

# OPERATION AND MAINTENANCE DOCUMENTATION

FOR  
THE BOILER OF  
“JUHAS”  
TYPE



# TECHNICAL DOCUMENTATION FOR BOILER OF “JUHAS” TYPE

Operating manual for the boiler of JUHAS type

Output 6 – 40 Kw

**NOTE!**

**Before installing and using the boiler, this manual should be studied thoroughly.**

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## ***Introduction***

***The following technical documentation applies to boilers of JUHAS type. What distinguishes those ecological and innovative JUHAS boilers from other water boilers is the fact that they are equipped with flame adjuster.***

***All STALMARK boilers are CE marked.***

Precise study of this documentation will allow for the safe use of JUHAS boilers.

This instruction manual includes essential information concerning the construction and maintenance of the boiler. It also contains guidelines for the proper handling and exploitation of the boiler. If the user does not follow the rules and guidelines presented in the following manual, the manufacturer will be released of all liabilities and obligations.

Before assembling and exploiting the boiler, the user should:

- check if the boiler has not been damaged in transport
- read the operation and maintenance documentation
- check if the equipment of the boiler is complete

## **Boiler usage**

JUHAS boilers are meant to be used in central heating systems in housing objects such as houses, stores, garages, utility buildings, etc.

### **1. Fuels**

Basic fuels for JUHAS boiler are: hard coal of cube type, nut type, pea type, and slack. Alternative fuels are: wood, coal briquettes, and wood pellets. Use of alternative fuels changes thermal efficiency of the boiler. Constant use of excessively wet fuels might lead to increased wearing of the boiler, and corrosion of the furnace plates as well as of the external plates located under the flue, since emission of the combustion products, such as water, nitric oxide, sulfur oxide, causes corrosion of steel elements of the boiler.

## 2. Technical data

Technical data of JUHAS boilers										
BOILER TYPE	Unit of measure	JUHAS 6	JUHAS 8	JUHAS 10	JUHAS 12	JUHAS 15	JUHAS 20	JUHAS 25	JUHAS 30	JUHAS 40
Nominal Power	kW	6	8	10	12	15	20	25	30	40
Output power range	kW	2-6	3-8	4-10	5-12	7-15	12-20	16-25	21-30	30-40
Heating surface	m <sup>2</sup>	0,6	0,8	1,1	1,3	1,6	2,1	2,6	3,2	4,3
Heated room surface	m <sup>2</sup>	60	80	100	115	130	180	230	280	380
Max. operating pressure	MPa	0,15								
Required flue gas draft	Pa	18	20	20	22	24	26	26	28	28
Furnace dimensions* width/depth/height	mm	250/225/245	250/275/245	250/327/280	250/352/282	300/402/282	300/502/338	350/552/340	400/552/340	500/552/421
Dimensions of the door used to load fuel width x height	mm	250x168	250x168	250x168	250x168	300x188	300x188	350x188	400x188	500x188
Water temperature [min./max.]	°C	55/90								
Boiler weight	kg	145	158	205	220	237	272	300	335	415
Boiler water capacity	l	32	38	46	50	56	68	82	98	115
Min. chimney height	m	5	6	6	7	7	8	8	9	10
Boiler efficiency	%	80								
Flue dimensions	ø	ø130			ø180					
Supply and return diameter	in	6/4"								
Power consumption by controller **	W	-								
Power consumption by fan **	W	-								

\* Presented dimensions refer to the water grate chamber

\*\* Optional equipment, not included in the basic version of the boiler.

*Tab. 1 Technical specification of JUHAS boilers*

Parameters specified above are approximate values and they may slightly change due to technological modifications.

### NOTE!

Only boilers of nominal power from 10 kW to 40 kW are equipped with ash removal system!

## 3. Construction of the boiler

The boiler has been designed with accordance with the latest technological achievements. The combustion of coal takes place on the water grate.

