KB</b>	25-34-45-60-80-100
<b>ÜKYP/Y</b>	130-160-180-200-250
<b>ÜKYP/Y</b>	300-350-400-450-500-600
<b>ÜKYS/Y</b>	200-225-250-300-350-400-450-500-600-700-800
<b>ÜKYS/3G-Y</b>	120-150-180-210-240-270-300-330-360-390-420-450-480-510-540-600-660-720-780-840-900-1000-1100-1200-1300-1500-2000

## INTRODUCTION

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We would like to thank you for your choice of ÜNMAK automatic feeding solid fuel boilers.

Please read the user manual carefully before installing and operating your product and keep the instruction manual for the duration of use. Do not touch or mix any part of the product except where permitted in the user manual.

The installation, maintenance and service of the boiler require a specialist technical team.

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

ÜNMAK automatic fuel feed boilers are high-efficiency, cast iron hot water boilers designed to burn only solid fuel. 10-18 mm diameter coal (sold in the market under the name of hazelnut coal), and granule size up to 25x25 mm are suitable for burning coal. These boilers are only used for heating of the heating system and are not suitable for direct water heating. However, it can produce hot water with the help of a boiler or heat exchanger. The energy required for domestic water will be taken from the boiler energy.

ÜNMAK automatic fuel feed boilers are heating boilers convert the chemical energy of the fuel in the fuel loading tank to the heat energy by burning and load it on the water which is the heating fluid. Excessive fuel accumulation to the combustion chamber will be kept longer than necessary and the fuel will take longer to burn.

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

ÜNMAK automatic-loading boilers can only burn granular fuels up to 25 mm in size. Powdered fuels will not be an efficient combustion for flying in the combustion chamber with the system fan. Powder fuel will collect more moisture, even in the spiral will cause helical blockage. Depending on the calorific values of the fuels, the heat from the boiler to the water may exceed the declared values.



***Please read your user manual carefully and it should be kept with the warranty certificate for the life of the boiler.***

## SHIPPING AND TRANSPORTATION

ÜNMAK solid fuel stocked boilers are manufactured from thick sheet. The boilers are packaged in one piece. Boiler fans, boilers up to 60.000 kcal / h (including) Capacity are located in the material box on the boiler.

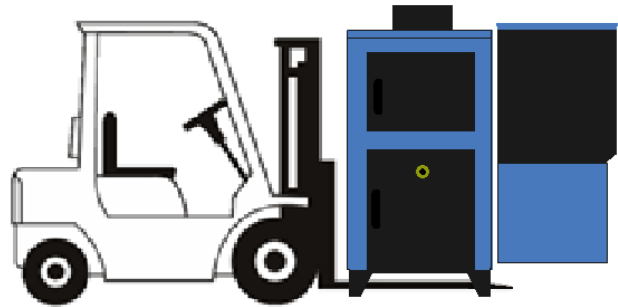
1. Boiler Group: It is shipped with boiler insulation and outer jacket covered.
2. Accessories: Control panel, pump (pump for capacities under the boiler including 60.000 kcal / h capacity), operating instructions with warranty certificate and boiler accessories are included in the boiler package.

### Safe transport of the product

Solid fuel boilers are heavy products, so care should be taken when transporting the boiler to the place where it will be installed. The equipment used to lift and transport the product must therefore be of sufficient capacity.

In order to prevent damage to the boiler's outer plates and the boiler during transportation;

In small boilers, it must be ensured that the hoisting rope does not damage the painted thin sheets of the boiler and the reducer and fan group under the hopper while carrying the hoisting rope from the forklift stands on the chassis and transporting the boiler with the help of crane or hoist.



It is also convenient to remove the large cauldrons from the forklift stands or the transport ring on the boiler. If the connection ropes are to be passed under the boiler when lifting by crane, preventive action should be taken to prevent the top of the boiler from being crushed by the ropes. Floor standing crane must be lifted without crane. When transporting in cold weather, the boiler should not be lifted suddenly in case of freezing of the rope from the cold.



***Pay attention to avoid damage to the gear unit and fan under the hopper during transport.***



***When removing the packaging around the boiler, hard and sharp objects should not be used to prevent damage to the painted boiler plates under the packaging.***

## SELECTION OF INSTALLATION PLACE

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The space where the boiler is installed must have sufficient free space for the installation, combustion and maintenance of the boiler. For the need of service, the gear unit and the shaft to which the shaft is connected should be easily spaced away from the wall. For this purpose, the dimensions in the paragraph titled “Mounting Dimensions” must be applied.

There should also be sufficient air circulation for efficient combustion, the chimney design must meet the required traction values for the model used and comply with the construction criteria given in the manual. The boiler should never be installed in open spaces, balconies, living areas (kitchen, living room, bathroom, and bedroom), explosive and flammable materials.

The door of the boiler room must not be opened directly to the escape ladder or general use ladder and must be opened to a security hall. In boiler rooms with thermal capacities of 50 kW-350 kW, there must be at least one door, a floor area of more than 100 m<sup>2</sup> or at least 2 exit doors in boiler rooms with a thermal capacity of more than 350 kW. The exit doors must be placed as far opposite as possible, at least 90 minutes resistant to fire, smoke-proof and self-closing.

At least one of the doors must be opened directly outwards and outwards. If it is possible to open a door directly from the boiler room, this creates the most appropriate solution. The door of the boiler room must not be opened directly to the escape ladder or general use ladders and must be opened to a common hall or corridor.

It is recommended to have a threshold of at least 10 cm in the doors opening into the building from the boiler room. If it is possible to illuminate the boiler room naturally, it should be ensured that the lighting openings do not come under the other windows of the building. If artificial lighting is done, a system that does not dazzle but illuminates the apartment must be properly installed. The main switchgear and panels for the boiler room should be placed around the entrance door and should be of leak-proof type. There should be a fire tube 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 absorbing dust from the ground. Ventilation can be done either naturally or in a forced manner. Ensure that the fresh air intake shaft is at the floor level and the air outlet nozzle mouth at the ceiling level.

At least 1 6 kg dry chemical powder fire extinguishing device and at least 1 fire cabinet should be provided in the boiler room.

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

The installed space must be directly connected to the external environment, allowing the access of fresh air. One of the grilles should be at most 40 cm below the ceiling of the boiler room and the other should be at least 50 cm above the floor. These grilles should be open continuously. The lower vent should be at least 40 x 40 cm and the upper grille should be at least 30 x 30 cm. Pets should not be fed, smoke and any food and beverages that may be affected should not be stored in the boiler room (boiler room).

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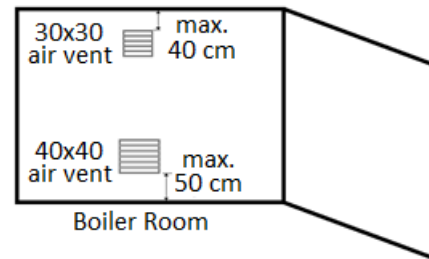
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All electrical and water installations must be carried out by authorized plumbers, in compliance with all applicable legal and technical rules, by the relevant regulatory authorities.

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

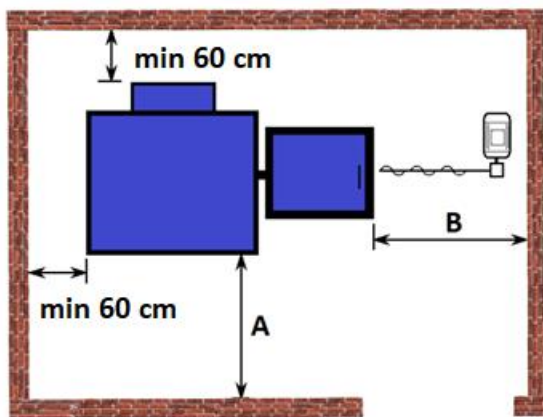
Boilers must be installed on a concrete base 10 cm above the base to protect the solid fuel from the moisture of the water. The concrete base prevents the fan from absorbing fuel or ash dust in the ground.

Laying of tiles with tile and tile stones facilitates cleaning.



***It is inconvenient to have flammable, caustic and flammable materials in the boiler room.***

#### Mounting dimensions:



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



**The electrical installation of this product must be performed by qualified personnel in accordance with the instructions given in this manual and in accordance with applicable local or national regulations.**

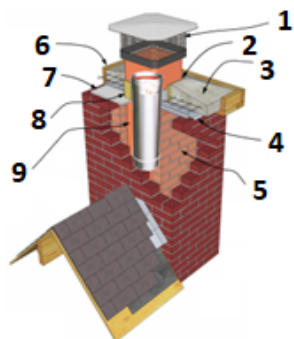


**THIS PRODUCT MUST BE CONNECTED TO THE ELECTRICITY WITH EARTH LINE!**



The boiler must be connected to a chimney in accordance with the specifications specified in the operating instructions and the relevant regulations. The chimney must provide the traction value required by the connected boiler. Your boiler should not be operated without a chimney connection and there must be enough traction to burn. In chimneys where sufficient traction is not ensured, the boiler must never be operated. Any installation in the place where the boiler is installed should not be installed.

In case of boiler changing in the boiler room, the old boiler must be removed or disconnected from



- 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

the chimney and the insulation must be sealed and insulation should be made. In no case should more than one boiler be connected to the same chimney. The cylindrical chimney can be passed through the chimney in the figure.

Smoke chimneys should not be placed on the outer wall of the building unless it is a technical requirement. The wall thickness of the chimney walls should not be less than a brick thickness. For chimney construction, hollow bricks and briquettes should never be used. It should be plastered inside and outside of the rectangular chimney.

It should be ensured that fresh air is continuously introduced into the area where the boiler is installed. Reference must be made to the dimensions specified in this manual. The boiler should never be installed in living spaces or in a place directly connected to such a place. In order to reduce the risk of scaling and corrosion in old and new installations, the instructions given in the relevant section of this manual should be applied by the installer who installs the boiler. In particular, if the

boiler is connected to an old installation, it is necessary to clean the waste completely before installation. The installation must be cleaned and cleaned several times.

Avoid overloading fuel into the boiler and check the suitability of the supply - standby settings given in the operating instructions. These settings, which indicate the working and stopping time of the gear unit, are the chimney characteristics of the boiler (traction difference, etc.), ambient conditions, thermal comfort need of the space, insulation of the space etc. It depends on many parameters. The settings given in the catalog are required when the boiler is required to operate at a lower power than it is given to operate at maximum power; combustion must be observed. Adjusting the settings to prevent the burning of the unburned coal down the ladle will be appropriate for both the boiler efficiency and the economy.

Burning and floating fuel particles in the boiler, fuel ashes out of the open door can easily open to the outside environment, the fan must not be opened while the fan is working. When the boiler is burned, the covers must not be opened or manually loaded onto the hob or into the boiler.



***The electrical connection must never be cut off while the boiler is operating.***

For any reason, direct cold water should not be added to the overheated boiler for cooling. This can cause noise in the installation, excessive thermal stresses in the boiler and thus permanent damage. The water in the installation must not be drained unless there is a risk of maintenance or freezing. The system design should ensure that the ratio between the water flow rate and the boiler capacity is not exceeded and the difference between the boiler inlet and outlet water temperatures of 20°C is not exceeded. In order to minimize the water missing in the installation, the water level should be checked regularly and the leaks in the system should be removed. Because excessive water additions to the system will cause lime accumulation on the water side of the boiler and this will cause regional overheating and this will damage the boiler.

