

**KY SERIES SOLID FUEL BOILER**

*Installation, Operation & Maintenance Manual*



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## Information on the boiler plate

The boiler Serial No. is shown on the plate which is attached to the cover panel of the cast iron body.


Solid Fuel Boilers	KY SERIES
Boiler Type:	_____
Boiler Class:	1
Max Operating Temperature:	90°C
Max Operating Pressure:	4 bar
Fuel 1: Coal Heating Output Range ( kW ):	-
Fuel 2: Wood Heating Output Range ( kW ):	-
Water Content ( l ):	_____
Production Year:	_____
Serial Number:	_____
Manufacturer Name:	<b>önmetal</b>
	DOKUM SANAYİ VE TİC. LTD. ŞTİ. İkinci Organize Sanayi Bölgesi, 17.sad. No:5 İstanbul - TURKEY
	
<ul style="list-style-type: none"><li>- The boiler can only be fitted in a room that meets the appropriate ventilation requirements.</li><li>- Read the installation manual before fitting the boiler.</li><li>- Carefully read the user's instructions before operating the boiler.</li></ul>	

fig.01

## Boiler dimensions

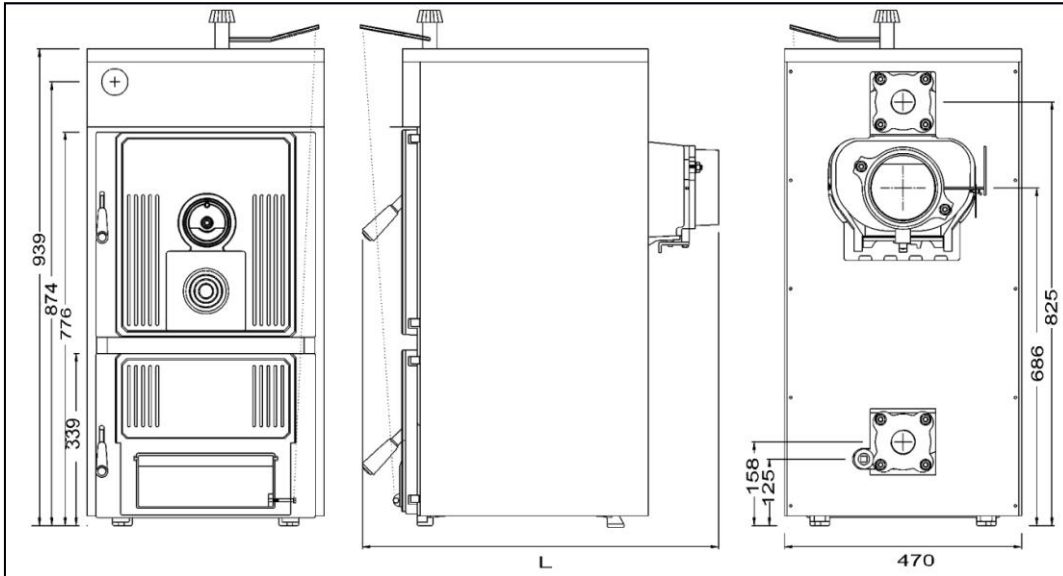


fig.02

Serie	KY - 03	KY - 04	KY - 05	KY - 06	KY - 07	KY - 08	KY - 10
L (mm)	613	715	797	899	1.001	1.103	1.307

## Boiler packaging dimensions

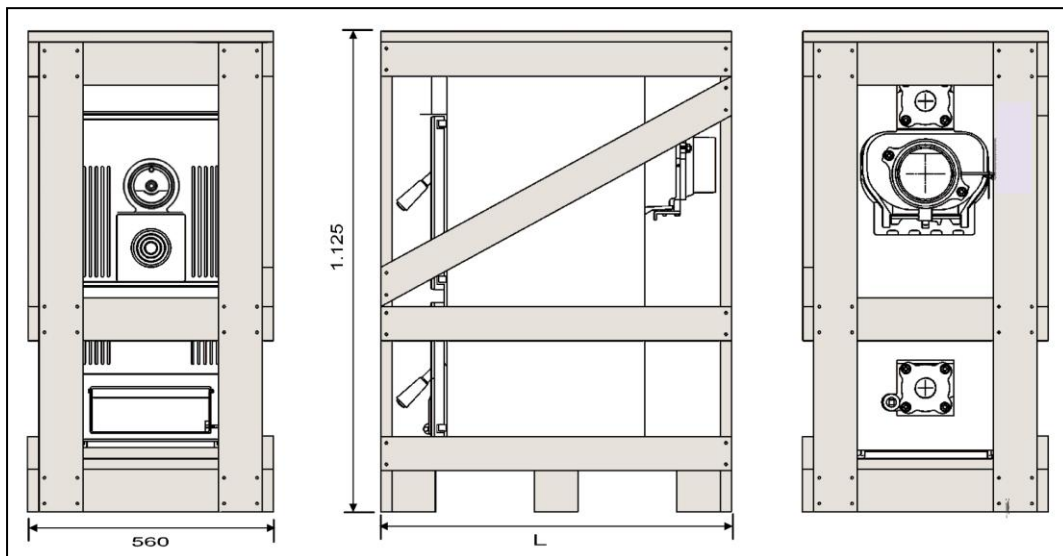


fig.03

Serie	KY - 03	KY - 04	KY - 05	KY - 06	KY - 07	KY - 08	KY - 10
L (mm)	686	786	866	966	1.066	1.166	1.366

Notice: Please obey to the meanings of the symbols on packaging for healthy care.



## Technical parameters

Series Name		KY-03	KY-04	KY-05	KY-06	KY-07	KY-08	KY-10	
Number Of Elements	Pcs.	3	4	5	6	7	8	10	
Nominal Heat Output (Black Coal -Walnut)	kW	15,0	21,0	26,5	32,5	37,0	41,0	50,0	
	kCal/h	12.900	18.060	22.790	27.950	31.820	35.260	43.000	
Nominal Heat Output (Hardwood Split Logs)	kW	14,0	18,5	24,0	29,0	33,0	37,0	46,0	
	kCal/h	12.040	15.910	20.640	24.940	28.380	31.820	39.560	
Nominal Heat Input	kW	19,0	26,6	33,5	41,1	46,8	51,9	63,3	
Minimum Heat Output	kW	7,6	10,6	13,4	16,4	18,7	20,7	25,3	
Heating Water Maximum Temp.	°C	90							
Heating Return Water Minimum Temp.	°C	50							
Burning Time For Nominal Output( B.Coal )	hr	>4							
Burning Time For Nominal Output( H .Wood )	hr	>2							
Range Of Temperature Control	°C	30-90							
Maximum Pressure of System	bar	4							
Minimum Pressure of System	bar	0,4							
Boiler Water Content	L	13,56	17,01	20,46	23,91	27,36	30,81	37,71	
	m <sup>3</sup>	0,01356	0,01701	0,02046	0,02391	0,02736	0,03081	0,03771	
Exit Flue Connection Diameter	mm	150					180		
Combustion Chamber Dimensions( W x H )	mm	314 x 395							
Combustion Chamber Dimensions( L )	mm	265	365	465	565	665	765	965	
Water Inlet- Outlet Connection	(")	G 2 "							
Inlet-Outlet Safety Cooling Loop Connection	(")	G 3/4 "							
Minimum Chimney Depression	mbar	0,12	0,14	0,17	0,2	0,22	0,25	0,3	
Gas Volume Of the Boiler	dm <sup>3</sup>	41,27	55,16	69,05	82,94	96,83	110,73	138,51	
	m <sup>3</sup>	0,041	0,055	0,069	0,083	0,097	0,111	0,139	
Gas Volume Of the Combustion Chamber	dm <sup>3</sup>	32,86	45,27	57,67	70,07	82,47	94,88	119,68	
	m <sup>3</sup>	0,033	0,045	0,058	0,070	0,082	0,095	0,120	
Safety Valve Temperature Limit	°C	95							
Boiler Category (according to EN 303-5)	Class	1							
Exit Flue GasTemperature ( Full Load )	°C	215-260			190-225				
Exit Flue GasTemperature ( Part Load )	°C	165-190			155-175				
Maximum Noise Level acc. to Valid Norms	dB	45-60 (A)							
Dry Weight	kg	227	265	308	345	379	417	500	

## Introduction

1. The boiler and all associated equipment must be installed and used in accordance with the installation design, all applicable legal regulations and technical standards and with the manufacturer's instructions. The boiler may be used only for the purpose for which it is intended.
2. The boiler may be installed only in an environment which it is designed for. If the boiler is delivered to the client by the same person who installs it, he must give the user also all accompanying boiler documentation ( in particular User Guide, Service Book, etc. ). Until the boiler is put into service, the original packaging must be kept in case the boiler has to be transported again.
3. After installation, the boiler must be put into operation by a service organisation authorized by the manufacturer.
4. The boiler complies with regulations applicable in the European Union. When used in the conditions of countries outside at EU, any deviations from local regulations must be identified and rectified.
5. In the event of a defect, call an authorized manufacturer's service organisation—any unauthorized interference may damage the boiler (and possibly also associated equipment!).
6. The service technician putting the boiler into operation for the first time must show the user the various parts of the boiler and how to control the boiler, with the boiler safety elements, their signals and appropriate user reaction to them, with fundamental parts of the boiler and their controls. If the boiler is delivered to the client by the same person who installs it, he must make sure that the original packaging is available in case the boiler has to be transported again.
7. Check the delivery for completeness.
8. Check whether the model and type supplied is suitable for the required use.
9. Whenever you are not certain how to control the boiler, study appropriate instructions in this Operation and installation Guide carefully and proceed accordingly.
10. Never remove or damage any markings and signs on the boiler. Keep the original packaging until the boiler has been put into service, in case the boiler has to be transported again.
11. When making any repairs, only original parts must always be used. It is forbidden to make any changes to the boiler's internal installation, or to interfere with it in any way.
12. At the end of its life cycle, the boiler its package and its parts must be disposed of in a way avoiding harm to the environment.
- 13 The manufacturer disclaims any responsibility for damages caused by the failure to abide by:
  - The conditions stipulated in this Operation and Installation Guide

- Applicable regulations and standards ;
- Sound installation and operation procedures
- Conditions stated in the Warranty Certificate and the Service Book.