The boiler has large, easy to use, combustion chamber. In boilers of JUHAS type it is possible to install additional fan and the controller.

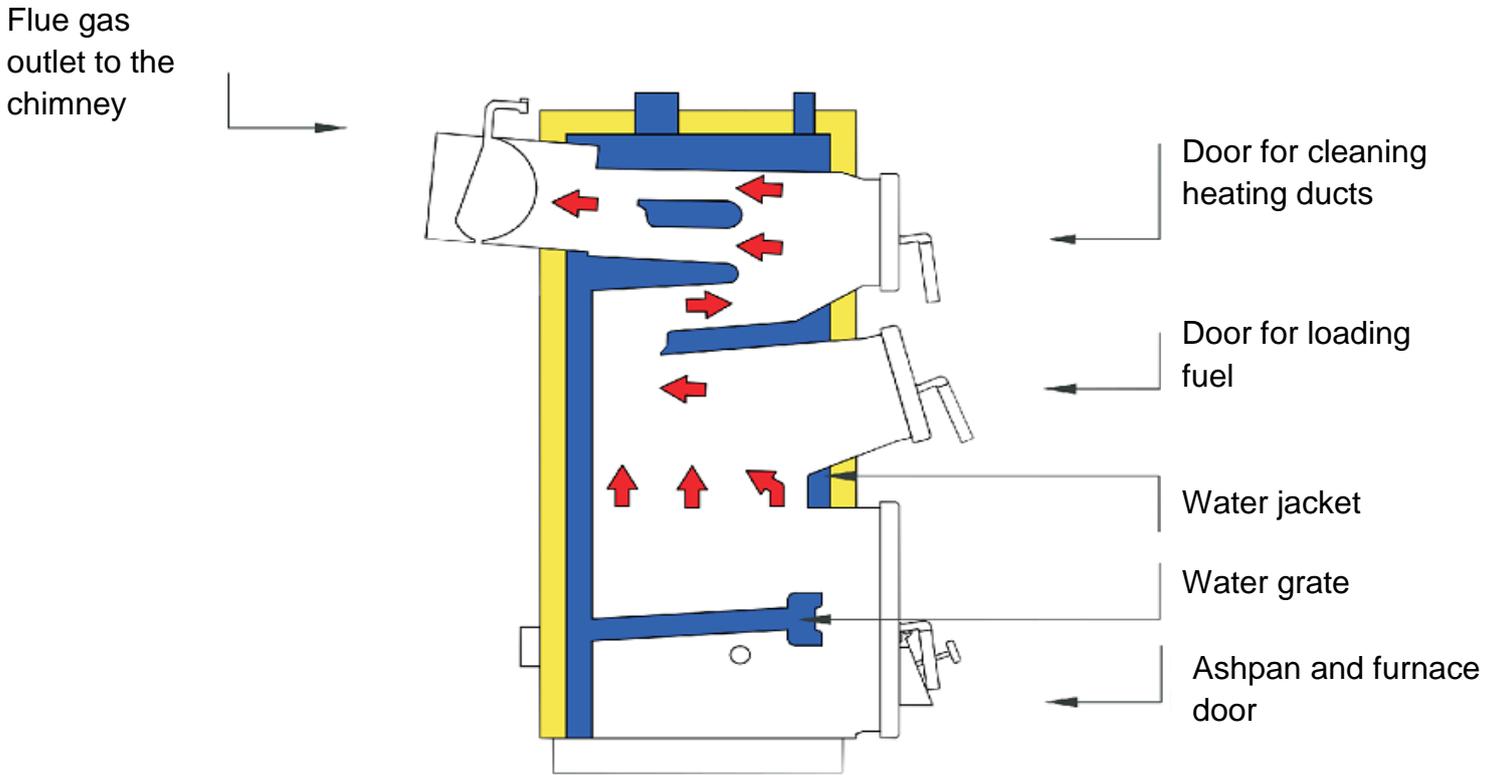


Fig. 1 Boiler cross-section

#### 4. Installation guidelines

The boiler is supplied as assembled. Prior to the boiler alignment and connection to the central heating system and the chimney flue, it must be checked whether all sub-assemblies are operational, and whether the boiler has full equipment necessary to its operation and cleaning (see tab. 2).

