

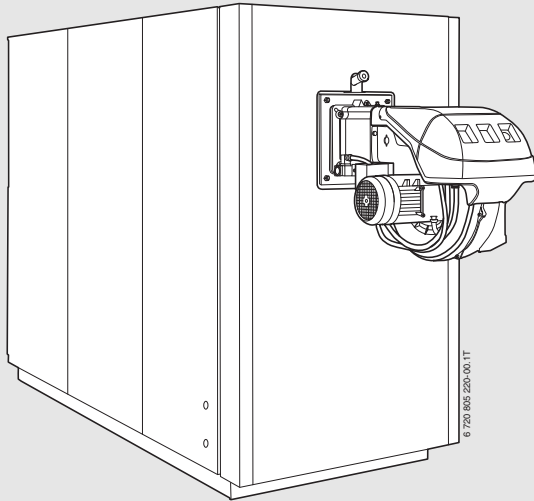
UPON COMPLETION OF THE INSTALLATION THE INSTALLER MUST INSTRUCT THE OWNER AND OPERATOR ON THE FUNCTIONALITY AND THE PROPER OPERATION OF THE BOILER AND THE HEATING SYSTEM THIS MANUAL SHOULD BE HANDED TO THE OWNER AND OPERATOR OF THE APPLIANCE.

INSTALLER MUST REVIEW ALL SAFETY INSTRUCTIONS WITH THE OWNER AND OPERATOR.

DANGER!

The installation instructions included in this Manual are intended solely for use by a trained and certified installer, service company or the gas supply company. If the information in this manual is not followed, a fire or explosion may result causing property damage, personal injury, or death.

- ▶ Have installation and service performed by a trained and certified installer or service company, or the gas supply company.
- ▶ Bosch recommends signing a service and maintenance contract with a trained and certified installer or service company that covers annual servicing and condition-based maintenance. Proper maintenance is a fundamental requirement for safe and efficient operation and long service life.
- ▶ The boiler must be serviced annually including the main burner, ignition burner, the entire venting system, and the combustion air supply. All parts that show any signs of damage or corrosion must be replaced.
- ▶ The owner and operator is responsible for the operational safety and regulatory compliance of the heating system.
- ▶ Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury, or death. Refer to this manual and consult a trained and certified installer or service company, or the gas supply company before installation, service or maintenance.



Stainless Steel Condensing Boiler

Buderus SB625WS/Buderus SB745WS

Low temperature condensing boilers for gas/oil fired power burners



Operating Instructions

6 720 805 220 (2013/02) US/CA



Read these instructions carefully before installation and operation of the heating system.

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1 Key to symbols and safety instructions

1.1 Explanation of symbols

Warnings



Warnings in this document are identified by a warning triangle printed against a grey background.

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- **NOTE** indicates that property damage may occur.
- **CAUTION** indicates that personal injury may occur.
- **WARNING** indicates that severe personal injury may occur.
- **DANGER** indicates that severe personal injury or death may occur.

Important information



Important information for the proper use of the boiler is also provided in this manual. You will find the information with a symbol shown on the left and bordered by horizontal lines above and below the text.

Additional symbols

Symbol	Meaning
▶	Sequence of steps
→	Cross-reference to other points in this document or to other documents
•	Listing/list entry
–	Listing/list entry (2nd level)

Table 1

1.2 General safety instructions

If you hear gas leaking

- ▶ Leave the building immediately.
- ▶ Prevent others from entering the building.
- ▶ Notify the police and fire department from outside the building.
- ▶ From outside the building, call the gas supply company and a trained and certified installer or service company.

If you smell gas

- ▶ Turn off the gas shut-off valve.
- ▶ Open windows and doors
- ▶ Do not touch any electrical switch, telephone, and do not use outlets.
- ▶ Extinguish all open flames.
- ▶ Do not smoke!
- ▶ Do not use lighters!
- ▶ Warn all occupants of the building that they need to leave the building.
- ▶ Do not ring doorbells!
- ▶ Notify the police and fire department from outside the building.
- ▶ From outside the building, call the gas supply company and a trained and certified installer or service company.

If you smell flue gas

- ▶ Switch off the heating system by shutting off the emergency shut-off switch.
- ▶ Open windows and doors.
- ▶ Call a trained and certified installer or service company.

DANGER: Risk of fatal injury from failing to consider your own safety!

- ▶ Never risk your own life. Your own safety must always take the highest priority

NOTICE: Risk of appliance damage from improper operation of the boiler!