The boiler must not be burned directly, it must be installed on a level surface. It is recommended that the height of the base on which the boiler is to be installed shall be at least 10 cm and its width is wider than the outside dimensions of the boiler. Thanks to the base, the boiler is protected from the water that can accumulate on the ground and the fan will be prevented from absorbing dust from the ground.



***Fuel must be added before emptying the hopper.***



***The hopper screen should not be removed while the fuel is being loaded.***

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## ELECTRICAL INSTALLATION INSTRUCTIONS

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ÜNMAK boilers are supplied with 230 Volt mains voltage. The regulator should be used where the mains voltage is less than or equal to ten percent.

The control panel must be connected to a wall panel with suitable grounding equipment, the distance between the boiler board and this wall panel must not exceed 50 cm. All electrical connections must be carried out by authorized personnel in accordance with local regulations.

Separate grounding installation must be done for each boiler room. Earthing installation:

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

The copper rod electrodes must be at least 1.5 m in length or Ø 20 mm in diameter and at least 1.25 m in length and the grounding resistance of the rod electrodes should be below the limits of 20 Q. (Neutral-Earth voltage Toprak3V)

In all three cases, copper electrodes or plates must be connected to the natural gas installation by soldering or welding using at least 16 mm<sup>2</sup> multi-stranded copper wire and conductive shoe. Copper electrodes or plates should be placed in the ground as a whole, and the conductor remaining on the ground must be connected to the boiler room main table with the pipe housing.



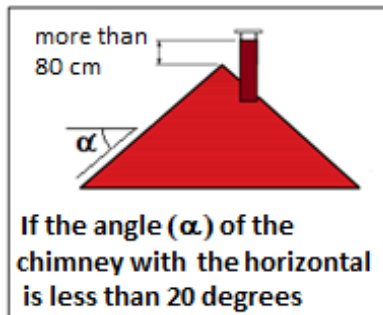
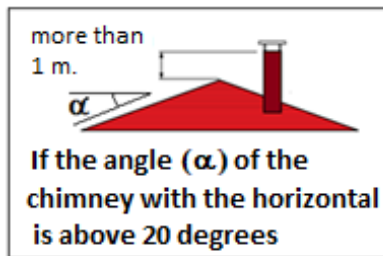
***THIS PRODUCT MUST BE CONNECTED TO A SAFE EARTH LINE!***



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



## INFORMATION ABOUT COMBUSTION

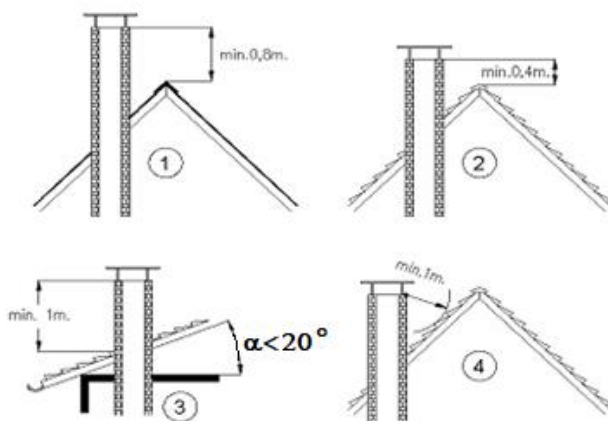


In order to ensure correct combustion, as a general rule, the air supplied to the fuel must be at a certain rate. So the fan speed should be adjusted well. The air required for a certain amount of fuel should not be too much. If the amount of air which is changed depending on the type of fuel is less 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

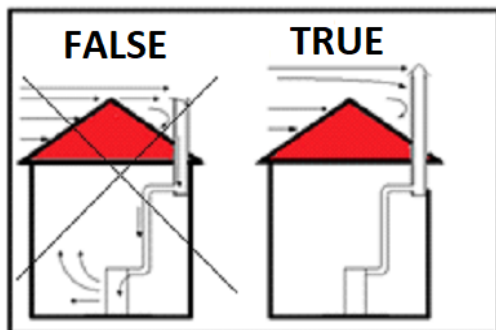
flue pipe shall be made of steel sheet or material which is resistant to 400 °C. All connections on the exhaust gas pipe must be sealed to obtain better combustion and efficiency. The exhaust gas pipe must be connected to the chimney in the shortest way within the dimensions given in the diagram below.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

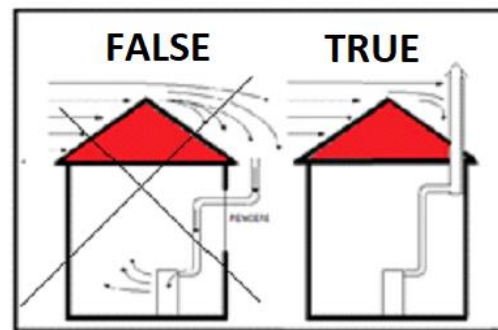
At the lowest level of the chimney, there must be a cleaning lid made of steel that is sealed.

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



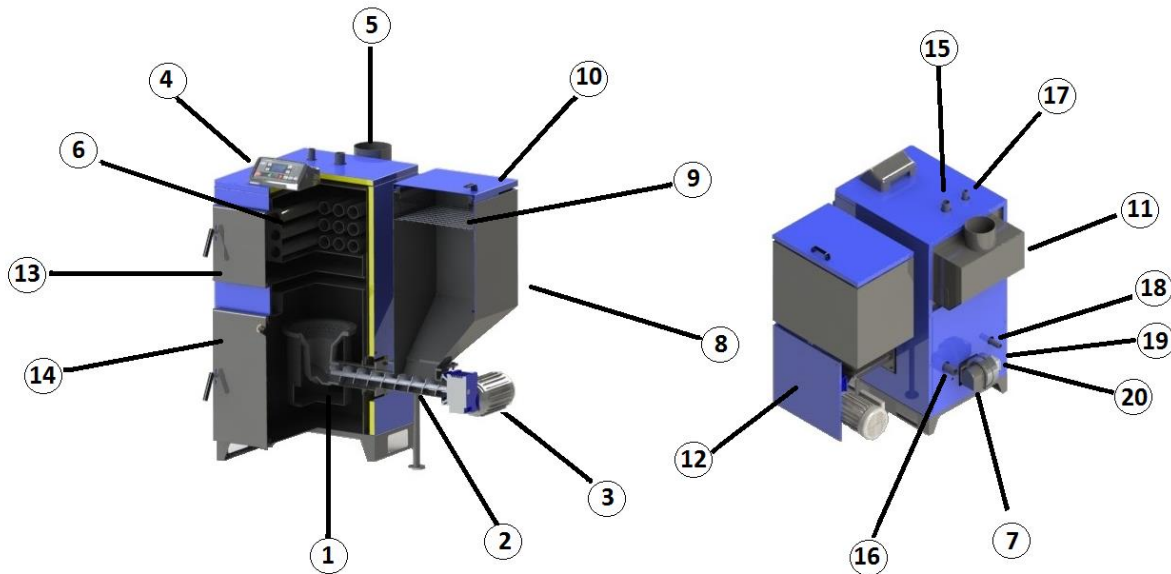
Incorrect installation chimney and correctly installed chimney hat



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

## BOILER FEATURES

### ÜKY/Y Boiler Features

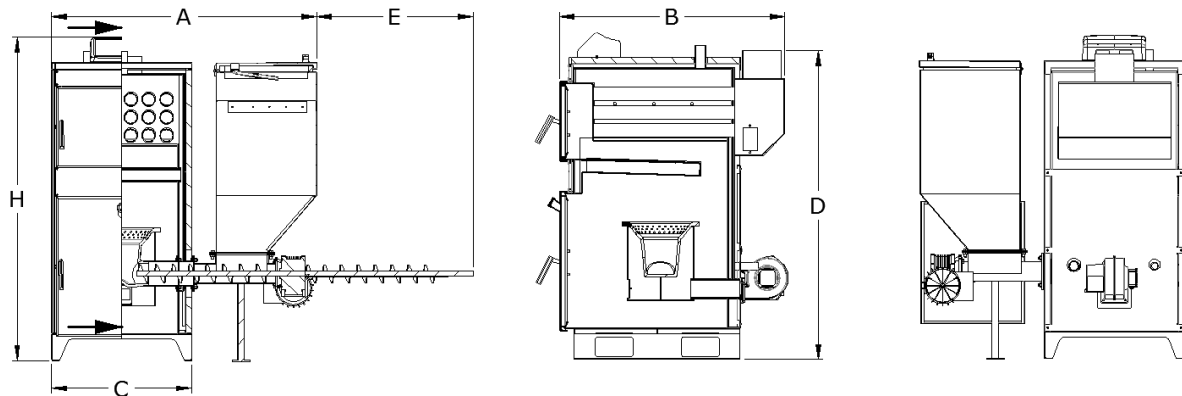


- |                |                  |                         |                           |
|----------------|------------------|-------------------------|---------------------------|
| 1. Fire pot    | 6. Flue pipes    | 11. Chimney hood        | 16. Return from radiators |
| 2. Auger       | 7. Fan clack     | 12. Motor protection    | 17. Safety outlet         |
| 3. Gear box    | 8. Hopper        | 13. Upper cover         | 18. Safety inlet          |
| 4. Control box | 9. Hopper sieve  | 14. Lower cover         | 19. Fill/discharge        |
| 5. Flue        | 10. Hopper cover | 15. Outlet to radiators | 20. Fan                   |