**NOTE!**

While assembling the fan, it is important to close the air inlet, located in the door, with the plug.

	Specification	Amount
1	Liquid thermometer	1
2	Ash scraper	1
3	Technical and maintenance documentation	1
4	Warranty Card	1

Tab. 2 List of additional equipment

## **4.1 Setting of the boiler**

The boiler room is not a place meant for people to stay there neither temporarily nor permanently. Minimum height of the boiler room is 2,2 m for the new buildings, and 1,9m for the already existing ones.

The boiler must be set on a non-flammable surface. If the boiler is placed in a cellar, it is recommended to set the boiler on a foundation minimum 50 mm thick.

The adjustable legs allow for accurate leveling of the boiler.

Setting the boiler should enable easy handling, cleaning, and maintenance of the boiler. The minimum distance:

- from the boiler to the side walls is 0,5 m;
- from the boiler to the back walls is 0,5 m;
- in front of the boiler is 1,5 m.

## **4.2 Ventilation**

The boiler room should be secured against the ingress of groundwater, and fitted with ventilation system ensuring the air supply necessary for the combustion process.

In boiler rooms with capacity up to 25 kW, the air should be supplied through an open hole with a minimum size of 200 cm<sup>2</sup>, and exhausted through the exhaust grating with a minimum diameter of 14 x 14 cm.

In boiler rooms with capacity ranging from 25 to 2000 kW, there should be an air supply duct with a diameter of not less than 50% of cross-sectional area of the chimney, but not less than 20 x 20 cm. The outlet of the air supply duct should be located at a height of minimum 1 m above the floor level. There should also be an exhaust channel with diameter of not less than 25% of cross-sectional area of the chimney, and with the air supply hole. The exhaust channel should extend above the roof, and it should be located near the chimney. The cross section of this channel should be not less than 14 x 14 cm.

The minimum cross-sectional dimensions of the chimney are 20 x 20 cm.

## **4.3. Connecting the boiler to chimney**

The connection of the flue to the chimney should be made of 3 mm steel pipe. It must be mounted on the flue outlet, inserted into the chimney, and sealed. The pipe should go slightly upwards (minimum 5°). The accurate height and cross section of the chimney have major influence on the proper work of the boiler. Before connecting the boiler to chimney it should be checked whether the cross section of the chimney is proper, and if any heating objects have already been connected to the chimney. Technical condition of the chimney should be assessed by a chimney sweep. In order to secure the chimney against the wind it should be extended above the roof for at least 1 m. The chimneys made of steel should be 15 – 20% higher than the chimneys made of brick. The chimney should be constructed so as the flue draft required by the manufacturer is ensured throughout the working range of the boiler.

## **4.4 Connecting the boiler to central heating system**

As the boiler is set in the boiler room and connected to chimney, the following installation works should be performed:

- before connecting the boiler to an old central heating installation it is necessary to rinse the system in order to remove the sludge from pipes and radiators
- the boiler should be connected to the central heating installation by screwing with a threaded joint
- the reduction and drain valve should be screwed in one of the return pipes

It is recommended to use either three- or four-way valve.

Installation of the boiler must be carried out by an authorized person, who is familiar with the boiler operating instructions. It is the user's obligation to ensure that the boiler installation is carried out in accordance with the binding regulations. The installation company should issue a written guarantee on their work.

Chimney ducts are not covered by manufacturer's warranty.

