

# Installation and maintenance instructions

## Sealed combustion gas boiler Logano GA124

**CAUTION!**

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

**WARNING!**

If installation, adjustment, modification, operation or maintenance of the heating system is carried out by an unqualified person, this may result in danger to life and limb or property damage. The directions of this installation and maintenance manual must be followed precisely. Contact a qualified service company, service provider or the gas company if support or additional information is required.

**CAUTION!**

The operating manual is a component of the technical documentation 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.



**Note:** Keep this installation and maintenance manual available for future reference.

# Buderus

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# 1 Safety

Observe these instructions for your safety.

The burner and control must be correctly installed and adjusted to ensure safe and economical operation of the gas-fired boiler.

Read this installation and maintenance manual carefully and note the details on the boiler nameplate before placing the boiler in operation.

## 1.1 Correct use

The Logano GA124 gas-fired boiler is designed to heat water for a hot water heating system for heating single or multiple occupancy buildings.

## 1.2 Observe the following symbols

Two levels of danger are identified and signified by the following terms:



### RISK TO LIFE

Identifies possible dangers emanating from a product, which might lead to serious injury or death if appropriate care is not taken.



### RISK OF INJURY/ SYSTEM DAMAGE

Identifies potentially dangerous situations, which might lead to medium or slight injuries or to material losses.

Additional symbols for identification of dangers and user instructions:



### RISK TO LIFE

from electric shock.



### USER NOTE

Tip for the optimum utilization and setting of the control(s) plus other useful information.

## 1.3 Please observe these notes

### 1.3.1 National regulations

The heating system must comply with the relevant regulations issued by national authorities, or the regulations issued by the National Fuel Gas Code, ANSI Z 223.1. In Canada the regulations of CAN/CGA B 149.1 or 2, Installation Code for Gas Burning Appliances and Equipment, must be observed.

If specified by the local regulatory authorities the heating system must comply with the regulations of the "Standard for Controls and Safety Devices for Automatically Fired Boilers", ANSI/ASME CSD-1.

Carbon monoxide detectors must be installed as specified by the local regulations. The boiler must be serviced annually; see Chapter 11 "Boiler inspection and maintenance", page 48.

### Boiler operating conditions

Maximum boiler temperature	220 °F
Maximum operating pressure	58 psi

The hot water pipe system must comply with the current legislation and regulations. If an existing boiler is replaced, the complete hot water pipe system must be inspected to ensure that it is in perfect condition to ensure safe operation.



### RISK TO LIFE

due to neglecting your own safety in case of emergency, such as with a fire.

- Never put yourself at risk. Your own safety must always take priority.

**WARNING!****RISK TO LIFE**

from explosion of flammable gases.  
If you smell gas there is a danger of explosion..

- Never work on gas lines unless you are licensed for this type of work..
- Make sure that a qualified company installs the boiler, connects gas and venting, places the boiler in operation, connects the electrical power, and maintains and repairs the boiler.
- No open flame. No smoking. Do not use lighters.
- Prevent spark formation.  
Do not operate electrical switches, including telephones, plugs or door bells.
- Shut off main gas supply valve.
- Open doors and windows.
- Warn other occupants of the building, but do not use door bells.
- Call gas company from outside the building.
- If gas can be heard escaping, leave the building immediately, prevent other people from entering, notify police and fire from outside the building.

**CAUTION!****SYSTEM DAMAGE**

due to incorrect installation.

- Observe all current standards and guidelines applicable to the installation and operation of the heating system as applicable in your country.

**WARNING!****RISK TO LIFE**

from electric shock.

- Disconnect the power supply to the heating system before conducting any work on it, e.g. switch off the heating emergency switch outside the boiler room.
- It is not sufficient just to switch off the control.

**CAUTION!****SYSTEM DAMAGE**

due to unsatisfactory cleaning and maintenance.

- Clean and service the system once a year. Check that the complete heating system operates correctly.
- Immediately correct all faults to prevent system damage.

**USER NOTE**

Only use original Buderus spare parts. Losses caused by the use of parts not supplied by Buderus are excluded from the Buderus warranty.

**1.3.2 Installation notes****WARNING!****RISK TO LIFE**

from explosion of flammable gases.

- Never work on gas lines unless you are licensed for this type of work.

**WARNING!****RISK TO LIFE**

from electric shock.

- Do not carry out electrical work unless you are qualified for this type of work.
- Before opening a unit: disconnect electrical power completely and lock to prevent accidental reconnection.
- Observe the installation regulations.

### 1.3.3 Information on the boiler room



**WARNING!**

#### **RISK TO LIFE**

by poisoning.

Insufficient ventilation during operation requiring room ventilation may cause dangerous flue gas leaks.

- Make sure that inlets and outlets are not reduced in size or closed.
- If faults are not corrected immediately, the boiler must not be operated.
- Inform the system operator of the fault and the danger in writing.



**WARNING!**

#### **RISK TO LIFE**

by poisoning.

When working on the flue gas monitoring equipment leaking flue gas may endanger the lives of people.

- Do not attempt to repair the flue gas temperature sensor.
- Use only original parts when replacing parts.
- When replacing the flue gas temperature sensor install the new one in the specified position.



**WARNING!**

#### **RISK TO LIFE**

by poisoning by leaking flue gas.

If the flue gas monitor trips frequently, there may be a problem with the chimney or the flue gas venting.

- If the flue gas monitor trips frequently the fault must be corrected and a function test must be conducted.



**WARNING!**

#### **RISK TO LIFE**

by poisoning by leaking flue gas.

- Make sure that the boiler is not fitted with a thermally controlled flue gas baffle after the back flow check.



**WARNING!**

#### **FIRE DANGER**

due to flammable materials or liquids.

- Make sure that there are no flammable materials or liquids in the immediate vicinity of the boiler.

### 1.4 Tools, materials and accessories

You need standard tools for the installation and maintenance of the boiler as used in heating system installation and oil, gas and water installations.

The following additional items will also be useful.

- Boiler cart with rope or Buderus boiler cart
- Cleaning brushes and/or chemical cleaning agents for wet cleaning

### 1.5 Disposal

- Dispose of the packaging material in an environmentally compatible fashion.
- Dispose of any components of the heating system that require replacement in an environmentally compatible fashion.

## 2 Product description

The boiler is a low temperature gas-fired boiler.



### USER NOTE

The boiler is fully functional with the factory-installed aquastat. The Logamatic 2107 control can also be installed in addition to the factory-installed aquastat.

The boiler consists of:

- Aquastat (control unit)
- Logamatic 2107 control (optional control)
- Boiler jacket and front panel
- Boiler block with insulation
- Burner

The control monitors and controls all electrical components of the boiler.

The boiler jacket prevents energy loss and acts as soundproofing.

The boiler block transfers the heat generated by the burner to the heater water. The insulation prevents energy loss.

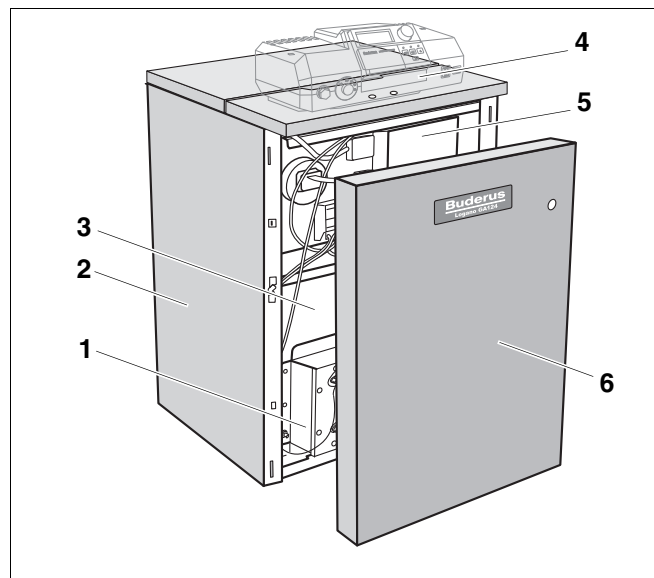


Fig. 1 Logano GA124 boiler

- 1 Burner
- 2 Boiler jacket
- 3 Boiler block with insulation
- 4 Logamatic 2107 control (optional)
- 5 Aquastat (control unit)
- 6 Boiler front panel

### 3 Dimensions and connections

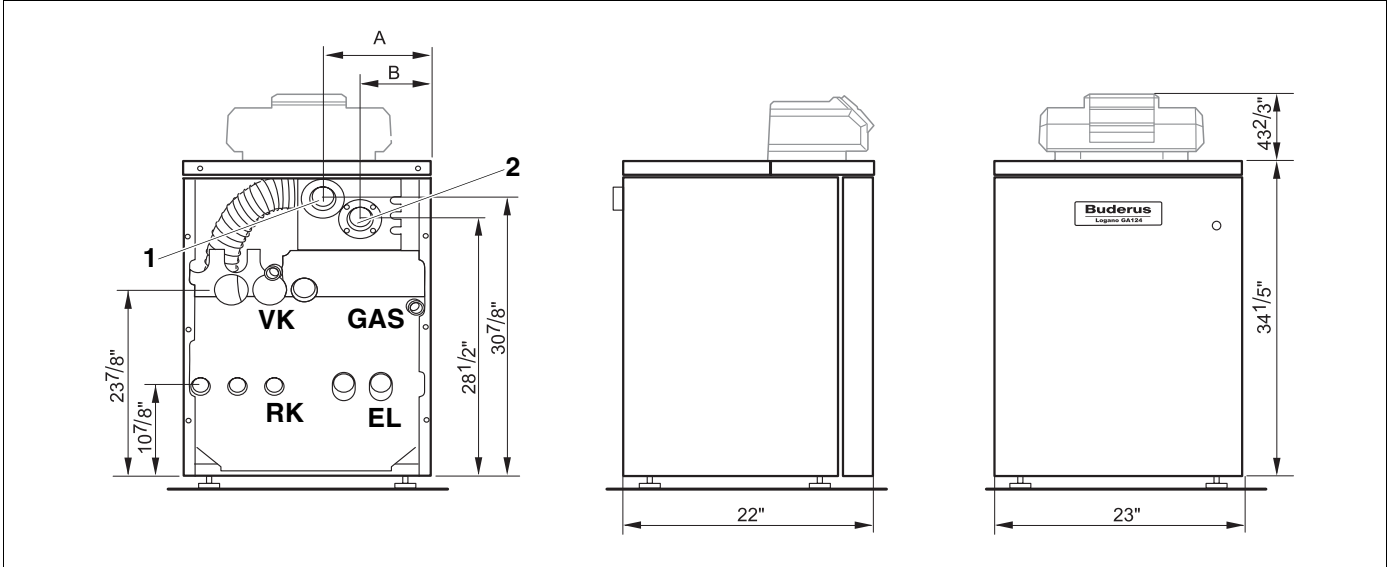


Fig. 2 Back, side and front view, measurements in inches

- 1 Combustion air line connection
- 2 Flue gas line

**Connections (measurements see the following tables):**

- VK = Boiler supply - 1"
- RK = Boiler return - 1"
- EL = Drain - 1/2"
- GAS = Gas connection - 1/2"

Boiler size	Boiler output	Combustion air connection	Flue gas connection	A	B	Min. overflow valve cap.	Number of orifices	Water volume	Empty weight
	MBtu/hr	Inches	Inches	Inches	Inches	lb/hr	Qty	US gal.	lbs
17	59	3"	3"	7 1/5"	3 1/10"	62	2	2.4	229
23	79	3"	3"	8"	6 2/3"	86	3	2.9	240
30	104	3"	3"	9 1/5"	10 1/5"	110	4	3.4	337

Tab. 1 Dimensions



**USER NOTE**

For the size and dimensions of the main gas orifice see → Chapter 13, page 80.

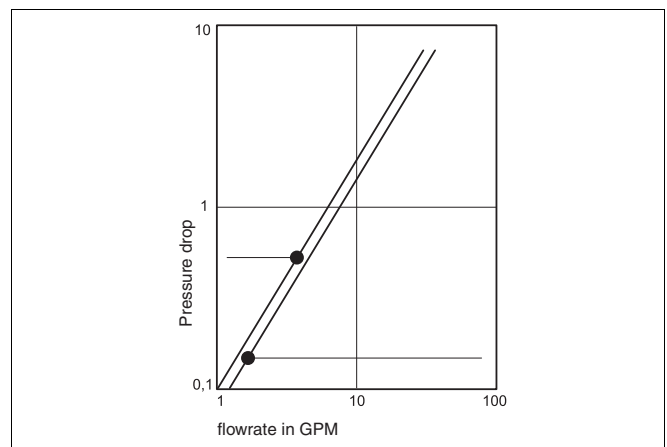


Fig. 3 Pressure gradient

## 4 Scope of delivery

- Check packaging on delivery for damage.
- Check delivery for completeness.

Component	Qty	Packaging
Boiler, complete	1	1 pallet
B-kit components: - supply manifold - 30 psi relief valve - temperature/pressure gauge - 90° elbow (1" NPT) - 90° elbow (3/4" NPT) - boiler drain (3/4") - screw-in feet (4) (M10x51)	1	1 foil package <sup>1</sup>
- wall penetration for horizontal flue system	1	separate packaging unit
- technical documents	1	1 foil package

Tab. 2 Scope of delivery

<sup>1</sup>On pallet

Optional Accessories <sup>1</sup>	Unit
Logamatic 2107 control	1
Heat circulation pump	1
Cleaning brush	1
Vertical flue system	1

Tab. 3 Accessories

<sup>1</sup> Accessories available by separate order

## 5 Moving the boiler

This chapter describes how to move the boiler safely,



**CAUTION!**

### SYSTEM DAMAGE

due to bumps.

- Check the transport diagrams on the packaging to protect the sensitive components from damage by bumping.



### USER NOTE

- Protect the boiler connections from dirt if the boiler is not installed immediately.



### USER NOTE

Dispose of the packaging material in an environmentally compatible fashion.

### 5.1 Moving the boiler with boiler cart

Move the boiler with packaging and on pallet as much as possible.



**CAUTION!**

### RISK OF INJURY

if the boiler is not properly secured to the boiler cart.

- Use suitable transport equipment, such as a boiler cart with a belt.
- Secure the boiler to prevent it from falling.
- Position transport equipment (e.g. boiler cart) at the back of the boiler.
- Secure boiler to cart.
- Move the boiler to the installation location.

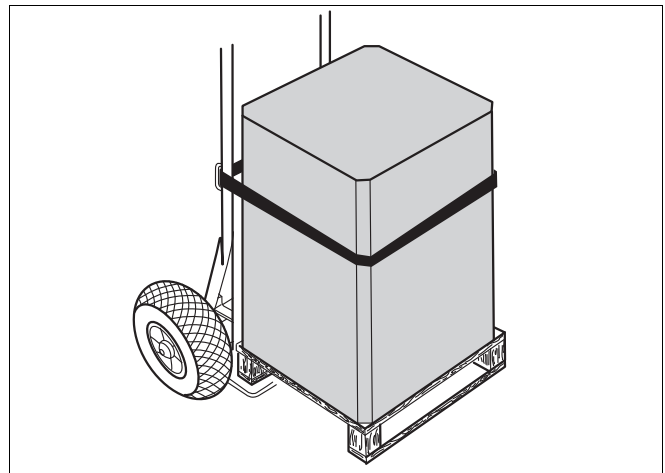


Fig. 4 Moving boiler with trolley

- Remove the straps and the cardboard packaging.
- Remove the bolts from the pallet.
- Lift the boiler at the sides and slide to the edge of the pallet. Place a pipe under the boiler and roll it on additional pipes to the installation location.
- Place the boiler in its final position.