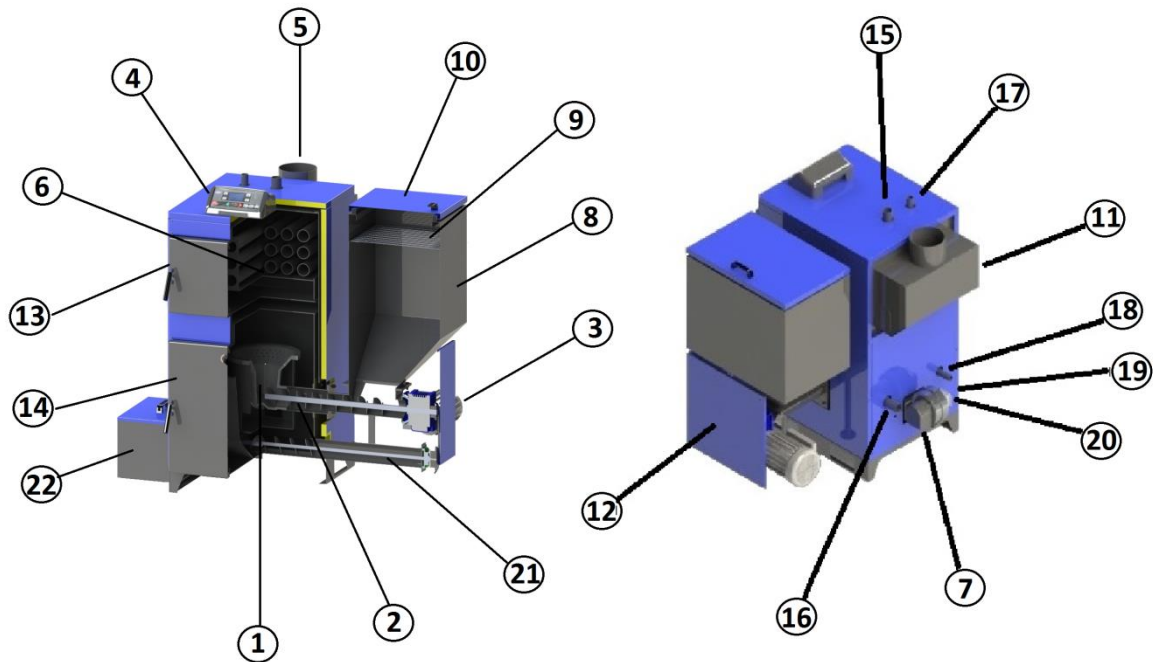
1. Fire pot: Consists of two nested containers. The fuel is driven by the spiral from the incoming chamber, blowing the fan out. The fan air and fuel meet above the ladle.
2. Auger: It is a spiral twist, which is the shaft in the middle of the hopper that supplies the fuel into the hearth. The fuel supply standby settings are settings for the helix operation.
3. Gear box: Used with motor. It is used to increase the power by decreasing the speed of the engine. Geared motor gives the movement of the auger.
4. Control box: It is the electronic box that activates the boiler. It controls when the gear unit, the motor, the pump will stop and when. The temperature values that you read while the controller is active.
5. Flue: It is the boiler section that throws out the toxic gases inside the boiler with the chimney mechanism to be connected. The biggest factor in the good burning of the boiler
6. Flue pipes: It is the way the burning inside the boiler is sent to the chimney. Fumes from the flame reach the chimney through the pipes.
7. Fan clack: When the fan is stopped when there is no burning, it is the mechanism used to prevent air from entering. The metal cover inside the flap prevents the air intake from falling automatically when the fan air does not pull.
8. Hopper: This is where the fuel is stored. The capacity to be taken according to the fuel size varies.

9. Hopper sieve: During the fuel loading from the hopper; Removal of the sieve must be avoided as the large fuel parts fall into the hopper on fuel loading and these parts can come together and prevent the fuel from passing through the throat over the helix.
  10. Hopper cover: If the hopper cover remains open during combustion, there may be a problem in boilers that do not suffice. Combustion wastes that cannot go out of the chimney can pass through the shortest path through the feeding auger and leave the hopper. Even if we call it smoking, it can have dangerous consequences until the fire in the future.
  11. Chimney hood: The smoke from the smoke pipes is the place where the smoke comes from the chimney. The smoke that was left in the smoke was deposited here and the more volatile combustion wastes left the boiler. These settling institutions should be cleaned at certain time intervals and should not obstruct the chimney traction.
  12. Motor protection: It is the plate made from motor and gearbox for the protection of people or pets.
  13. Upper Cover: Smoke pipe cleaning door: The ashes in the pipes of the smoke cause the pipe to be narrowed and the boiler draw decreases, thus decreasing the boiler efficiency. To prevent this, open the top cover and clean with a circular wire brush provided with the boiler. It must be tightly closed during combustion.
  14. Lower cover: Opened lid for cleaning ashes from the pot. It must be tightly closed during combustion.
  15. Outlet to radiators: It is a conduit for radiators or heating installation. The water heated in the boiler is sent from this pipe to radiators or heating installations.
  16. Return from radiators: It is the pipe from which the water returned from the radiators or the heating system is returned to the boiler. It can also be called return pipe or return line.
  17. Safety outlet: It is also an expansion line. It is the line where the water that is expanded due to heating in the boiler is sent as security.
  18. Safety return: It is the line in which the water sent back to the expansion tank is taken back to the boiler.
  19. Fill/Discharge: This is the line used for the first installation of water from this line to the boiler. If the water in the boiler needs to be drained for maintenance, it can be discharged from this line. If the water decreases over time, water can be printed from this line when the boiler is cold.
  20. Fan: It is a fan that provides combustion air. The control panel can be set to operate at the desired speed.
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## ÜKY/Y Technical Features



Model: ÜKY/Y		25	34	45	60	80	100	
Type of Fuel		Coal-Olive Pomace-Fruit Seeds etc.						
Power	kW	29	40	52	70	93	116	
	kcal/h	25.000	34.000	45.000	60.000	80.000	100.000	
Burning Pot Diameter	mm	330		400		470		
Hopper Capacity	kg			200				
Water Volume	Lt	75	85	107	138	206	249	
Boiler Weight	kg	300	325	390	425	510	590	
Draught	Pa	25-28	28-31	31-33	33-35	35-40		
Temperature Control Range	°C	40-90						
Return Temp. (recommended)	°C	40						
Max. Operating Pressure	bar	3						
Test Pressure	bar	5						
Dimensions	Boiler Total Width (a)	mm	1100	1180		1250	1380	
	Depth (b)	mm	930	840	990	1100	1370	1460
	Body Width (c)	mm	535	625			740	
	Flue Connection Height (d)	mm	1230	1320	1360		1150	1220
	Auger Disass. Distance (e)	mm	820	850			920	1000
	Boiler Total Height (h)	mm	1270	1350	1420		1480	
Flue Connection Diameter	mm	130		180		220		
Min. – Max. Flue Temperature	°C	170-210						
Boiler Inlet-Outlet	R"	1"	1 ¼"		1 ½"	2"		
Safety Inlet-Outlet	R"	1"				1 ½"		
Filling – Discharging	R"	½"						
Electricity Connection	V/Hz	230V - 50Hz						

ÜKY/Y-KB Boiler Features

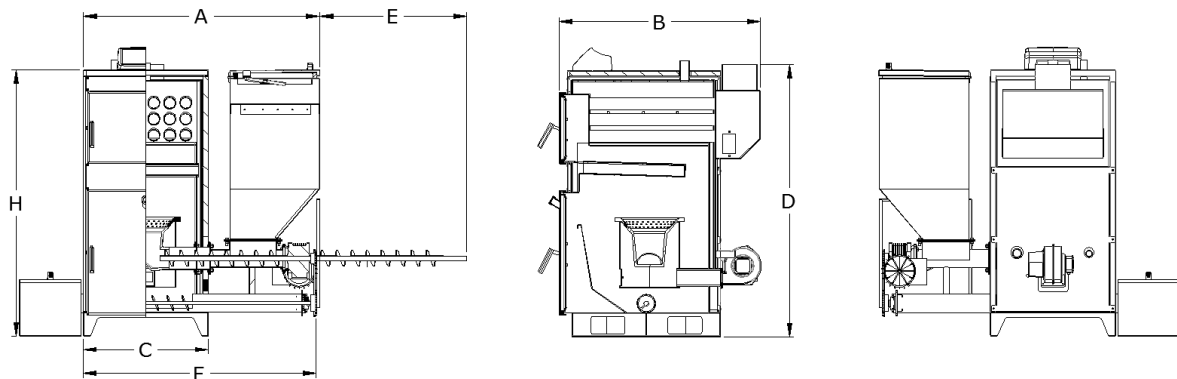
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2. Auger	8. Hopper	14. Lower cover	20. Fan
3. Gear box	9. Hopper sieve	15. Outlet to radiators	21. Ash cleaning auger
4. Control box	10. Hopper cover	16. Return from radiators	22. Ash container
5. Flue	11. Chimney hood	17. Safety outlet	
6. Flue pipes	12. Motor protection	18. Safety inlet	

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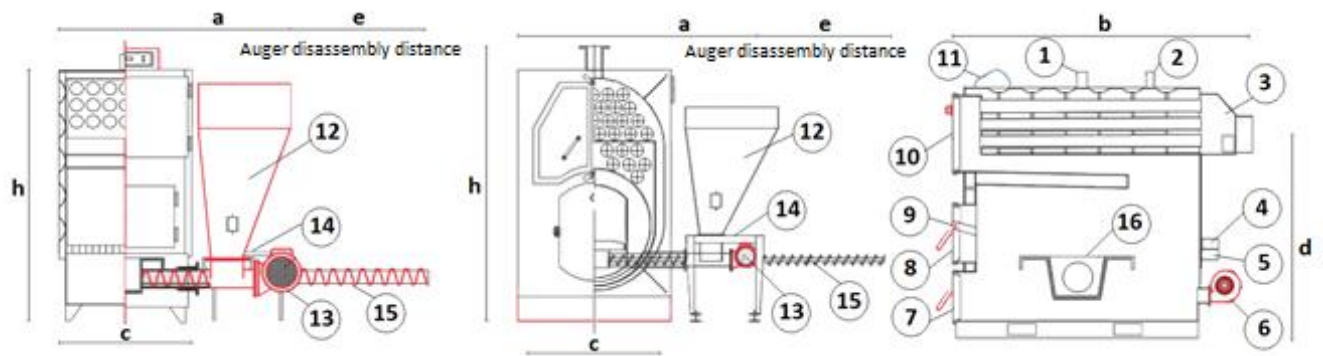


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  13. Upper Cover: Smoke pipe cleaning door: The ashes in the pipes of the smoke cause the pipe to be narrowed and the boiler draw decreases, thus decreasing the boiler efficiency. To prevent this, open the top cover and clean with a circular wire brush provided with the boiler. It must be tightly closed during combustion.
  14. Lower cover: Opened lid for cleaning ashes from the pot. It must be tightly closed during combustion.
  15. Outlet to radiators: It is a conduit for radiators or heating installation. The water heated in the boiler is sent from this pipe to radiators or heating installations.
  16. Return from radiators: It is the pipe from which the water returned from the radiators or the heating system is returned to the boiler. It can also be called return pipe or return line.
  17. Safety outlet: It is also an expansion line. It is the line where the water that is expanded due to heating in the boiler is sent as security.
  18. Safety return: It is the line in which the water sent back to the expansion tank is taken back to the boiler.
  19. Fill/Discharge: This is the line used for the first installation of water from this line to the boiler. If the water in the boiler needs to be drained for maintenance, it can be discharged from this line. If the water decreases over time, water can be printed from this line when the boiler is cold.
  20. Fan: It is a fan that provides combustion air. The control panel can be set to operate at the desired speed.
  21. Ash cleaning auger: Operates synchronously with the fuel feed coil. It operates at a slower rate than the fuel feed coil.
  22. Ash container: It is a bucket where the ashes are deposited. After the cleaning of the ash, it must be fully seated when snapping again.
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## ÜKY/Y-KB Technical Features