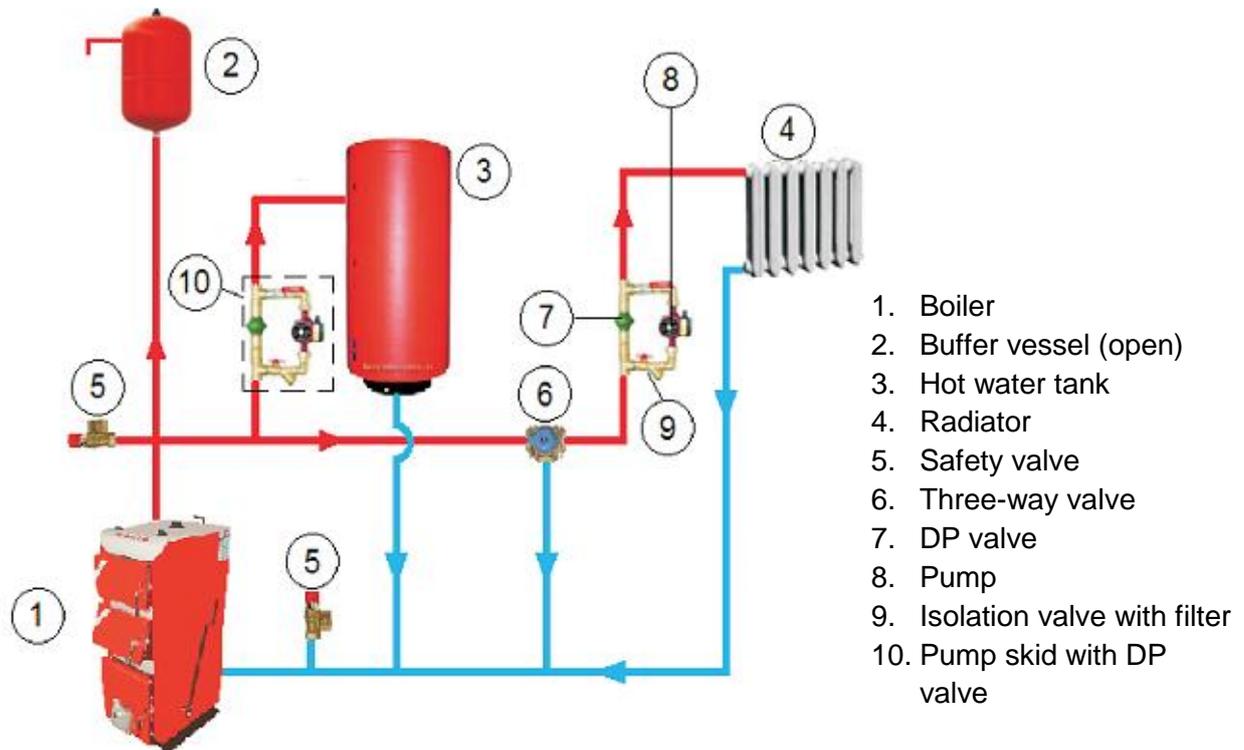


Fig. 2 Boiler connection diagram

#### 4.5 Filling the boiler with water

The boiler can be filled up with water from water supply system (through the boiler's drain cock) by means of a flexible hose, which should be disconnected from the boiler after filling the installation up.

#### NOTE!

The installation must meet all norms and regulations concerning the security of water heating devices working in open systems of the country in which it is being used.

Major terms for the installations covered by PN-91/B-02413 norm:

- it is forbidden to retrieve water from heating installation for other purposes than heating; the operating pressure cannot be higher than the maximum pressure allowed for all the devices and elements of the installation
- securing of the open water heating system should include basic safety devices as well as supplementary accessories
- the internal diameter of the overflow pipe should be larger than the internal diameter of the expansion and safety pipes
- the internal diameter of the safety pipe should be minimum 25 mm
- the internal diameter of the overflow pipe should be minimum 25 mm
- the internal diameter of the vent pipe and signaling pipe should be minimum 17 mm

**NOTE!**

It is forbidden to install valves and other devices, which may reduce the internal cross diameter of the pipe, on the safety pipes, overflow pipes, and vent pipes.

