
NOVA SERIES

WOOD AND COAL BOILER

Installation, Operation & Maintenance Manual



REV.01 / 2012 123794



CAUTION!

Observe the safety instructions of this installation and maintenance manual before placing the boiler in operation.

If an unqualified person carries out installation, adjustment, modification, operation or maintenance of the heating system, this may result in danger to life and limb or property damage. The directions of this installation and maintenance manual must be followed precisely. If you require assistance or further information, contact a qualified installer or an appropriate service provider.



The installation and service instructions are a component of the technical documentation and must be handed over to the operator of the heating system. Discuss the instruction in this manual with the owner or operator of the heating system to ensure that they are familiar with all information required for operation of the heating system.

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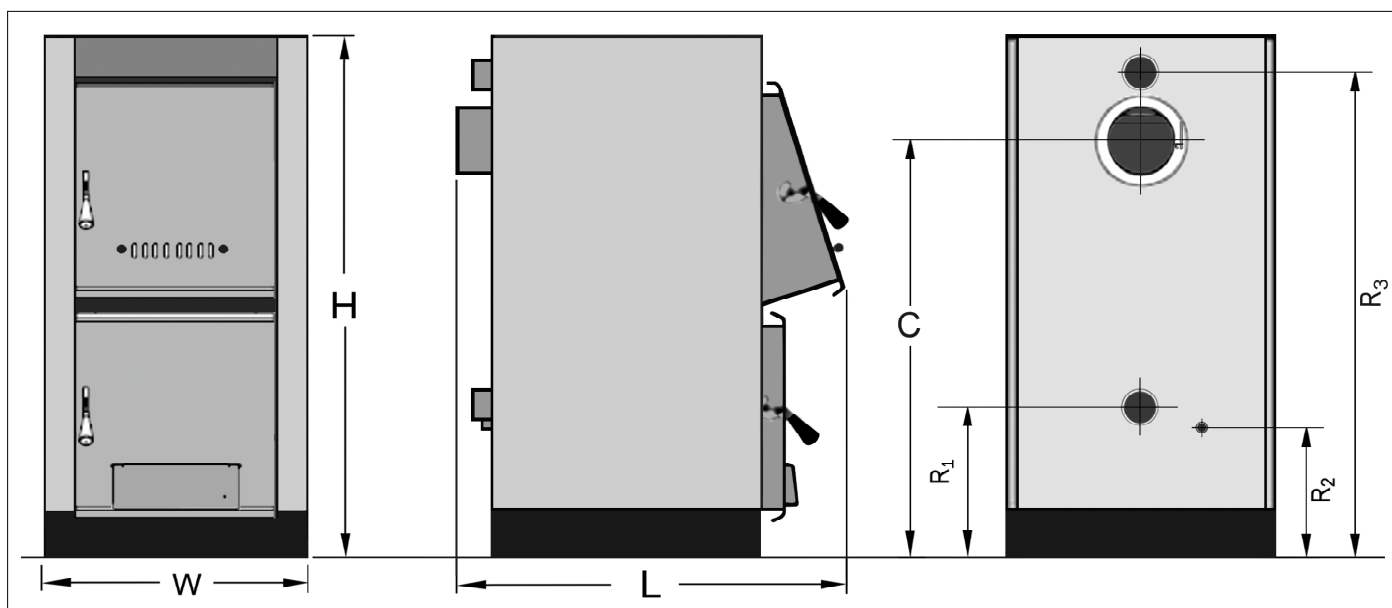
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Information on the boilerplate

The boiler serial no is shown on the plate which is attached to the backside cover panel of the boiler body.

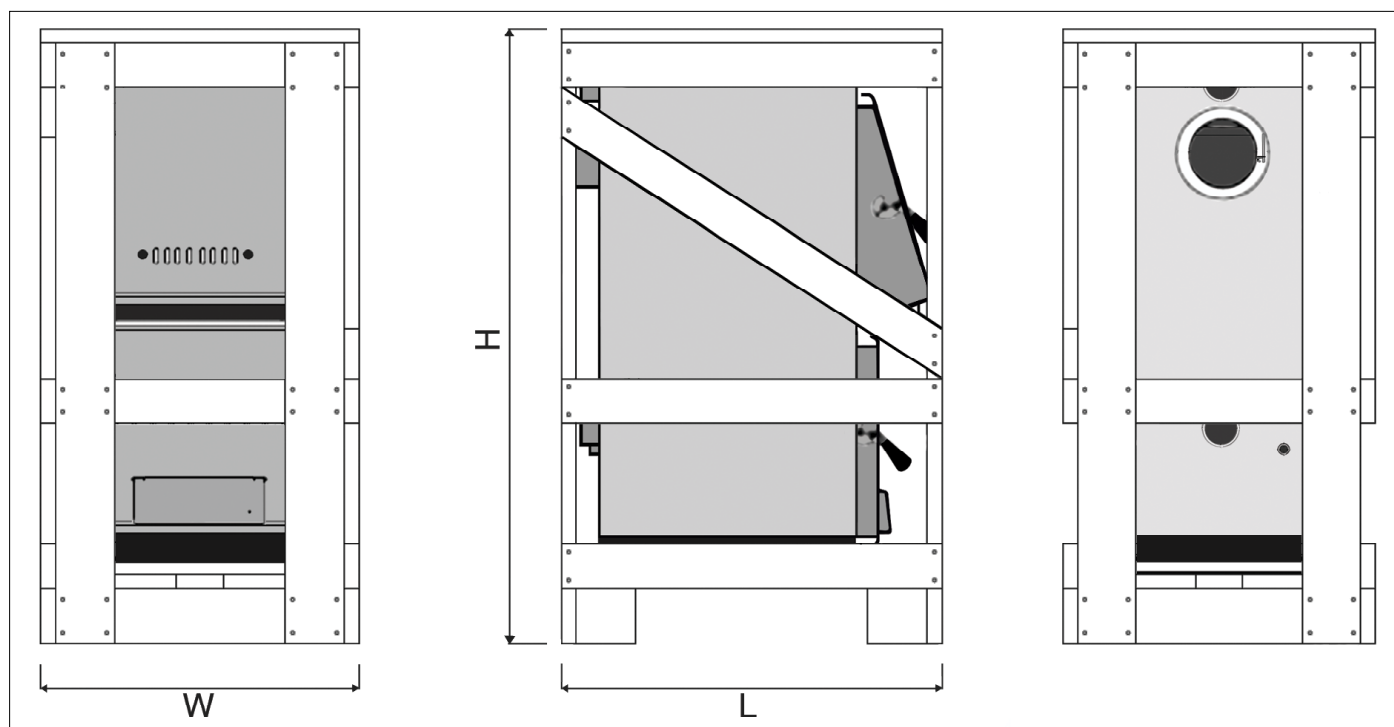
Solid Fuel Boilers	NOVA Series
Boiler type :	NOVA -
Maximum operating temperature :	90 °C
Maximum operating pressure :	3 bar
Fuel 1 : Wood heating output range (kW) :	
Fuel 2 : Coal heating output range (kW) :	
Water content (l) (Volume) :	
Production year :	
Serial number :	
Test date :	
Manufacturer :	STECO METAL SANAYI TICARET L.T.D.Ş.T.İ
Fluid Group : 2 Standard : EN 303-5 Test pressure : 4,5 bar	
 0036 	
<ul style="list-style-type: none">* The boiler can only be fitted in a room the that meets the appropriate ventilation requirements.* Read the installation manual before fitting the boiler* Carefully read the user's instructions before operating the boiler.	