- ▶ Only use the boiler for its intended purpose.
- ▶ Only operate the boiler if it has been installed and maintained per the instructions provided in the Installation Manual.
- ▶ Do not attempt to operate an appliance if any part of it is not in working order or is damaged.
- ▶ Use only original spare parts! The use of parts not supplied by the manufacturer may cause damage to the boiler, other property and personal injury. Also, boiler damage caused by the use of unauthorized parts is not covered by the warranty.

DANGER: Risk of fire when soldering and brazing!

- ▶ Take appropriate protective measures when soldering and brazing around combustible and flammable material.

NOTICE:

- ▶ The installation must comply with all applicable national, state, and local codes, rules, and regulations.
- ▶ The operator is responsible for the operational safety and regulatory compliance of the heating system.
- ▶ In the Commonwealth of Massachusetts, the appliance must be installed by a licensed plumber or gas fitter.

DANGER: Risk of personal injury or death from flue gas poisoning!

- ▶ Do not install a thermostatic flue gas damper downstream of the draft hood.
- ▶ Do not tamper with, remove, or attempt to repair the blocked vent switch.
- ▶ When replacing the blocked vent switch, install the new part in the original location.
- ▶ A blocked vent switch tripping more than once indicates a problem with the venting system or chimney which must be repaired immediately.
- ▶ Ensure none of the vent pipes and chimneys are damaged or blocked.
- ▶ Connect only one appliance to each venting system or chimney.
- ▶ The venting system must not feed into or route through another air extraction duct.
- ▶ The venting system must be inspected annually. All parts that show any signs of damage or corrosion must be replaced.
- ▶ Never close off or reduce the size of the combustion air openings.
- ▶ The boiler must not be operated until any obstructions have been removed.

DANGER: Risk of personal injury or death from explosion!

- ▶ Work on gas components may only be carried out by a trained and certified installer or service company.
- ▶ Appliance installation, the connection of gas and vent piping, initial commissioning, electrical connections, and service and maintenance must only be carried out by a trained and certified installer or service company.

DANGER: Risk of personal injury or death from fire!

- ▶ Do not use flammable or combustible material in the boiler room.
- ▶ It is recommended not to store any items within 16 inches (415mm) of the appliance

CAUTION: Appliance damage from contaminated combustion air!

- ▶ Keep the combustion air free of corrosive substances, e.g. halogenated hydrocarbons from painting operations or beauty salons.
- ▶ Keep combustion air free from dust and lint, e.g. from laundry or agricultural operations.
- ▶ If clean room air is not available, fresh outdoor combustion air must be provided

DANGER: Risk of personal injury or death from electric shock.

- ▶ Before removing the front panel, disconnect the heating system from the electrical power supply by shutting off the emergency shutoff switch or the heating system circuit breaker.
- ▶ It is not enough to switch off the control panel. **Power to the panel must be disconnected!** Ensure that the power is not restored unintentionally by following proper lock out/tag out procedures.
- ▶ Only qualified electricians are permitted to carry out electrical work.

DANGER: Safety devices!

- ▶ Never shut off safety valves!
- ▶ Hot water may escape from the safety valve at any time when the appliance is running.

DANGER: Risk of personal injury or death after a flood!

- ▶ Do not attempt to operate an appliance if any part of it has been under water.
- ▶ An appliance that was subject to flooding must be replaced.

NOTICE:

- ▶ Upon completion of the installation, these instructions should be handed to the owner and operator of the appliance.
- ▶ The installer must instruct the owner and operator on the functionality of the components and the proper operation of the boiler and the heating system.
- ▶ The boiler must be serviced annually including the main burner, ignition burner, the entire venting system, and the combustion air supply. All parts that show any signs of damage or corrosion must be replaced.

2 Product description

The oil/gas fired boiler SB625WS/SB745WS has been developed and built employing the latest technologies and safety regulations.

Particular emphasis is placed on ease of operation. Please observe the safety instructions and the operating instructions to ensure optimum safe, economical and environmentally-friendly operation of your system.

The main components of the SB625WS/SB745WS gas/oil fired boiler are:

- Boiler block [3].
The boiler block transfers the heat generated by the burner to the heating water.
- Boiler shell [1], thermal insulation [2].
The boiler jacket and thermal insulation minimize energy loss.