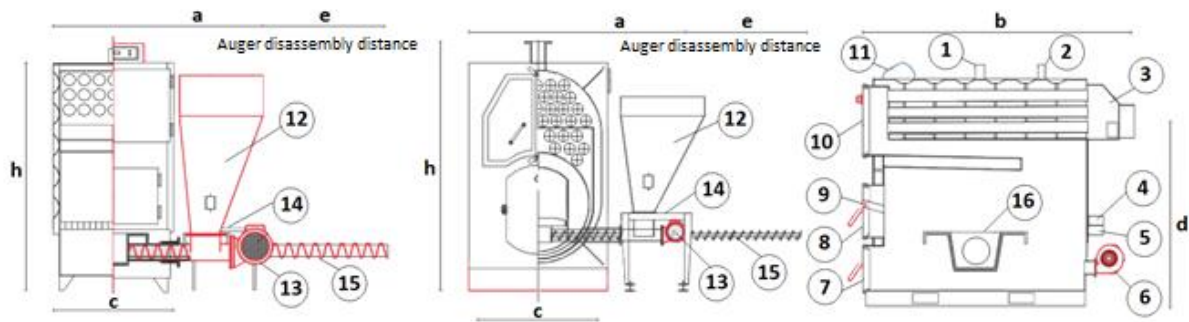


Model: ÜKY/Y-KB		25	34	45	60	80	100
Type of Fuel		Coal-Olive Pomace-Fruit Seeds etc.					
Power	kW	29	40	52	70	93	116
	kcal/h	25.000	34.000	45.000	60.000	80.000	100.000
Burning Pot Diameter	mm	330		400		470	
Hopper Capacity	kg			200			
Water Volume	Lt	75	85	107	138	206	249
Boiler Weight	kg	300	325	390	425	510	590
Draught	Pa	25-28	28-31	31-33	33-35	35-40	
Temperature Control Range	°C	40-90					
Return Temp. (recommended)	°C	40					
Max. Operating Pressure	bar	3					
Test Pressure	bar	5					
Dimensions	Boiler Total Width (a)	mm	1100	1180		1250	1380
	Depth (b)	mm	930	840	990	1100	1370
	Body Width (c)	mm	535	625		740	
	Flue Connection Height (d)	mm	1230	1320	1360		1150
	Auger Disass. Distance (e)	mm	820	850		920	1000
	Boiler Total Height (h)	mm	1270	1350	1420		1480
Flue Connection Diameter	mm	130		180		220	
Min. – Max. Flue Temperature	°C	170-210					
Boiler Inlet-Outlet	R"	1"	1 ¼"		1 ½"	2"	
Safety Inlet-Outlet	R"	1"				1 ½"	
Filling – Discharging	R"	½"					
Electricity Connection	V/Hz	230V - 50Hz					



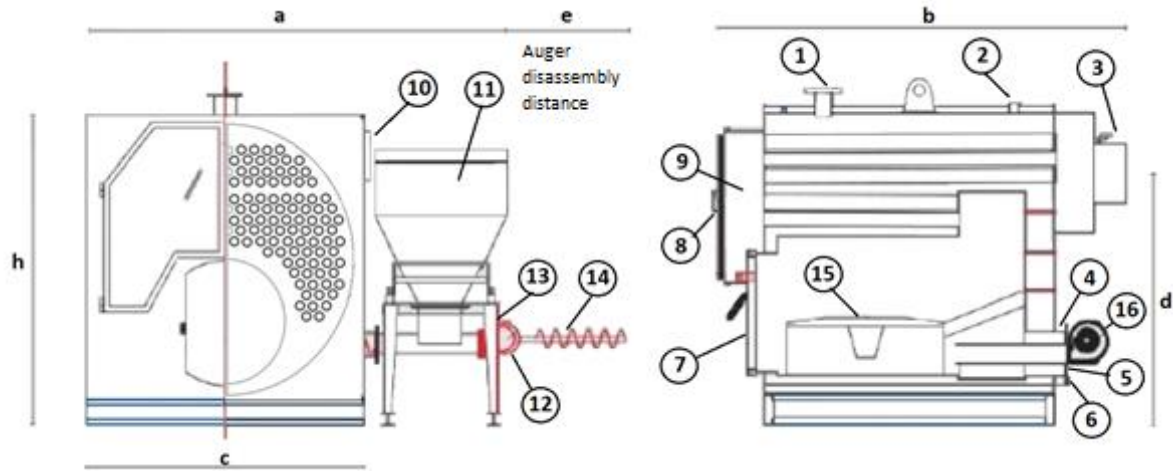
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|--------------------------|--------------------------------|------------------|
| 1- Outlet to radiators   | 7- Ash discharge cover         | 13- Gearbox      |
| 2- Safety outlet         | 8- Manually fuel feeding cover | 14- Hopper table |
| 3- Flue                  | 9- Flame inspection window     | 15- Auger        |
| 4- Return from radiators | 10- Flue pipes cleaning cover  | 16- Fire pot     |
| 5- Safety inlet          | 11- Control box                |                  |
| 6- Fan and clack         | 12- Hopper                     |                  |

Model: ÜKYP/Y		130	160	180	200	250
Type of Fuel		Coal-Olive Pomace- Fruit Seeds etc.				
Power	kW	151	186	209	233	291
	kcal/h	130.000	160.000	180.000	200.000	250.000
Burning Pot Dimensions	mm	430x410				
Fuel capacity – Coal	kg	220				
	kg	185				
Water volume	kg	320	400	480	560	640
Boiler weight	kg	805	920	1080	1155	1300
Draught	Pa	42 – 45	44 – 47		45 – 49	
Temperature Control Range	°C	40 – 80				
Return Temp. (recommended)	°C	40				
Max. Operating Pressure	bar	3				
Test Pressure	bar	5				
Dimensions	Boiler Total Width (a)	1460		1560		1660
	Depth (b)	1615	1815		1915	
	Body Width (c)	760		860		960
	Flue Connection Height (d)	1615	1815		1915	
	Auger Disass. Distance (e)	1100				
	Boiler Total Height (h)	1640				
Flue Connection Diameter	mm	220				
Min. – Max. Flue Temperature	°C	170 – 210				
Boiler Inlet-Outlet	R"	2"				2 ½"
Safety Inlet-Outlet	R"	1 ½"				
Filling – Discharging	R"	½"				
Electricity Connection	V/Hz	230V – 50Hz				



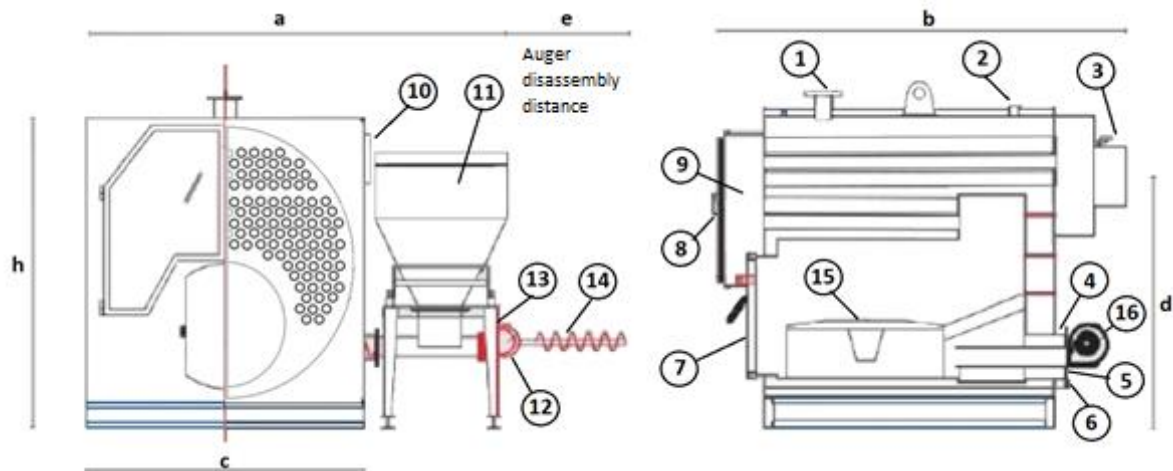
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|--------------------------|--------------------------------|------------------|
| 1- Outlet to radiators   | 7- Ash discharge cover         | 13- Gearbox      |
| 2- Safety outlet         | 8- Manually fuel feeding cover | 14- Hopper table |
| 3- Flue                  | 9- Flame inspection window     | 15- Auger        |
| 4- Return from radiators | 10- Flue pipes cleaning cover  | 16- Fire pot     |
| 5- Safety inlet          | 11- Control box                |                  |
| 6- Fan and clack         | 12- Hopper                     |                  |

Model: ÜKYP/Y		300	350	400	450	500	600
Type of Fuel		Coal-Olive Pomace-Fruit Seeds etc.					
Power	kW	349	407	465	523	582	698
	kcal/h	300.000	350.000	400.000	450.000	500.000	600.000
Burning Pot Dimensions	mm	430x410		600x600			
Fuel capacity – Coal	kg	300					350
– Olive pomace	kg	255					297
Water volume	kg	890	925	1195	1240	1505	1570
Boiler weight	kg	1755	1900	2130	2200	2505	2750
Draught	Pa	47-51				50-53	
Temperature Control Range	°C	40 – 80					
Return Temp. (recommended)	°C	40					
Max. Operating Pressure	bar	3					
Test Pressure	bar	5					
Dimensions	Boiler Total Width (a)	mm	1940	1990	2200		
	Depth (b)	mm	2280	2400		2750	
	Body Width (c)	mm	1130	1180	1390		
	Flue Connection Height (d)	mm	1465	1600	1665		1675
	Auger Disass. Distance (e)	mm	1200		1300		
	Boiler Total Height (h)	mm	2000	2065	2095		2125
Flue Connection Diameter	mm	300					350
Min. – Max. Flue Temperature	°C	170 – 210					
Boiler Inlet-Outlet	R"	DN80		DN100		DN125	
Safety Inlet-Outlet	R"	1 ½"	2"				
Filling – Discharging	R"	¾"					
Electricity Connection	V/Hz	400V – 50 Hz					



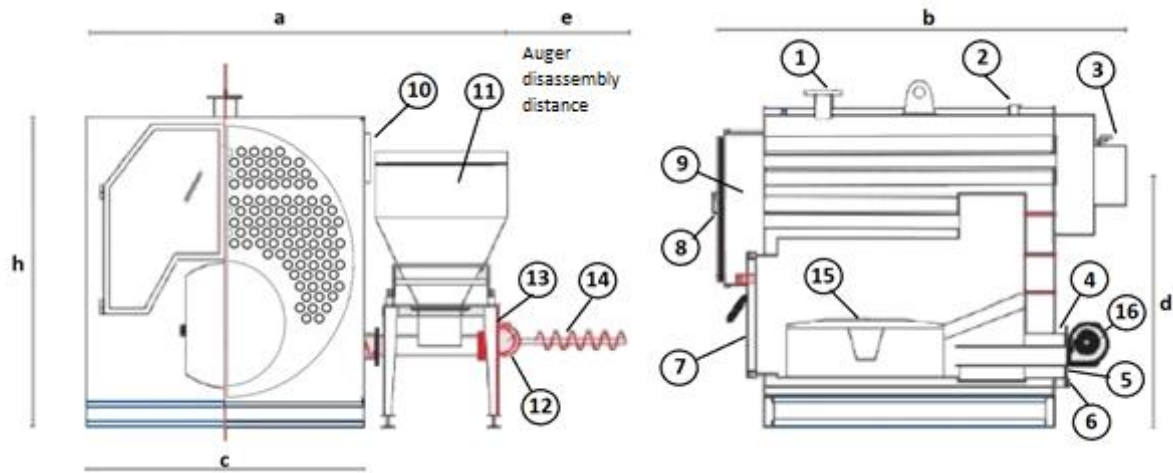
- 1- Outlet to radiators
- 2- Safety outlet
- 3- Flue
- 4- Return from radiators
- 5- Safety return
- 6- Filling-Discharging
- 7- Ash removal cover
- 8- Flame inspection hole
- 9- Flue pipes cleaning cover
- 10- Control box
- 11- Hopper
- 12- Gearbox
- 13- Hopper table
- 14- Auger
- 15- Burning pot
- 16- Fan