Situations might occur in practice, when the following essential precautions must be taken:

- Shut the boiler down every time when there are any ( even temporary ) flammable or explosive fumes present on the premises from which combustion air is supplied to the boiler ( e.g. from paint when painting, laying and spraying molten substances, from gas leakage, etc.) ;
- if it is necessary to drain water from the boiler or from the whole system, the water must not be dangerously hot;
- If there is any leakage from the boiler's heat exchanger, or when the exchanger is clogged up with ice, do not attempt to start up the boiler until normal operating conditions have been restored;

### Ensuring safety of equipment and people

- The boiler ( and all accessories ) complies with the requirements of EN 303 – 5 its updates and all relevant European standards.
- In order to run and operate the boiler in accordance with the purpose for which it is designed in actual conditions of use (hereafter referred to only as use), it is necessary to abide also by additional requirements the most essential ones of which (i.e.those which must not be omitted ) are found in the related regulatory documents.
- In addition to the above mentioned documents, it is necessary when using the boiler to proceed in accordance with this Operation and Installation guide and the accompanying boiler manufacturer's documentation.
- Any interference by children, persons under the influence of narcotic drugs, certified persons, etc., when using the boiler, must be prevented.

### Head Losses

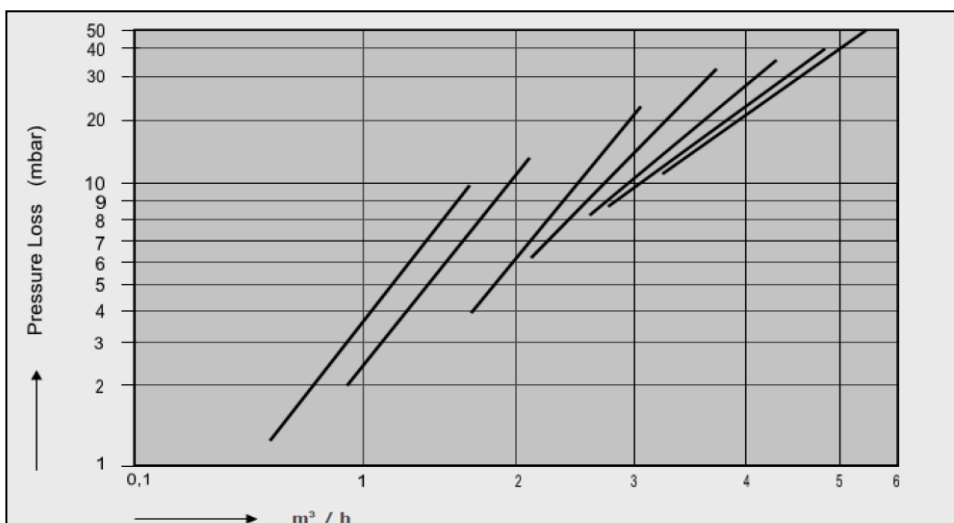


fig.04

## Operating Instructions

### **KY Series Boiler – General features**

- KY series solid fuel fired boiler is designed for heating both residential and industrial buildings.
- Besides professional installation, precondition for correct functioning of the boiler is the required chimney thrust and correct operation.
- KY series solid fuel fired boiler is designed for heating systems which are suitable for forced circulation systems only.
- KY series boilers are available in seven output series ( determined by the number of segments 3, 4,5,6, 7, 8 and 10 ) from 13,8 to 50 kW.
- The cast iron boiler body comprises of segments and serves as a combustion chamber ( including combustion gases routes ), and at the same time as a water reservoir ( including water routes ). Segments are of three types – front and rear, inserted between which are 1 to 8 middle segments (of the same kind). By assembling and joining together an appropriate number of segments, a boiler body of the required size is constructed ( both the combustion chamber and the water reservoir ). Assembled boiler body is equipped with necessary pipe sections for water connection. It also has brackets for fitting thermostat sensors and brackets on feet for fastening the boiler to the base. Attached to the cast iron boiler body are sheet metal covers which are fitted on the inside with thermal insulation.
- To ensure that the boiler functions correctly and runs economically, it is important that its nominal output is equal to the thermal losses of the heated premises.
- Choosing a boiler of insufficient output will result in inadequate heating of the premises, and thus failure to provide a heating comfort.
- Choosing a boiler of unnecessarily high output will result in the boiler not running in full output, and as a consequence in tarring and dewing.

### **Recommended fuel**

- Recommended fuels for KY boilers are coal, coke and firewood.
- Optimal coal and coke granularity is 24 – 60 mm.
- Optimal firewood size is logs of diameter 40 – 100 mm. Their length will depend on how many segments the boiler have.
- Fuel must be stored in a dry place. To reach the boiler nominal output, water content in firewood must not exceed 20% .
- Approximate stoking intervals ( referred to as Burning Time ) are shown in the Technical Data Table on page 4.
- The boiler is stoked manually.

### **Please note**

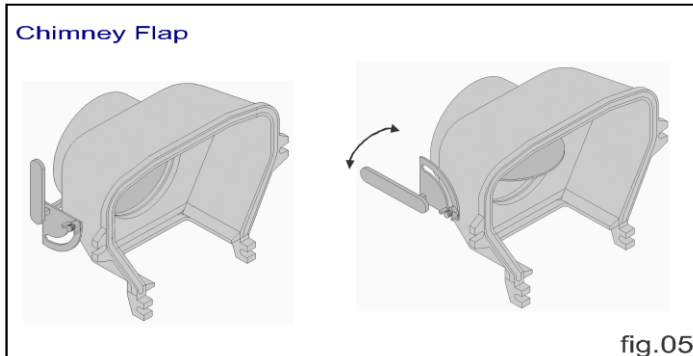
The boiler is not intended for burning any type of waste.



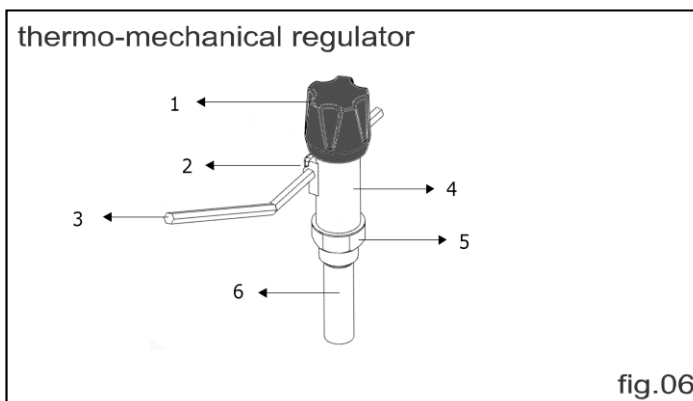
## Control and safety devices

KY boilers are equipped with three main control elements:

A **chimney flap ( Fig. 5 )**, by means of which the chimney thrust can be controlled, i.e. the discharge of combustion fumes into the chimney. The flap is situated in the flue neck of the boiler, and is controlled manually.



Another thrust control element is a **thermo-mechanical output regulator (Fig. 6)**. It is situated on the outlet from the boiler cast iron body. It detects temperature of the hot water and regulates the supply of primary combustion air to underneath the boiler stoker, by opening or shutting a flap situated in the ashtray door.

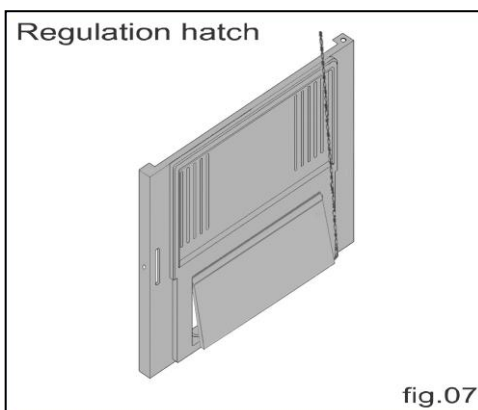


- 1 . Regulation Head
- 2 . Arm holder
- 3 . Arm
- 4 . Regulator body
- 5 . Hexagon
- 6 . Pit



- When fitting the safety and the control elements remember to meet the principles of work safety.
- If replacing of safety device and of thermo - mechanical output regulator is necessary, please use recommended devices in case of using any other type of the device negotiate with ÖNMETAL.
- Functionality of thermo-mechanical output regulator (SATROM) must be checked or inspected by authorized person once in a year.

Changing the hatch position controls the combustion intensity and thus the boiler output. The thermo mechanical output regulator is connected with the regulating hatch by chain. The chain is connected to the hatch in such a way that its tension can be set ( Fig. 7 ).