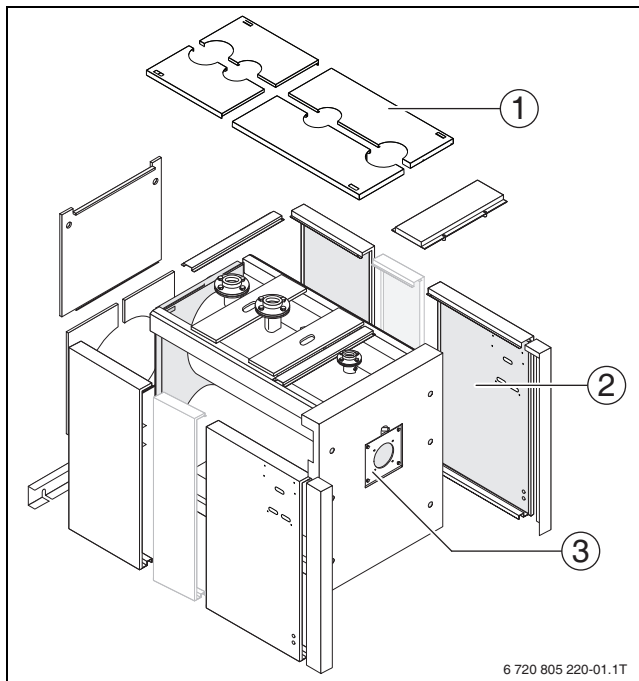


Fig. 1 Oil/gas fired boiler Buderus SB625WS/Buderus SB745WS

- [1] Boiler shell (jacket)
- [2] Thermal insulation
- [3] Boiler block

2.1 Correct use

The SB625WS/SB745WS is designed for heating boiler water and water heating. Any other purpose is considered improper use. Any resulting damage is excluded from the manufacturer's warranty.

The SB625WS/SB745WS can be operated with gas, oil, and combination burners. For a list of the approved burners, please contact Bosch Thermotechnology Corp. Required operating conditions of allowable fuels may be found in the boiler installation manual.

The boiler can be operated with an aquastat, the Logamatic 4000, and other control systems.

2.2 Certification and testing mark

This appliance has been tested and certified and meets all applicable standards for the US and Canadian markets.

2.3 Data plate



If you contact the manufacturer with any questions about this product, always provide the details on the data plate and serial number plate. These details enable us to assist you specifically and quickly.

Serial number plate

The serial number plate is located on the rear of the boiler block and specifies the serial number and model.

Data plate

This lists the appliance's technical specifications and performance. The data plate will be factory installed on the boiler side panel.



If these plates or any other means of clearly identifying the product are defaced, removed or lost, proper installation and servicing may be difficult.

2.4 The correct fill and make-up water

Note the fundamental system-specific water quality requirements.

Water designation

Water is used as the heat transfer medium in your heating system. Depending on its purpose, the water is given different descriptions.

- Heating water:
Water contained within your heating system.
- Fill water:
Water used for the first filling of your system before commissioning.
- Make-up water:
Water used for topping up the heating system in case of water loss.

Water quality requirements

All water contains substances, e.g. $\text{Ca}(\text{HCO}_3)_2$ (calcium hydrogen carbonate) that could affect the operation of your heating system. These can cause corrosion, scale formation or deposits.

To ensure your heating system always operates economically, properly and safely, not to mention in an energy-efficient manner, we require that you regularly monitor the quality of the fill and make-up water and treat it accordingly as and when necessary.



NOTICE: System damage from corrosion or scale formation as the result of using fill and make-up water that does not conform to the system-specific requirements.

- ▶ Ask your trained and certified installer or local water company what the concentration of $\text{Ca}(\text{HCO}_3)_2$ (calcium hydrogencarbonate) is in your area.
- ▶ If the fill and make-up water does not meet system-specific requirements, it will have to be treated. Consult your trained and certified installer if this is the case.


For the correct use and treatment of the fill and make-up water, the contents of the following table MUST be observed.

Parameters	Unit of measure	Heating water
pH		7.5- 9,5
Hardness	ppm	< 50
Electrical conductivity	µs/cm	< 100
Chlorides	mg/l	< 10
Sulphides	mg/l	< 10
Nitrides	mg/l	< 10
Oxygen in solution	mg/l	-
Iron (Fe)	mg/l	< 0.5


Table 2 Requirements of heating system water

2.5 The correct fuel


To ensure it operates properly, the heating system requires fuel of the correct type and grade.



NOTICE: Risk of system damage from use of incorrect fuel.
 ► Only use the fuel specified. The correct fuel is entered in → Tab. 3 by the heating contractor.



Consult your system installer if you intend on changing the fuel for your system.



NOTICE: Risk due to oil leaks
 ► When using oil as the fuel, national regulations hold the operator responsible for immediately calling a specialist contractor to remedy oil leaks the moment they are discovered.

2.6 Combustion Air Quality

- Keep the supply of combustion air free of corrosive substances (e.g. halogenated hydrocarbons that contain chlorine or fluorine compounds).