MODEL		ÜKYS/3G-Y	120	150	180	210	240	270
Type of Fuel			Coal-Olive Pomace- Fruit Seeds etc.					
Power	kW		140	174	209	244	279	314
	kcal/h		120.000	150.000	180.000	210.000	240.000	270.000
Burning pot dimensions		mm	430*410					
Fuel Capacity	Coal	kg	250			300		350
	Olive pomace	kg	213			255		299
Water volume		lt	720	794	894	1146	1276	1213
Boiler Weight		kg	1420	1525	1760	1890	2075	2150
Draught		Pa	42-45			44-47		46-49
Temperature control range		°C	40 - 80					
Return Temp. (recommended)		°C	40					
Max. Operating Pressure		bar	4					
Test Pressure		bar	6					
Dimensions	Boiler Total Width (a)	mm	2100	2140	2220	2328	2410	
	Depth (b)	mm	2220					
	Body Width (c)	mm	1200	1240	1320	1428	1510	1510
	Flue Connection Height (d)	mm	1145	1120		1300	1315	1370
	Auger Disass. Distance (e)	mm	1550			1600		
	Boiler Total Height (h)	mm	1570	1610	1690	1798	1880	
Flue Connection Diameter		mm	250			300		
Min. – Max. Flue Temperature		°C	170 - 210					
Boiler Inlet-Outlet		R"	DN 50		DN 65		DN 80	
Safety Inlet-Outlet		R"	1 1/4"			1 1/2"		
Filling – Discharging		R"	3/4"					
Electricity Connection		V/Hz	400 V / 50Hz					



- 1- Outlet to radiators
- 2- Safety outlet
- 3- Flue
- 4- Return from radiators
- 5- Safety return
- 6- Filling-Discharging
- 7- Ash removal cover
- 8- Flame inspection hole
- 9- Flue pipes cleaning cover
- 10- Control box
- 11- Hopper
- 12- Gearbox
- 13- Hopper table
- 14- Auger
- 15- Burning pot
- 16- Fan

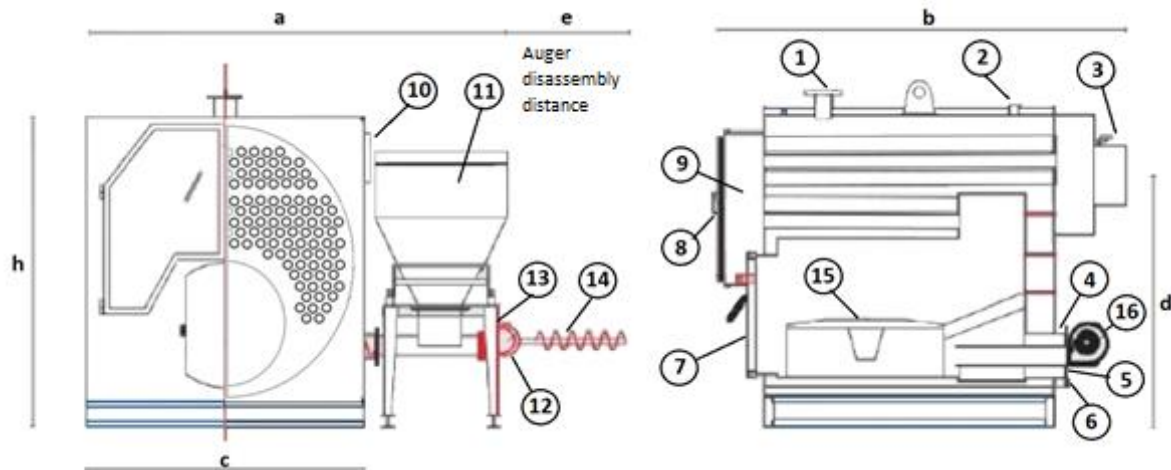
MODEL		ÜKYS/3G-Y	300	330	360	390	420	450	
Type of Fuel			Coal-Olive Pomace-Fruit Seeds etc.						
Power	kW		349	384	419	454	488	523	
	kcal/h		300.000	330.000	360.000	390.000	420.000	450.000	
Burning pot dimensions		mm	430*410				640*810		
Fuel capacity	Coal	kg	350						
	Olive pomace	kg	299						
Water volume		lt	1768	1814	1905	1987	2063	2433	
Boiler weight		kg	2600	2765	2890	2980	3250	3400	
Draught		Pa	46-49			48-52			
Temperature control range		°C	40 - 80						
Return Temp. (recommended)		°C	40						
Max. Operating Pressure		bar	4						
Test Pressure		bar	6						
Dimensions	Boiler Total Width (a)	mm	2480		2600	2650	2740		
	Depth (b)	mm	2690						
	Body Width (c)	mm	1580	1600	1650	1650	1700	1790	
	Flue Connection Height (d)	mm	1415	1440	1475	1485	1480	1575	
	Auger Disass. Distance (e)	mm	1600				1860		
	Boiler Total Height (h)	mm	1950	1970	2020		2070	2160	
Flue Connection Diameter		mm	300			350			
Min-Max Flue temperature		°C	170 - 210						
Boiler inlet-outlet		R"	DN 80					DN 100	
Safety inlet-outlet		R"	1 1/2"			2"			
Filling-Discharging		R"	3/4"						
Electricity connection		V/Hz	400 V / 50Hz						



- |                          |                              |                  |
|--------------------------|------------------------------|------------------|
| 1- Outlet to radiators   | 7- Ash removal cover         | 13- Hopper table |
| 2- Safety outlet         | 8- Flame inspection hole     | 14- Auger        |
| 3- Flue                  | 9- Flue pipes cleaning cover | 15- Burning pot  |
| 4- Return from radiators | 10- Control box              | 16- Fan          |
| 5- Safety return         | 11- Hopper                   |                  |
| 6- Filling-Discharging   | 12- Gearbox                  |                  |

MODEL - SERİ		ÜKYS/3G-Y		480	510	540	600	660	720
Type of fuel		Coal-Olive Pomace- Fruit Seeds etc.							
Power	kW	558	593	628	698	768	837		
	kcal/h	480.000	510.000	540.000	600.000	660.000	720.000		
Burning pot dimensions		mm	640*810	690*1000					
Fuel capacity	Coal	kg	350			450			
	Olive pomace	kg	299			383			
Water volume		lt	2369	2628	2679	2585	2915	3093	
Boiler weight		kg	3485	3735	3850	4010	4285	4500	
Draught		Pa	51-54			53-57			
Temperature control range		°C	40 - 80						
Return Temp. (recommended)		°C	40						
Max. operating pressure		bar	4						
Test pressure		bar	6						
Dimensions	Boiler Total Width (a)	mm	2740		2760	2810	2890	2950	
	Depth (b)	mm	2690	2920		3020			
	Body Width (c)	mm	1790	1790	1810	1810	1890	1950	
	Flue Connection Height (d)	mm	1615	1640	1570		1655	1645	
	Auger Disassemb. Distance (e)	mm	1860			1900			
	Boiler Total Height (h)	mm	2160		2180		2260	2320	
Flue Connection Diameter		mm	350				400		
Min. – Max. Flue Temperature		°C	170 - 210						
Boiler Inlet-Outlet		R"	DN 100			DN 125			
Safety Inlet-Outlet		R"	2"						
Filling – Discharging		R"	3/4"						
Electricity Connection		V/Hz	400 V / 50Hz						

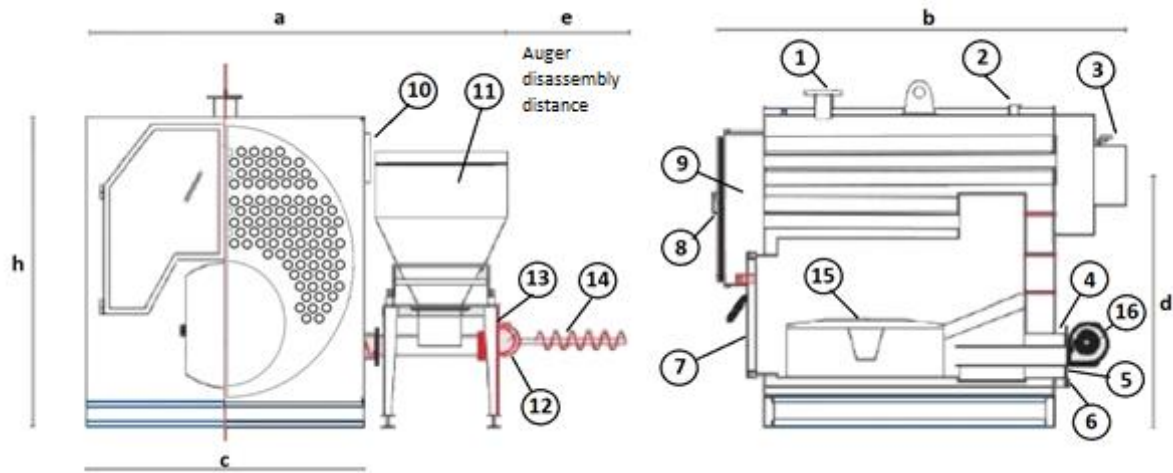




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|--------------------------|------------------------------|------------------|
| 1- Outlet to radiators   | 7- Ash removal cover         | 13- Hopper table |
| 2- Safety outlet         | 8- Flame inspection hole     | 14- Auger        |
| 3- Flue                  | 9- Flue pipes cleaning cover | 15- Burning pot  |
| 4- Return from radiators | 10- Control box              | 16- Fan          |
| 5- Safety return         | 11- Hopper                   |                  |
| 6- Filling-Discharging   | 12- Gearbox                  |                  |

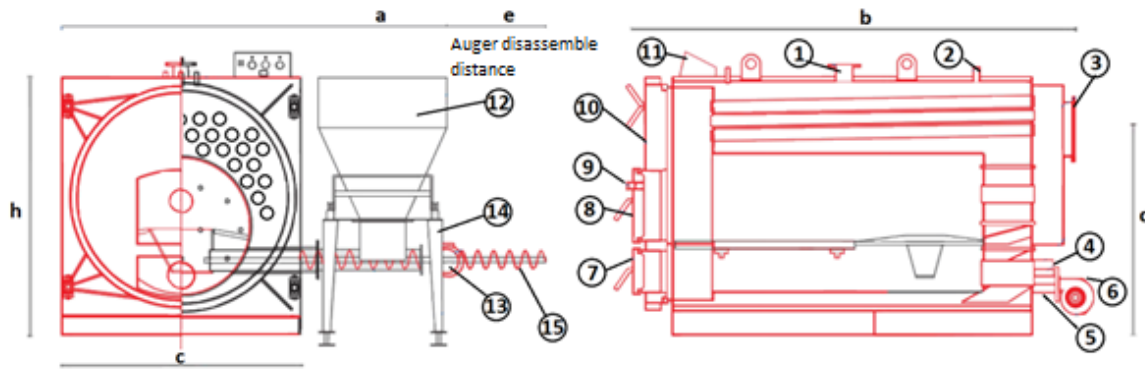
MODEL		ÜKYS/3G-Y	780	840	900	1000	1100	1200
Type of Fuel			Coal-Olive Pomace-Fruit Seeds etc.					
Power	kW		907	977	1047	1163	1279	1396
	kcal/h		780.000	840.000	900.000	1.000.000	1.100.000	1.200.000
Burning pot dimensions		mm	690*1000			740*1000		
Fuel capacity	Coal	kg	450					
	Olive pomace	kg	383					
Water volume		lt	3248	3448	3354	4396	4479	4610
Boiler weight		kg	4640	4890	5170	5750	6040	6400
Draught		Pa	56-59					
Temperature control range		°C	40 - 80					
Return temperature (recommended)		°C	40					
Max. operating pressure		bar	4					
Test pressure		bar	6					
Dimensions	Boiler Total Width (a)	mm	2950	3000	3050		3100	
	Depth (b)	mm	3020			3540		
	Body Width (c)	mm	1950	2000	2050	2050	2100	2150
	Flue Connection Height (d)	mm	1700	1750	1760		1815	1860
	Auger Disass. Distance (e)	mm	1900	1950				
	Boiler Total Height (h)	mm	2320	2370	2420		2470	2520
Flue Connection Diameter		mm	400					
Min. – Max. Flue Temperature		°C	170 - 210					
Boiler Inlet-Outlet		R"	DN 125			DN 150		
Safety Inlet-Outlet		R"	2"		2 1/2"			
Filling – Discharging		R"	3/4"					
Electricity Connection		V/Hz	400 V / 50Hz					