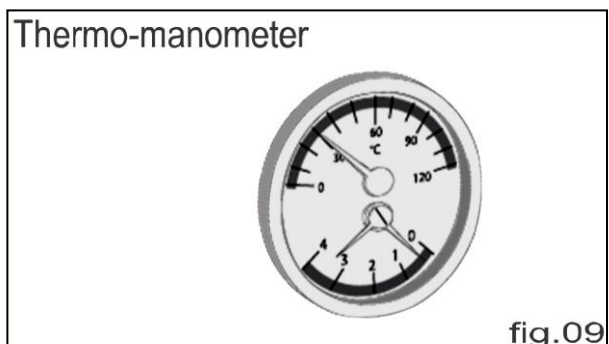


Keep object's away from regulation hatch's front and channels for allowing primary air transfer.

Supply of secondary combustion air is controlled by an air rosette ( Fig. 8 ), situated in the boiler's stoking door, which has a direct effect on the level of emission.



Hot water temperature can be checked on a thermo-manometer (Fig. 9), which is situated in the front boiler cover above the stoking door.



## Temperature safety valve

The KY boilers are equipped with a safety valve (**Fig.10**) which ensures dissipation of excessive heat without additional device and supply of external energy in such a way that the maximum permissible boiler temperature of 95°C is not exceeded. A temperature safety valve must be connected to the inlet - outlet connections of the boiler.

### Please note

- It is not permissible to reverse the flows, the indications for inlet and drain shown on the valve must be followed.
- Maximum temperature of the input water for temperature safety valve is 15 °C and minimum water pressure is 2 bar.
- Functionality of safety device ( caleffi 544 ) must be checked or inspected by authorized person once in a year.

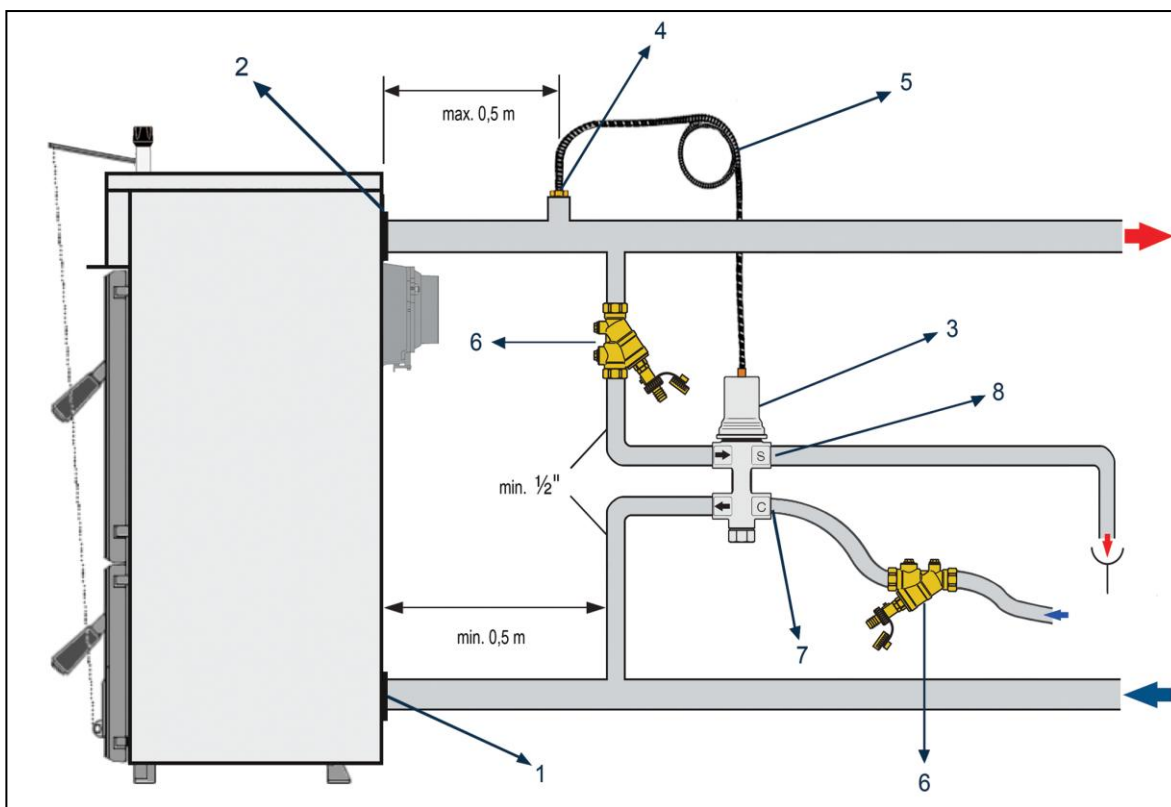


fig. 10

1. Heating water inlet
2. Heating water outlet
3. Safety device ( caleffi 544 ) - max. working pressure : 6 bar
4. Safety device probe ½"
5. Safety device probe capillary
6. Filter
7. Cooling water inlet ½"
8. Safety heat outlet ( drain) ½"

## Hydraulic Connection Diagram

It is suggested hydraulic system should be installed according to following schemes.

### Open Expansion Tank System

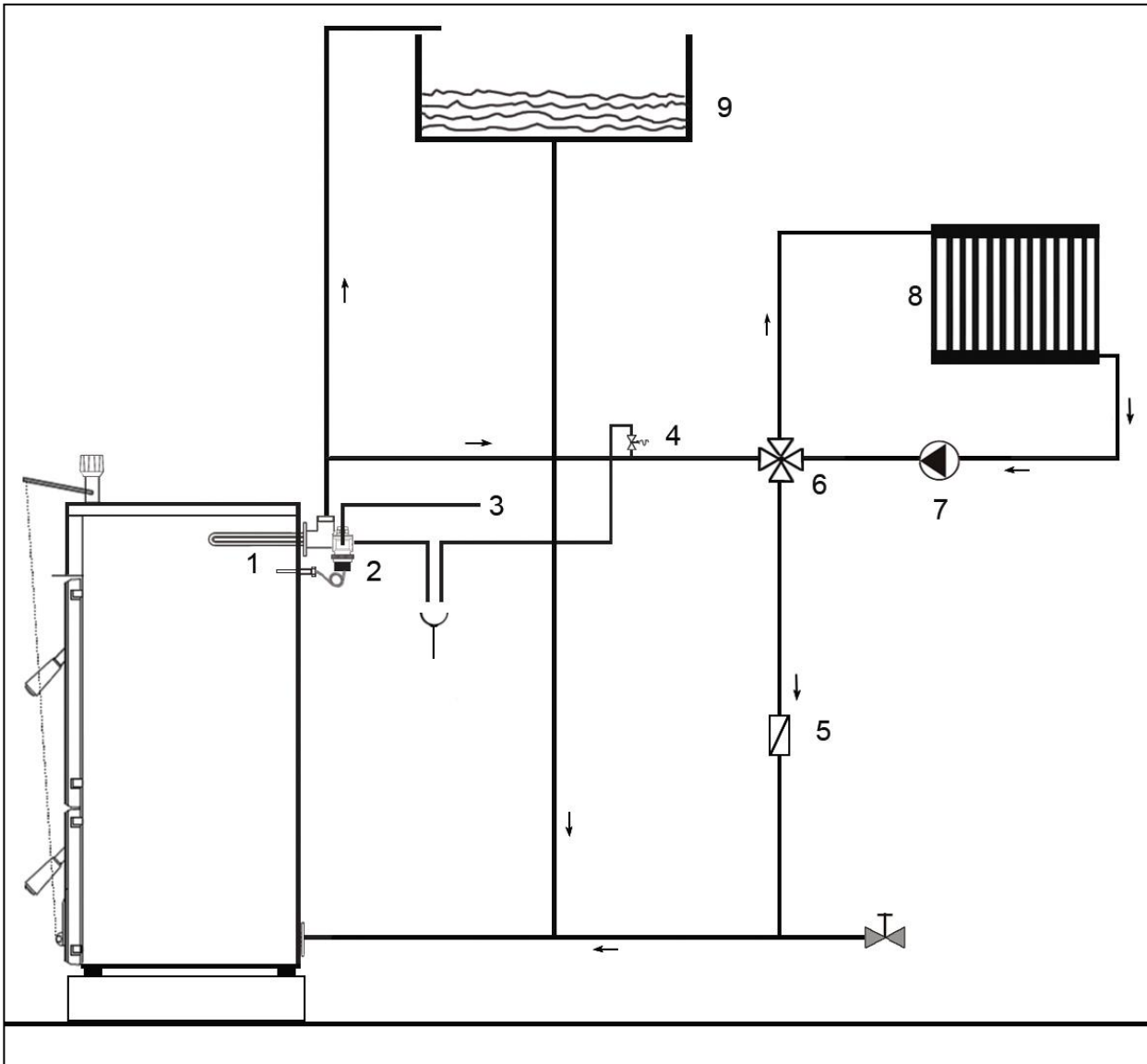


fig. 11

1. Safety Heat Exchanger (SHT)
2. Safety Valve (TS 131 , STS 20 )
3. Water Supply
4. System Safety Valve ( 3 bar - 1/2" )
5. Check Valve
6. Mixing Valve
7. System Pump
8. Heating System
9. Open Expansion Tank

Open-type expansion tank must be equipped with the highest level in the entire hydraulic system.

The expansion tank must be selected properly against the changes in water volume resulting from heating and cooling.

The expansion tanks and their connecting pipes must be protected against to freezing

Diameter of drainage pipe must be selected properly against to overflow into tank.