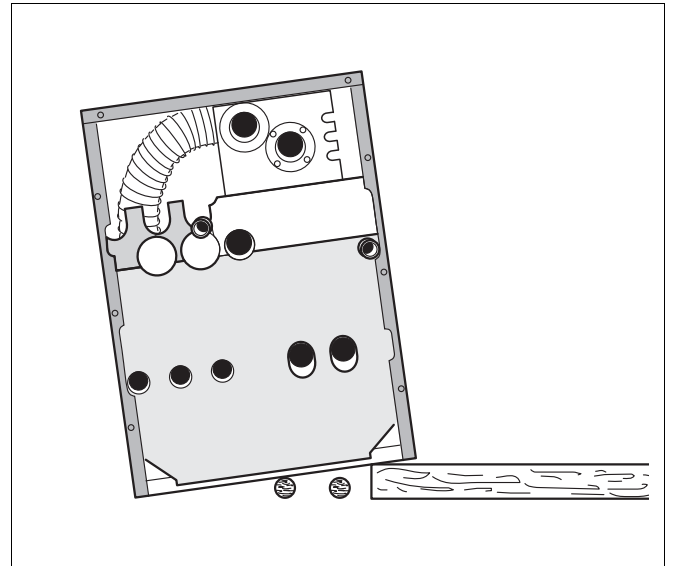


Fig. 5 Moving the boiler

## 5.2 Lifting and carrying the boiler

The boiler can be picked up at the hand grips shown.



**CAUTION!**

### **RISK OF INJURY**

due to carrying heavy loads.

- Lift and carry the boiler with at least four people at the designated hand grip positions.

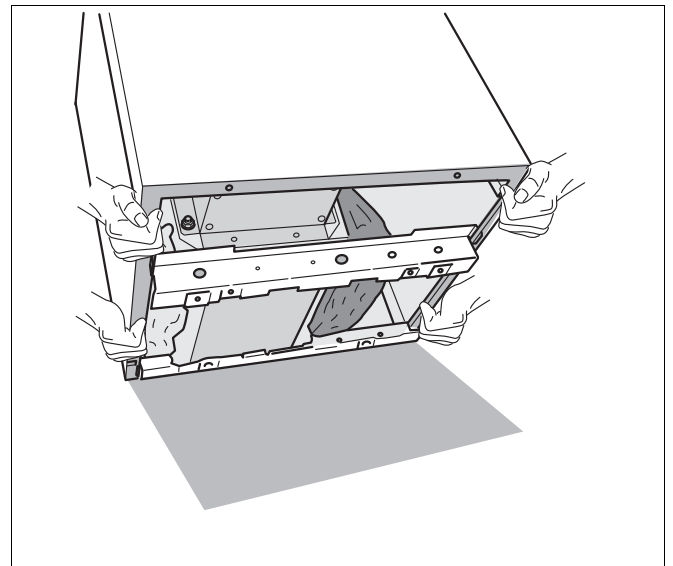


Fig. 6 Lifting and carrying the boiler

## 6 Placing the boiler

This chapter explains how to place the boiler and position it in the boiler room.



### SYSTEM DAMAGE

through frost.

#### CAUTION!

- Place the boiler in a frost-free room.

This boiler is approved for installation in enclosed rooms, such as storage rooms.

The boiler is very heavy when full. Check that the floor can bear the weight before installation.

### 6.1 Clearances

A space of at least 33 inches is required in front of the boiler with the door open to allow sufficient access space for operation and maintenance. When the door is closed, a minimum clearance of 2 inches is required at the front and sides, 2 inches clearance is also required for the flue pipe and 30 inches clearance to the ceiling. The installation location and the base must be smooth and horizontal. The boiler may be installed on a flammable base, but not on carpet.

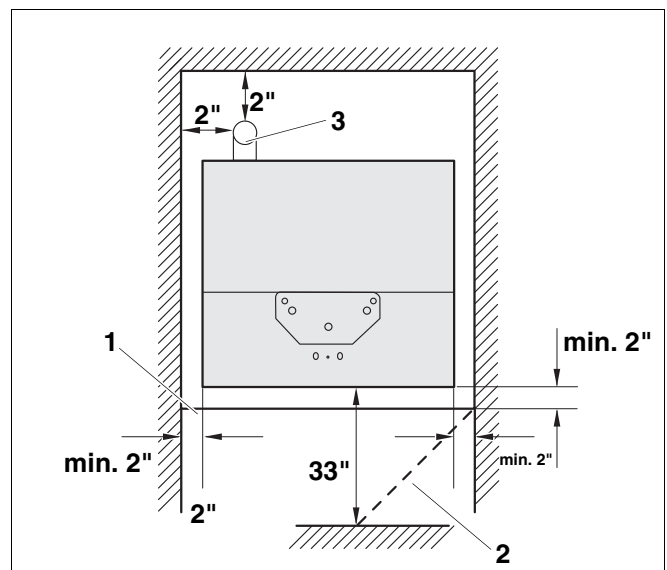


Fig. 7 Required clearances in the boiler room

- 1 Door closed
- 2 Door open
- 3 Flue pipe

## 6.2 Leveling the boiler

- Screw the four rubber feet 0.25 to 1.0 inches into the bottom rails.
- Place boiler on the feet.
- Level boiler horizontally and vertically by screwing the feet in and out.

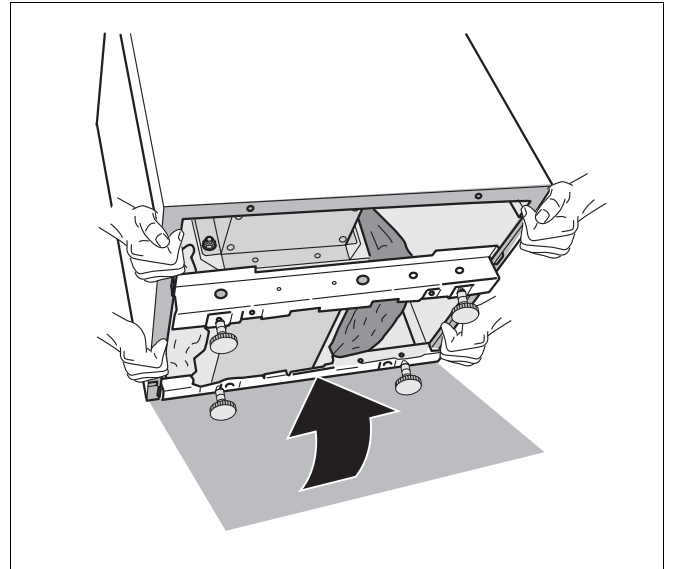


Fig. 8 Unscrewing screw-in feet

## 7 Boiler installation

This chapter describes how to install the boiler. This includes the following tasks:

- Connecting the heating system
- Electrical connection
- Fuel supply connection
- Installation of flue system

### 7.1 Preparing for installation

- Unpack all boxes and containers and check all parts against the packing lists to make sure that everything has been supplied.



#### USER NOTE

Every boiler is carefully inspected and tested before it leaves the factory.

However, if you discover any damage or missing parts, please inform the supplier immediately. Before disposing of packing material, make sure that no parts are still in it.

## 7.2 Heating circuit connection



**CAUTION!**

### BOILER DAMAGE

through moisture.

- Protect the components of the gas ignition system from moisture (dripping, spray, rain) during installation of the boiler, during operation and during maintenance work (such as replacing the pump, replacing the control, etc.).



**CAUTION!**

### SYSTEM DAMAGE

due to overheating as a result of low water.

- Note that a boiler installed above the level of the heating system must be fitted with a low-water alarm. The low-water alarm must be installed during installation of the boiler (→ Fig. 9).



**CAUTION!**

### SYSTEM DAMAGE

due to high temperature variations in the heating system.

- If the boiler is operated in connection with a refrigeration system, make sure that the pipes for the refrigerated liquid are connected in parallel to the boiler system with suitable valves to prevent the refrigerated liquid from entering the boiler.
- The pipe system of a boiler connected to the heating coils of hot-air heating systems that may be exposed to the circulation of cooled air must be fitted with a flow-control valve or some other automatic system for preventing the boiler water from circulating by gravity during the cooling cycle.

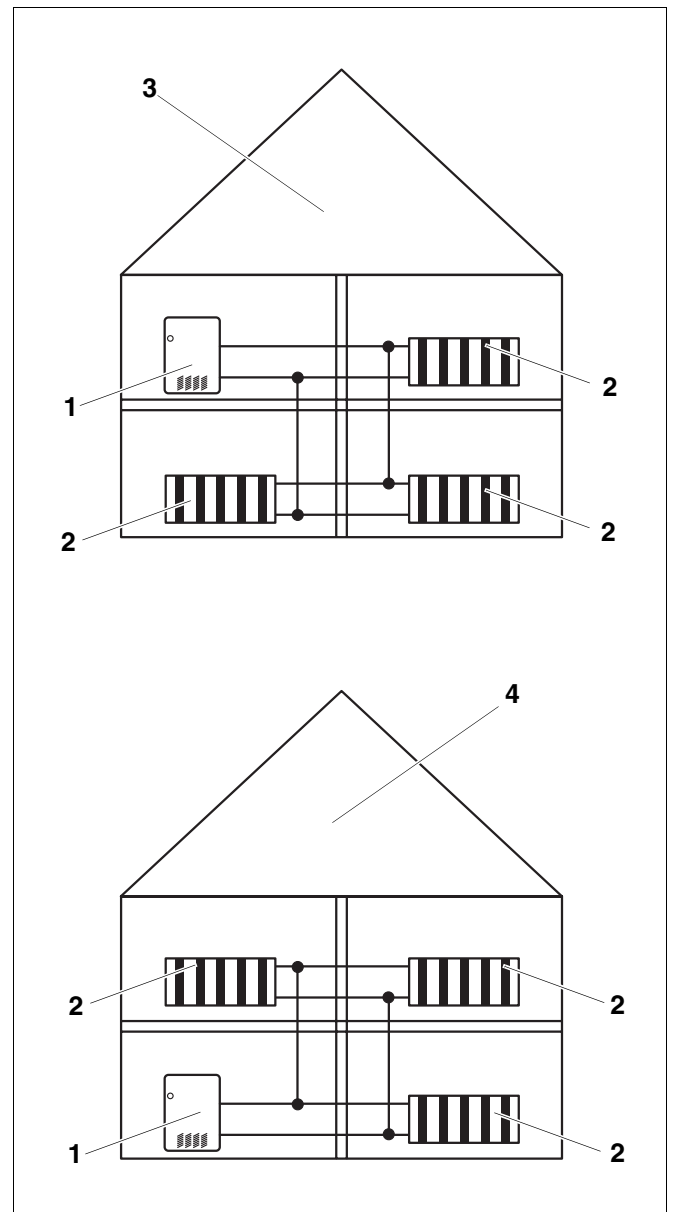


Fig. 9 Low-water alarm

- 1 Boiler
- 2 Radiator
- 3 Heating system with low-water alarm
- 4 Heating system without low-water alarm

### Installation of B-kit

The relief valve and the pressure/temperature gauge are mounted on the boiler supply VK over the supply manifold (included in B-kit).

- Seal 90° 1" NPT elbow on VK.
- Seal supply manifold on 90° 1" NPT elbow. The supply manifold can be mounted vertically or rotated 90° to the right.
- Seal temperature/pressure gauge on supply manifold.



#### USER NOTE

Install the relief valve after the leak test (→ Chapter 7.7, page 32).

The relief valve must be installed in a vertical position.

The relief valve must also be installed in accordance with the requirements of the ANSI/ASME Boiler and Pressure Vessel Code, Section IV.



#### USER NOTE

We recommend installing a dirt filter (optional) in the heater return connection to reduce build-up of debris on the water side.



#### USER NOTE

Observe the local regulations for connection of boiler systems.



**CAUTION!**

#### FIRE DANGER

due to heat.

- Note that a minimum clearance of two inches is required between pipes carrying hot water and flammable walls in the boiler room.

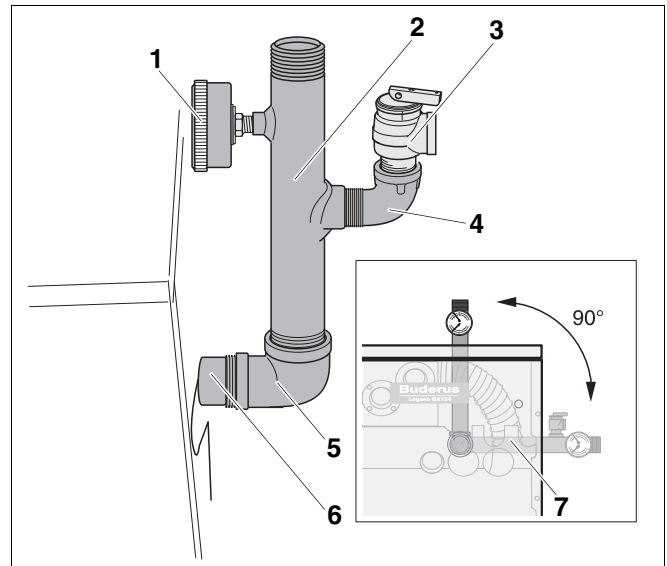


Fig. 10 Installation of B-kit

- 1 Pressure/temperature gauge
- 2 Supply manifold
- 3 Relief valve 3/4"
- 4 90° 3/4" elbow
- 5 90° 1" NPT elbow
- 6 Boiler supply VK
- 7 B-kit rotated 90° right

### 7.3 Electrical connection

The electrical connections of the boiler must be manufactured as specified by the local codes and the current regulations of the National Electrical Code, ANSI/NFPA-70.

In Canada the regulations of CSA C 22.1 Canadian Electrical Code, Part 1, must be observed.

The boiler must be grounded as specified by the regulations of the relevant local authorities; otherwise follow the regulations of the National Electrical Code, ANSI/NFPA-70.



#### USER NOTE

When making the electrical connections follow the circuit diagrams on → page 81 to page 83.

Install an ON/OFF switch near the boiler.



**WARNING!**

#### RISK TO LIFE

from electric shock.

- When conducting maintenance work label all cables before disconnecting them.
  - If cables are connected incorrectly the system may not operate correctly with possibly dangerous consequences.
- 
- Check that the heating system functions correctly after any maintenance work.

## 7.4 Installation of Logomatic 2107 control (optional accessory)

The boiler is fully functional with the factory-installed aquastat. The Logomatic 2107 control can also be installed in addition to the factory-installed aquastat.

All Logomatic capillaries and sensors are to be installed to the boiler immersion well together with the existing Honeywell aquastat sensor (see page 20 for details)



### USER NOTE

Note the following when making electrical connections:

- Lay out cables and capillaries carefully.
- Do not bend the capillaries during installation.
- Never carry out any electrical work on the heating system unless you are licensed for this type of work. If you are not a licensed electrician, have a specialist electrical company make the electrical connections.
- Observe the local regulations.