Boiler dimensions



		NOVA - 20	NOVA - 30	NOVA - 40	NOVA - 50	NOVA - 60
Physical Dimensions						
Boiler Width	W	570	570	570	570	570
Boiler Length	L	740	740	840	940	1.040
Boiler Height	H	1.025	1.125	1.125	1.125	1.125
Water Connections						
Dimensions	R ₁	245	265	265	265	265
	R ₂	200	220	220	220	220
	R ₃	923	1.023	1.023	1.023	1.023
Boiler Flow	VK	2"	2"	2"	2"	2"
Boiler Return	RK	2"	2"	2"	2"	2"
Boiler Drain		1/2"	1/2"	1/2"	1/2"	1/2"
Temperature Control Tap		1/2"	1/2"	1/2"	1/2"	1/2"
Firing Controller Tap		3/4"	3/4"	3/4"	3/4"	3/4"
Safety Exchanger Connec. Tap		1/2"	1/2"	1/2"	1/2"	1/2"
Chimney Connections						
Flue Connections		150	150	150	180	180
	D	147	147	147	177	177
	C	773	873	873	888	888

Boiler packaging dimensions



Dimensions	Case Width	Case Length	Case Height
NOVA – 20	660	810	1.190
NOVA – 30	660	810	1.290
NOVA – 40	660	910	1.290
NOVA – 50	660	1.010	1.290
NOVA – 60	660	1.110	1.290

Technical parameters

Series			NOVA - 20	NOVA - 30	NOVA - 40	NOVA - 50	NOVA - 60
Nominal Heat Output (Black Coal - Walnut)	kW		19,0 - 22,0	27,5 - 31,3	35,0 - 40,5	46,6 - 50,0	55,2 - 60,0
Nominal Heat Output (Hard wood - Split Logs)	kW		17,2 - 19,0	24,0 - 26,5	31,8 - 35,1	42,0 - 44,0	50,0 - 53,0
Heating Water Maximum Temp.	°C		90				
Heating Return Water Minimum Temp.	°C		50				
Safety Valve Temperature Limit	°C		95				
Burning Time For Nominal Output	B. Coal	h	> 4				
	H.Wood	h	> 2				
Range Of Temperature Control	°C		30 - 90				
Maximum Pressure of System	bar		3				
Minimum Pressure of System	bar		0.5				
Boiler Water Content	lit.		50	56	65	74	83
	m3		0.050	0.056	0.065	0.074	0.083
Flue Gas Mass Flow	B. Coal	kg/s	0.029	0.034	0.042	0.046	0.050
	H.Wood	kg/s	0.024	0.030	0.034	0.037	0.039
Minimum Chimney Depression	mbar		0.15	0.17	0.19	0.21	0.22
Combustion Chamber Dimensions	W x H	mm	442 x 482	442 x 562			
	L	mm	385	385	485	585	685
Exit Flue Gas Temperature	°C		210 - 285				
Weight	kg		211	227	253	278	304

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 same person who installs it delivers the boiler to the client, 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 organization 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 organization – 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 same person who installs it delivers the boiler to the client, 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.
- The conditions stipulated in this Operation and Installation guide

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

Shut the boiler down every time when here are any (even temporary)

Flammable or explosive fumes present on the premises from combustion air are 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.

Operating Instructions

NOVA Series Boiler – General features

- NOVA 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.
- NOVA series solid fuel fired boiler is designed for heating systems, which are suitable for forced circulation systems only.
- NOVA series boilers are available in five output series: 20 kW up to 60 kW.
- Attached to the boiler body are sheet metals covers 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 NOVA 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 kW size.

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 7.

The boiler is stoked manually.

Please note

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

Control and safety devices

Thermo - mechanical regulator

It is situated on the outlet from the boiler 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.

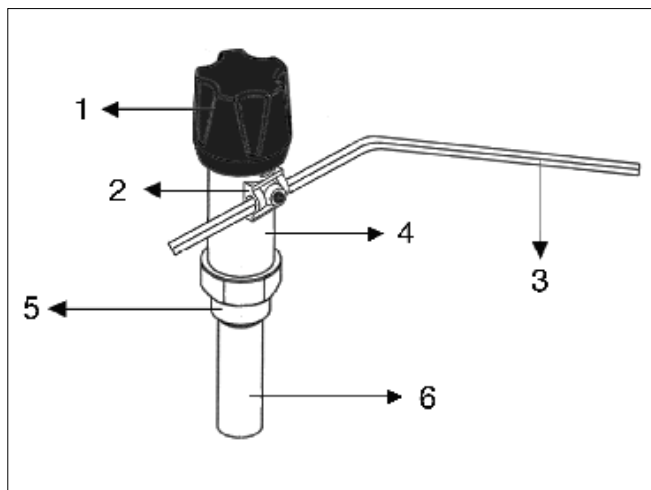


Fig. 01

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 regulator is necessary, please use recommended devices in case of using any other type of the device negotiate with satrom.

Functionality of thermo-mechanical output regulator must be checked or inspected by authorized person once in a year.

Regulating hatch

Changing the hatch position controls the combustion intensity and thus the boiler output. The thermo mechanical 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. 02

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

Air rosette

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



Fig. 03

Chimney flap

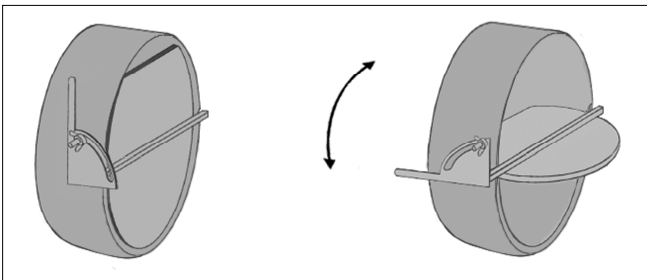


Fig. 04

Thermometer

Hot water temperature can be checked on a thermometer, which is situated in the upper side boiler cover.