## Putting the boiler into service

### Checking the boiler before turning it on

Before putting the boiler into operation, the service technician must check:

- Whether the installation conforms with the design;
- Whether the boiler has been filled in and is under pressure (on the thermo - manometer ), and whether there are any leakage in the heating system;
- Connection to the chimney - connection must be approved by an authorized chimney sweep ( chimney inspection);
- Functioning of the heating controls.

#### Please note

The service technician must show the user how to control the boiler and enter the date when the boiler was put into service into the Warranty Certificate.

### Filling up and draining the heating system

The system can only be filled up or topped up with water which meets the parameters specified by EN standards. The water must be clear, colourless, free of suspended particles, oil and chemically corrosive substances, and must not be acidic ( pH factor must be greater than 7.2 ). First of all, the heating system must be thoroughly flushed and all dirt washed out.

#### Please note

Water in system must not be reduced or put out unless the boiler is in service or under freezing danger. Against freezing anti-freeze liquid can be added in to system water at the rate of % 15.

#### Please note

The failure to meet this requirement may lead to the heat exchanger getting clogged up, and the cast iron block may crack as a result.

During the heating season, a constant volume of water must be maintained inside the heating system. When topping up water, care must be taken that no air is sucked into the system. Water must never be let out of the boiler or the heating system, unless it is absolutely essential, such as before repairs, etc. Draining water and refilling the system with new water increases the risk of corrosion and formation of incrustation.

#### Please note

Filling or topping up water to the heating system must always be done with the boiler cold or cooled down; otherwise the boiler segments may crack !

## Operation and controls

### Starting a fire

Check on the thermo -manometer whether there is enough water in the heating system. Open the shutting valve between the boiler and the heating system. Spread paper on top of the clean stoker and then enough finely chopped wood. Open the flue flap in the chimney adapter and shut the stoking door. Light the paper through the open ashtray door and fully open the regulating flap in the ashtray door. The fire has caught up enough, stoke a layer of main fuel on top of the burning firewood. When the fire is powerful enough, stoke more fuel right up to the bottom edge of the stoking door and level it into.

Provide an even layer throughout the entire boiler depth. If the fuel suddenly turns into dark red blaze, open partially the secondary air supply rosette in the stoking door. When the flame turns yellow, shut the secondary air supply rosette again. When the boiler has reached the required output, it is suitable to partially shut the flue thrust flap to prevent heat from unnecessarily escaping into the chimney.



- Do not start the boiler without connecting the boiler to the chimney.
- Control chimney connections before starting the boiler.
- Adjust the chimney blow as requested level. If chimney blow is under mentioned levels try not to use the boiler.

### Setting the outlet water temperature

When the required outlet water temperature is say 60 °C, heat up the boiler to a temperature for instance 5 °C higher than the required temperature of 60 °C (measured on the thermometer on the boiler outlet pipe). Then turn the control knob to 65 °C and check whether the chain is stretched and the regulating hatch completely shut. This position of the chain and regulating hatch is fine-adjusted by turning the control knob. Then let the regulation process work. When the water temperature drops, the regulating hatch will start opening by the tension applied by the regulator on the chain. When the water temperature suddenly rises, the regulating hatch will start opening. And the hot water temperature on the boiler outlet is controlled.

### Stoking

First shut the regulating hatch; this will shut supply of combustion air into the boiler. Then open the chimney flap completely. Partially open the stoking door and wait until all combustion gases have been sucked from the combustion chamber into the chimney. Only then open the stoking door completely and start stoking the boiler. After shutting the stoking door, set the chimney flap again and restore the functioning of the regulating hatch.



- Boiler doors must not be held open as the boiler is continuously working.
- Provide a minimum 5 cm gap to be between top point of the fuel and ceiling of stoking chamber when boiler is stoked.

### Overnight heating mode

This mode is used when you want to maintain the fire in the boiler for instance over night. First scrape all ash out of the combustion chamber, with the chimney flap completely opened. Then stoke the boiler with fuel and shut the boiler up completely. Then shut the chimney flap and also almost shut the regulating hatch. This will reduce the chimney thrust and restrict the supply of combustion air. Shut also the secondary air supply rosette in the stoking door. To restore the boiler's required output, just open the chimney flap and partially open the regulating hatch to the required boiler output.

### Removing solid combustion residuals

This is done by removing and emptying the ashtray situated underneath the stoker in the ash compartment. This must be done on a regular basis to prevent ash from accumulating and blocking the supply of air to the combustion chamber from underneath the stoker.

## **Dewing and tarring**

When starting fire in a cold boiler, water condensates on the walls and runs down into the ash compartment, which may make an impression that the boiler is leaking. This dewing will disappear after the ashtray has settled on the boiler's inside walls. When running the boiler with low water temperature usually below 65°C, or when using damp fuel, water condensates in combustion gases and the condensate runs down the boiler's cold walls. Low temperature heating also reduces the chimney life. Therefore it is recommended to equip the boiler with for instance a four-way blending valve which will ensure that the temperature of return water does not drop below 50°C. Boiler tarring occurs under similar conditions (lack of combustion air, the boiler is choking). To prevent dewing and tarring, we recommend you run the boiler at temperatures higher than 65 °C and choose a boiler to match the required heating system output. An oversized boiler suffers unnecessarily, because it has to be run at low temperatures.

## **Boiler shutdown**

We do not recommend that you try to speed up the boiler combustion process. The fuel must burn completely on its own on the stoker.

## **Short term shutdown**

After shutting the boiler down, clean it, remove all combustion residuals, empty the ashtray, clean the stoking door contact surfaces and the ash compartment, and then shut the boiler's stoking door and ash compartment door.

## **Long term shutdown**

When shutting the boiler down for a protracted period of time (heating season end), the boiler must be thoroughly cleaned from all soot and ash sediments, in which dampness accumulates and causes excessive corrosion of the boiler body.

## **Important information**

- The boiler may only be operated by an adult person familiar with these Operating Instructions.
- Shut the boiler down every time there are any (even temporary) flammable or explosive fumes present on the premises from which combustion air is supplied to the boiler (e.g. From paint when painting, laying and spraying molten substances, from gas leakage, etc.).
- It is forbidden to light the boiler with explosive substances.
- It is forbidden to overheat the boiler.
- At the end of the heating season the boiler, flue and flue adapter, must be thoroughly cleaned. Lubricate all hinges, the flue flap mechanism and other moving.

## Boiler cleaning

When the boiler is used, soot and fine ash accumulates on the boiler walls, mainly on heat exchanger ribs and in the flue neck, which reduces heat transfer and the boiler output. The actual quantity of soot and fine ash will depend on the quality of the fuel used and on the boiler operating conditions.

If the boiler is oversized or was for some reason run at low temperatures, more soot is generated. This may also result in inadequate chimney thrust.

The boiler must be cleaned regularly, at least once a month, which is done with a steel brush through an open boiler door.

After taking front section plate off, all boiler walls inside the combustion chamber and combustion gases routes should be cleaned. If a larger quantity of tar has accumulated on internal walls of the combustion chamber, it must be removed with a scraper or burnt with hard wood ( or coke ), running the boiler at maximum operating temperature.

### Please note

Ashes should be stored ( by using proper glove ) in a noncombustible container properly and transported outdoors. Other waste must not be stored in this container.