1. Unscrew left and right screws in the side panels, lift front panel up, pull outward and remove to the front.

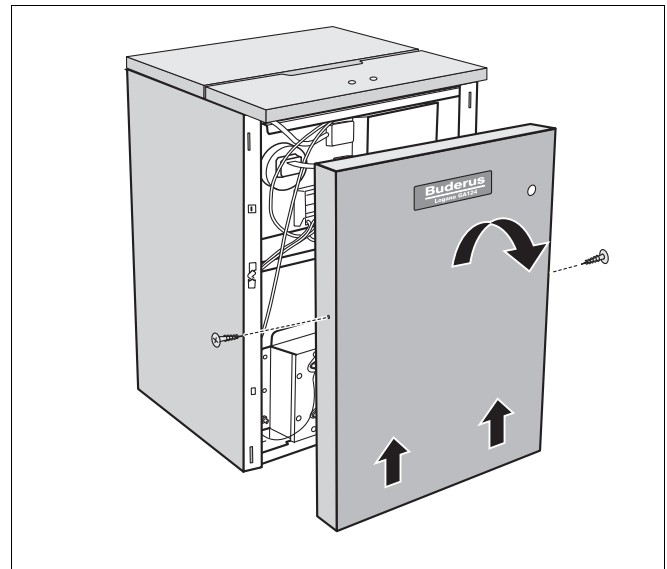


Fig. 11 Removing front panel of boiler

2. Lift the back boiler jacket and remove to the back.

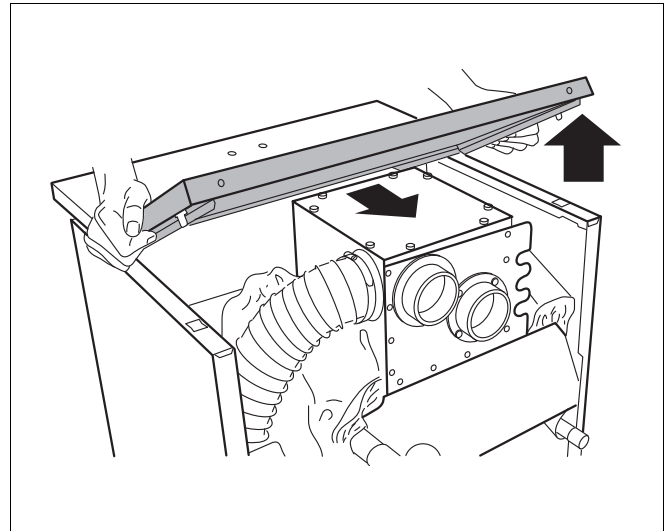


Fig. 12 Removing boiler jacket

3. Slide the insertion tabs of the control into the oval openings.
4. Slide control toward the boiler front panel.
5. Push to snap plastic tabs of the control into the knock-outs.

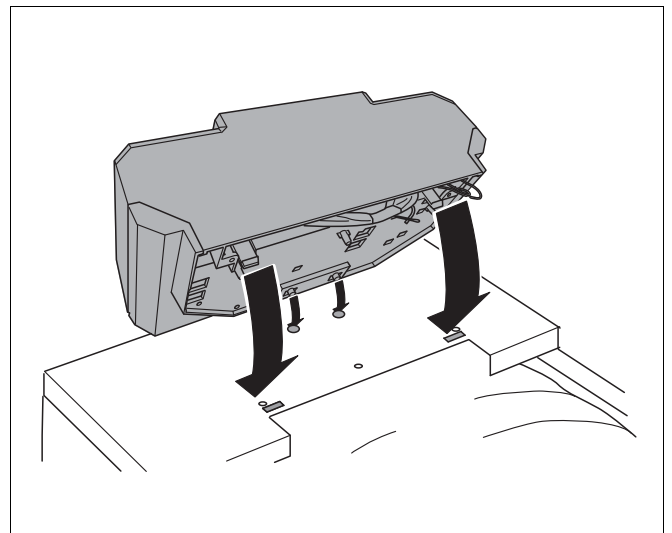


Fig. 13 Removing terminal cover

6. Remove top cover of control Remove screws from the top cover.
7. Fasten control with sheet-metal screws.
8. Route boiler water sensor cable through the cable opening and unroll to the required length.

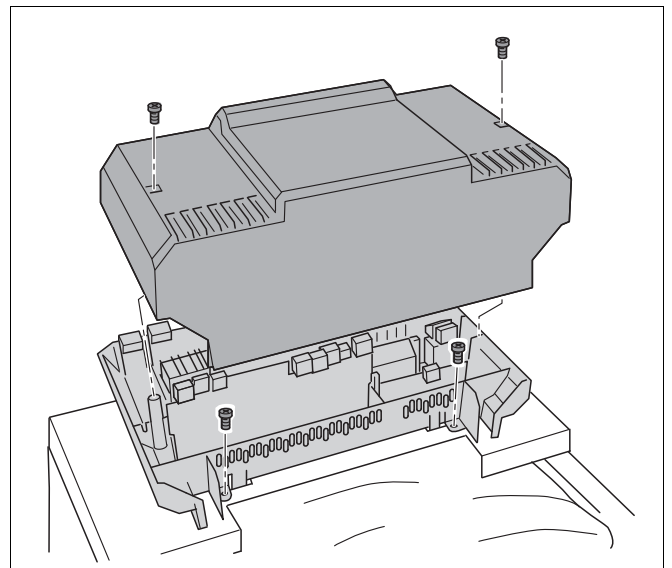


Fig. 14 Installation of Logamatic 2107 control

**Installation of Logomatic boiler water sensor**

9. Trace boiler water sensor wiring under the front boiler cover to the measuring point (immersion well).
10. Pull sensor clip from the head of the immersion well.
11. Pull existing sensor packet from the immersion well.
12. Replace a quadrant segment (blank) with the boiler water sensor of Logomatic 2107.
13. Insert entire sensor packet fully into the immersion well to the stop.
14. Press sensor clip from the side or from above on to the immersion well.
15. Carefully roll up unnecessary wiring and capillaries and stow in the Logomatic 2107 control.

**Power connection and connections of additional components**

Connect to the power supply as specified by the local code.

**FIRE DANGER**

Hot boiler components may damage electrical wiring.

- Make sure that all wiring is routed in the ducts or on the boiler insulation.

16. Route all wiring to the control through the wiring opening and connect as specified by the circuit diagram.

**Install strain relief**

Secure all wiring with wiring clips (included with control):

- Insert wiring clip with wiring from above into the slot of the clip frame; the lever bar must point upwards (step 1).
- Slide wiring clip down (step 2).
- Press (step 3).
- Move lever up (step 4).

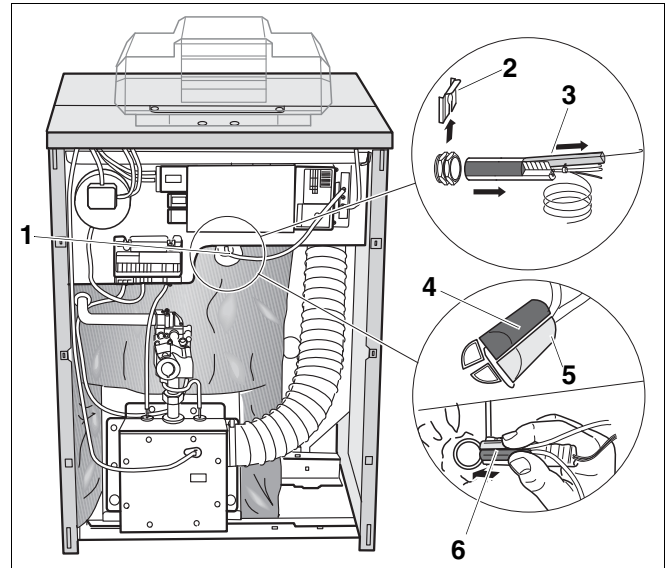


Fig. 15 Front of boiler

- 1 Measuring point (immersion well)
- 2 Sensor holder
- 3 Quadrant (blanking piece)
- 4 Sensor (aquastat)
- 5 Boiler water sensor (Logomatic 2107 control)
- 6 Sensor packet

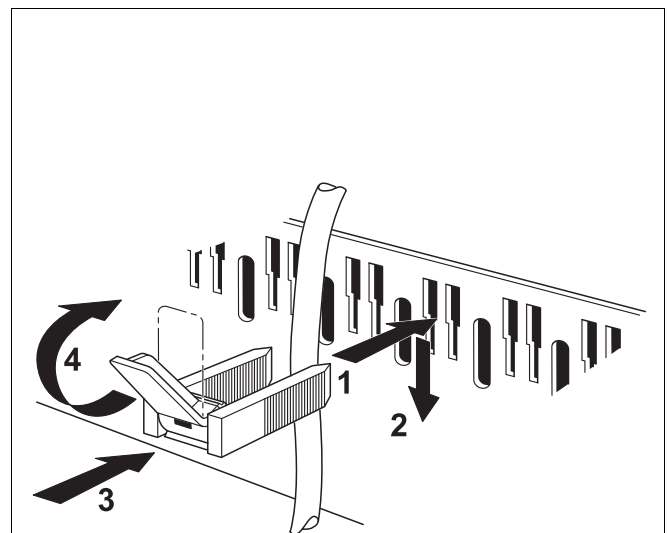


Fig. 16 Secure wiring with wiring clip

## Installing panel components

17. Swivel display unit to the desired position.



### USER NOTE

We recommend positioning the display unit straight on combinations with an L-tank.

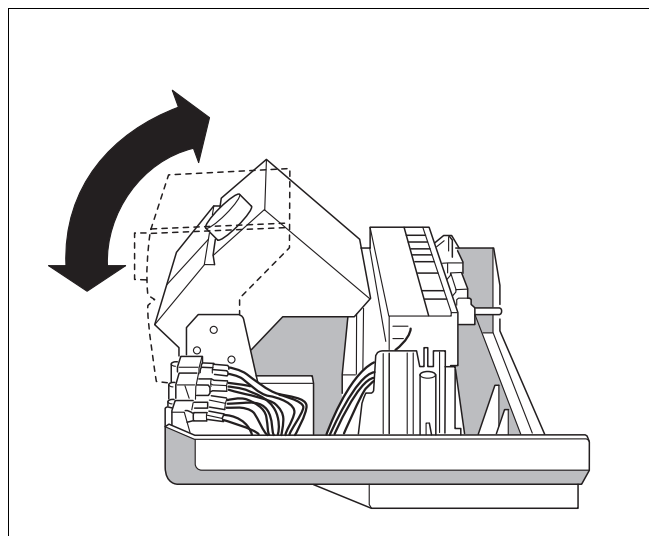


Fig. 17 Swivel display unit

18. Position terminal cover and screw to control.

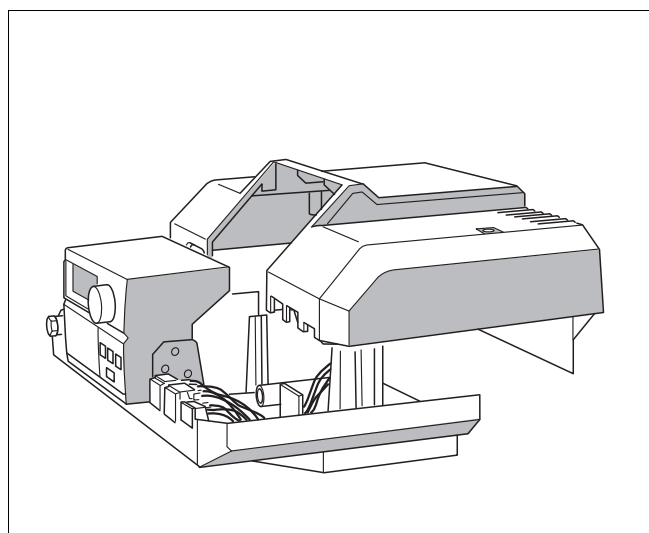


Fig. 18 Positioning terminal cover

19. Slide tabs of rear boiler cover under the front boiler cover and press down at back.

20. Screw rear boiler cover to rear panel of boiler.



### CAUTION!

### SYSTEM DAMAGE

due to dirt.

If the boiler is assembled and not in use, note the following:

- Protect the boiler connections from dirt by closing the connections.

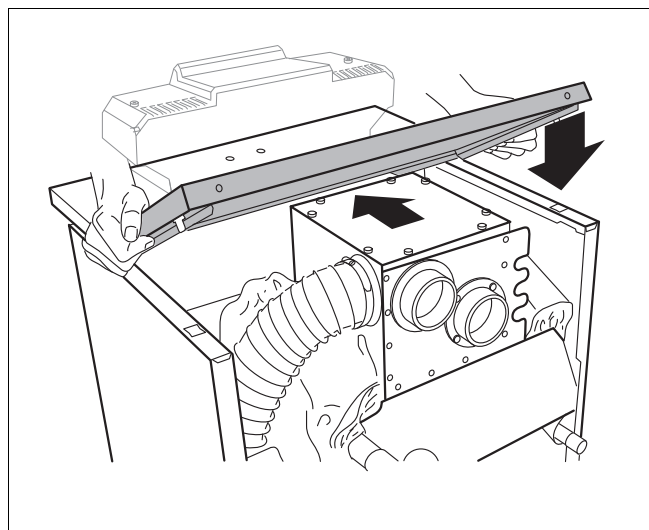


Fig. 19 Installing rear boiler cover

## 7.5 Fuel supply connection

### 7.5.1 Gas connections

For the gas pipe diameter required for the installation please see Tab. 4 and Tab. 5. Make sure that the pipe fitting has the correct thread size.

Make sure that a sediment trap is installed at the inlet for the gas supply pipe to the boiler. A gas shut-off must be installed outside the boiler jacket if required by the local code. We recommend installing a gas shut-off in the main gas pipe to the boiler. The gas pipes must be fastened outside the boiler.

The local codes must be observed during installation of the gas connection, otherwise the regulations of the National Fuel Gas Code, ANSI Z 223.1.



#### DANGER OF EXPLOSION

Leakage from the gas pipes and gas connections may cause an explosion.

- Use soap solution to find leaks.

Length of pipe in feet	Gas pipe supply volume in cubic feet of gas per hour <sup>1</sup>				
	1/2	3/4	1	1 1/4	1 1/2
10	132	278	520	1060	1600
20	92	190	350	730	1100
30	73	152	285	590	890
40	63	130	245	500	760
50	56	115	215	440	670
75	45	93	175	360	545
100	38	79	160	305	480
150	31	64	120	250	380

Tab. 4 Gas pipe supply volume

<sup>1</sup> Maximum gas supply volume in cubic feet per hour, based on a specific gas weight of 0.60 and a gas pressure of 0.5 psi or less and a pressure gradient corresponding to a water column of 0.3 inches.

Nominal diameter of iron pipe (inches)	Equivalent lengths for pipe fittings in feet			
	Pipe fitting type			
	90° angle	T-piece	Stop valve	Gas valve
	Equivalent lengths in feet			
1/2	1.4	2.7	0.3	0.80
3/4	2.1	4.1	0.5	1.25
1	2.6	5.2	0.6	1.6
1 1/4	3.5	6.9	0.8	2.15
1 1/2	4.0	8.0	0.9	2.50

Tab. 5 Equivalent lengths for pipe fittings

Disconnect the boiler with the gas shut-off from the gas supply pipe system the system is pressure tested with a test pressure greater than 1/2 psi.

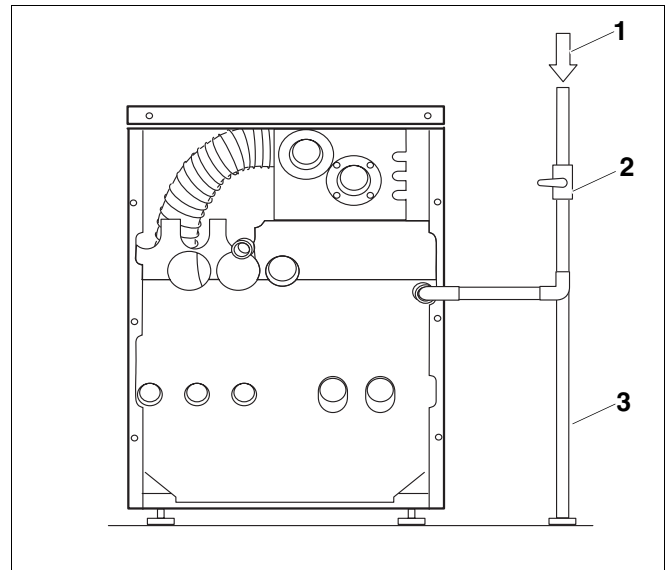


Fig. 20 Pipe connection to gas fittings – back view

- 1 Gas feed
- 2 Hand stop valve
- 3 Sediment trap

If the gas supply pipe system is pressure tested at a test pressure of 1/2 psi or less, it is sufficient to disconnect the boiler from the pipe system by closing the stop valve.