This will help prevent corrosion.

- Never use or store chlorinated cleaning agents or halogenated hydrocarbons (as contained in spray cans, solvents or cleaning agents, paints and adhesives, for example) in the boiler room.
- Keep the combustion air supply free of dust.
- If building work is taking place in the installation room and creating a lot of dust, shut the boiler down.
- A burner contaminated during building work must be cleaned before commissioning.

Stamp/Signature/Date

Table 3 Fuel to be used (entered by heating system installer)

3 System start-up

This chapter explains how you prepare the system for operation and how to commission the control panel and the burner.



WARNING:

- ▶ Do not attempt to start the burner when excess heat oil has accumulated, when the units is full of vapor, or when the combustion chamber is very hot.

3.1 Making the system operational

You should check the following to prepare the system for operation:

- ▶ Operating water pressure of the system (→ Chapter 3.2).
- ▶ Fuel is supplied and the main fuel shut-off valve is open.
- ▶ Heating system emergency shutoff switch set to ON.

Ask your heating contractor to show you where the fill valve for your heating system is located.

3.2 Check and correct the operating pressure

Your heating system must contain sufficient water to ensure the functionality of your system.



NOTICE: Risk of system damage due to frequent refilling.

- ▶ If you need to add water frequently, the heating system may be damaged by corrosion and scale buildup depending on the water quality.
- ▶ Bleed the heating system. If necessary, fill with make-up water.
- ▶ Check the heating system for leaks and the correct operation of the expansion vessel.
- ▶ Notify your heating contractor if you find the need to refill your heating system frequently.

If the operating pressure in the system is too low, fill make-up water into your system (→ Chapter 2.4, page 5).

- Recently added fill or make-up water loses much of its volume in the first few days because it releases gases. With newly filled heating systems, initially check the operating pressure daily and then in ever increasing intervals.



Air pockets may form in the heating system from the fill or make-up water releasing gases.

- Once fill or make-up water volume has stabilized, check the operating pressure of the heating water once a month.

All factory default settings will have already been made by the heating contractor when the system was first commissioned.

3.2.1 Checking the operating water pressure

The recommended operating pressure should remain above 22 psi (1.5 bar) to eliminate air from the system and prevent system noise.

- ▶ Read the current operating pressure and temperature (°F (°C)) on the temperature/pressure gauge.
- ▶ If the operating pressure drops below design, fill up the heating water.

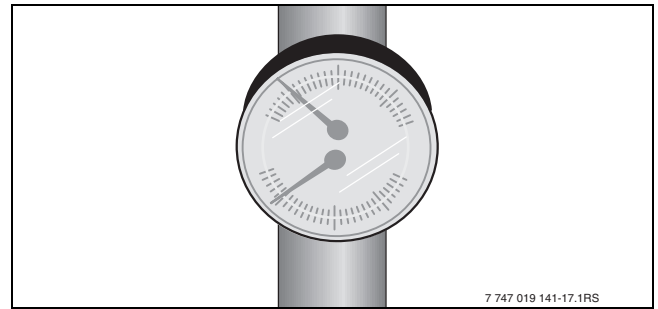


Fig. 2 Pressure/temperature gauge

3.2.2 Filling with heating water and bleeding the system



Let your local heating contractor show you where the boiler fill and drain valve for filling and draining the heating water is located on your heating system.

- ▶ Slowly fill the heating system via the on-site fill valve. During filling, observe the display (pressure gauge).
- ▶ Once the desired operating pressure is reached, stop the procedure.
- ▶ Bleed the heating system via the purge valves.
- ▶ Add fill water again if the operating pressure drops as a result of bleeding the system.

3.3 Starting up the control panel and the burner



NOTICE:

The control unit should only be operated by a trained professional - call your service personnel for servicing advice.

Start your boiler via the control panel (→ Fig. 3). By starting the control panel, you also automatically start the burner. The burner is then fired by the control panel. For further details, see the operating instructions of the relevant control panel or burner.

- ▶ Switch the boiler water thermostat [1] to "AUT".
- ▶ Set the ON/OFF switch [2] to "I" (ON).