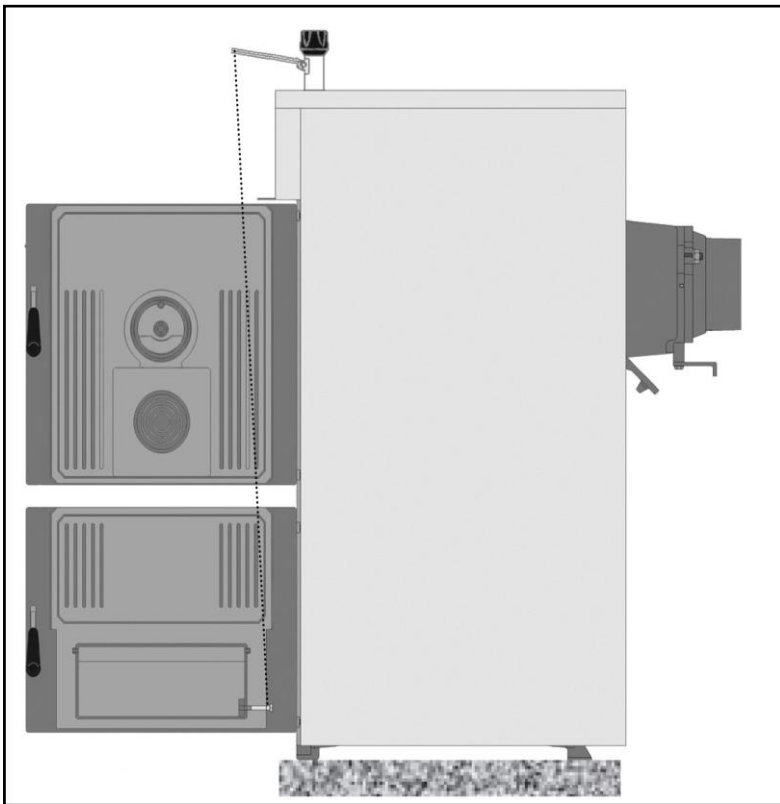


fig.12

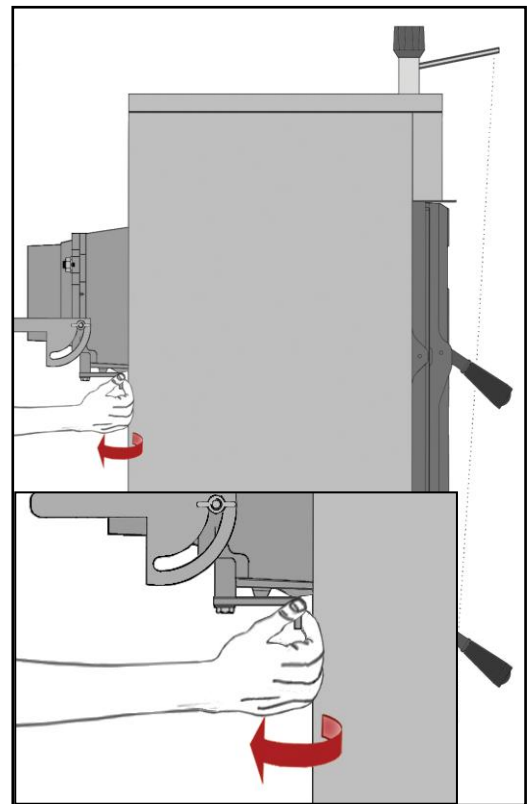


fig.13



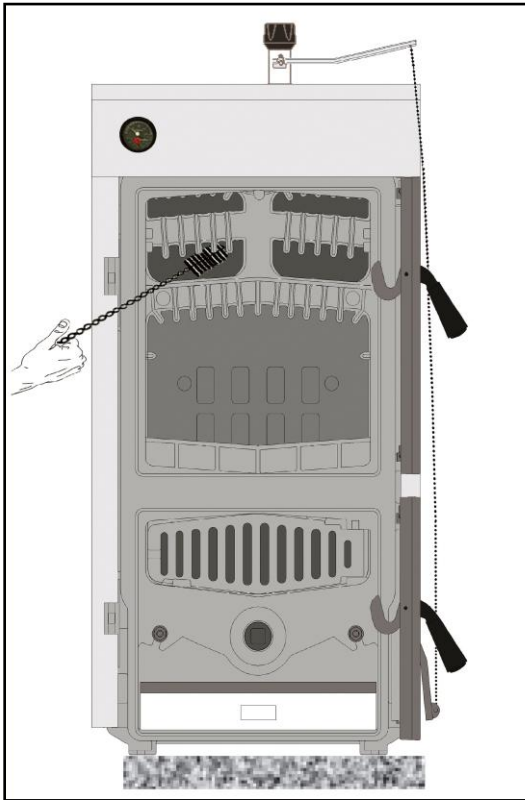


fig.14

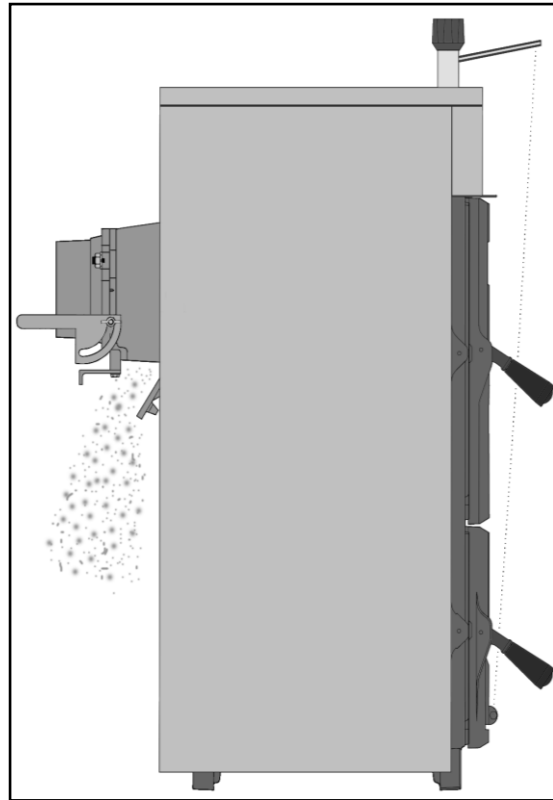


fig.15

### Boiler repairs

The boiler may be repaired by an authorized service technician or organisation only. The user or owner may do only normal maintenance and simple replacements of some parts—e.g. sealing cords.

### Please note

When repairing the boiler, original parts must always be used.

### Warranty and Warranty Conditions

KY boilers are covered by warranty specified in the Warranty Certificate, Service Book and User and Installation Guide ( chapter Introduction, Installing the boiler ).

### Boiler delivery

Rima KY boilers are supplied completely assembled and functionally tested.

### The delivery includes :

1. Boiler
2. Operating and Installation Instructions
3. Service Book
4. List of service centres
5. Warranty Certificate
6. Thermo-mechanical output regulator
7. Cleaning kit (brush, poker)

## Installation Instructions

### **Boiler installation - General information**

Rima KY boilers must be put into service by an authorized services. A network of authorized service organisations which meet these conditions is available for all boiler installations, putting them into service and for warranty repairs. These networks are organised by Önmatal's agreed distributors outside of Turkey.

The boiler is designed to supply heating systems with gauge pressure up to 400 kPa which use water that meets the requirements of related standards ( under no circumstances may the water be acidic, i.e. it must have  $pH > 7$ , and it should have minimum carbon hardness).

The heating system must be designed in such a way that hot water can circulate all the time through at least some of the radiators.

Antifreeze fluids – because of their unsuitable properties, we do not recommend to use them. They have a reduced ability to transfer heat, have large volumetric expansion, age and damage rubber components. If under concrete circumstances there is no other option how to reliably prevent .

Before final installation, the heating system distribution piping must be flushed several times with pressurised water. In old, already used systems, the flushing must be done in opposite direction to the hot water circulation. In new systems, all radiators must be cleaned from conservation material and rinsed with warm water under pressure.

We recommend installing a sludge trap upstream of the boiler (i.e. on hot water return pipe ). The sludge trap design should allow emptying in regular intervals, without the need to drain a lot of hot water. The sludge trap may be combined with a filter; however, a filter alone will not provide an adequate protection.

#### **Please note**

System must be connected to open expansion tank for safety reasons.

Any valve must not be connected to safety input and safety output lines.

For increasing safety of the system, by-pass line must be installed on the line between input and output of circulation pumps, as shown in diagrams.

By-Pass line's valve must be kept closed as the boiler is working normally.

By-Pass line's valve can be used in electricity problems and must be opened if there is a risk of overheating in system water caused by an electricity cut or problem.

The pipe used in by-pass line must be at least in the diameter of plumbing systems pipe.

UPS (Power Supply Units) can be used for preventing electricity problems.

#### **Please note**

Any problems (malfunctions) caused by boiler clogging with dirt from the heating system and/or malfunctions induced by clogging, are not covered by the boiler warranty.

#### **Please note**

The filter as well as the sludge trap must be checked and cleaned regularly.

### **Heating water requirements**

Heating water requirements are specified in EN Standards. When the sum of concentrations of calcium and magnesium in the water exceeds 1.8 mmol/l , additional non - chemical treatments preventing lime deposition must be considered (e.g. Magnetic or electrostatic field treatment).

### **Boiler location**

KY boilers can be located both on non-habitable premises ( e.g. in boiler room, cellar, corridor...) and in habitable rooms. The room in which the boiler is located must have a permanent supply of air necessary for the combustion process. The air must be free of halogen hydrocarbons and corrosive vapours, and must not be excessively humid and dusty. The room must be protected against frost, with ambient temperature within the range +5 °C to +35 °C and relative humidity not exceeding % 80.

To comply with fire regulations, the boiler must be installed:

- on floor constructed of non-flammable material
- on a non-flammable material overlapping the boiler footprint by 20 mm on each side and covering the entire depth of the boiler body.
- if the boiler is installed in a cellar, we recommend to put it on a socket at least 50 mm high, positioning the boiler in the middle

To comply with standards, at least 600 mm manipulation space must be left in front of the boiler. Minimum distance between the back of the boiler and the wall must be also 600 mm, and a free space of at least 600 mm must be left between one side of the boiler and the wall, to allow access to the rear of the boiler. Fuel must not be stacked directly behind or next to the boiler at a distance less than 800 mm. If there are two boilers in the boiler room, no fuel is allowed to be stacked between them. We recommend to keep a minimum distance of 800 mm between the boiler and fuel ( **Fig. 16** ), or keep fuel in a room other than the one in which the boiler is installed.



\* Do not put flammable materials on top of the boiler or near the boiler than specified safety distance.