- The boiler and its gas connections must be tested for leaks before placing it into operation, (→ Chapter 9, page 36).

Use only sealant that is resistant to corrosion by LPG for pipe connection. Only a small amount of sealant must be applied to the external thread of the pipe connections.

If you wish to convert the boiler to propane, please contact Buderus for the required conversion components. Do not attempt to convert the boiler without the approved Buderus parts and the relevant technical documentation. The technical documentation is included with the conversion parts.

### 7.5.2 Installation at high altitudes

The boiler is designed for installation at altitudes below 8500 feet above sea level. The boiler must be restricted appropriately for installation above altitudes of 8500 feet. The conversion consists of replacing the main gas orifices.



#### **USER NOTE**

If the installation location is over 8500 feet above sea level, please contact Buderus for the required conversion components.

Do not attempt to convert the boiler without the approved Buderus parts and the relevant technical documentation.

The technical documentation is included with the conversion parts (accessories).

## 7.6 Installation of flue system

The boiler system as delivered includes the wall connection for horizontal flue systems.

Flue systems from the following manufacturers can be installed for the flue and combustion air lines:

Manufacturer	Flue pipe 3"	
	horizontal Type	vertical* Type
heat fab	SAF-T vent	SAF-T vent
O-flex-L	Star 34	-
Pro Tech	FasNSeal	-
Z-Flex	Z-Flex, model SVE	-

Tab. 6 Manufacturer of flue pipe

\* The roof penetration is not included with the boiler



### USER NOTE

Note that pipes of different maximum lengths are allowable depending on the size of the boiler and the flue system. The maximum possible lengths are listed in → Tab. 7 - Tab. 11 on → page 31 and → page 32.



### USER NOTE

You must follow all directions for installation of the flue venting in all parts of the flue system, particularly the assembly instructions of the flue system manufacturer. Use only pipes with a diameter of 3" for the flue pipes and accessories from the manufacturer named in Tab. 6.

Use rigid or flexible metallic pipes with a diameter of 3" for the combustion line.

The flue system components can be ordered as accessories from your wholesaler or from other suppliers of accessories.



**CAUTION!**

### OPERATING FAULTS

due to strong winds.

If a t-piece is not installed at the end of the flue line, the boiler may stop operating in a storm.

- Note that a termination tee must always be installed at the end of the flue line.
- The termination tee can be purchased from the selected flue line manufacturer.



### USER NOTE

Consult the local building and fire inspection authority for any restrictions and inspections of heating systems. Comply with the national regulations.

### 7.6.1 Installation of the wall penetration of a horizontal flue systems

Please read the following instructions and information on the installation of the wall penetration carefully and note the safety instructions.

The wall penetration must be installed in the wall as directed by the regulations and/or local building codes.

- Make an opening in the wall with a diameter of six (6) inches at the required position of the wall penetration.
- Insert the wall penetration into the wall from the outside and attach to the outside wall with the four screws.

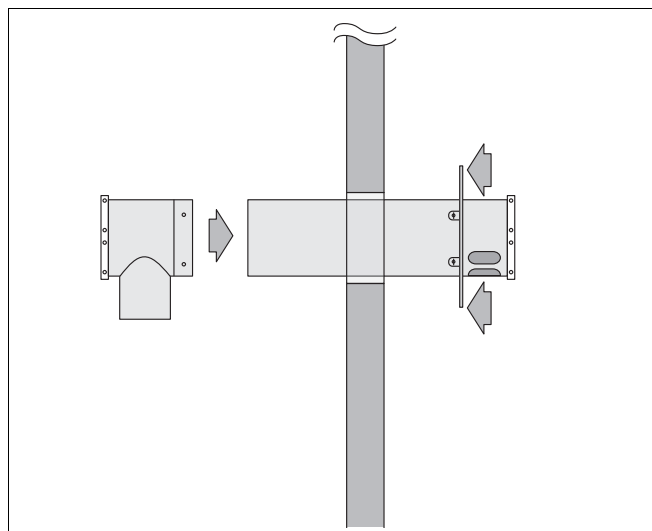


Fig. 21 Wall penetration

- Insert flue pipe into wall penetration from the outside. Attach the termination tee horizontally to the flue pipe and install as directed by the installation instructions of the flue system manufacturer.

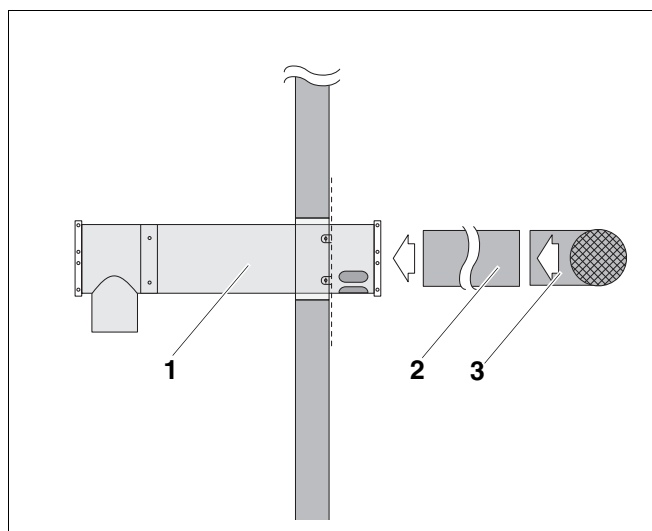


Fig. 22 Installing flue pipe

- 1 Wall penetration
- 2 Flue pipe
- 3 End piece of flue pipe (t-piece)

- Install flue pipe in the wall penetration so the termination tee on the flue pipe extends 10 inches beyond the front edge of the wall penetration..
- Attach the flue pipe to the wall penetration with the two securing clips. Rotate the securing clips down and attach with the screws (→ Fig. 24).
- Seal gap (→ Fig. 24) with silicone.

Make sure that the flue system termination tee through the side wall of a building is at least 12 inches above the ground.

The flue system termination tee must be installed on all heating systems to ensure proper operation and to prevent foreign bodies from entering the flue system.

The termination tee must be at least 12 inches above the expected snow level in areas with heavy snowfall.

No changes are permitted to the wall penetration or any other parts of the flue system. All parts must be installed in original condition.

The flue system must end no less than seven (7) feet above a sidewalk or pedestrian passage.

Make sure that the termination tee is at least six (6) feet away from the combustion air intake of another unit.

The flue system must be installed more than three (3) feet away from any other opening in the building. Terminating gas meters, controls etc.

The flue system must terminate at least four (4) feet below, four (4) feet horizontally or one (1) foot above every door, every window or every air vent of a building.

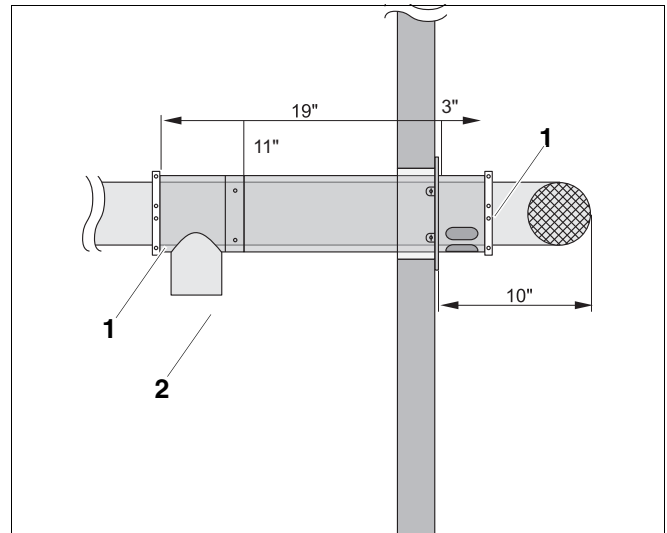


Fig. 23 Position of termination tee on the flue pipe

- 1 Securing clips
- 2 3" connection for combustion air pipe

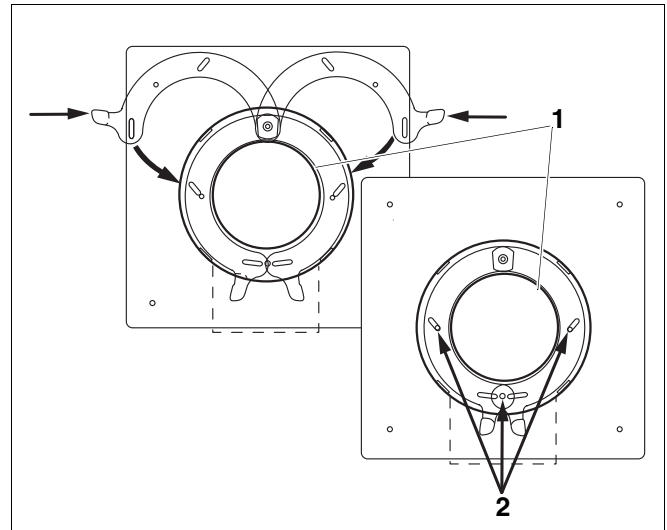


Fig. 24 Securing clips

- 1 Seal gap with silicone.
- 2 Screws

Clearance to combustibles for stainless steel vent pipe

clearance enclosed		clearance unenclosed	
horizontal 8"	vertical 4"	horizontal 1"	vertical 1"

## 7.6.2 Installation of the wall penetration of a vertical flue systems



### USER NOTE

The vertical flue system requires the flue pipe and concentric pipe with roof penetration from Heat-fab, SAF-T vent. Please contact Buderus to select the required flue system components.

You must follow the directions for installation of the flue venting in all parts of the flue system, particularly the assembly instructions of the flue system manufacturer.

The combustion air is supplied through a concentric 5" pipe in the vertical flue system. The typical installation of a vertical system is shown in → Fig. 25.



### USER NOTE

A condensation trap must always be installed at the flue vent.

Note the clearances of the roof penetration above the roof as shown in → Fig. 25.

The maximum length of the concentric combustion air pipe is 10 feet (cf. → Fig. 25).

Note the maximum length of the complete flue system including the concentric pipe as shown in → Tab. 10 and → Tab. 11, (→ page 32).

Clearance from flammable building components is not required near the concentric pipe penetration. A clearance of two (2) inches from flammable building components is required in the area of flue pipe to the concentric pipe.

When calculating the extended pipe length for adjustment of the combustion air baffle (→ Chapter 7.6.4, page 30) the length of the concentric pipe must also be taken into account. The condensation trap need not be considered in the calculation.

Fire protection collars (→ Fig. 25) may need to be installed in existing ceiling penetrations.

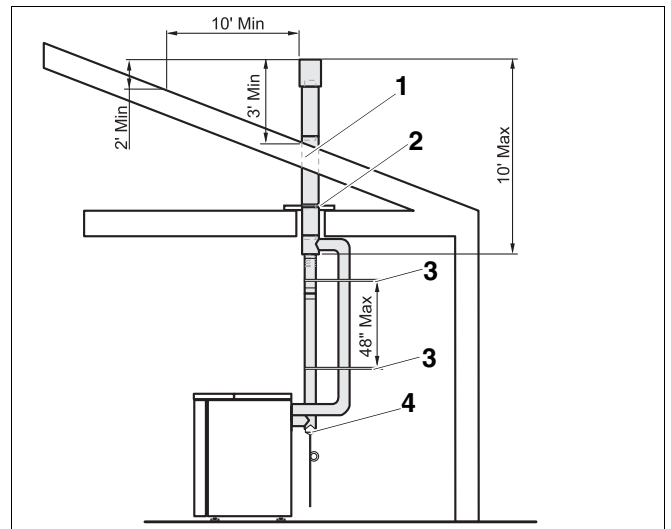


Fig. 25 Vertical flue system

- 1 Roof penetration
- 2 Fire protection ring
- 3 Fastening the flue pipe
- 4 Condensation trap

### 7.6.3 Installation of the flue and combustion air pipe

#### Installation of the flue pipe (→ Fig. 27) at the boiler

- Install condensation trap.



#### USER NOTE

A condensation trap must always be installed at the flue vent.

- Position silicone strip approx. 1/4" wide on the boiler intake (500 ° F-resistant silicone, use G. E. 106 or similar).
- Attach condensation trap to boiler connection (see arrow) and secure with the included hose clamp.
- Place a strip of silicone around the connection point and smooth it to form a gas-tight connection.

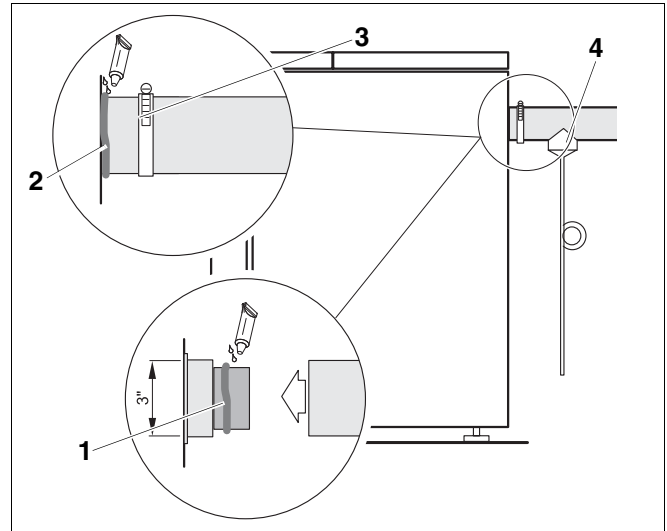


Fig. 26 Condensation trap

- 1 Silicone strip
- 2 Silicone strip
- 3 Hose clamp
- 4 Condensation trap

#### Installation of the combustion air pipe at the boiler

Proceed as described above for the flue pipe to install the combustion air pipe. A condensation trap is not installed on the combustion air line.

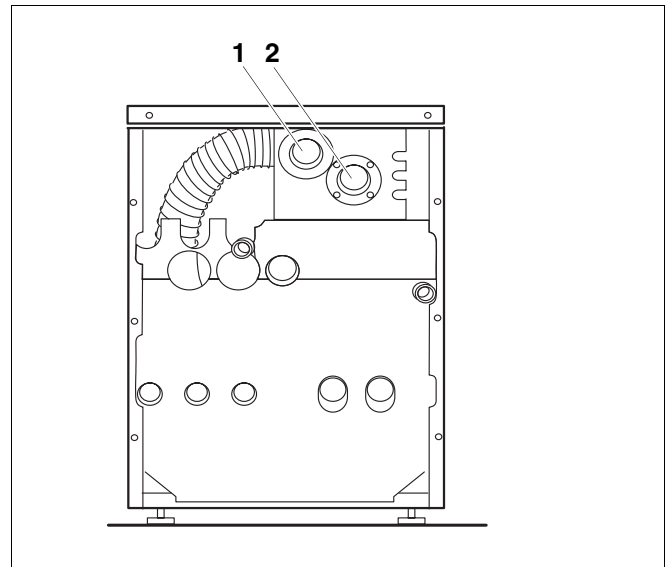


Fig. 27 Back view

- 1 Combustion air line connection
- 2 Flue gas line

**RISK TO LIFE**

by poisoning by leaking flue gas.

**WARNING!**

- Connect the flue system to one boiler only.
- Connection of another boiler may cause serious injury or death.
- The flue pipes must not be routed into another vent. In addition, the pipes of the flue system must not be routed through another vent or inside another vent, such as with an existing brick or factory-manufactured chimney lining.

**FIRE DANGER**

due to insufficient clearance between flue pipe and flammable building components.