- all the accessories for the expansion vessel as well as the way of placing it are specified by norms and regulations of a given country.

In the areas where the expansion vessel, safety pipes, expansion pipe, signaling pipe, and overflow pipe are located the temperature must not drop below 0°C.

If the expansion vessel is placed in an area where the temperature drops below 0°C, the circulating pipes and safety valves connecting the vessel to the boiler should be used along with thermal insulation, all in accordance with norms and regulations of a country in which it is being used. Thermal insulation of the safety devices is designed to protect them against freezing only during short stoppages of the boiler.

**NOTE!**

Lack of thermal insulation, inadequate positioning of the expansion vessel, i.e. not in accordance with the norms and regulations of a given country, along with mounting valves on the overflow pipe may cause warranty loss. The warranty services may be denied, especially if the leakage took place when the temperature dropped below 0°C.

## 5. Starting the boiler

Before firing the boiler up, it is necessary to fill both the boiler and the installation with water. It should be checked if there is water in the expansion vessel which is situated at the highest point of the installation. Checking should last few seconds in order to make sure that water flows out of the vessel.

Before starting the boiler, it must be checked whether there is enough water in the system, and if the water in the system is not frozen. Additionally, it must be checked if the boiler and whole heating system are in proper working order. Draft regulator and the ashpan door should be open. The boiler should be fired up gradually, using tinder and small amount of basic fuel. When the fuel is burning, fill the combustion chamber with fuel, close the door, and set the draft regulator in accordance with desired temperature in the boiler.

### **5.1 Boiler operating temperature**

If the temperature of water supplying the central heating installation is below 55°C, steam will condensate on the sides of the boiler, and water may leak out. Operating the boiler at low temperature may cause corrosion. Thus, it is recommended to use the boiler when the temperature of water supplying the central heating installation is higher than 55°C.

Using the boiler when the temperature of water is lower than 55°C causes precipitation of tar from the combusted fuel, which concentrates in the heat exchanger and the chimney duct. The deposits of tar in the heat exchanger and the flue are dangerous as they might catch fire.

Maximum water temperature in the boiler must not overreach 90°C. The JUHAS boilers may be used in central heating systems with natural or forced water circulation. The boiler should be secured in accordance with norms and regulations of the country in which it is being installed.

### **5.2. Using the flame adjuster**

Use flame adjuster knob to set the temperature. Then heat the boiler until it reaches that temperature. When the temperature in the boiler reaches the desired temperature, fasten the chain to the flap which doses the air. The chain must be well stretched (toleration max 1 mm). Remember to tighten the screw properly.

### **5.3 Process of combustion**

The boiler should be refilled with fuel once in a while. When working with nominal power, the reserve of fuel in the boiler should be enough for approximately 5 hours. When boiler works with lower thermal power, this period is longer. The combustion process can be regulated by use of the smoke conduit throttle (fumes outlet regulator) as well as by the flame adjuster.

#### **NOTE!**

It is forbidden to stand in front of the boiler while opening the door! It might cause severe burns. In order to avoid the risk of burn, open the ashpan and wait a few minutes before opening the door. It should be done with due care and in accordance with safety rules.

## 5.4. Cleaning

To maintain the highest efficiency of the combustion process, the smoke channels and plates inside the furnace should be kept clean. Soot, dust, and ash, which appear as a side effect of burning, decrease the efficiency of the combustion process. The smoke channels and the plates inside the furnace should be cleaned with fire iron. Ash and combustion residues should be removed through the ashpan door.

## 6. Stopping the boiler

When the heating season ends, or during the break in the heating season, the boiler should be cleaned thoroughly, and the combustion residues should be removed from it. Use scraper to clean the walls of the boiler and leave it open to ventilate.