### Minimum Distances

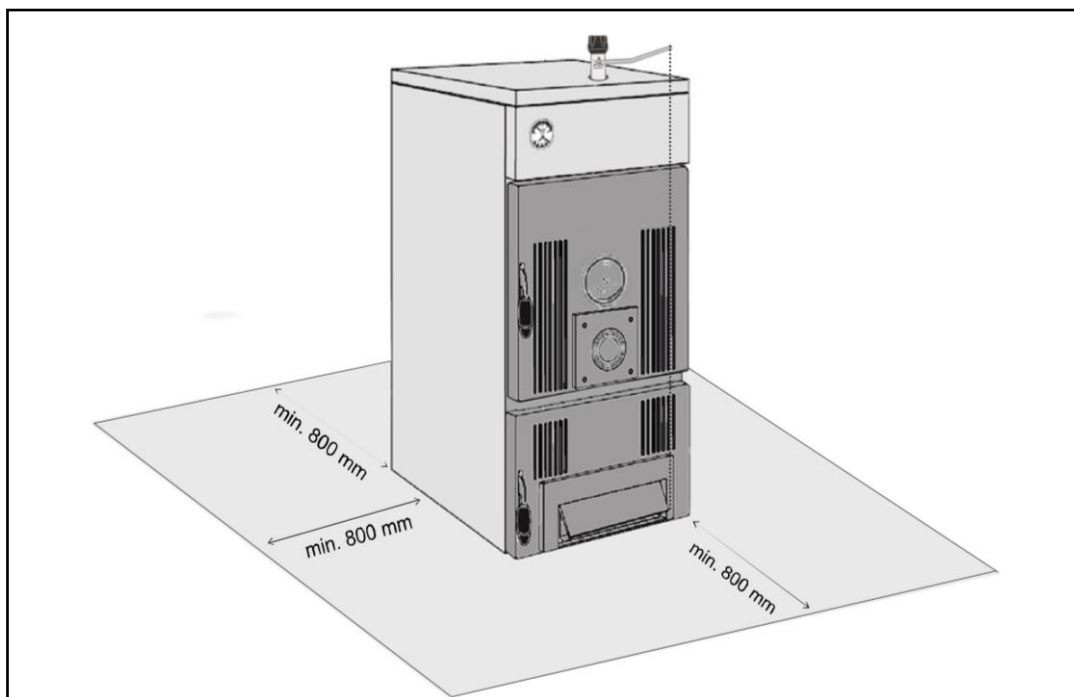


fig.16

( Fig. 17 ) illustrates minimum distances which must be kept in order to ensure safe operation of the boiler room and allow manipulations with the boiler, such as cleaning and stoking. The distance between the front of the boiler and the wall should be at least the boiler length  $L$  plus 500 mm. Minimum distances between the boiler side and rear should be 800 mm, with the distance of the rear also determined by the way the boiler is connected to the chimney.

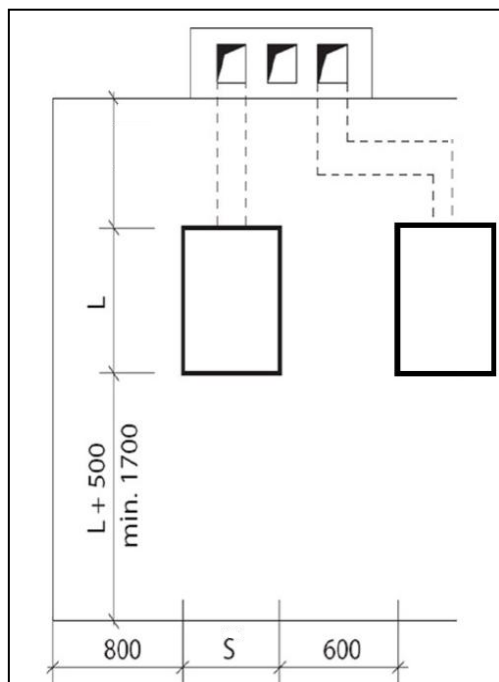


fig.17



- Do not touch hot water connections or the flue outlet when the boiler is operating.

### Installation procedure

- Place the boiler body on a non - flammable materials.
- Install a temperature safety valve. Watch for the arrow indicating the water flow direction. It must be as shown in fig 10.
- After connecting the boiler to the heating system, screw filling and drain stopcocks into the back section.
- Screw the flue adapter with smoke flap onto the boiler combustion gases outlet.
- Put a flue over the flue adapter and insert it into the chimney connection hole. The flue diameter is 150 mm
- Install a thermo-mechanical output regulator into the opening in the top part of the front section.
- We recommend fitting shutting valves on the hot water inlet and outlet, without which it would be necessary to drain the entire heating system before the filter can be cleaned.
- No shutting valve may be installed between the boiler and the expansion vessel.