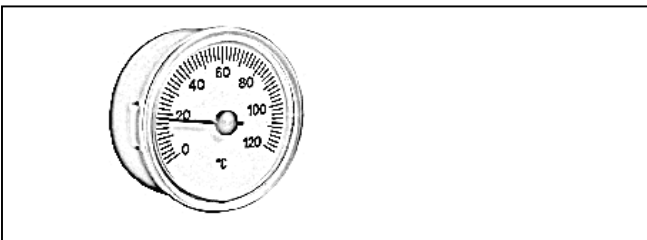


Fig. 05

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 to the design.

Whether the boiler has been filled in and is under pressure (on the thermometer), and whether there are any leakage in the heating system;

Connection to the chimney - connection must be approved by an authorised 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 steel 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, such as before repairs, etc 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 block may crack!

Operation and controls

Starting a fire

Check on the thermometer 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

Removing and emptying the ashtray situated underneath the stoker in the ash compartment do this. 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 astray has settled on the boilers 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 (back 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

- An adult person familiar with these operating Instructions may only operate the boiler.
- 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 repairs

An authorised service technician or organisation may repair the boiler 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

NOVA boilers are covered by warranty specified in the warranty certificate, Service book and user and Installation guide (chapter Introduction, Installing the boiler).

Boiler delivery

NOVA series 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 brush

Installation Instructions

Boiler installations – General information

NOVA boilers must be put into service by an authorised service. A network of authorised 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 STECO'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 $\text{pH} > 7$, 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 system, 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.
- 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.
- 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

NOVA 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 putting 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. 7), or keep fuel in a room other than the one in which the boiler is installed.

Minimum distance

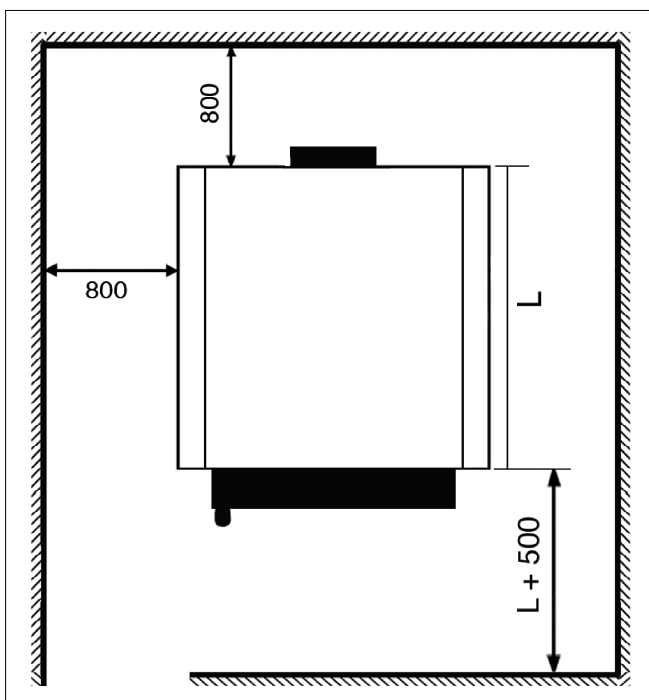


Fig. 06



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

Boiler room disposition layout

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.

- 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.

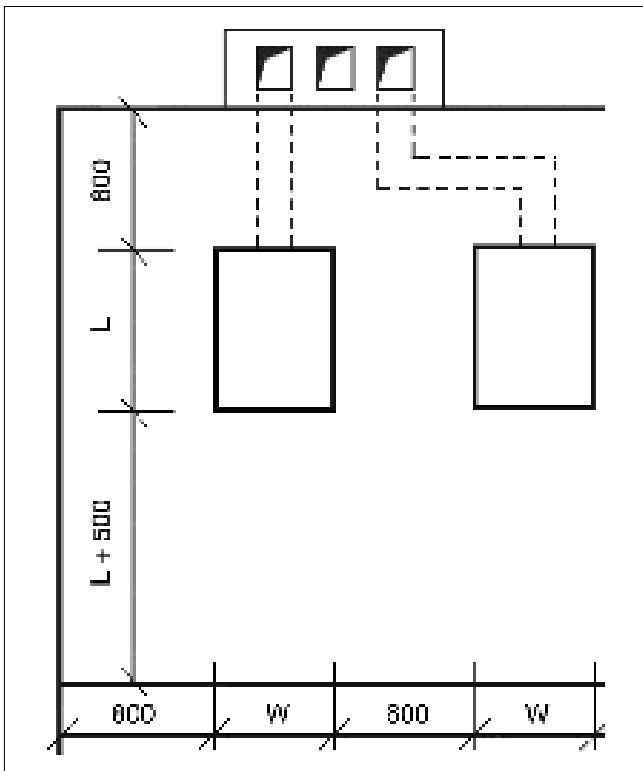


Fig. 07

Chimneys and chimney connection warnings

Flue pipe installation

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 are only carried out by qualified personnel.
- If a wrong boiler chimney is connected, the warranty is not valid.

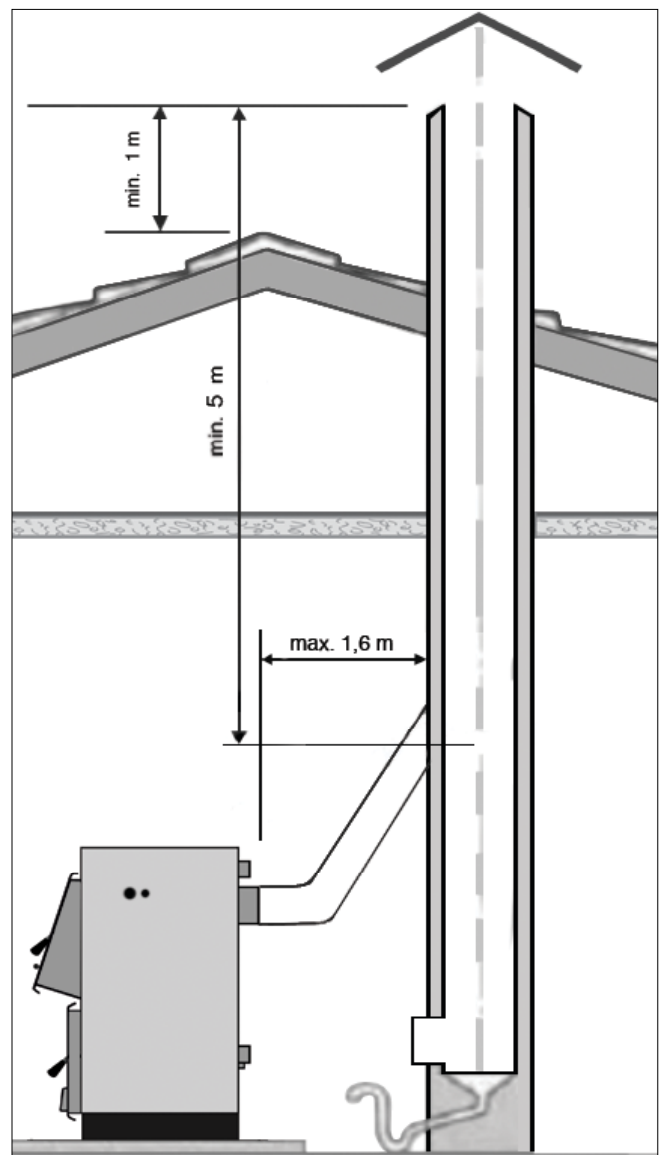


Fig. 08

Fig. 07 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.