**WARNING!**

- Make sure that there is a minimum clearance of two (2) inches to flammable building components.
- No minimum clearance is required between the wall penetration and flammable building components.

The vent pipe must be securely fastened. Vertical venting pipes must be fixed with a fire protection collar at every ceiling penetration and fixed with at least one retainer at the base of vertical pipe.

The flue system pipes must be fixed with retainer bands along their length in the vicinity of all elbows and connections and at intervals of at least 48 inches.

When installing fastening components do not drill holes into any of the components of the flue system when joining pipes or fittings or when installing retainer bands. If pipe lengths are cut to size, the cut edges must be filed or ground smooth before joining them. The coupling end of the pipe must not be cut.

Make sure that all horizontal venting pipes have a slope of at least 1/4 inch per foot. All horizontal venting pipes must have a downward slope to the boiler to prevent any accumulations of moisture in the flue system.

The flue system is under overpressure. Silicone sealant must be left to dry for 24 hours before putting the boiler into operation.

**RISK TO LIFE**

by poisoning by leaking flue gas.

**WARNING!**

- After carrying out one of the above installation instructions always check that all connections in the complete flue system are correctly joined and sealed.
- Check the seams and joints for leaks.
- Have the complete flue system checked by a technician once a year.

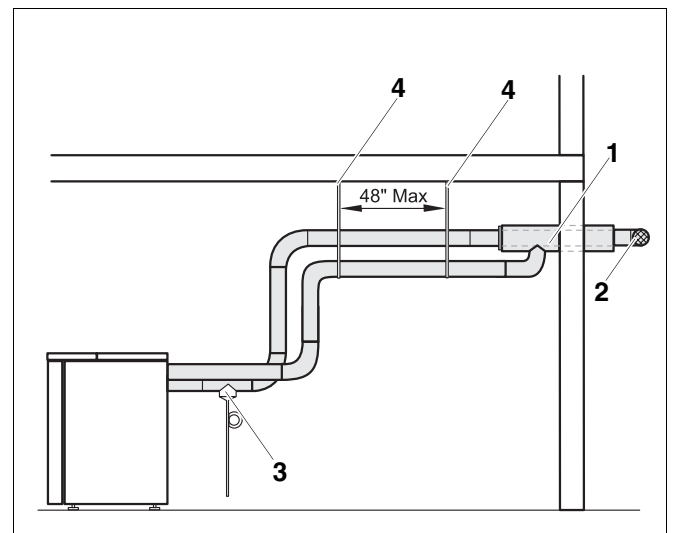


Fig. 28 Horizontal flue system

- 1 Wall penetration
- 2 End piece of flue pipe (termination tee)
- 3 Condensation trap
- 4 Fastening the flue pipe

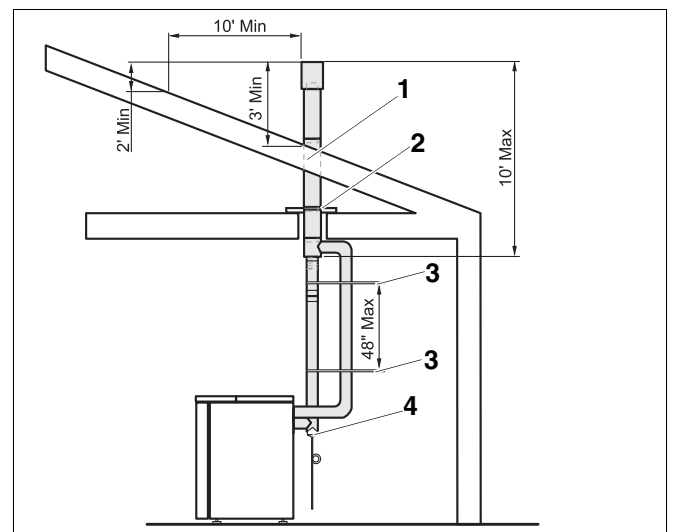


Fig. 29 Vertical flue system

- 1 Roof penetration
- 2 Fire protection collar
- 3 Fastening the flue pipe
- 4 Condensation drain

### 7.6.4 Adjusting the combustion air baffle

**Note the following when calculating the total flue pipe length or combustion air pipe length.**

- 1 x 90° elbow corresponds to 10 ft of pipe.
- 2 x 45° elbows correspond to 10 ft of pipe.
- If the combustion air pipe is longer than the flue pipe, the combustion air baffle is adjusted depending on the total length of the combustion air pipe.



#### USER NOTE

It is not necessary to consider the condensation trap, the wall penetration and the termination tee when calculating the total pipe length.

#### Determining the combustion air baffle position

- Unscrew cover of blower enclosure.
- Calculate the extended length of the flue pipe or the combustion air pipe by adding the individual sections.
- Calculate the adjustment dimension X of the combustion air baffle with the extended pipe length in Table 7-12.
- Compare the setting of the combustion air baffle and correct if necessary.

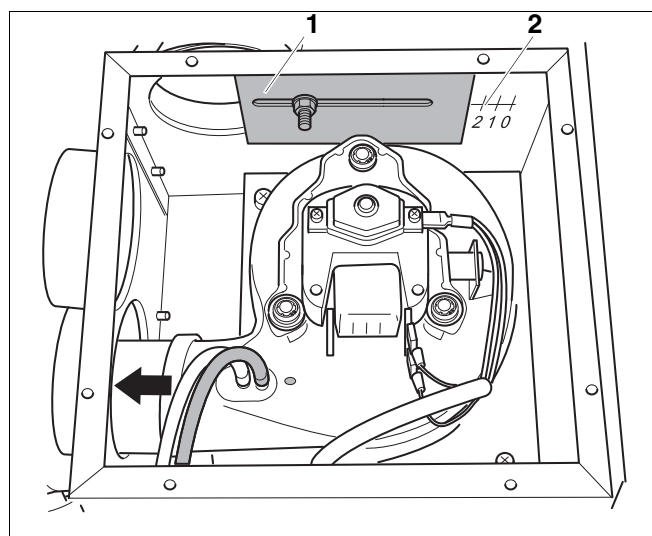


Fig. 30 Adjusting the combustion air baffle

1 Combustion air baffle

2 Adjustment dimension X

**Adjustment for horizontal flue system independent of room air**

Combustion air supply through combustion air pipe or flexible combustion air hose from outside.

Boiler size	Adjustment dimension X of the combustion air baffle depending on the length (feet) of the horizontal flue pipe/combustion air pipe				
	up to 12 feet	up to 20 feet	up to 30 cm	up to 40 feet	up to max. feet
30	5.0	4.5	3.5	0	0 (up to 42 feet)
23	5.0	5.0	4.5	4.0	4.0 (up to 50 feet)
17	5.0	5.0	4.5	4.5	4.0 (up to 50 feet)

Tab. 7 Rigid combustion air pipe 3" as per Fig. 31.

Boiler size	Adjustment dimension X of the combustion air baffle depending on the length (feet) of the horizontal flue pipe/combustion air hose
30	0 (up to 20 feet maximum)
23	4.0 (up to 20 feet maximum)
17	4.0 (up to 30 feet maximum)

Tab. 8 Flexible combustion air hose 3" as per Fig. 31

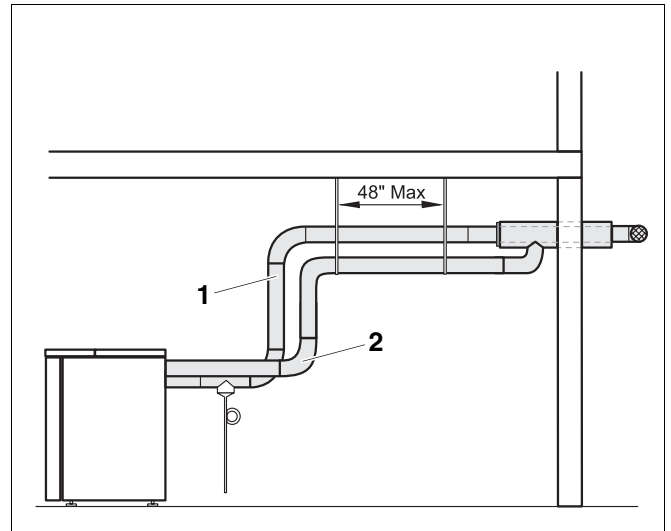


Fig. 31 Horizontal flue system independent of room air

- 1 Flue pipe 3"
- 2 Combustion air pipe 3" or combustion air hose 3"

**7.6.5 Adjustment for horizontal flue system using room air**

Combustion air supply from the boiler room.

Boiler size	Adjustment dimension X of the combustion air baffle depending on the length (feet) of the horizontal flue pipe				
	up to 12 feet	up to 12 feet	up to 30 feet	up to 40 feet	up to max. feet
30	5.5	5.0	5.0	5.0	5.0 (up to 42 feet)
23	5.5	5.5	5.0	5.0	5.0 (up to 50 feet)
17	5.5	5.5	5.0	5.0	5.0 (up to 50 feet)

Tab. 9 Horizontal flue system using room air as per Fig. 32

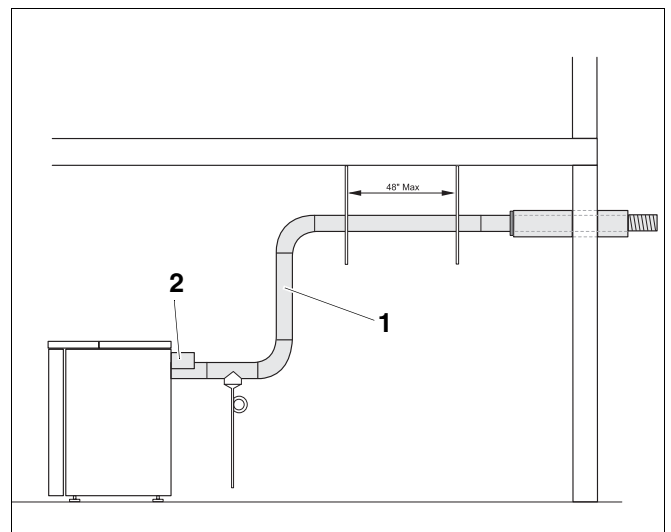


Fig. 32 Horizontal flue system using room air

- 1 Flue pipe 3"
- 2 Combustion air inlet from the room

**Adjustment for vertical flue system independent of room air**

Combustion air supply through combustion air pipe or flexible combustion air hose from outside.

Boiler size	Adjustment dimension X of the combustion air baffle depending on the length (feet) of the vertical flue pipe/combustion air pipe			
	up to 5 feet	up to 30 feet	up to 45 feet	up to max. 50 feet
30	4.5	3.5	0	-
23	4.5	4.0	2.5	2.5
17	4.5	4.0	3.0	3.0

Tab. 10 Rigid combustion air pipe 3" as per Fig. 33

Boiler size	Adjustment dimension X of the combustion air baffle depending on the length (feet) of the vertical flue pipe/combustion air hose
30	0 (up to 30 feet maximum)
23	2.0 (up to 30 feet maximum)
17	3.0 (up to 30 feet maximum)

Tab. 11 Flexible combustion air hose 3" as per Fig. 33

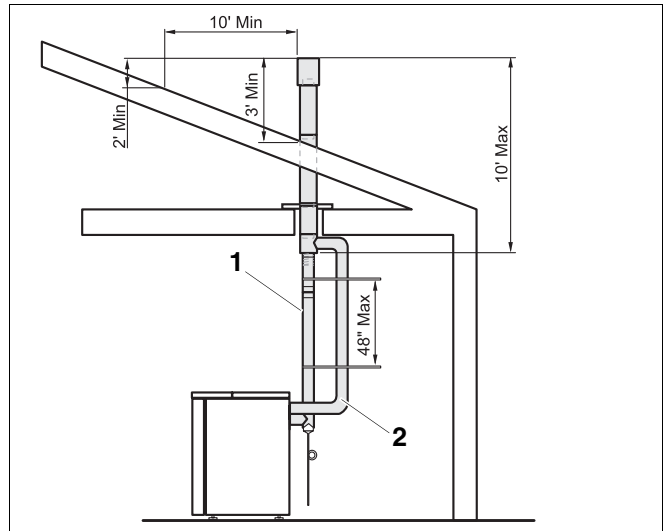


Fig. 33 Vertical flue system independent of room air

- 1 Flue pipe 3"
- 2 Combustion air pipe 3" or combustion air hose 3"

**7.7 Filling heating system and checking for leaks**

The boiler is tested for leaks at the factory. Before placing the heating system into use, check it for soundness to avoid leaks occurring during operation.

**Water treatment**



**USER NOTE**

Have the water analyzed before filling the heating system. The water may require treatment as a result of the analysis.

Please consult the local water supply company if the water is extremely hard or has a pH level below 7.0.



**CAUTION!**

**SYSTEM DAMAGE**

due to overpressure during the leak test. Pressure, control or safety components may be damaged by high pressure.

- Before conducting the leak test make sure that no pressure, control or safety components that cannot be disconnected from the water compartment of the boiler are installed.

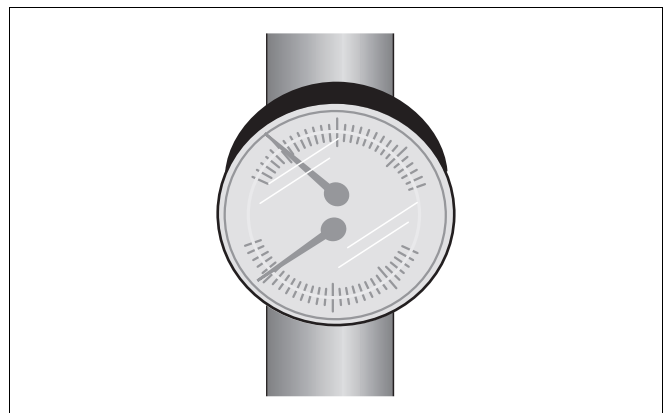


Fig. 34 Temperature/pressure gauge

Carry out the leak test at 1.5 times the normal operating pressure and as specified by the local codes as follows:

Maximum operating pressure	Maximum construction site test pressure
30 psi (with the included relief valve)	45 psi
58 psi (with a different relief valve)	75 psi

Tab. 12 Test pressures

- Close connection for relief valve (→ Fig. 10, page 16) and all other open connections with plugs.
- Disconnect the expansion tank from the system by closing the cap valve.
- Open mixing and stop valves on hot water side.
- Fill boiler slowly with water from the building connection.
- Turn cap of automatic vent one revolution to allow the air to escape.
- Slowly fill heating system. Observe pressure display on pressure gauge during this process.
- Check connections and pipes for leaks.
- Bleed heating system through the bleed valves on the radiators.
- If the pressure falls while bleeding, water must be added.
- Install relief valve (→ Fig. 10, page 16).

## 8 Openings for combustion air supply and venting



**CAUTION!**

### **BOILER DAMAGE AND OPERATING FAULTS**

due to missing or inadequate openings for combustion air and venting of the boiler room.

The openings for combustion air supply and venting are always required regardless of whether the combustion air is supplied from the room (operation from room air) or directly to the boiler through ducts (operation independent of room air).

Inadequate venting of the boiler room may result in excessive ambient temperatures. This can damage the boiler.

Inadequate combustion air supply may cause operating faults.

- Make sure that inlets and outlets are not reduced or closed and that they are adequately sized.
- If faults are not corrected immediately, the boiler must not be operated.
- Inform the system operator of the fault and the danger.

To ensure an adequate combustion air supply and venting of the heating system suitable measures must be taken in accordance with the National Fuel Gas Code, Section 5.3, Air for Combustion and Ventilation, or the local codes.

In Canada the regulations in accordance with the CSA/CGA-B 149.1 or 2 Installation Codes apply.