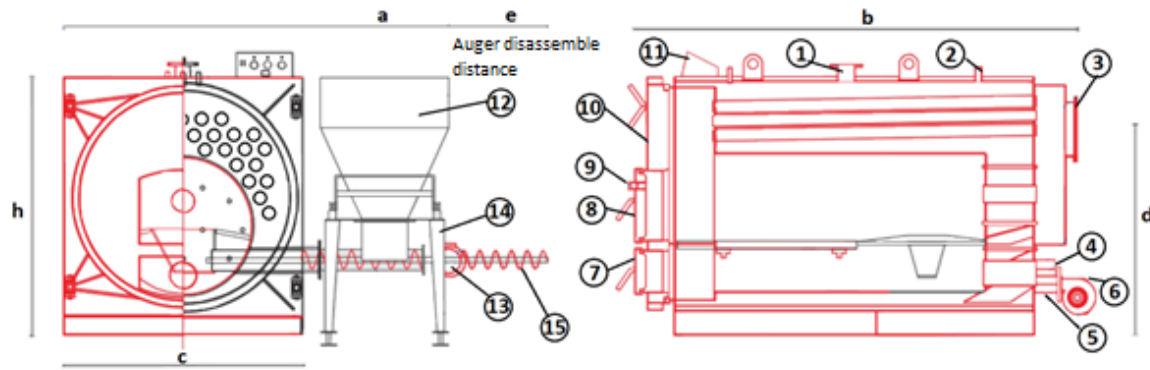
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|--------------------------|------------------------------|------------------|
| 1- Outlet to radiators   | 7- Ash removal cover         | 13- Hopper table |
| 2- Safety outlet         | 8- Flame inspection hole     | 14- Auger        |
| 3- Flue                  | 9- Flue pipes cleaning cover | 15- Burning pot  |
| 4- Return from radiators | 10- Control box              | 16- Fan          |
| 5- Safety return         | 11- Hopper                   |                  |
| 6- Filling-Discharging   | 12- Gearbox                  |                  |

MODEL		ÜKYS/3G-Y	1300	1500	2000
Type of Fuel			Coal-Olive Pomace-Fruit Seeds etc.		
Power	kW		1512	1745	2326
	kcal/h		1.300.000	1.500.000	2.000.000
Burning pot dimensions		mm	550*1050	640*1250	550*1050
Fuel capacity	Coal	kg	450		
	Olive pomace	kg	383		
Water volume		lt	4490	5370	7400
Boiler weight		kg	6800	7850	11700
Draught		Pa	0,58-0,61		
Temperature control range		°C	40 – 80		
Return temperature (recommended)		°C	35		
Max. operating pressure		bar	4		
Test pressure		bar	6		
Dimensions	Boiler Total Width (a)	mm	2150	2300	2400
	Depth (b)	mm	5020	4800	6100
	Body Width (c)	mm	2150	2300	2400
	Flue Connection Height (d)	mm	1860	1920	1960
	Auger Disass. Distance (e)	mm	2800	3700	3000
	Boiler Total Height (h)	mm	2520	2600	2750
Flue Connection Diameter		mm	450	500	800
Min. – Max. Flue Temperature		°C	170 - 210		
Boiler Inlet-Outlet		R"	DN 150		DN 200
Safety Inlet-Outlet		R"	2 ½"		3" – 2 ½"
Filling – Discharging		R"	¾"		
Electricity Connection		V/Hz	400 V / 50 Hz		



- 1- Outlet to radiators
- 2- Safety outlet
- 3- Flue
- 4- Return
- 5- Safety return
- 6- Fan
- 7- Ash removal cover
- 8- Manual fuel feeding cover
- 9- Flame inspection hole
- 10- Flue pipes cleaning cover
- 11- Control box
- 12- Hopper
- 13- Gear box
- 14- Hopper table
- 15- Auger

MODEL		ÜKYS/Y	200	225	250	300	350	400	
Type of Fuel			Coal-Olive Pomace-Fruit Seeds etc.						
Power	kW		233	262	291	349	407	465	
	kcal/h		200.000	225.000	250.000	300.000	350.000	400.000	
Burning pot dimensions		mm	430*410					770*680	
Fuel capacity	Coal	kg	300			350			
	Olive pomace	kg	255			298			
Water volume		lt	900	1000	1050	1260	1440	1880	
Boiler weight		kg	2000	2200	2310	2590	2900	3170	
Draught		Pa	44-47		46-49				
Temperature control range		°C	40-80						
Return temperature (recommended)		°C	40						
Max. operating pressure		bar	4						
Test pressure		bar	6						
Dimensions	Boiler Total Width (a)	mm	2050	2150	2200		2300		
	Depth (b)	mm	2210			2650		3025	
	Body Width (c)	mm	1250	1350	1400		1500		
	Flue Connection Height (d)	mm	1015	1115	1165		1265		
	Auger Disass. Distance (e)	mm	1350	1450	1500		1600		
	Boiler Total Height (h)	mm	1530	1630	1680		1780		
Flue connection diameter		mm	300				350		
Min. – Max. Flue Temperature		°C	170 - 210						
Boiler Inlet-Outlet		R"	DN 65		DN 80				
Safety Inlet-Outlet		R"	1 1/4"		1 1/2"		2"		
Filling – Discharging		R"	3/4"						
Electricity Connection		V/Hz	400 V - 50 Hz						



- |                        |                               |                  |
|------------------------|-------------------------------|------------------|
| 1- Outlet to radiators | 6- Fan                        | 11- Control box  |
| 2- Safety outlet       | 7- Ash removal cover          | 12- Hopper       |
| 3- Flue                | 8- Manual fuel feeding cover  | 13- Gear box     |
| 4- Return              | 9- Flame inspection hole      | 14- Hopper table |
| 5- Safety return       | 10- Flue pipes cleaning cover | 15- Auger        |

MODEL		ÜKYS/Y	450	500	600	700	800
Type of fuel			Coal-Olive Pomace- Fruit Seeds etc.				
Power	kW		523	582	698	814	930
	kcal/h		450.000	500.000	600.000	700.000	800.000
Burning pot dimensions		mm	820*710	820*780	850*880	950*900	1000*960
Fuel capacity	Coal	kg	350		450		
	Olive pompace	kg	298		383		
Water volume		lt	1990	2050	2560	3090	3300
Boiler weight		kg	3650	3820	4525	5300	5820
Draught		Pa	48-52			51-54	
Temperature control range		°C	40-80				
Return temperature (recommended)		°C	40				
Max. operating pressure		bar	4				
Test pressure		bar	6				
Dimensions	Boiler Total Width (a)	mm	2350		2500	2700	2730
	Depth (b)	mm	3090	3360	3400	3550	
	Body Width (c)	mm	1550		1700	1900	1930
	Flue Connection Height (d)	mm	1315		1465	1665	1695
	Auger Disass. Distance (e)	mm	1650		1800	2000	2030
	Boiler Total Height (h)	mm	1830		1980	2180	2210
Flue connection diameter		mm	350			400	
Min. – Max. Flue Temperature		°C	170 - 210				
Boiler Inlet-Outlet		R"	DN 100		DN 125		
Safety Inlet-Outlet		R"	2"				2 1/2"
Filling – Discharging		R"	3/4"				
Electricity Connection		V/Hz	400 V - 50 Hz				

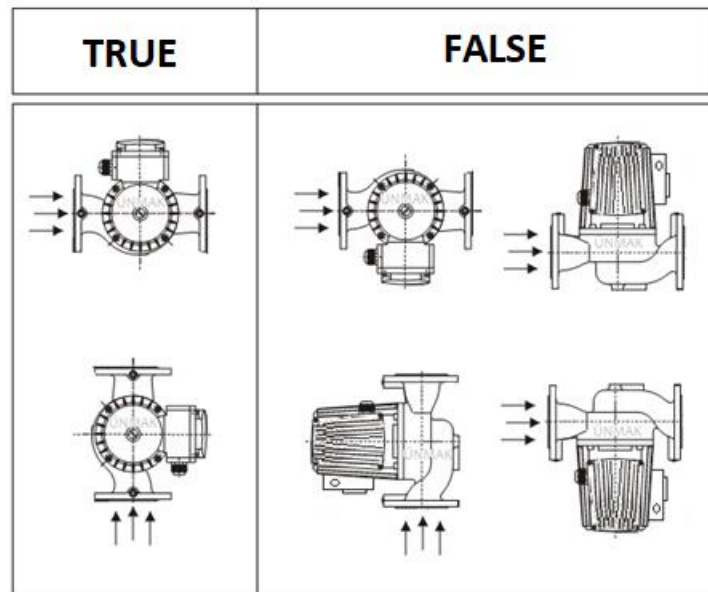
## RULES FOR HEATING INSTALLATION

### 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.

### Expansion tank:

In hot water heating systems, when the water is heated from 10°C to 90°C, its volume increases by 3.55% in its first volume. Expansion tanks are used in order to obtain this expansion due to 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 support functions for the system. Expansion tanks are divided into two parts:

#### Systems with closed expansion tanks:

Closed expansion tanks are manufactured with air and nitrogen pressure before they are installed in the system. Pressure in the expansion tank is the pressure of the system. When the expansion tank heating circuit is active, the water volume which is expanded with the heating of the water is collected into the expansion tank. Then, when the heat falls, this water returns to the installation and balances the pressure of the installation. Compared to open systems; Since there is no piping operation to the top point of the radiator, no crushing process will be done, there will not be any heat loss due to the fact that there is not any open door to the external environment, there will not be a part of the system which is exposed to corrosion and since the system is closed, there will be no water loss due to evaporation.

In closed expansion tanks, the water inside the system can be observed with manometer. Manometer is pressure gauge. The water in the boiler should show 1-1.5 bar pressure when it is cold. Pressure will increase as the boiler water heats up.