The figures in tab. 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 = Sections resulting (cm²)

a = Coefficient

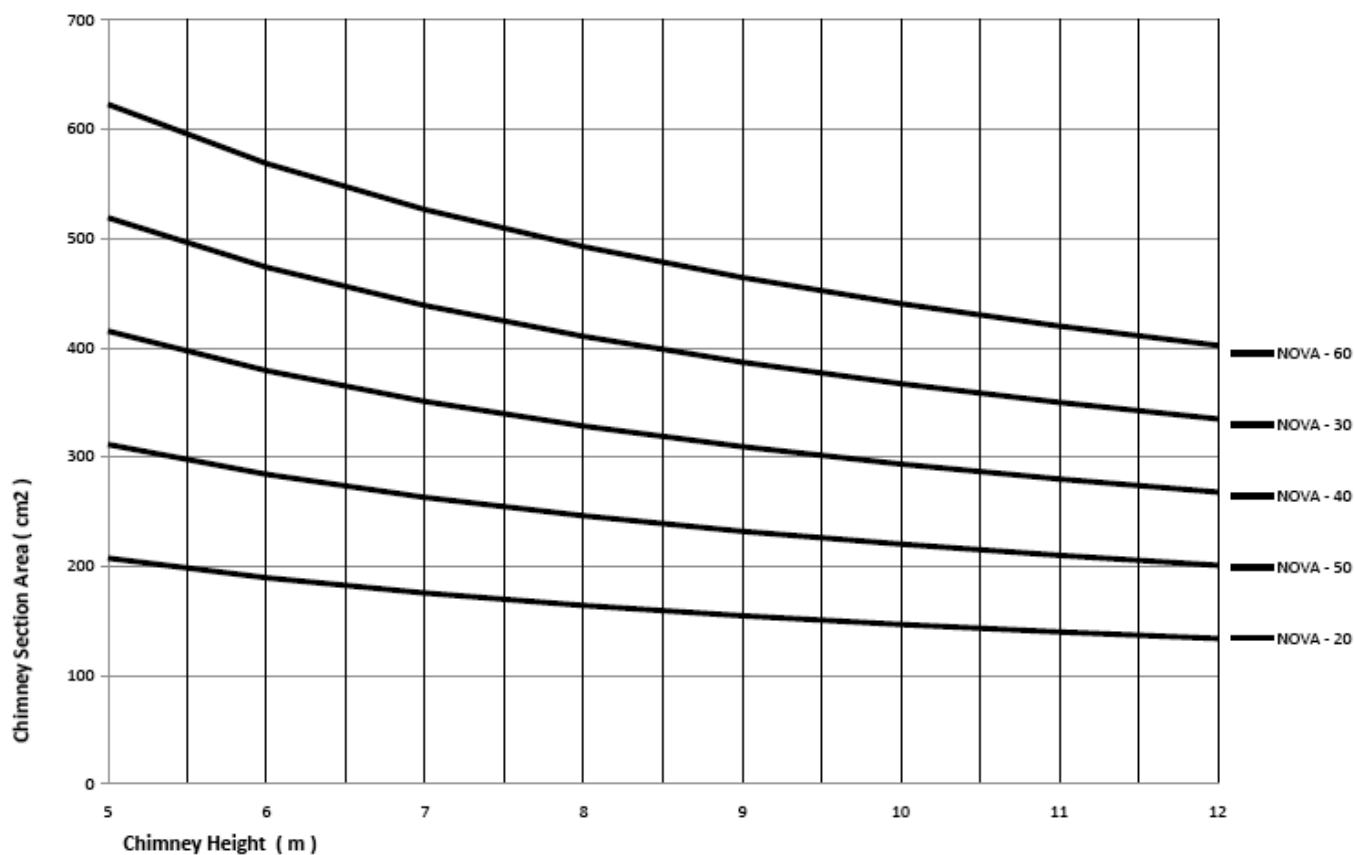
Q_N = Boiler heat output (kCal/h)

H = Height of chimney (meters)

Boiler Output	Flue duct size	Minimum height
20 kW	150 mm	8 m
	180 mm	7 m
	200 mm	6 m
	230 mm	5 m
30 kW	150 mm	10 m
	180 mm	8 m
	200 mm	7 m
	230 mm	6 m
40 kW	150 mm	11 m
	180 mm	9 m
	200 mm	8 m
	230 mm	7 m
50 kW	180 mm	10 m
	200 mm	9 m
	230 mm	8 m
	250 mm	7 m
60 kW	180 mm	11 m
	200 mm	10 m
	230 mm	9 m
	250 mm	8 m

- Recommended minimum chimney flue heights
- Have precise calculations carried out by a heating engineer or flue installer.

Chimney Height - Section Chart (For Carbon)



Model	Heat Output (kCal/h) For Carbon	Height Of Chimney (meters)							
		5	6	7	8	9	10	11	12
NOVA - 20	17,200	208	190	176	164	155	147	140	134
NOVA - 30	25,800	312	284	263	246	232	220	210	201
NOVA - 40	34,400	415	379	351	328	310	294	280	268
NOVA - 50	43,000	519	474	439	410	387	367	350	335
NOVA - 60	51,600	623	569	527	493	464	441	420	402

Accumulator tank capacity

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 that 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.