**CAUTION!**

### **BOILER DAMAGE**

due to contaminated combustion air.

- Never use cleaning agents that contain chlorine and halogenated hydrocarbons (e.g. spray bottles, solvents and cleaning agents, paints, glues).
- Do not store or use these substances in the boiler room.
- Prevent excessive dust levels.



### **USER NOTE**

If contamination of combustion air is possible (e.g. installation near swimming pools, dry cleaners or hair saloons), operation with air outside the room is recommended.



**WARNING!**

### **FIRE DANGER**

due to flammable materials or liquids.

- Do not store flammable materials or liquids in the immediate vicinity of the heat generator.

### **Total air supply from inside the building**

Make sure that the boiler room has two permanent openings that are connected with one or more other rooms. When calculating the cross-section areas of the openings, the total combustion output of all gas-fired appliances in the connected rooms must be taken into account. Each opening must have a minimum cross-section of one square inch per 1000 Btu/h of the total combustion output of all gas-fired appliances inside the connected rooms. Note that the minimum cross-section of every opening must not be less than 100 square inches. One opening must not be more than 12 inches from the ceiling and the other must not be more than 12 inches from the floor of the boiler room, calculated from the outer edge of the opening. The shortest dimension of all inlet and outlet openings must not be less than three inches.

**Total air supply from outside the building**

Make sure that the boiler room has two permanent openings, one of which must not be more than 12 inches from the ceiling and the other must not be more than 12 inches from the floor of the boiler room, calculated from the outer edge of the opening. The openings have a direct connection or a connection through ventilation ducts to the outside or to rooms that have an unobstructed connection to the outside (crawl space or attic). The shortest dimension of all inlet and outlet openings must not be less than three inches.

1. If there is a direct connection to the outside, each opening must have a minimum cross-section of one square inch per 4000 Btu/h of the total combustion output of all gas-fired appliances inside the closed room.
2. If there is a connection to the outside through vertical ventilation ducts, each opening must have a minimum cross-section of one square inch per 4000 Btu/h of the total combustion output of all gas-fired appliances inside the closed room.
3. If there is a connection to the outside through horizontal ventilation ducts, each opening must have a minimum cross-section of one square inch per 2000 Btu/h of the total combustion output of all gas-fired appliances inside the closed room.
4. If the openings are connected to ventilation ducts, the ducts must have the same cross-section area as the openings.

## 9 Placing the heating system in operation

The gas burner and gas fittings unit integrated in the boiler have been tested in the factory as described in detail in ANSI Z 21.13 and CGA 4.9 to ensure safe operation of the heating system and to test specific performance indicators.



**WARNING!**

### RISK TO LIFE

due to electrical current when the unit is open.

- Before opening the unit:  
To prevent electrical shock, isolate the heating system with the heating system emergency stop switch or by shutting off the main fuse.
- Lock the heating system to prevent accidental reactivation.

1. Set the room thermostats to the lowest setting.
2. Inspect flue and combustion air piping and the openings for combustion air supply and ventilation.
3. Fill heating system with water and bleed the complete system including the radiators.
4. Unscrew left and right screws in the side panels, lift front panel up, pull down and remove to the front.

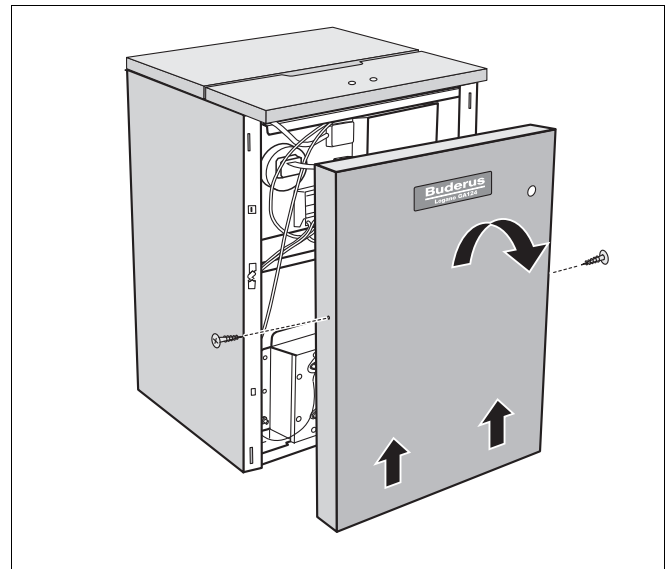


Fig. 35 Removing front panel of boiler

**Carrying out leak test**

5. Open gas valve in the gas line.
6. Check the gas connection line to the gas fitting (→ Fig. 36) for leaks with soap solution. If no leaks are found, continue with step 8. If any leaks are found, close gas valve.
7. Seal leaks and repeat step 6.
8. Close main gas shut-off. Remove the screw plug for the gas pressure measuring port on the gas valve. Install pressure measuring nipple and attach a pressure gauge to measure the gas pressure.
9. Remove the screw plug for the orifice pressure measuring port on the gas valve. Install pressure measuring nipple and attach a pressure gauge to measure the manifold pressure.
10. Open gas valve and measure the gas supply pressure of the boiler. The supply pressure must be between 4.7" and 10.5" W.C. for natural gas and between 11" and 13" W.C. for propane gas. If the supply pressure for natural gas is not between 4.7" and 10.5" W.C. and not between 11" and 13" W.C. for propane gas, contact the customer service technician or the gas company.
11. Always follow the start-up instructions on the next page.

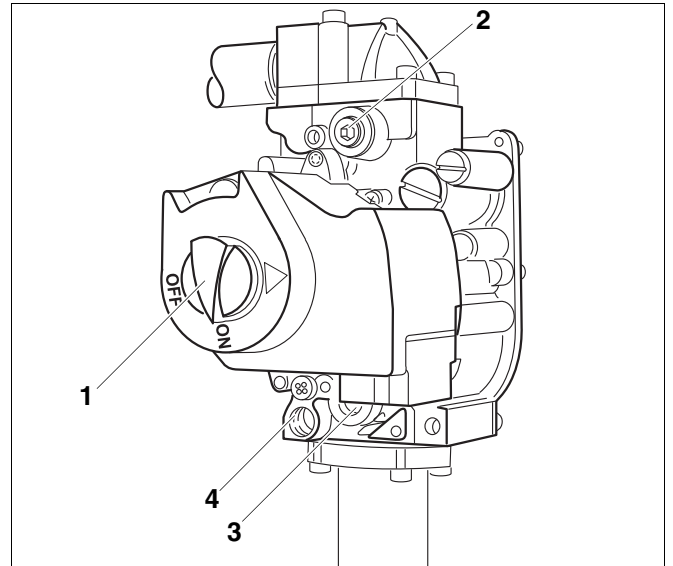


Fig. 36 Gas valve

- 1 ON/OFF button (at ON position)
- 2 Screw plug for gas supply measuring port
- 3 Screw plug for manifold measuring port
- 4 Pilot gas line connection

## 9.1 Start-up instructions

Read the instructions before start-up for your safety.



**WARNING!**

### RISK TO LIFE

due to not observing the start-up instructions and resulting incorrect operation.

- If these instructions are not followed exactly, a fire or explosion may be caused with serious property damage or loss of life or serious injury.
- Observe the start-up instructions.



**WARNING!**

### DANGER OF EXPLOSION

If you smell gas there is a danger of explosion..

- No open flame. No smoking.
- Prevent spark formation.  
Do not operate electrical switches, including telephones, plugs or door bells.
- Shut off main gas supply valve.
- Open doors and windows.
- Warn other occupants of the building.
- Evacuate the building.
- Call gas company, heating service company or fire department from outside the building.

- A** This unit is fitted with an igniter that automatically starts the burner. Do not attempt to ignite it manually.
- B** Check for an odor of gas around the heating system. This test must also be conducted at floor level, because some types of gas are heavier than air and may accumulate at floor level.
- C** Switch on the ON/OFF switch on the gas fitting by hand only. Never use a tool as assistance. If you cannot actuate the ON/OFF switch on the gas fitting by hand, do not attempt to repair it. Contact a qualified technician. Any attempt to use force or to repair the switch may cause a fire or explosion.
- D** Do not operate the unit if any part is under water. Contact a qualified customer service technician immediately to have the unit checked and to replace the parts of the control and gas fittings that were under water.

## 9.2 Making boiler ready for operation

**STOP!** First read the safety instructions on → page 36 of this manual.

1. Carry out leak test (→ page 7). Wait five (5) minutes until all gas residues have dissipated. Finally check whether there is any smell of gas, including at floor level. If there is a gas odor: STOP! Follow instructions in section "B" of the safety instructions on → page 36 of this manual. If there is no sign of a gas odor, continue with the next step.
2. Open main gas valve.

### 9.2.1 Placing heating system with aquastat control in operation

The boiler is fully functional with the factory-installed aquastat.

3. Turn on ON/OFF switch (contractor installed) (ON position). This turns on the boiler with all its components. Then continue with step 7.
4. Make sure that the room thermostat signals a heat requirement (set thermostat at least 10 °F above room temperature).

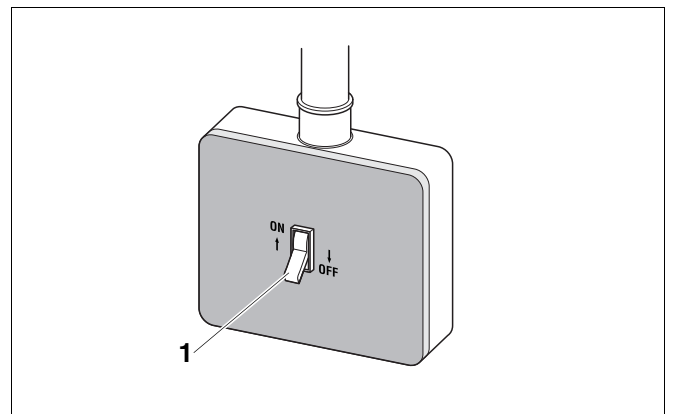


Fig. 37 Switching on heating system (with aquastat)

1 ON/OFF switch (main switch)

**9.2.2 Placing heating system with Logamatic 2107 (accessory) in operation**

The boiler is fully functional with the factory-installed aquastat. The Logamatic 2107 control can also be installed in addition to the factory-installed aquastat.

Turn on the heating system with the ON/OFF switch on the control. The burner starts operating if heat is required (→ observe control service manual).

5. Make sure that heat is required at the control. Select "Manual operation" (hand symbol) with the mode selector switch.
6. Turn on ON/OFF switch ("I" position). Then continue with step 7.



**USER NOTE**

After carrying out the instructions for starting described below, the control must be set to "AUT" mode (automatic operation) with the mode selector.

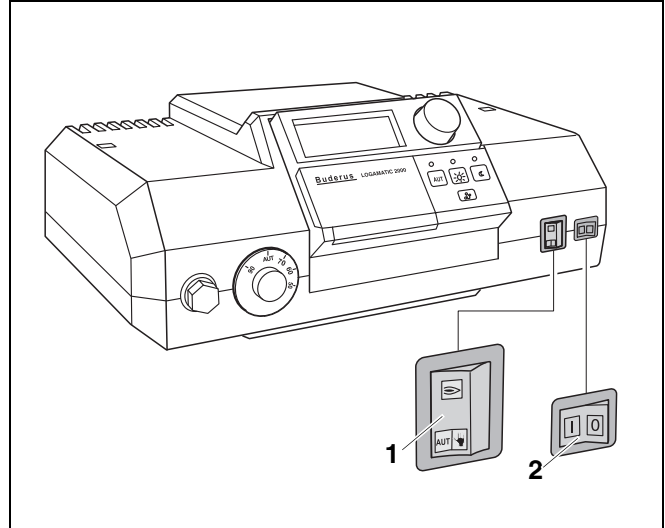


Fig. 38 Turning on heating system (with Logamatic 2107 control)

- 1 Mode selection switch
- 2 ON/OFF switch

**9.3 Then carry out start-up procedures.**

The following start-up procedures must be carried out regardless of the control type.

7. Look at the igniter through the sight glass in the burner housing.

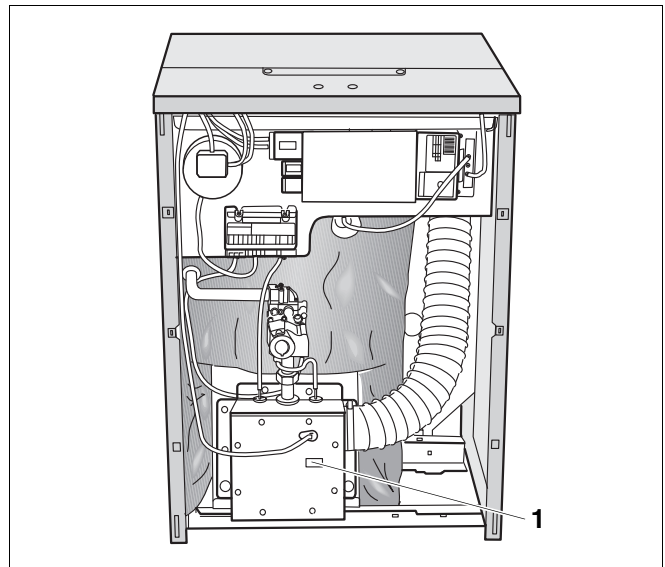


Fig. 39 Front view

- 1 Sight glass

8. Turn gas valve ON/OFF switch counterclockwise to ON position.
9. The automatic igniter must generate sparks towards the pilot burner. The pilot flame must appear and then ignite the main burner. If the main burner does not ignite, close the gas valve. Disconnect heating system from the power supply and inform your customer service technician or LP gas company.
10. If the main burner has ignited, the gas valve must be checked for leaks with soap solution. If no leaks are found, continue with step 12. If leaks have been found, switch ON/OFF switch on gas valve clockwise to the OFF position. Disconnect heating system from the power supply and set the thermostat to the lowest setting.
11. Seal leaks. Repeat steps 1 and 2 (regardless of the control in use).

**Caution:**

With aquastat control continue with steps 3 and 4, with the Logamatic 2107 continue with steps 5 and 6.

Then repeat steps 7 to 10 regardless of the control in use.

12. Check the supply gas pressure while the boiler is operating. The supply pressure must be between 4.7" and 10.5" W.C. for natural gas and between 11" and 13" W.C. for propane gas. Record the measured values in the commissioning protocol in the installation and maintenance instructions.

GA124	Natural gas [inch W.C.]	Propane [inch W.C.]
17	3.6	8.9
23	3.6	9.9
30	3.5	9.5

Tab. 13 Manifold pressure

13. Check manifold pressure. The manifold pressure must be set in accordance with the values in → Tab. 13. To set the manifold pressure the cover (→ Fig. 40) on the gas valve must be removed. Turn the adjustment screw clockwise to increase the pressure and counterclockwise to reduce the pressure. This setting must be adjusted while the boiler is operating.
14. Record the set value in the commissioning protocol of the installation and maintenance instructions and screw the safety screw (→ Fig. 40, page 41) into the gas valve again.