## 7. Troubleshooting

When the maximum temperature is overreached, close the air dosing flap using flame adjuster, or unpin the line connecting those two elements. Next, close the smoke conduit throttle and the door for cleaning heating ducts. If the temperature does not drop after completing the above mentioned activities, rake out the hearth content into metal (non-flammable) ashpan, taking due care, following safety regulations, and wearing protective gloves.

**IT IS FORBIDDEN TO REPLENISH THE BOILER WITH COLD WATER WHILE IT IS HEATED. IT IS ALSO FORBIDDEN TO USE WATER TO EXTINGUISH THE BOILER!!!**

## 8. Maintenance

Inspection and repair of the boiler should be done on a regular basis. In order to inspect the boiler and further determine the extent of possible repairs, the boiler must be cleaned from the residues. After the heating season ends, it may be necessary to repair some minor defects, even if the boiler was used properly. Most of the minor defects can be repaired by the user. However, serious faults occurring due to mechanical damages, breakdowns, improper usage, or natural wearing of the boiler should be made by a qualified person.

## 9. Transportation of the boiler

The boiler is supplied as assembled. It must be transported in vertical position. It is forbidden to attach ropes, chains, etc. to the boiler as it may cause its damage. The boiler should be fastened with tension straps at the upper frame of the door and the flue.

## 10. Notes

The boiler must be used only by an adult person who has read this documentation thoroughly. It is forbidden for children to be near the boiler without the supervision of adults. Do not use flammable liquids to ignite the boiler. Use solid fuel, wood, or paper. Do not keep any combustible materials either on the boiler, nor near the boiler. Use only fuel recommended by the manufacturer, delivered by a licensed supplier.

## **11. Procedure in case of soot fire in the flue duct**

In case when the soot in flue duct catches fire, notify the fire brigade immediately. People staying in heated rooms should be warned and prepared for immediate evacuation. The air supply to the stove should be stopped. While waiting for the fire brigade, it should be observed (if possible) whether the fire does not spread to flammable objects via sparks, or overheated chimney pipe.

## **12. Closing remarks**

The main advantage of JUHAS boilers is that their construction ensures high efficiency along with the low fuel consumption. Make sure that you receive the Warranty Card when you purchase the boiler. When issuing a complaint, it is necessary to specify the type of the boiler, serial number, and the year of production.

# Warranty Card

1. The Manufacturer gives warranty for the heating boiler of JUHAS type for the period of:
  - 48 months for water tightness of the exchanger, however for no longer than 54 months from the date of production;
  - 12 months for the furnace door protection and cast-iron deflector.
2. The Manufacturer provides free of charge repair within 14 days from the date of notifying the damage resulting due to defective parts or workmanship, and is not responsible for any breaks in heating nor losses suffered due to the boiler breakdown.
3. Repairs carried out by an unauthorized person will cause loss of warranty.
4. Any damages or breakdowns caused by:
  - improper storage, humid boiler room, lack of ventilation;
  - the fact that the boiler has not been cleaned according to manual;
  - exceeding the maximum temperature of 90°C as well as maintaining the boiler temperature below the minimum level of 55°C;
  - improper transportation, mechanical damages;
  - damaging the grate due to using wood containing steel (nails);
  - other reasons not caused by the Manufacturer's fault may be repaired at user's expense.
5. The warranty does not cover:
  - varnished surfaces, galvanized surfaces, hinges, sealing rope, thermometer.
6. The Warranty Card without date of sale, stamp, and seller's signature is invalid.
7. In case a complaint is found to be unjustified, all the costs related with the repair and the arrival of personnel will be covered by the claimant.
8. Service will be provided only when a copy of the Warranty Card and purchase proof are sent earlier.

boiler output ..... year of production ..... serial number .....

.....  
signature and stamp of the manufacturer

.....  
signature and stamp of the quality controller

.....  
signature and stamp of the seller

.....  
date of sale

**List of repairs under the warranty**

Repair notification date	Date of repair	Details of repair	Signature and stamp of the serviceman

**Notes:**

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**Client's data:**

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