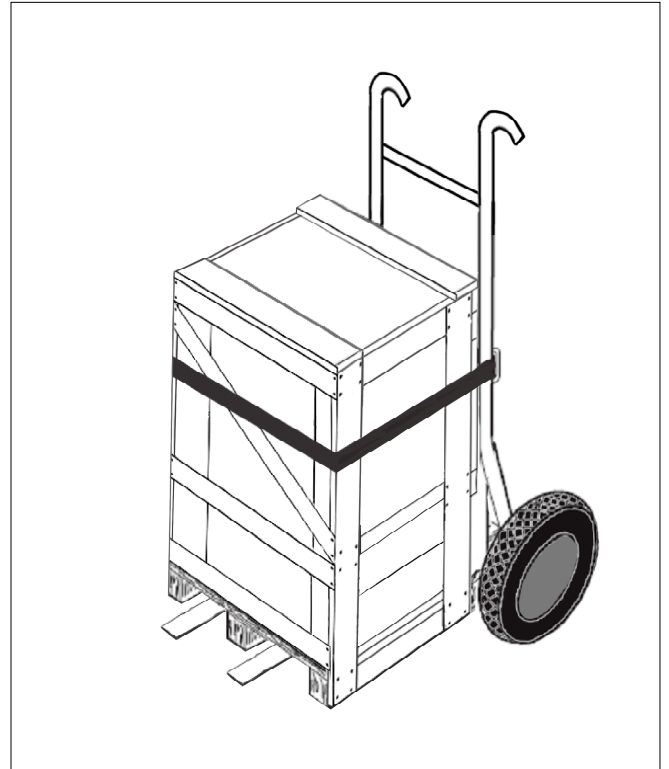


Fig. 09

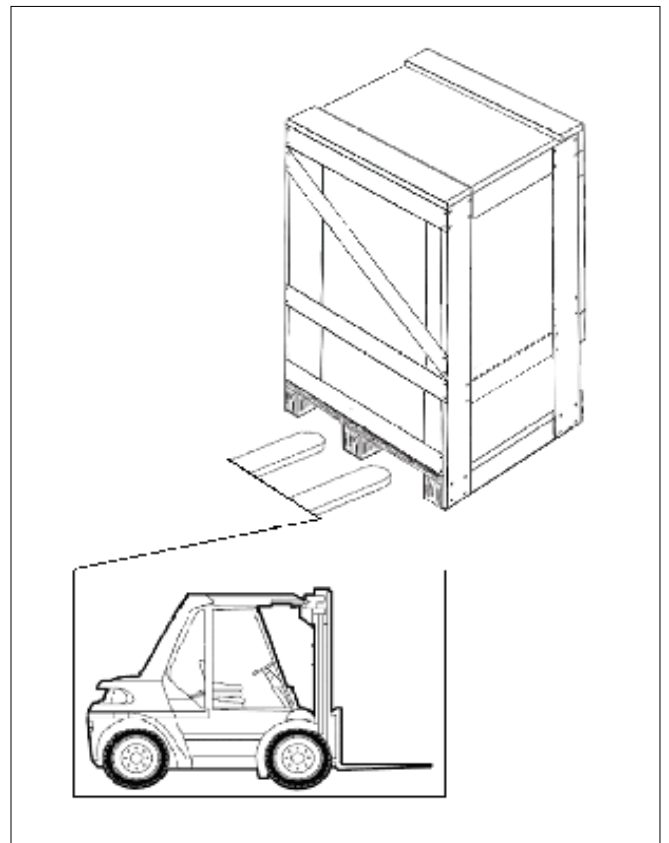


Fig. 10



Warning !

- Risk of injury from carrying heavy loads!
- Boiler must not be carried or transported without using forklift, trans pallet or other wheeled carrying vehicles.
- Use personal protective equipment (e.g. helmet, safety shoes, protective gloves).
- Risk of system damage from impact shocks!
- Fragile components could be damaged.
- Protect boiler connections from dirt if the boiler is not to be installed immediately.

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.

Flue gas cleaning

The boiler must be cleaned regularly, at least once a week, with a steel brush.

Open the boiler-stoking door. After open the cleaning plate. 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.



- Insufficient cleaning can cause damage to the boiler and the voiding of warranty claims.
- Risk of system damage due to insufficient maintenance and cleaning!



Fig. 11



Fig. 12

Ash pan cleaning

The ashes must be removed from the combustion chamber/ash pan every 1 – 3 days.

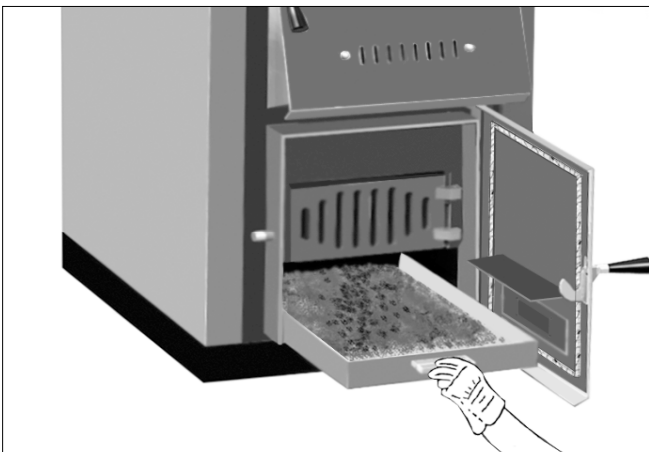


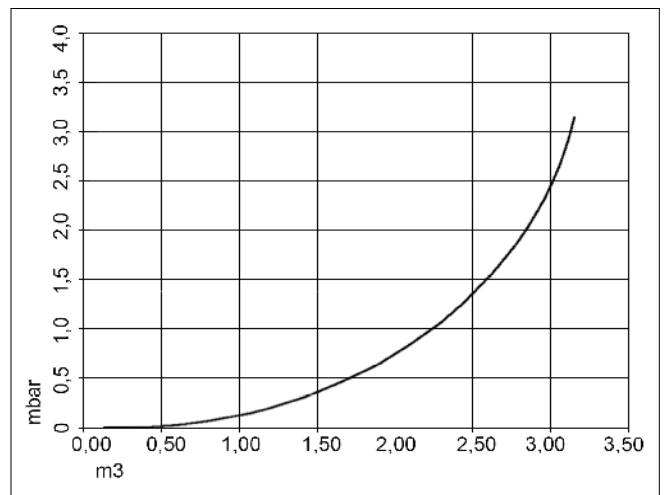
Fig. 13

- Open the ash pan door.
- Remove the combustion residues from the ash pan with the ash shovel.



- Do not place hot ashes in plastic and waste containers.