KY boiler parts

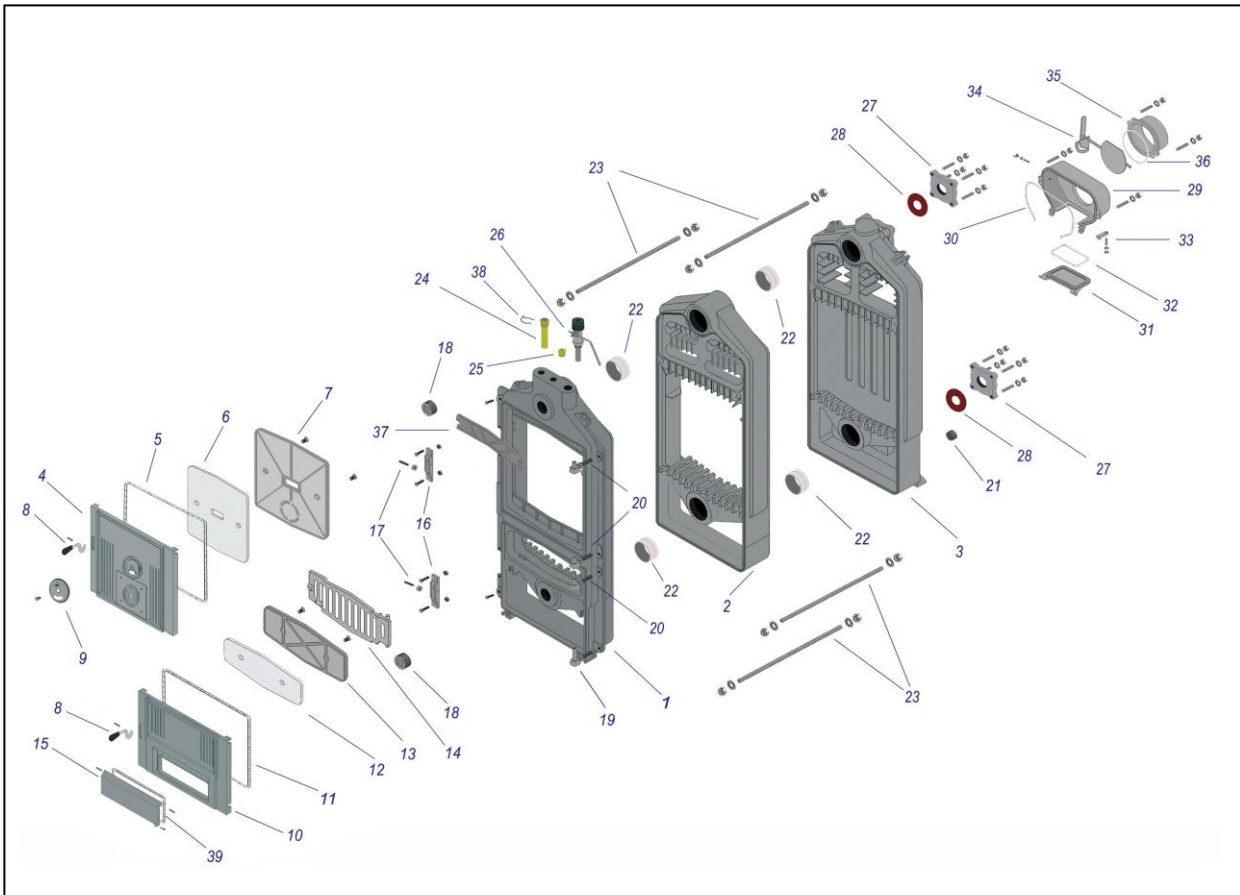


fig.18

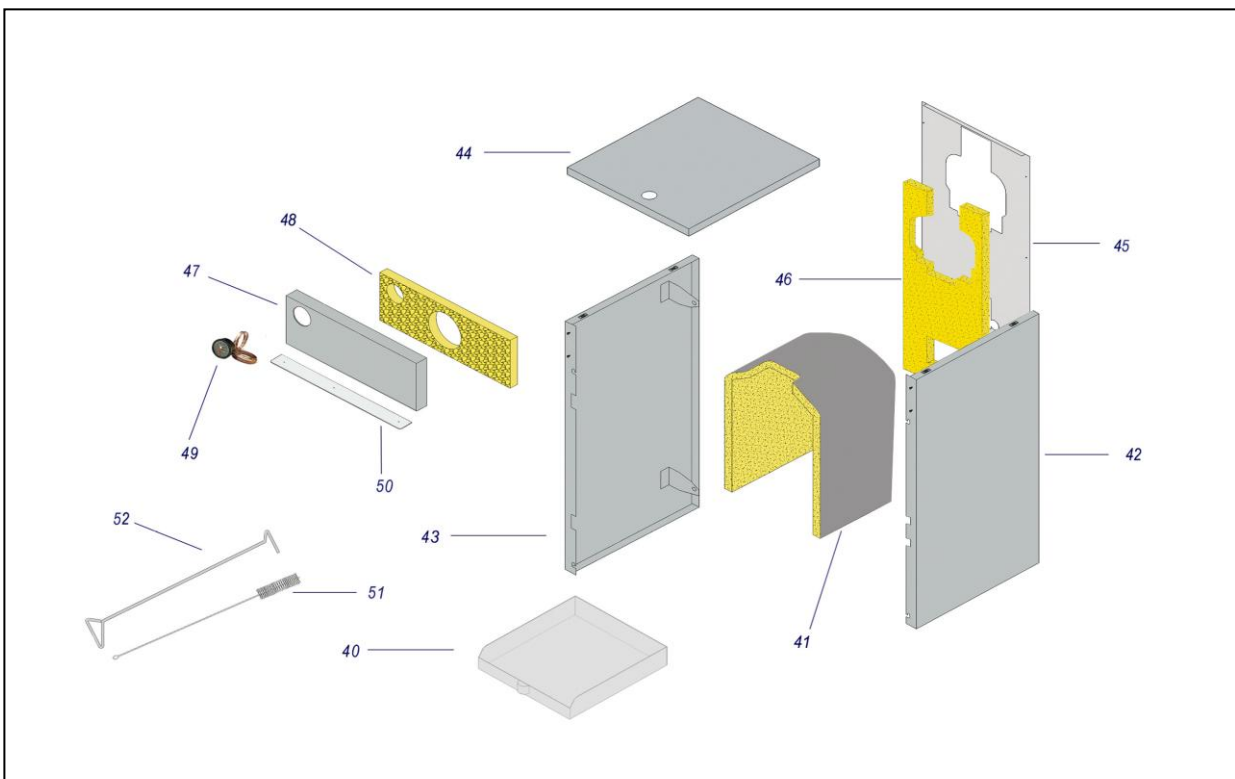


fig.19

## Spare parts list

ITEM	DESCRIPTION	DRAWING NO	PART NUMBER						
			KY - 03	KY - 04	KY - 05	KY - 06	KY - 07	KY - 08	KY - 10
1	FRONT SECTION	KY 002700111	KY-MD.060	KY-MD.060	KY-MD.060	KY-MD.060	KY-MD.060	KY-MD.060	KY-MD.060
2	MIDDLE SECTION	KY 002700112	KY-MD.050	KY-MD.050	KY-MD.050	KY-MD.050	KY-MD.050	KY-MD.050	KY-MD.050
3	BACK SECTION	KY 002700113	KY-MD.070	KY-MD.070	KY-MD.070	KY-MD.070	KY-MD.070	KY-MD.070	KY-MD.070
4	STOKING DOOR	KY 002700114	KY-PD.010	KY-PD.010	KY-PD.010	KY-PD.010	KY-PD.010	KY-PD.010	KY-PD.010
5	STOKING DOOR ISOLATION ROPE	KY 002700115	KY-CY.011	KY-CY.011	KY-CY.011	KY-CY.011	KY-CY.011	KY-CY.011	KY-CY.011
6	STOKING DOOR ISOLATION	KY 002700116	KY-SE.012	KY-SE.012	KY-SE.012	KY-SE.012	KY-SE.012	KY-SE.012	KY-SE.012
7	STOKING DOOR ISOLATION COVER	KY 002700117	KY-PD.013	KY-PD.013	KY-PD.013	KY-PD.013	KY-PD.013	KY-PD.013	KY-PD.013
8	DOOR HANDLE	KY 002700118	KY-BD.014	KY-BD.014	KY-BD.014	KY-BD.014	KY-BD.014	KY-BD.014	KY-BD.014
9	AIR ROSETTE	KY 002700119	KY-PD.015	KY-PD.015	KY-PD.015	KY-PD.015	KY-PD.015	KY-PD.015	KY-PD.015
10	ASHTRAY DOOR	KY 002700120	KY-PD.020	KY-PD.020	KY-PD.020	KY-PD.020	KY-PD.020	KY-PD.020	KY-PD.020
11	ASHTRAY DOOR ISOLATION ROPE	KY 002700121	KY-CY.021	KY-CY.021	KY-CY.021	KY-CY.021	KY-CY.021	KY-CY.021	KY-CY.021
12	ASHTRAY DOOR ISOLATION	KY 002700122	KY-SE.022	KY-SE.022	KY-SE.022	KY-SE.022	KY-SE.022	KY-SE.022	KY-SE.022
13	ASHTRAY DOOR ISOLATION COVER	KY 002700123	KY-PD.023	KY-PD.023	KY-PD.023	KY-PD.023	KY-PD.023	KY-PD.023	KY-PD.023
14	GRID	KY 002700124	KY-PD.030	KY-PD.030	KY-PD.030	KY-PD.030	KY-PD.030	KY-PD.030	KY-PD.030
15	REGULATION HATCH	KY 002700125	KY-PD.024	KY-PD.024	KY-PD.024	KY-PD.024	KY-PD.024	KY-PD.024	KY-PD.024
16	DOOR LOCK SOCKET	KY 002700126	KY-PD.040	KY-PD.040	KY-PD.040	KY-PD.040	KY-PD.040	KY-PD.040	KY-PD.040
17	DOOR LOCK CYLINDER	KY 002700126	KY-DT.041	KY-DT.041	KY-DT.041	KY-DT.041	KY-DT.041	KY-DT.041	KY-DT.041
18	STOPPER 1 1/4	KY 002700127	KY-SD.080	KY-SD.080	KY-SD.080	KY-SD.080	KY-SD.080	KY-SD.080	KY-SD.080
19	LONG LOCK HINGE (35)	KY 002700128	KY-ST.090	KY-ST.090	KY-ST.090	KY-ST.090	KY-ST.090	KY-ST.090	KY-ST.090
20	SHORT LOCK HINGE (24)	KY 002700128	KY-ST.091	KY-ST.091	KY-ST.091	KY-ST.091	KY-ST.091	KY-ST.091	KY-ST.091
21	STOPPER 1/2	KY 002700127	KY-SD.085	KY-SD.085	KY-SD.085	KY-SD.085	KY-SD.085	KY-SD.085	KY-SD.085
22	NIPPLE	KY 002700129	KY-ST.110	KY-ST.110	KY-ST.110	KY-ST.110	KY-ST.110	KY-ST.110	KY-ST.110
23	CONNECTION ROD	KY 002700130	KY-ST.123	KY-ST.124	KY-ST.125	KY-ST.126	KY-ST.127	KY-ST.128	KY-ST.130
24	THERMOSTAT BULB	KY 002700131	KY-PM.140	KY-PM.140	KY-PM.140	KY-PM.140	KY-PM.140	KY-PM.140	KY-PM.140
25	THERMOMANOMETER CHECK VALVE	KY 002700132	KY-PM.131	KY-PM.131	KY-PM.131	KY-PM.131	KY-PM.131	KY-PM.131	KY-PM.131
26	THERMOSTATIC REGULATOR	KY 002700133	KY-IM.150	KY-IM.150	KY-IM.150	KY-IM.150	KY-IM.150	KY-IM.150	KY-IM.150
27	WATER INLET - OUTLET FLANGE	KY 002700134	KY-PD.215	KY-PD.215	KY-PD.215	KY-PD.215	KY-PD.220	KY-PD.220	KY-PD.220
28	FLANGE GASKET	KY 002700135	KY-KC.300	KY-KC.300	KY-KC.300	KY-KC.300	KY-KC.300	KY-KC.300	KY-KC.300
29	CHIMNEY ADAPTER	KY 002700136	KY-PD.400	KY-PD.400	KY-PD.400	KY-PD.400	KY-PD.400	KY-PD.400	KY-PD.400
30	CHIMNEY ADAPTER ISOLATION ROPE	KY 002700137	KY-PD.401	KY-PD.401	KY-PD.401	KY-PD.401	KY-PD.401	KY-PD.401	KY-PD.401
31	CHIMNEY CLEANING DOOR	KY 002700138	KY-PD.402	KY-PD.402	KY-PD.402	KY-PD.402	KY-PD.402	KY-PD.402	KY-PD.402
32	CHIMNEY CLEANING DOOR ISOLATION ROPE	KY 002700139	KY-PD.403	KY-PD.403	KY-PD.403	KY-PD.403	KY-PD.403	KY-PD.403	KY-PD.403
33	CHIMNEY CLEANING DOOR LOCK	KY 002700138	KY-PD.404	KY-PD.404	KY-PD.404	KY-PD.404	KY-PD.404	KY-PD.404	KY-PD.404
34	CHIMNEY FLAP	KY 002700140	KY-PD.405	KY-PD.405	KY-PD.405	KY-PD.405	KY-PD.405	KY-PD.405	KY-PD.405
35	CHIMNEY	KY 002700141	KY-PD.450	KY-PD.450	KY-PD.455	KY-PD.455	KY-PD.455	KY-PD.455	KY-PD.455
36	CHIMNEY ISOLATION ROPE	KY 002700142	KY-PD.451	KY-PD.451	KY-PD.451	KY-PD.451	KY-PD.451	KY-PD.451	KY-PD.451
37	FRONT SECTION CLEANING PLATE	KY 002700143	KY-PD.061	KY-PD.061	KY-PD.061	KY-PD.061	KY-PD.061	KY-PD.061	KY-PD.061
38	THERMOSTAT BULB SEGMENT	KY 002700144	KY-ST.141	KY-ST.141	KY-ST.141	KY-ST.141	KY-ST.141	KY-ST.141	KY-ST.141
39	REGULATION HATCH ISOLATION ROPE	KY 002700145	KY-CY.025	KY-CY.025	KY-CY.025	KY-CY.025	KY-CY.025	KY-CY.025	KY-CY.025
40	ASHTRAY	KY 002700146	KY-ST.503	KY-ST.504	KY-ST.505	KY-ST.506	KY-ST.507	KY-ST.508	KY-ST.510
41	CASTING BODY INSULATION	KY 002700147	KY-CY.553	KY-CY.554	KY-CY.555	KY-CY.556	KY-CY.557	KY-CY.558	KY-CY.560
42	RIGHT SIDE COVER PANEL	KY 002700148	KY-ST.603	KY-ST.604	KY-ST.605	KY-ST.606	KY-ST.607	KY-ST.608	KY-ST.610
43	LEFT SIDE COVER PANEL	KY 002700148	KY-ST.653	KY-ST.654	KY-ST.655	KY-ST.656	KY-ST.657	KY-ST.658	KY-ST.660
44	TOP COVER PANEL	KY 002700149	KY-ST.703	KY-ST.704	KY-ST.705	KY-ST.706	KY-ST.707	KY-ST.708	KY-ST.710
45	REAR COVER PANEL	KY 002700150	KY-ST.900	KY-CY.900	KY-CY.900	KY-CY.900	KY-CY.900	KY-CY.900	KY-CY.900
46	REAR COVER PANEL ISOLATION	KY 002700151	KY-CY.901	KY-CY.901	KY-CY.901	KY-CY.901	KY-CY.901	KY-CY.901	KY-CY.901
47	FRONT COVER PANEL	KY 002700152	KY-ST.753	KY-ST.753	KY-ST.753	KY-ST.753	KY-ST.753	KY-ST.753	KY-ST.753
48	FRONT COVER PANEL ISOLATION	KY 002700153	KY-CY.763	KY-CY.763	KY-CY.763	KY-CY.763	KY-CY.763	KY-CY.763	KY-CY.763
49	THERMOMANOMETER	KY 002700154	KY-IM.160	KY-IM.160	KY-IM.160	KY-IM.160	KY-IM.160	KY-IM.160	KY-IM.160
50	PROTECTION STEEL SHEET	KY 002700152	KY-ST.773	KY-ST.773	KY-ST.773	KY-ST.773	KY-ST.773	KY-ST.773	KY-ST.773
51	CLEANING BRUSH	KY 002700155	KY-ST.803	KY-ST.804	KY-ST.805	KY-ST.806	KY-ST.807	KY-ST.808	KY-ST.810
52	MIXING ROD	KY 002700155	KY-ST.903	KY-ST.904	KY-ST.905	KY-ST.906	KY-ST.907	KY-ST.908	KY-ST.910