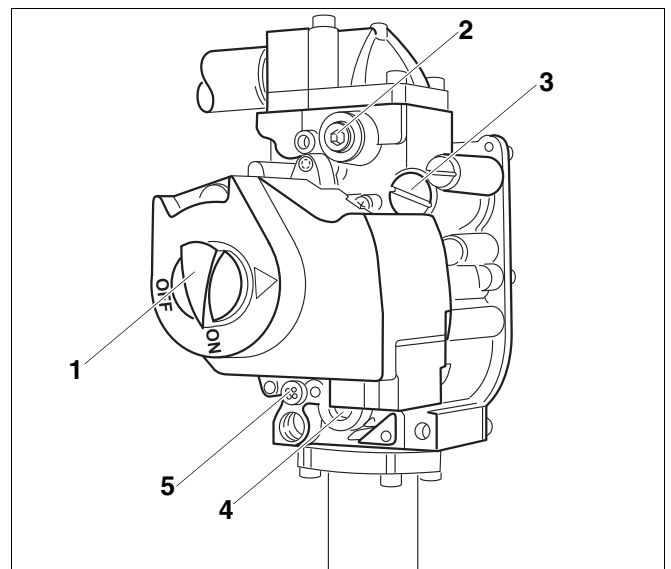


Fig. 40 Gas valve

- 1 ON/OFF button (at ON position)
- 2 Screw plug for gas supply pressure measuring port
- 3 Safety screw for manifold pressure setting
- 4 Screw plug for manifold measuring port
- 5 Safety screw for pilot ignition pressure setting

- 15. Observe ignition flame through the sight glass (→ Fig. 39, page 40) in the burner housing.
- 16. The flame must envelope the flame guard 1/2 to 1 1/2 inches. If this is the case continue with step 20.
- 17. If the ignition flame is too small or too large, the pressure for the pilot burner must be adjusted with the corresponding adjustment screw.



**USER NOTE**

The adjustment screw is behind the ignition gas pressure adjustment safety screw (→ Fig. 40, page 41).

- 18. Remove safety screw for pilot ignition pressure setting (→ Fig. 40, page 41). Turn the inner adjustment screw clockwise to reduce the ignition flame and counterclockwise to enlarge the ignition flame.
- 19. After adjustment tighten the ignition gas pressure adjustment safety screw (→ Fig. 40, page 41) again.
- 20. Observe main burner flame through the sight glass (→ Fig. 39, page 40) in the burner housing. The flame must have a steady and fixed contour and generally has a bluish color. If the main burner flame meets the requirements, proceed with step 21. If the main burner flame is too weak or is yellow or goes out, turn the ON/OFF switch (→ Fig. 40, page 41) on the gas valve clockwise to OFF. Close the gas valve and disconnect the heating system from the power supply and contact the customer service technician or the gas company.

**Checking flame sensor**

- 21. Test the safety switch by closing the gas valve. The main burner flame (→ Fig. 42) and the ignition flame (→ Fig. 41) are extinguished. After six (6) seconds at the most the main gas solenoid valve on the gas valve must close with an audible noise.
- 22. After 90 seconds the automatic igniter must switch to lock status and stop generating sparks.
- 23. Disconnect the heating system from the power supply. Open main gas valve. Switch on unit power supply. A normal operating cycle must follow.
- 24. If the gas valve operates correctly, proceed to step 25. If the gas valve does not operate correctly, switch ON/OFF switch (→ Fig. 43) on the gas valve clockwise to the OFF position immediately. Close main gas valve. Disconnect heating system from the power supply and inform the customer service technician or LP gas company.

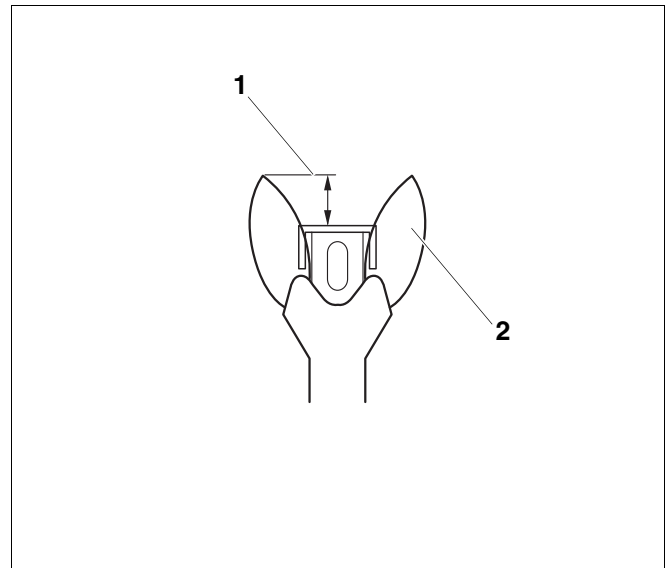


Fig. 41 Correct pilot flame setting

- 1 1/2 to 1 1/2 inches
- 2 Pilot flame

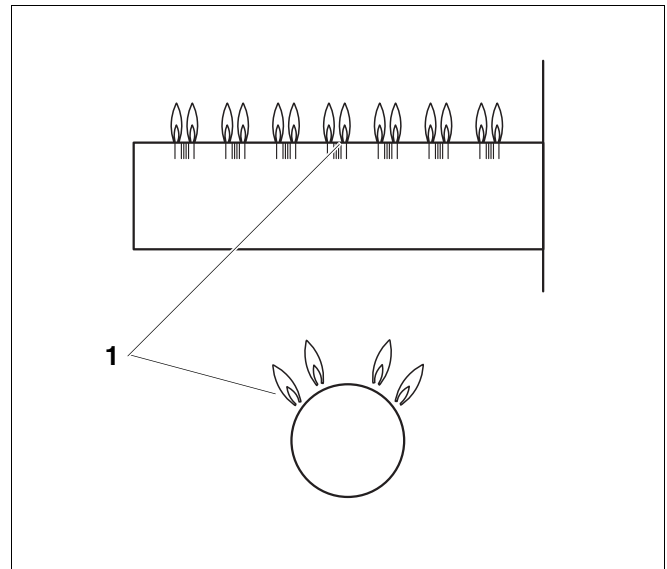


Fig. 42 Main burner

- 1 Main burner flame

25. Turn gas valve ON/OFF button clockwise to OFF position.
26. Close main gas shut-off.
27. Disconnect heating system from the power supply and set the thermostat to the lowest setting.
28. Remove pressure measuring nipple and pressure gauge for measuring gas supply pressure and manifold pressure from the gas valve and close the openings with the screw plugs.
29. Repeat steps 1 to 10 (depending on the control) and 20 to restart the heating system. Check the screw plugs for leaks with soap solution. If no leaks are found, continue with step 31. If leaks are found, close gas shut-off and switch ON/OFF button on gas valve clockwise to the OFF position. Disconnect the heating system from the power supply.
30. Seal leaks. Open gas shut-off and repeat step 24.
31. Carefully wipe away the soap solution to prevent corrosion caused by the alkali content of the soap.
32. Check the function of the maximum aquastat to make sure that it switches off the boiler as soon as the boiler water temperature set at the aquastat or the Logamatic 2107 control is reached. Record the result in the commissioning protocol of the installation and maintenance instructions.
33. Replace front panel of boiler.

#### With the Logamatic 2107 control only

34. Select AUT (automatic mode) with the mode selection switch.

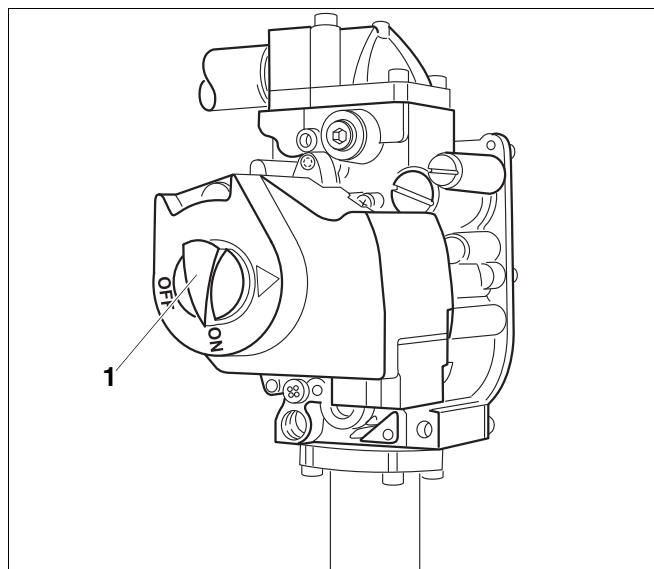


Fig. 43 Gas valve

1 ON/OFF button (at ON position)

## 9.4 Shutting off gas supply to boiler

1. Set thermostat to the lowest value.
2. Disconnect heating system from the power supply before carrying out maintenance work.
3. Remove front panel of boiler

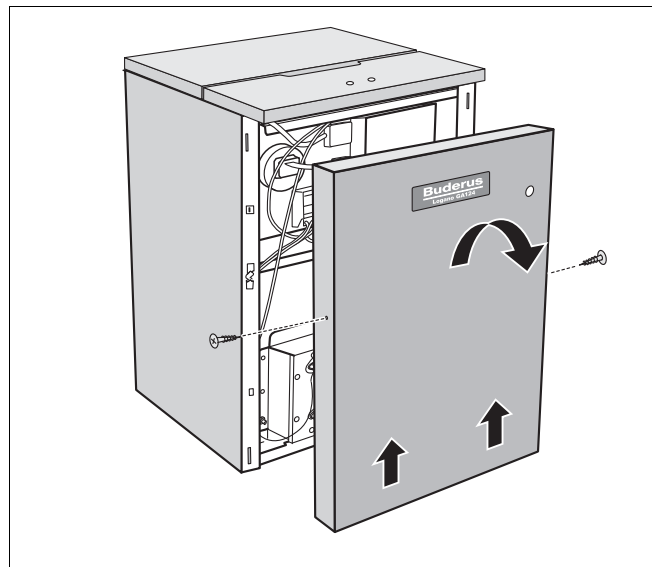


Fig. 44 Remove front panel of boiler

4. Turn gas valve ON/OFF button clockwise to OFF position. Do not use force.
5. Replace front panel of boiler.

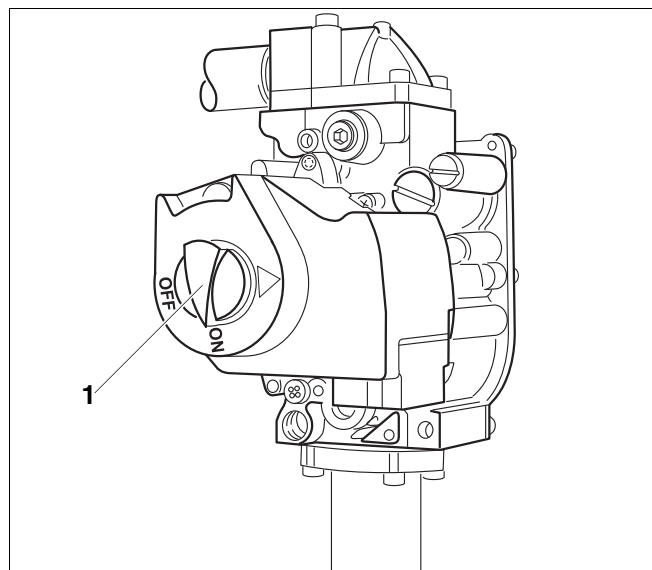


Fig. 45 Gas valve

1 ON/OFF button (at ON position)

## 9.5 Instruct owner/operator and hand over technical documentation

Inform the owner/operator of the operation of the complete heating system and the operating instructions for the boiler. Together with the owner sign the protocol on page 46 and hand over the technical documentation.



**CAUTION!**

### **SYSTEM DAMAGE**

due to frost.

The heating system may freeze in frosty conditions if the control is not switched on.

- Protect the heating system from freezing when there is a danger of frost.
- When the main switch or control is switched off, drain the water from the boiler, the tank and the pipes of the heating system.

### 9.6 Start-up protocol

Please check off the start-up work as it is completed and record the measured values in the table.

Start-up work	Remarks or measured values
1. Type of gas	<input type="checkbox"/> Natural gas <input type="checkbox"/> Propane
2. Check combustion air, inlet and outlet openings and flue gas connection	<input type="checkbox"/>
3. Check the unit fittings (correct orifices?, → Tab. 14 below) and convert gas type if necessary	<input type="checkbox"/>
4. Fill boiler with water and bleed complete heating system	<input type="checkbox"/>
5. Measure gas pressure (supply pressure)	_____ inches W. C.
6. Measure manifold pressure and adjust if necessary	_____ inches W. C.
7. Leak check in operating status, check pilot and main burner flame and correct functioning of the venting system	<input type="checkbox"/>
8. Check maximum aquastat	<input type="checkbox"/>
9. Install front boiler panel	<input type="checkbox"/>
10. Inform operator, hand over technical documentation	<input type="checkbox"/>
11. Installer  Operator:	Signature: _____  Signature: _____

	Main gas orifice identification		
Boiler size	17	23	30
Natural gas	265	250	250
Propane gas	175	160	160

Tab. 14 Main gas orifice identification



**USER NOTE**

- Inform the customer of the correct fuel and enter it in the table (→ operating manual of boiler).

## 10 Taking the boiler out of operation

### 10.1 Normal boiler shut-down

1. With the aquastats:  
Switch off main switch ("OFF" position). This shuts down the boiler with all components (e.g. burner).
2. Additional shut-down procedure → follow the directions for the aquastats.

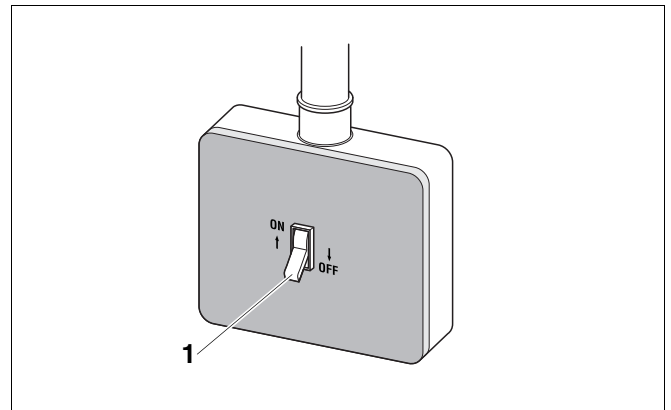


Fig. 46 Shutting down heating system (with aquastat)

1 ON/OFF switch

3. Logamatic 2107 control (accessory):  
Switch off ON/OFF switch on control ("0" position). This shuts down the boiler with all components (e.g. burner).

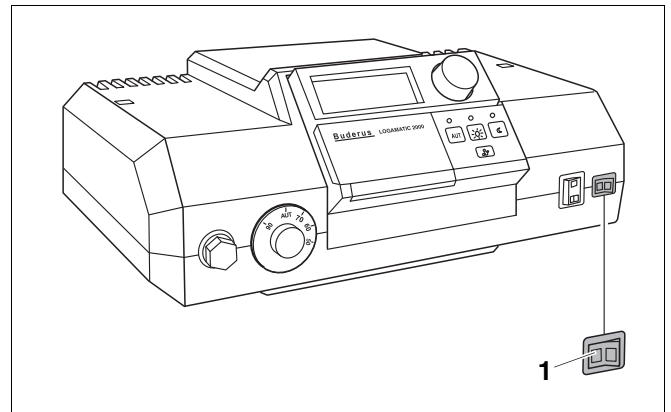


Fig. 47 Shutting down heating system (with Logamatic 2107 control)

1 ON/OFF switch

4. Shut off main fuel supply valve.



#### SYSTEM DAMAGE

through frost.

**CAUTION!** The heating system can freeze up in cold weather if it is shut down.

- Leave the heating system switched ON constantly as much as possible.
- Protect the heating system from freezing by draining the heater and water pipes at the lowest point.

### 10.2 Emergency shut-down

Inform your customer of the procedure in case of emergency, such as a fire.

1. Never put yourself at risk. Your own safety must always take priority.
2. Shut off main fuel supply valve.
3. Shut down the heating system with the heater emergency switch or the corresponding circuit-breaker.

## 11 Boiler inspection and maintenance

### 11.1 Why is regular maintenance important?

Heating systems require regular maintenance for the following reasons:

- To maintain high efficiency operation and to operate the heating system economically (low fuel consumption).
- To sustain safe operation.
- To maintain combustion at an environmentally friendly level.