Head Loses



Hydraulic Connection Diagrams

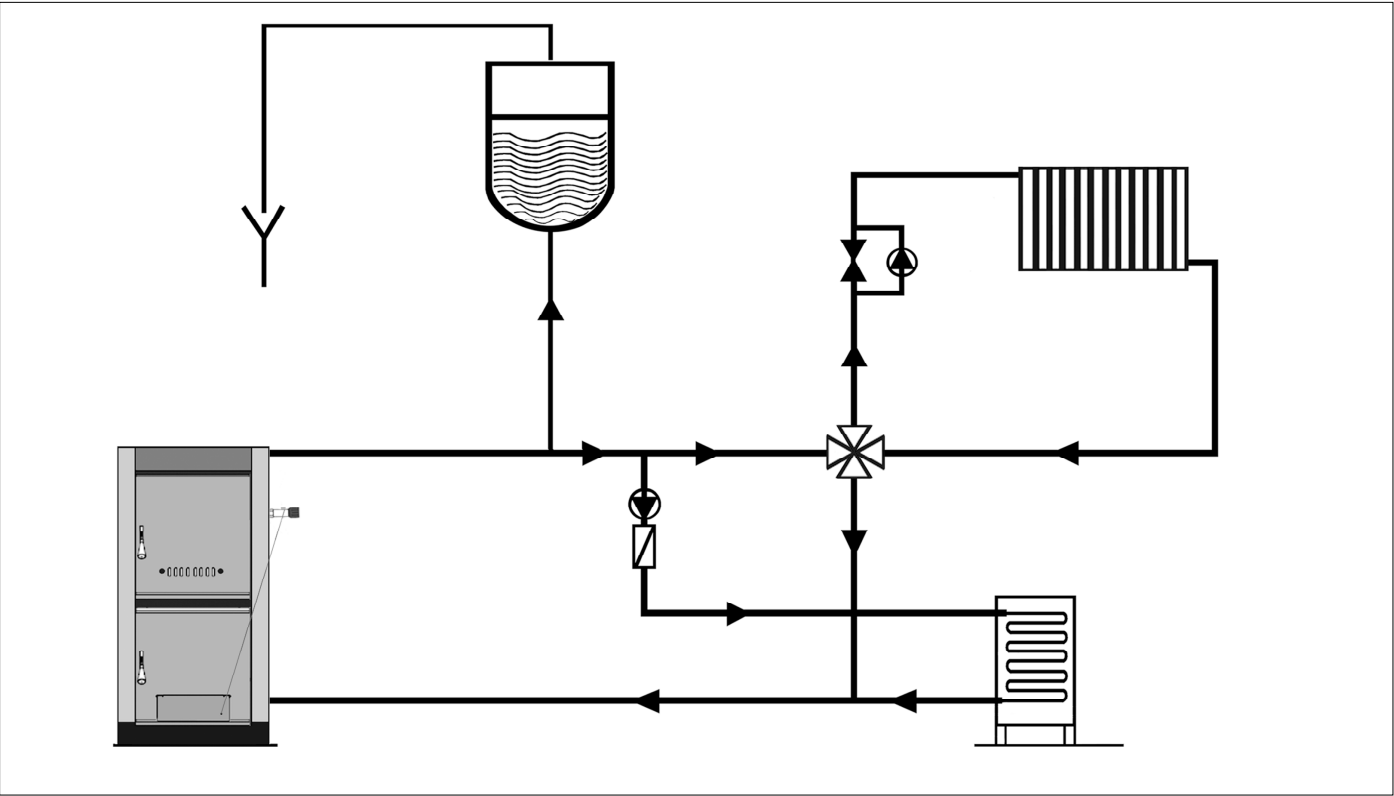


Fig. 14

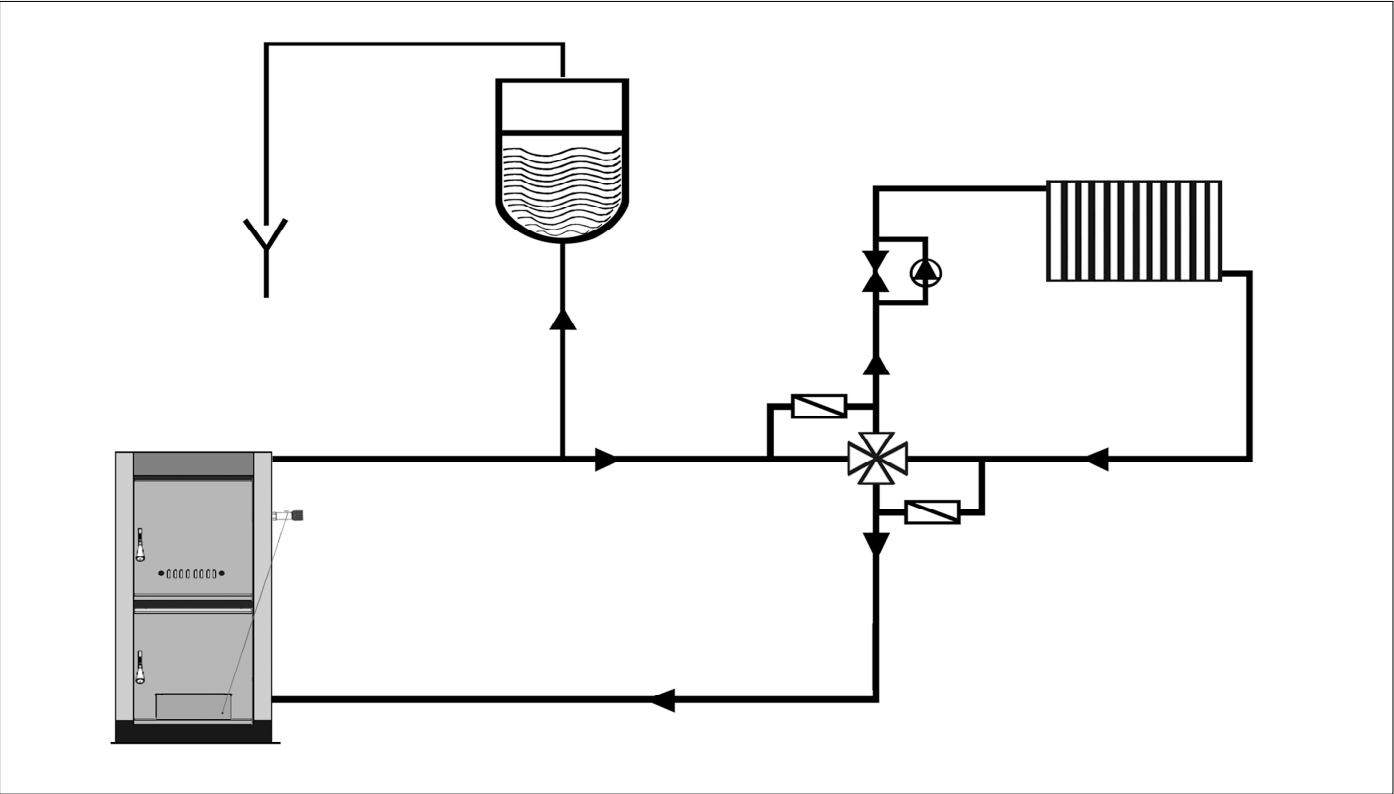
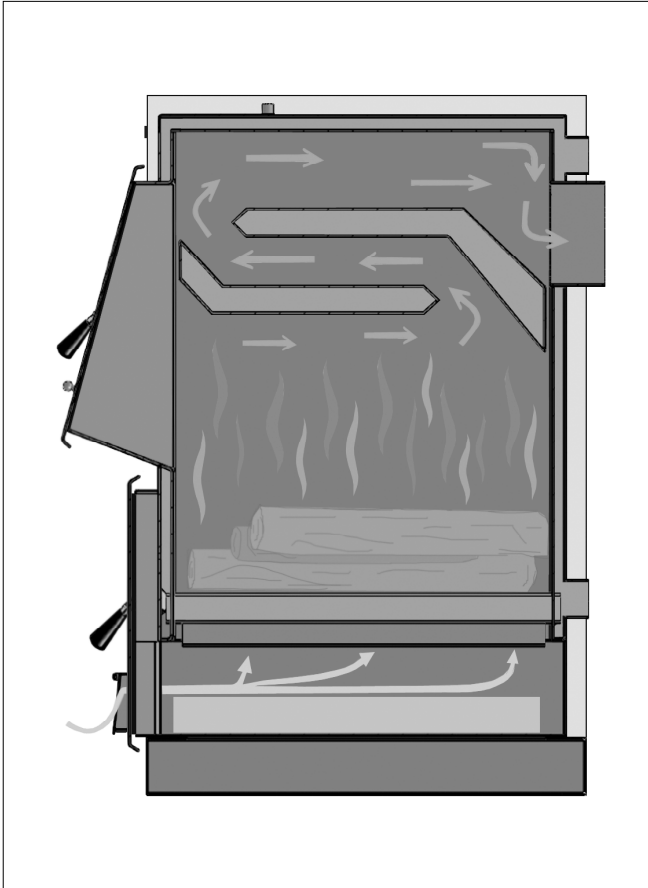