**Boilers to be fitted with closed expansion tank must be installed with appropriate safety valve and automatic air vent.**

For heating systems with closed expansion tank, safety valve must be used. The following table shows the safety valve capacities that must be in ÜNMAK solid fuel, automatic loading boilers. It is advisable to equip the system with double and appropriate safety valve against the risks of calcification.

At least closed expansion tank volumes and safety valve connection diameters are given according to boiler capacities. According to the boiler capacities and the number of floors applied, the expansion tank volumes vary.

The number of floors given in the table has been accepted in the basement of the boiler and the expansion tank.

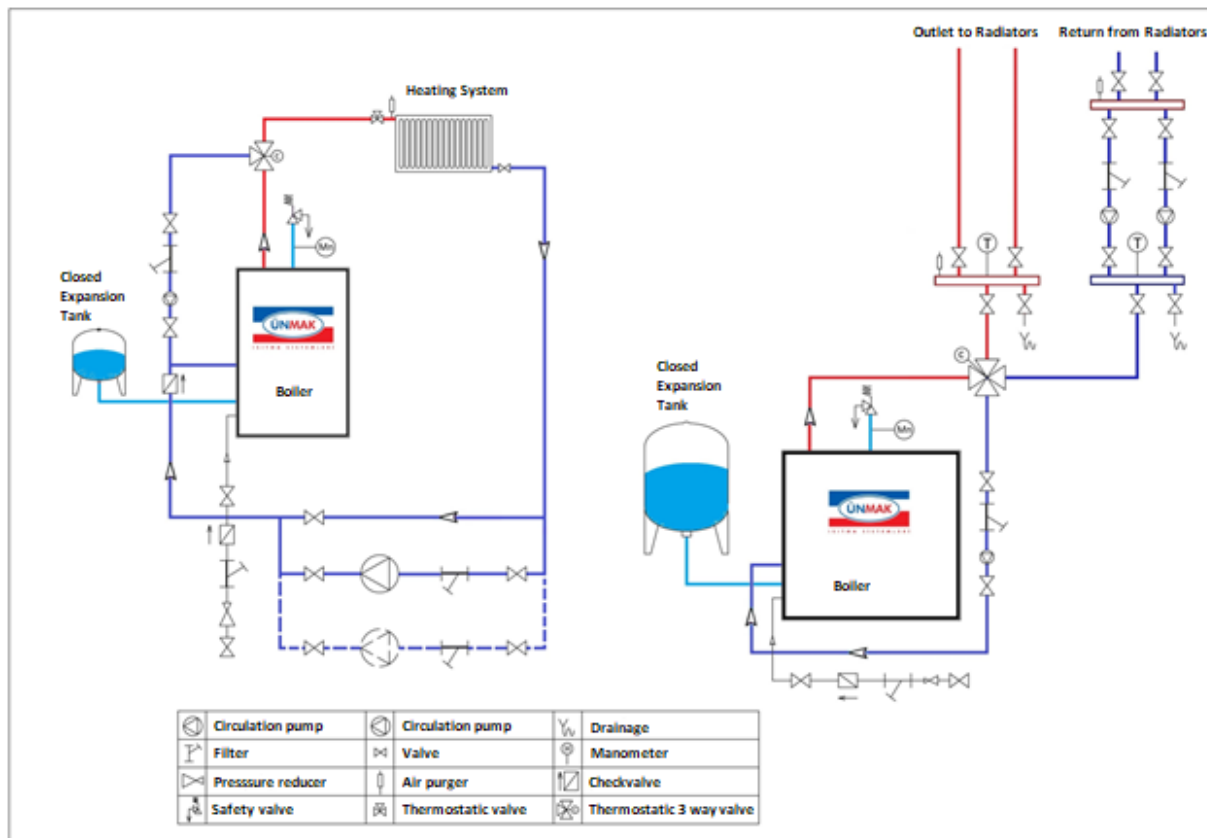
*Safety valve and closed expansion tank volumes which should be according to the rated boiler capacity*

BOILER POWER (Mcal/h)	SAFETY VALVE CONNECTION DIAMETER (inch)	NUMBER of FLOOR												
		1	2	3	4	5	6	7	8	9	10	11	12	
25 (3 bar)	1/2"	18												
34 (3 bar)	1/2"	25	25	35										
45 (3 bar)	1/2"	35	35	50	50	50								
60 (3 bar)	3/4"	50	50	50	80	80	100							
80 (3 bar)	3/4"	50	80	80	80	100	150	200						
100 (3 bar)	1"	80	80	80	100	150	150	200	300					

BOILER POWER (Mcal/h)	SAFETY VALVE CONNECTION DIAMETER (inch)	KAT SAYISI											
		1	2	3	4	5	6	7	8	9	10	11	12
120 (4 bar)	3/4"	80	80	80	100	100	150	150	150	200	300	500	750
130 (3 bar)	1"	80	100	100	150	150	200	300	500	1000			
150 (4 bar)	1"	80	100	100	150	150	150	200	200	300	300	500	1000
160 (3 bar)	1"	100	150	150	150	200	300	300	500	1500			
180 (3 bar)	1 1/4"	150	150	150	200	200	300	500	750	1500			
180 (4 bar)	1"	100	150	150	150	150	200	200	300	300	500	750	1000
200 (3 bar)	1 1/4"	150	150	200	200	300	300	500	750	1500			
200 (4 bar)	1"	150	150	150	150	200	200	200	300	500	500	750	1000
210 (4 bar)	1"	150	150	150	150	200	200	300	300	500	500	750	1500
225 (4 bar)	1"	150	150	150	200	200	200	300	300	500	500	750	1500
240 (4 bar)	1"	150	150	200	200	200	300	300	300	500	500	750	1500
250 (3 bar)	1 1/4"	150	200	200	300	300	500	500	1000	2000			
250 (4 bar)	1"	150	150	200	200	200	300	300	500	500	750	750	1500
270 (4 bar)	1 1/4"	150	200	200	200	300	300	300	500	500	750	1000	1500
300 (4 bar)	1 1/4"	200	200	200	300	300	300	500	500	500	750	1000	2000
330 (4 bar)	1 1/4"	200	200	300	300	300	300	500	500	750	750	1000	2000
350 (4 bar)	1 1/4"	200	300	300	300	300	500	500	500	750	750	1000	2000
360 (4 bar)	1 1/4"	200	300	300	300	300	500	500	500	750	750	1500	2000
390 (4 bar)	1 1/4"	300	300	300	300	500	500	500	500	750	1000	1500	2000
400 (4 bar)	1 1/4"	300	300	300	300	500	500	500	500	750	1000	1500	3000
420 (4 bar)	1 1/4"	300	300	300	300	500	500	500	750	750	1000	1500	3000
450 (4 bar)	1 1/2"	300	300	300	500	500	500	500	750	750	1000	1500	3000
480 (4 bar)	1 1/2"	300	300	500	500	500	500	750	750	750	1000	1500	3000
500 (4 bar)	1 1/2"	300	300	500	500	500	500	750	750	1000	1000	1500	3000
510 (4 bar)	1 1/2"	300	300	500	500	500	500	750	750	1000	1000	1500	3000
540 (4 bar)	1 1/2"	300	500	500	500	500	500	750	750	1000	1500	2000	3000
600 (4 bar)	1 1/2"	500	500	500	500	500	750	750	1000	1000	1500	2000	4000
660 (4 bar)	1 1/2"	500	500	500	500	750	750	750	1000	1000	1500	2000	4000
700 (4 bar)	1 1/2"	500	500	500	500	750	750	750	1000	1500	1500	2000	4000
720 (4 bar)	1 1/2"	500	500	500	750	750	750	1000	1000	1500	1500	3000	4000
780 (4 bar)	2"	500	500	500	750	750	750	1000	1000	1500	1750	3000	5000
800 (4 bar)	2"	500	500	750	750	750	750	1000	1000	1500	2000	3000	5000
840 (4 bar)	2"	500	500	750	750	750	1000	1000	1500	1500	1750	3000	5000
900 (4 bar)	2"	500	750	750	750	750	1000	1000	1500	1500	2000	3000	5000
1000 (4 bar)	2"	750	750	750	750	1000	1000	1500	1500	2000	2000	3000	6000
1100 (4 bar)	2"	750	750	750	1000	1000	1500	1500	1500	2000	2500	4000	6000
1200 (4 bar)	2"	750	750	1000	1000	1000	1500	1500	2000	2000	2500	4000	6000
1300 (4 bar)	2"	750	1000	1000	1000	1500	1500	1500	2000	2000	4000	4000	7500
1500 (4 bar)	2"	1000	1000	1000	1000	1500	1500	2000	2000	2500	4000	5000	10000
2000 (4 bar)	2 1/2"	1500	1500	1500	1500	2000	2000	2000	2500	4000	5000	6000	10000

Example: If the boiler with 80.000 kcal / h capacity is to be operated with closed expansion system; 3 bar, safety valve must be used. The building to which this boiler is connected should be installed with 80 liters in 4 floors and 100 liters closed expansion in 5 floors.

#### Wiring diagram with closed expansion tank



#### Open expansion tank systems:

At the top of the system, the roof is put on the level difference and works open to the atmosphere. An expansion tank is placed at a slightly higher point than the highest point of the dispensing system to collect the expanded water volume. The water that expands in the boiler is stored in the expansion tank by means of a travel safety pipe. When the water in the installation is cooled, the water of the installation is completed by the expansion tank by means of the return safety pipe. As the expansion tank also opens the system to the atmosphere, it ensures the safety of the system by preventing the pressure in the heating installation to rise above atmospheric pressure. The venting pipes are opened from the expansion tank to the atmosphere and the air in the system is discharged. It is recommended to use separate expansion tanks according to their capacities for each boiler in the installation. That is, it is not correct to connect the two boilers to a single expansion tank. There are return and return safety pipes for each boiler and expansion tank. Valves, check valves etc. on these safety pipes. No fittings such as material should not be installed. Safety pipes must reach the

nearest point of the boiler inlet and outlet by the shortest vertical path. Horizontal movement is only allowed at the level of the expansion tank and at minimum length.

ÜNMAK solid fuel boilers must be connected to an installation with an open expansion tank in accordance with the installation diagram shown below. The circulation pump can be connected to the return or return line. If the pump is in the boiler return; the open expansion tank must be higher than the discharge head of the pump.

Warning about the water level:

After the first water is pressed into the system, the minimum water level must be marked on the hydrometer. Water level should be checked on a daily basis and water should be added to the installation when it falls below the minimum value.