fig.20

**NOTE :** The heat can be supplied for example by an accumulator tank. The following applies as a reference for the minimum storage boiler content :

$$V_{sp} = 15T_b \times Q_N ( 1-0,3 \times (Q_H/Q_{min}))$$

- $V_{Sp}$  : Accumulator tank capacity in L
- $Q_N$  : Nominal heat output in kW
- $T_B$  : Burning period in h
- $Q_H$  : Heating load of the premises in kW
- $Q_{min}$  : Minimum heat output in kW

Heating boilers using several allowable fuels should have the tank size based on the fuel which requires the largest accumulator tank.

The accumulator tank is not necessary when the required volume is less than 300 L.

### Transportation and storage

The manufacturer handles the boiler that is on a pallet and secured against shifting (with screws).The boiler may not be transported in a different position than on its base.

At least regular storage conditions shall be ensured during boiler storage and transportation (non- aggressive environment, air humidity lower than 75 %, temperature range from 5 °C to 55 °C, low dustiness and preventing influence of biological factors).

The force may not be applied on the boiler coverings and panel during storage and transportation.



Boiler must not be carried or transported without using forklifts, transpallettes or other wheeled carrying vehicles.

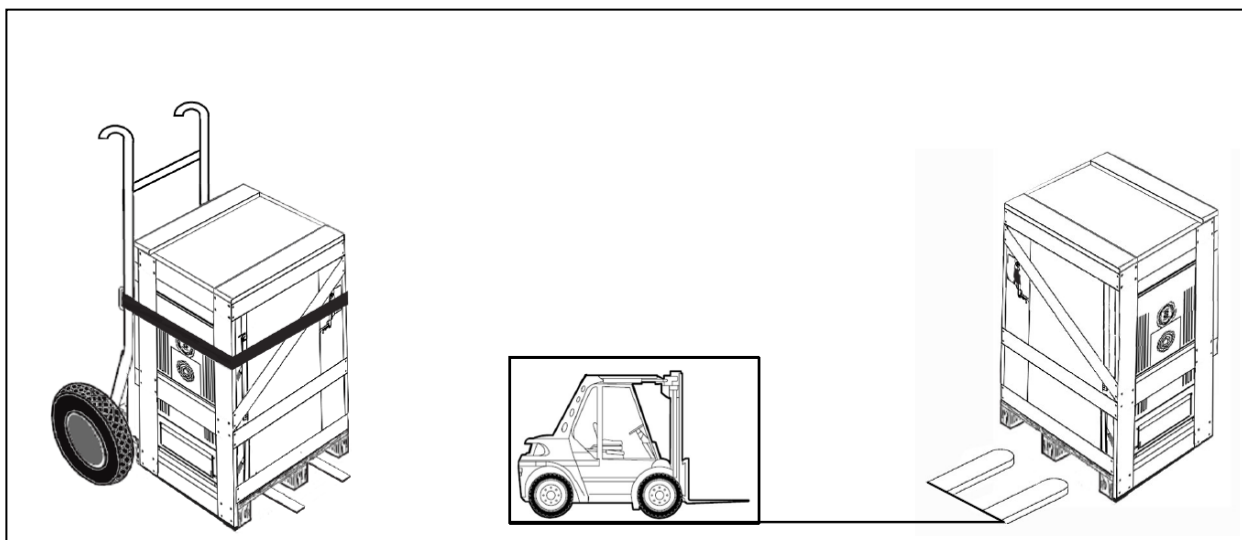
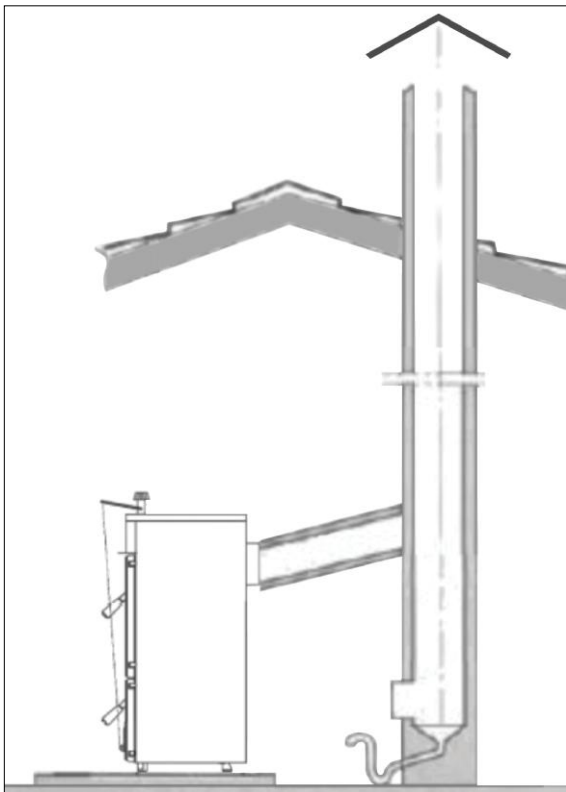


fig.21

### Flue Pipe Installation

**Fig. 23** shows the proper flue gas connection with additional air equipment. Observe the following during the installation of the flue gas connection:

- Install a flue pipe connection with an inspection aperture for cleaning.
- Fasten the flue gas connector piece to the boiler.
- Feed the connector into the flue gas system on a short, ascending path. Avoid deflections, especially those with an angle of 90°.
- Fasten and support connectors sufficiently.
- Since the flue pipe is only fixed into the flue gas system and push-fitted onto the boiler flue socket, it should be fitted very carefully so that it does not come loose.
- Only use parts of non-flammable materials for the flue gas system.



**fig.22**

### **Chimneys and Chimney Connection Warnings**

A sufficient flue draft of the flue gas system is the basic requirement for the correct functioning of the boiler. It fundamentally affects its performance and efficiency. Therefore, heed the following for the flue gas connection:

- Please note that the boiler must be connected to the flue gas system in accordance with the relevant local Building code regulations, manufacture's instructions and in consultation with an approved flue installer.
- The boiler may only be connected to a flue gas system with proper flue draft ( technical spec. table).
- The dimension calculations of the flue gas path must be based on the flue gas mass-flow rate at maximum rated output.
- The effective chimney flue height is measured from the point of entry of the flue pipe into the chimney.
- Ensure that the calculation of the flue gas path and the connection of the flue gas system is only carried out by qualified personnel.
- If a wrong boiler chimney is connected, the warranty is not valid.

The figures in Tab. **(Fig. 23)** are only guide figures. The draft depends on the diameter, height, roughness of the chimney wall, and the temperature difference between combustion products and the outside



atmosphere. We recommend the use of a chimney liner.

Have precise calculations carried out by a heating engineer or flue installer.

$$F = \frac{a \cdot Q_N}{\sqrt{H}}$$

Coefficient = 0,041 ( for wood )

Coefficient = 0,027 ( for carbon )

**F** = Section Resulting ( cm<sup>2</sup> )

**a** = Coefficient

**Q<sub>N</sub>** = Boiler Heat Output ( kCal/h )

**H** = Height of Chimney ( meters )

## Troubleshooting

Problem	Reason	Solution
Boiler is not heating	Quality of the fuel might be low besides the moisture content of it maybe higher	Try to use the fuel which has better calorific value and moisture
	Operational instructions are not fulfilled	Inspect chimney draft, position of flap, circulation of outlet temperature.
	Tar existing on surface of heat exchanger	Clean regularly the heat exchanger with the brush supplied by ÖNMETAL or proper one
Over condensation on boiler part and formation of black liquid	Using the fuel which has high moisture	Use proper fuel
	Low outlet temperature	Try to operate the boiler with a chimney temperature 160 K above ambient temperature.
Outlet temperature of boiler is not adjusted	Lower door is not well sealed properly when closed	Check the sealing of the lower door or replace it with new one
	Temperature controller (draft regulator) is not functional	Check functionality of the device
Boiler is heating but radiators are not	Circulation pump is not working or water circulation was blocked (i.e. closed valve)	Check circulation system especially water pump



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