Fig. 15

Boiler combustion system

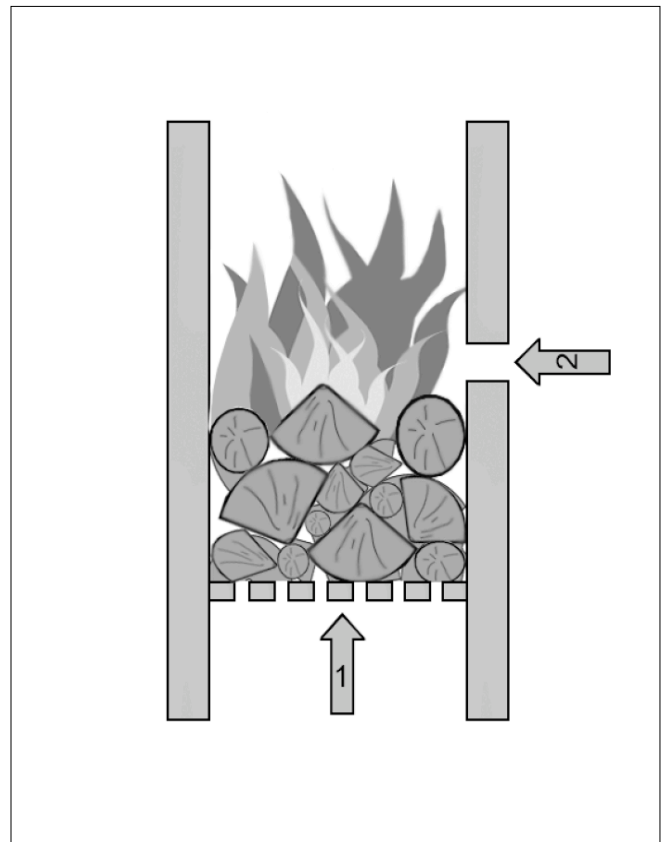


NOVA series solid fuel boiler is designed as a three pass. NOVA series boiler has a large combustion chamber.