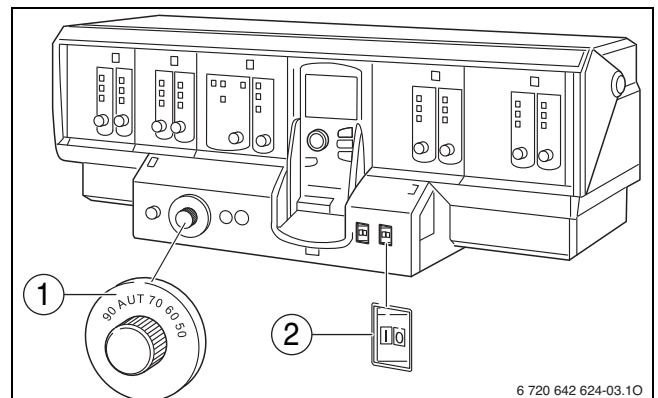


Fig. 3 Control panel (for example: Logamatic 4000)

- [1] Boiler water thermostat
- [2] ON/OFF switch



Follow the control panel operating instructions.

4 Shutting down the system

This chapter explains how you shut down your boiler and switch off the control panel and the burner. Furthermore, it contains details on how to shut down your heating system in an emergency.



NOTICE: Risk of system damage from freezing.

- ▶ The system can freeze up if it is out of service, e.g. from a shutdown because of fault(s).
- ▶ Protect your system against frost damage where temperatures below freezing are expected.
- ▶ Drain the heating water at the lowest point in the system, using the boiler drain valve. To do this, open a purge valve at the highest point in the system.



Contact the Technical Assistance Service if you encounter any problems in completing the following procedure.

- ▶ Shut off the fuel supply at the main fuel shut-off valve.

4.1 Switching off the control panel and the burner

Shut down your boiler via the control panel (→ Fig. 3). The burner is automatically shut down when the control panel is switched off.

- ▶ Set the ON/OFF switch (→ Fig. 3, [2]) to "0" (OFF).



For further details on this subject, see the operating instructions for the relevant control panel.

4.2 Shutting down the system in an emergency



Only in emergencies, switch off the system using the emergency shutoff switch or by disengaging the heating system circuit breaker.

In other dangerous situations, immediately close the main fuel shut-off valve and the power supply of the heating system using the emergency shutoff switch or by disengaging the heating system circuit breaker (→ Chapter 1.2, page 3).

5 System maintenance

This chapter explains, why regular maintenance is important for your system. It will also indicate to you, how you can check and regulate the water pressure.



CAUTION: System damage through inadequate cleaning and maintenance.

- ▶ Have your system inspected, cleaned and maintained annually by a specialist contractor.
- ▶ We recommend you enter into a contract covering an annual inspection and maintenance on an "as-required-basis".

Observe the separate maintenance instructions for maintenance work on the neutralising system. Only specialists should carry out work on the neutralising system.

5.1 Why is regular maintenance important?

You should have your system regularly serviced for the following reasons:

- to maintain the highest level of efficiency and to operate the system economically (low fuel consumption),
- to achieve a high level of operational reliability,
- to maintain the highest level of environmentally responsible combustion.

5.2 Ordinary analysis and checking, frequency and sampling points

The following symbols and terms are used to identify sampling frequency and the location of sampling points:

Symbols and terms	
Frequency of analysis	A - Twice a year, in the season in which the heating system is in use
	B - Once a month
	C - Once every 15 days
	D - Once a week
Sampling points	1 - Filling water
	2 - Filling and/or refilling water
	3 - Water in the boiler or heating circuit

Table 4

Type of system analysis and checks	Hot water heating system	Notes
Appearance	2A-3A	
pH	3A	
Total hardness	2B	
Fixed residues		
Electrical conductivity		Electrical conductivity measurement can be used instead
Iron	3A	Fixed residue measurement can be used instead
P-alkalinity		
Chemical conditioner	3A	
Copper	3A	

Table 5

6 Troubleshooting

Heating system faults are shown on the control panel display. You will find detailed information regarding fault displays in the service instructions for the relevant control panel. The burner fault is also indicated by a fault lamp on the burner.



NOTICE: Risk of system damage from freezing.

- ▶ The system can freeze if it is out of service, e.g. power failure, shutdown caused by fault(s).
- ▶ If the system remains switched off for several days because of a fault shutdown, you should drain the heating water via the boiler drain valve at the lowest point in the system to protect it against freezing.

- ▶ Press the burner reset button (see burner operating instructions).



NOTICE: Risk of system damage due to too many resets.

- ▶ The burner ignition transformer may be damaged if you press the reset button more than three times in succession when the burner refuses to start.
- ▶ Do not attempt to remedy the fault by pressing the reset button more than three times in succession.

If the burner does not restart after three attempts, refer to the technical documentation provided with the burner to find out how to reset it.

Notes



United States and Canada

Bosch Thermotechnology Corp.
50 Wentworth Avenue
Londonderry, NH 03053
Tel. 603-552-1100
Fax 603-965-7581
www.bosch-climate.us
U.S.A.

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