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

Expansion tank volumes that must be rated according to the rated boiler capacity

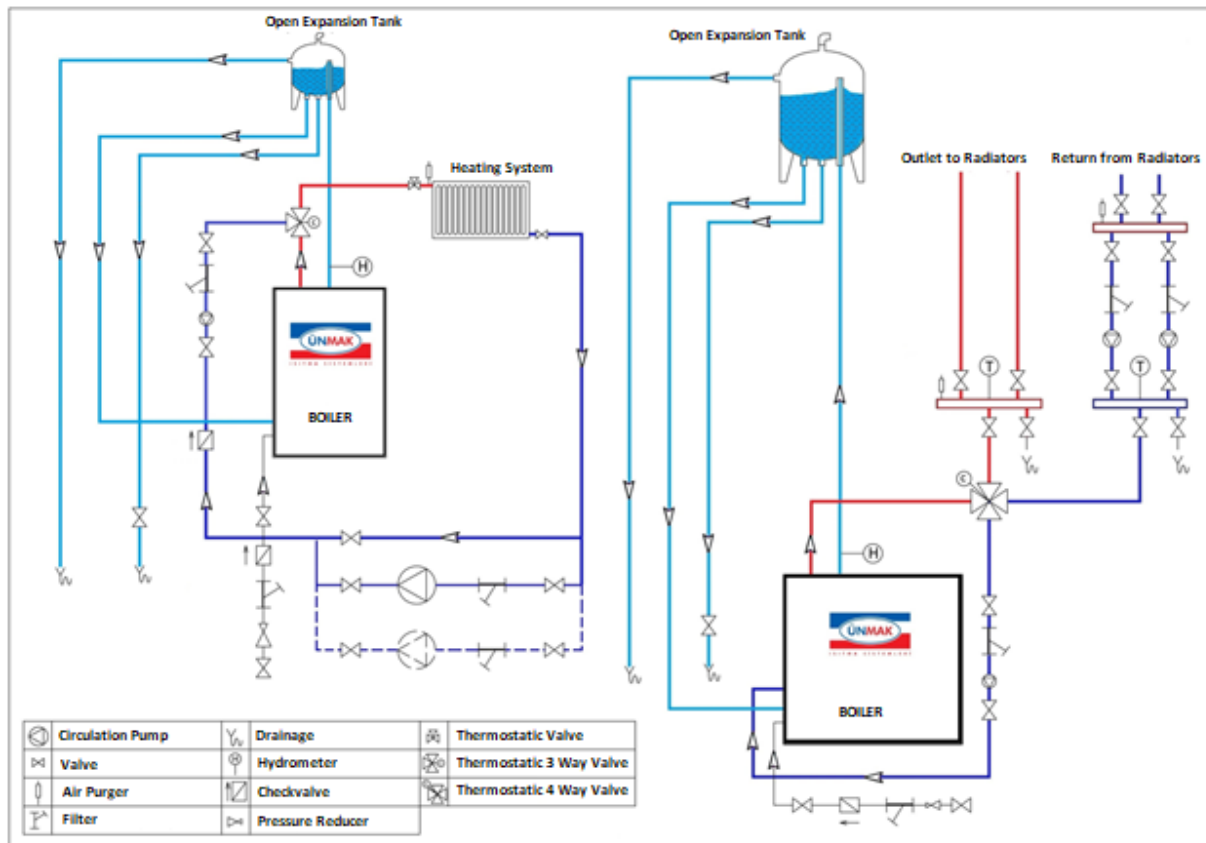
BOILER POWER (kcal/h)	OPEN EXPANSION TANK VOLUME (lt)	BOILER POWER (kcal/h)	OPEN EXPANSION TANK VOLUME (lt)
25.000	50	400.000	750
34.000	50	420.000	750
45.000	90	450.000	750
60.000	90	480.000	750
80.000	110	500.000	750
100.000	210	510.000	750
120.000	210	540.000	1000
130.000	210	600.000	1000
150.000	210	660.000	1000
160.000	300	700.000	1000
180.000	300	720.000	1000
200.000	300	780.000	1200
210.000	300	800.000	1200
225.000	500	840.000	1300
240.000	500	900.000	1400
250.000	500	1.000.000	1500
270.000	500	1.100.000	1600
300.000	500	1.200.000	1800
330.000	500	1.300.000	2000
350.000	500	1.500.000	2250
360.000	750	2.000.000	2500
390.000	750		



Example: The volume of open expansion tank required for a 60,000 kcal / h boiler is 90 liters.

*Open expansion tanks were selected by considering the open expansion volumes of Ünmak brand and panel radiator in the system.*

*Wiring diagram with open expansion tank*



### 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.***






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## 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.

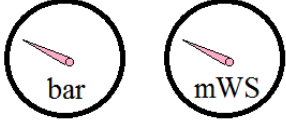



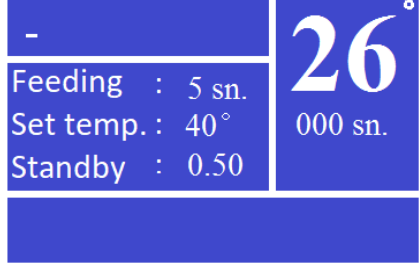





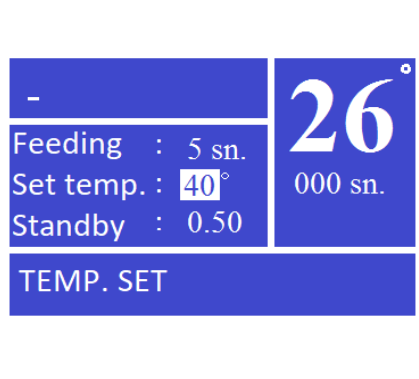



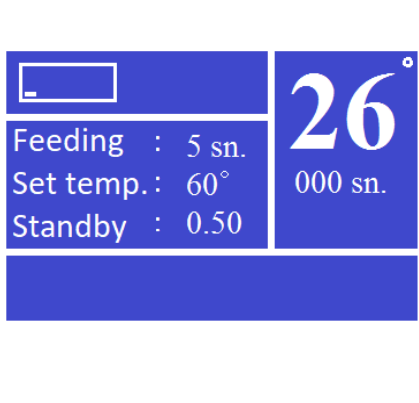


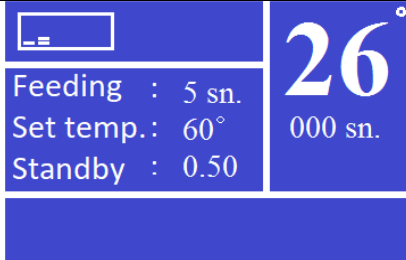





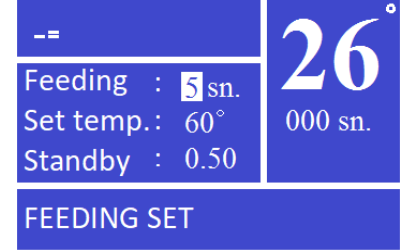
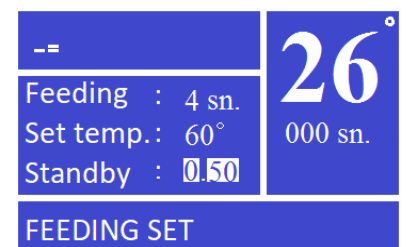

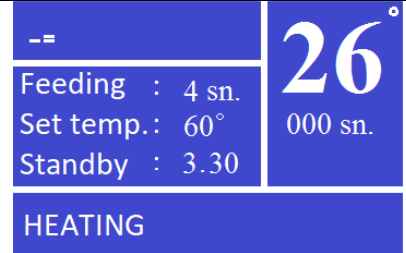

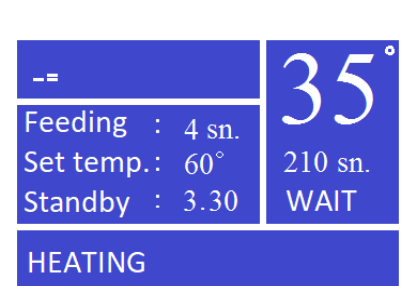
- Fan
- Pump
- Gearbox
- No Fuel
- Fuel Stuck

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>	 <p>Manometer      Hydrometer</p>
<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>FEEDING SET</p>  <p>FEEDING SET</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>HEATING</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>	 <p>HEATING</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.

Power (Mcal/h)		25	34	45	60	80	100	120	130	150	160	180	200	210	225	240
6.000 kcal/kg.h High Quality Fuel	Stand by (min)	04:50	04:30	04:10	04:10	04:10	03:30	03:40	03:50	03:40	03:50	03:40	03:40	03:50	03:30	03:30
	Feeding (sec)	4	5	6	8	11	11	7	8	9	10	11	12	13	13	14
4.000 kcal/kg.h High Quality Fuel	Stand by (min)	03:20	03:30	03:30	03:20	03:20	03:20	03:20	03:30	03:30	03:30	03:20	03:20	03:20	03:30	03:20
	Feeding (sec)	4	6	8	10	13	16	10	11	13	14	15	17	18	20	21
3.500 kcal/kg.h High Quality Fuel	Stand by (min)	01:20	01:30	01:30	01:30	01:30	01:20	01:30	01:20	01:20	01:30	01:20	01:20	01:00	01:10	01:00
	Feeding (sec)	2	3	4	5	7	7	5	5	6	7	7	8	6	8	7

Power (Mcal/h)		250	270	300	330	350	360	390	400	420	450	480	500	510
6.000 kcal/kg.h High Quality Fuel	Stand by (min)	03:50	03:50	03:50	04:00	03:50	04:00	04:00	04:00	04:00	04:00	03:50	03:50	03:40
	Feeding (sec)	16	17	19	22	23	24	27	20	21	23	23	25	23
4.000 kcal/kg.h High Quality Fuel	Stand by (min)	03:20	03:20	03:10	03:00	03:00	03:00	03:00	03:00	03:00	03:00	03:00	03:00	02:40
	Feeding (sec)	22	24	25	26	28	29	32	24	25	27	29	31	27
3.500 kcal/kg.h High Quality Fuel	Stand by (min)	01:10	01:00	01:00	01:10	01:00	01:00	01:00	01:00	01:10	01:10	01:10	01:10	01:10
	Feeding (sec)	9	8	9	12	11	12	12	9	11	12	13	14	14

Power (Mcal/h)		540	600	660	700	720	780	800	840	900	1000	1100	1200
6.000 kcal/kg.h High Quality Fuel	Stand by (min)	03:40	03:20	03:20	03:20	03:20	03:00	03:00	02:50	02:50	02:20	02:10	02:00
	Feeding (sec)	25	25	28	30	31	30	31	31	34	30	32	33
4.000 kcal/kg.h High Quality Fuel	Stand by (min)	02:40	02:30	02:20	02:20	02:20	02:10	02:10	02:00	01:50	01:30	01:20	01:20
	Feeding (sec)	28	30	31	34	35	36	37	37	37	33	34	38
3.500 kcal/kg.h High Quality Fuel	Stand by (min)	01:10	01:00	01:00	01:00	00:50	00:50	00:50	00:50	00:40	00:30	00:30	00:30
	Feeding (sec)	15	14	16	17	15	16	17	18	16	15	17	19



**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.

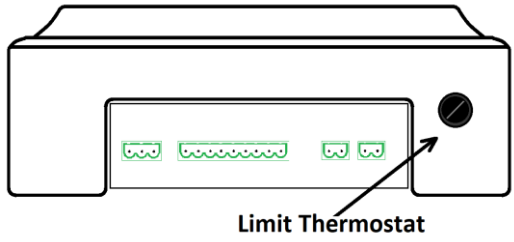
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## INFORMATION ON USAGE ERRORS

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> 
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 doors and the hopper door in case of power cuts; do not add water to the boiler.**

## ÜNLÜSOY YAPI MALZEMELERİ SANAYİ ve TİCARET LİMİTED ŞİRKETİ

Address: Pancar Organize Sanayi Bölgesi, 2. Etap No:2, Torbalı/İZMİR – TURKEY

Tel: +90 444 35 32, Fax: +90 232 469 2412

www.Ünmak.com