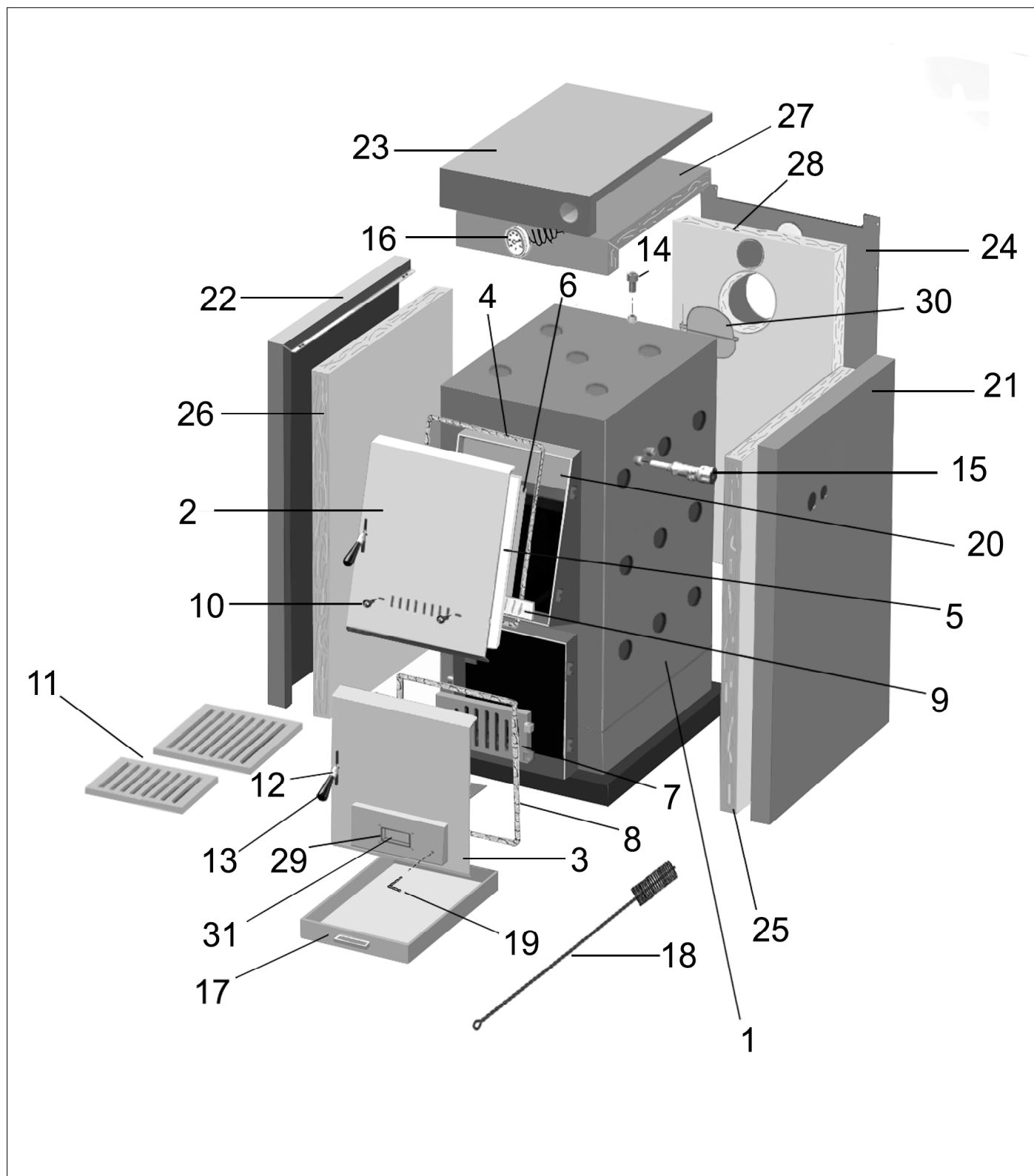
Air inlets

If the air vent is closed completely, there is no complete combustion. Creosote accumulates on the heating surfaces, which requires more cleaning effort.

1. Primary air inlet
2. Secondary air inlet



NOVA boiler parts



NOVA boiler spare parts lists

Item	Description	Ordering no	NOVA 20	NOVA 30	NOVA 40	NOVA 50	NOVA 60
01	Boiler block - NOVA 20	NVA 2010001	X				
01	Boiler block - NOVA 30	NVA 3010002		X			
01	Boiler block - NOVA 40	NVA 4010003			X		
01	Boiler block - NOVA 50	NVA 5010004				X	
01	Boiler block - NOVA 60	NVA 6010005					X
02	Stoking door - I	NVA 1050001	X				
02	Stoking door - II	NVA 1050002		X	X	X	X
03	Ash door - I	NVA 1060001	X				
03	Ash door - II	NVA 1060002		X	X	X	X
04	Stoking door isolation rope - I	NVA 1050003	X				
04	Stoking door isolation rope - II	NVA 1050004		X	X	X	X
05	Stoking door isolation material - I	NVA 1050005	X				
05	Stoking door isolation material - II	NVA 1050007		X	X	X	X
06	Stoking door isolation metal plate - I	NVA 1050008	X				
06	Stoking door isolation metal plate - II	NVA 1050009		X	X	X	X
07	Cast iron grill door	NVA 1100100	X	X	X	X	X
08	Ash door isolation rope - I	NVA 1060003	X				
08	Ash door isolation rope - II	NVA 1060004		X	X	X	X
09	Air rosette	NVA 1200100	X	X	X	X	X
10	Air rosette bakalite handle	NVA 1200101	X	X	X	X	X
11	Cast iron grill - NOVA 20	NVA 2010020	X				
11	Cast iron grill - NOVA 30	NVA 3010030		X			
11	Cast iron grill - NOVA 40	NVA 4010040			X		
11	Cast iron grill - NOVA 50	NVA 5010050				X	
11	Cast iron grill - NOVA 60	NVA 6010060					X
12	Door closer metal handle	NVA 1500005	X	X	X	X	X
13	Door closer plastic handle	NVA 1500006	X	X	X	X	X
14	Thermometer bulb (½ ")	NVA 0010016	X	X	X	X	X
15	Mechanical thermostat (regulator ¾ ")	NVA 0010017	X	X	X	X	X
16	Thermometer	NVA 0010018	X	X	X	X	X
17	Ash spade - NOVA 20	NVA 2550020	X				
17	Ash spade - NOVA 30	NVA 2550030		X			
17	Ash spade - NOVA 40	NVA 2550040			X		
17	Ash spade - NOVA 50	NVA 2550050				X	
17	Ash spade - NOVA 60	NVA 2550060					X
18	Brush	NVA 0030022	X	X	X	X	X
19	Control chain rods	NVA 0030024	X	X	X	X	X

20	Cleaning plate	NVA 2650040	X	X	X	X	X
21	Right side cover panel - NOVA 20	NVA 2600020	X				
21	Right side cover panel - NOVA 30	NVA 2600030		X			
21	Right side cover panel - NOVA 40	NVA 2600040			X		
21	Right side cover panel - NOVA 50	NVA 2600050				X	
21	Right side cover panel - NOVA 60	NVA 2600060					X
22	Left side cover panel - NOVA 20	NVA 2700020	X				
22	Left side cover panel - NOVA 30	NVA 2700030		X			
22	Left side cover panel - NOVA 40	NVA 2700040			X		
22	Left side cover panel - NOVA 50	NVA 2700050				X	
22	Left side cover panel - NOVA 60	NVA 2700060					X
23	Top side cover panel - NOVA 20	NVA 2800020	X				
23	Top side cover panel - NOVA 30	NVA 2800030		X			
23	Top side cover panel - NOVA 40	NVA 2800040			X		
23	Top side cover panel - NOVA 50	NVA 2800050				X	
23	Top side cover panel - NOVA 60	NVA 2800060					X
24	Rear side cover panel - I	NVA 2900020	X				
24	Rear side cover panel - II	NVA 2903040		X	X		
24	Rear side cover panel - III	NVA 2905060				X	X
25	Right side glass woll isolation - NOVA 20	NVA 3200020	X				
25	Right side glass woll isolation - NOVA 30	NVA 3200030		X			
25	Right side glass woll isolation - NOVA 40	NVA 3200040			X		
25	Right side glass woll isolation - NOVA 50	NVA 3200050				X	
25	Right side glass woll isolation - NOVA 60	NVA 3200060					X
26	Left side glass woll isolation - NOVA 20	NVA 3300020	X				
26	Left side glass woll isolation - NOVA 30	NVA 3300030		X			
26	Left side glass woll isolation - NOVA 40	NVA 3300040			X		
26	Left side glass woll isolation - NOVA 50	NVA 3300050				X	
26	Left side glass woll isolation - NOVA 60	NVA 3300060					X
27	Top side glass woll isolation - NOVA 20	NVA 3400020	X				
27	Top side glass woll isolation - NOVA 30	NVA 3400030		X			
27	Top side glass woll isolation - NOVA 40	NVA 3400040			X		
27	Top side glass woll isolation - NOVA 50	NVA 3400050				X	
27	Top side glass woll isolation - NOVA 60	NVA 3400060					X
28	Rear side glass woll isolation - I	NVA 3500020	X				
28	Rear side glass woll isolation - II	NVA 3503040		X	X		
28	Rear side glass woll isolation - II	NVA 3505060				X	X
29	Regulation hatch for ash door	NVA 1500007	X	X	X	X	X
30	Chimney flap - I	NVA 4203040	X	X	X		
30	Chimney flap - II	NVA 4506000				X	X
31	Fan flap	NVA 1060117	X	X	X	X	X

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 STECO 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	Low 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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