All maintenance work must be carried out by a qualified customer service technician only. When replacing components use only parts approved by Buderus. Maintenance is required once a year. Record the results of the inspection in the protocol at → page 59.



#### USER NOTE

Spare parts can be ordered from your local distributor.

### 11.2 Testing the flue system, including combustion air, air inlets and Ventilation openings

Check the venting system, including the combustion air, inlet and outlet openings. All faults must be repaired immediately.

Make sure that the combustion air feed and the inlets and outlets are not blocked at any point.

### 11.3 Inspection of the boiler and burner

1. Visually check the boiler and burner for external dirt.
2. Check burner box, supply air hose and burner rods for dirt.
3. Check air supply hose for damage and replace if necessary.
4. If dirt is found, clean boiler and burner.

## 11.4 Preparing boiler for cleaning

1. Take the boiler out of operation (→ Chapter 10.1, page 47).

**RISK TO LIFE**

from electric shock.

**WARNING!**

- Before opening a unit: disconnect electrical power completely and lock to prevent accidental reconnection.

2. Remove front panel of boiler (→ Fig. 35, page 36).

**RISK TO LIFE**

from explosion of flammable gases.

**WARNING!**

- Never work on gas lines unless you are licensed for this type of work..

3. Turn gas valve ON/OFF button clockwise to OFF position. Do not use force.

**RISK TO LIFE**

from explosion of flammable gases.

**WARNING!**

- Wait five (5) minutes until all gas residues have dissipated. Check whether there is any smell of gas, including at floor level. If there is a gas odor: STOP! Follow instructions in section "B" of the safety instructions on → page 38 If there is no sign of a gas odor, continue with the next step.

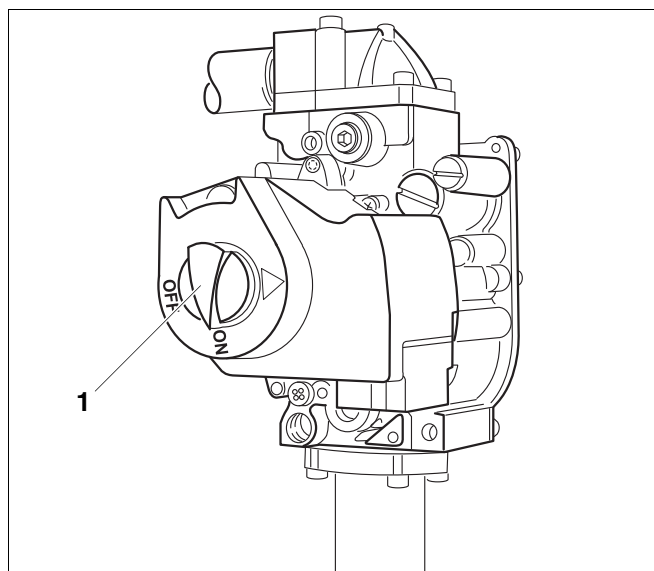


Fig. 48 Gas valve

1 ON/OFF button (at ON position)

## 11.5 Cleaning the boiler

The boiler can be cleaned with brushes and/or by wet cleaning. Cleaning tools are available as accessories.

### 11.5.1 Cleaning the boiler with brushes

Remove burner:



**WARNING!**

#### **RISK TO LIFE**

from electric shock.

- Label all electrical wiring before disconnecting it for cleaning the boiler. If cables are connected incorrectly the system may not operate correctly with possibly dangerous consequences.
- After maintenance test the heating system for proper function.



**WARNING!**

#### **RISK TO LIFE**

from electric shock.

- Before opening a unit: disconnect electrical power completely and lock to prevent accidental reconnection.

1. Disconnect your heating system from the mains electricity supply.
2. Shut off main gas supply valve.

3. Disconnect pilot gas line from gas valve.
4. Disconnect ignition cable from ignition module.
5. Attach gas supply line to burner control holder with wire or string.
6. Remove screws (→ Fig. 50) between gas valve and burner box. Place the gas connection pipe gasket in a safe place.
7. Label connection lines of flame roll-out switch and disconnect from the switch.

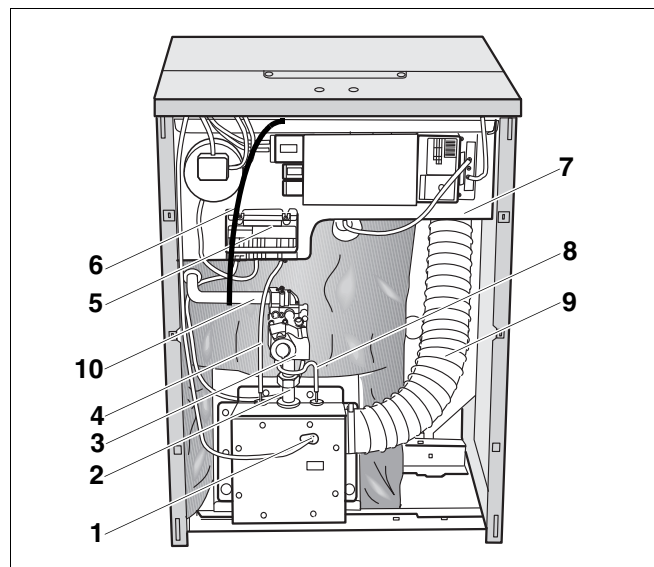


Fig. 49 Front view

- 1 Flame roll-out switch (boiler size 17)
- 2 Gas supply pipe
- 3 Gas valve
- 4 Ignition cable
- 5 Ignition module
- 6 Wire holder for gas supply line
- 7 Burner control
- 8 Ignition gas line
- 9 Air supply hose
- 10 Gas supply line

8. Remove screws in burner box cover and remove cover.
9. Unscrew nuts and remove gas burner with burner box.
10. Release air supply hose (→ Fig. 49) and pull off burner box.
11. If there is dirt in the burner compartment, remove venting fan, otherwise continue with (→ Chapter 11.6, page 54).

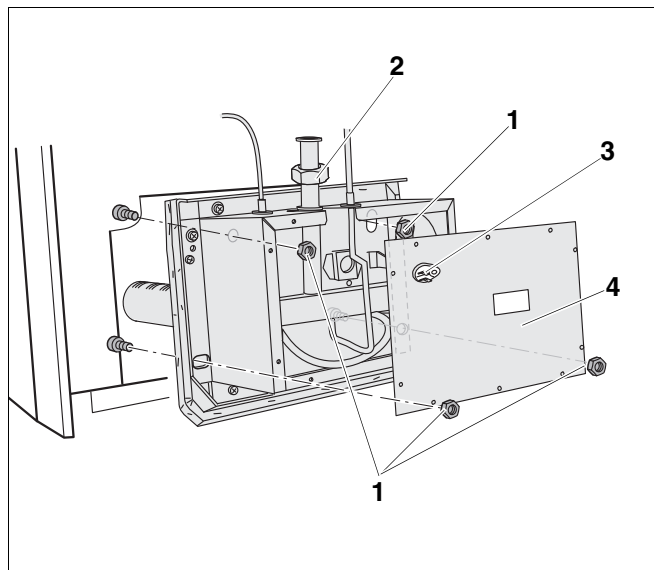


Fig. 50 Removing gas burner

- 1 Fixing nuts
- 2 Screws
- 3 Flame roll-out switch (boiler size 23 and 30)
- 4 Burner box cover

**Removing venting fan**

12. Remove rear boiler jacket.

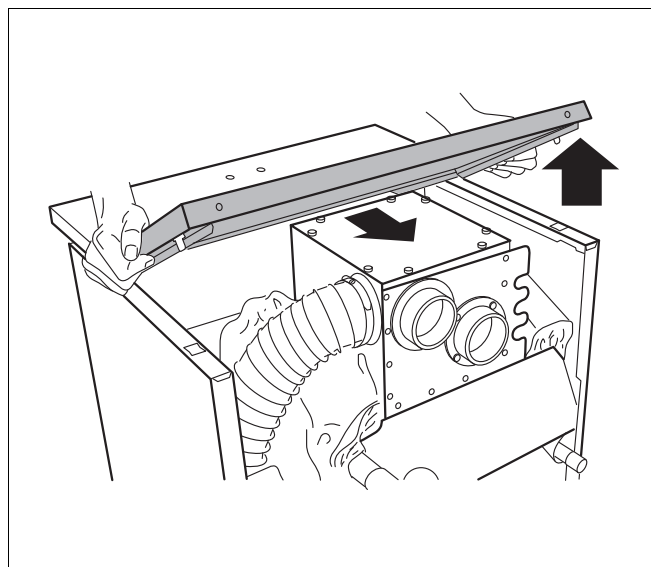


Fig. 51 Removing rear boiler jacket

13. Slide fan manifold into the venting adapter in the direction of the arrow to the stop.

14. Pull off connecting hose for differential pressure connection on measuring points on fan.

15. Disconnect electrical wiring.

16. Unscrew the four screws of the fan retainer panel.

17. Lift fan with retainer panel slightly and remove.

18. Check fan blades for dirt and clean if necessary.

19. If the hot gas ducts are dirty clean boiler.

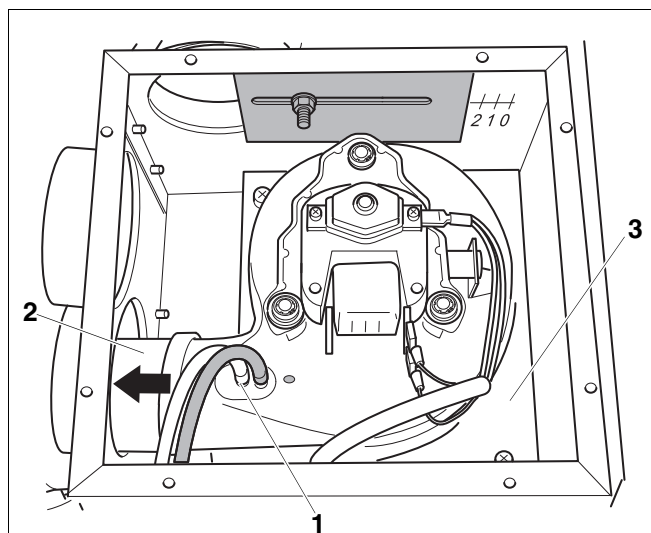


Fig. 52 Removing venting fan

- 1 Pressure measurement point on fan
- 2 Fan manifold
- 3 Fan retainer panel

20. Cover control with foil to prevent entry of metal dust into the control.

21. Use boiler brush to clean out flue gas passages.

22. Clean combustion chamber and bottom insulation.

**11.5.2 Wet cleaning (chemical cleaning)**

For the wet cleaning use a suitable cleaning agent for the degree of build-up of dirt (soot or scale).

Use the same procedure as described for cleaning with brushes (→ Chapter 11.5.1, page 50).



**USER NOTE**

Observe the directions for use of the cleaning agent. In some case you may need use a different procedure from that described here.

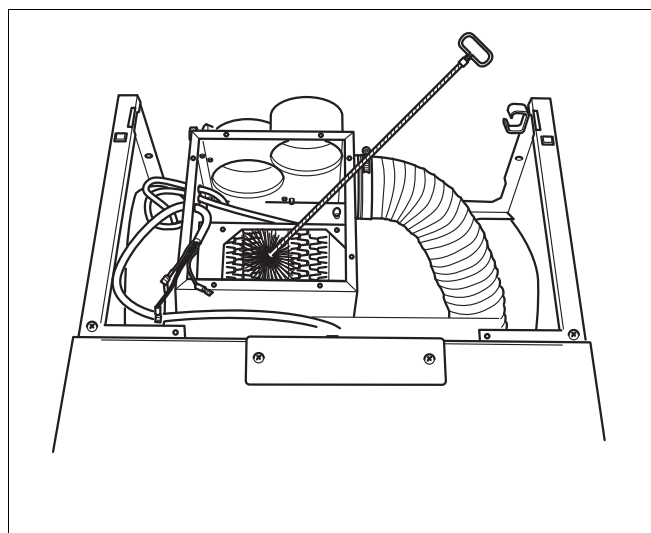


Fig. 53 Cleaning with brushes

23. Cover control with foil to prevent entry of spray into the control.
24. Ventilate boiler room well.
25. Place cloths on the floor insulation to catch excess spray.
26. Spray flue gas vents evenly with the cleaning agent.
27. Assemble and install the burner in reverse order of removal and disassembly (→ page 50). Tighten the fixing nuts well. Make sure that the front edge of the burner box cover is properly engaged in the sealing grommets.
28. Install venting fan in reverse order of removal; see → page 52.
29. The blue connector sleeves on the differential measuring case must be connected to the blue connecting sleeves of the measuring points.
30. Make sure that the fan manifold is completely pushed on to the fan during reassembly.
31. Place the heating system in operation.
32. Heat the boiler water to a temperature of at least 50 °F.
33. Take the boiler out of operation.
34. Allow boiler to cool.
35. Remove burner and venting fan (→ page 50).
36. Brush out flue gas passages.
37. Clean combustion chamber and bottom insulation.
38. Remove cloths.
39. Ventilate boiler room well again.
40. Assemble and install the burner in reverse order of removal and disassembly (→ page 50). Tighten the fixing nuts well. Make sure that the front edge of the burner box cover is properly engaged in the sealing grommets.
41. Install venting fan in reverse order of removal; see → page 52.
42. The blue connector sleeves on the differential measuring case must be connected to the blue connecting sleeves of the measuring points.
43. Make sure that the fan manifold is completely pushed on to the fan during reassembly.

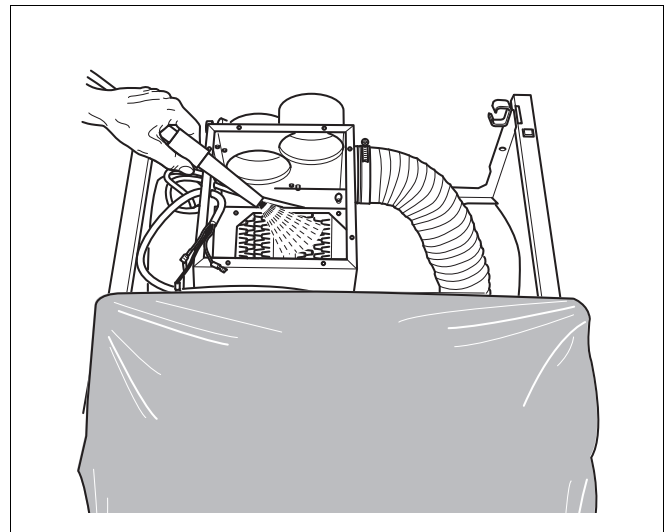


Fig. 54 Spray cleaning

## 11.6 Cleaning the burner

1. Remove burner (→ page 50).
2. Check burner rods for dirt. If necessary, clean burner as described below.
3. Unscrew pilot burner unit from burner.
4. Disconnect pilot gas line from ignition burner unit.
5. Remove pilot gas orifice and blow out.
6. Immerse burner rods in water with cleaning agent and brush off.



### USER NOTE

Make sure that the insulation on the burner shield does not get wet.

7. Rinse out burner rods with a water jet; hold burner so water enters all slots if the burner rods and drains out again.
8. Remove remaining water by swinging the burner.
9. Check that the slots of the burner rods are free. Remove water and dirt residue in the slots. If any slots are damaged the burner must be replaced.
10. Assemble and install the burner in reverse order of removal and disassembly (→ page 50). Tighten the fixing nuts well. Make sure that the front edge of the burner box cover is properly engaged in the sealing grommets.
11. Place boiler in operation as directed in (→ Chapter 9, page 36).
12. Check operation of aquastat.
13. Test low water cut-off if installed.
14. Check area around boiler for hazards.  
The area around the boiler must be free from flammable substances, gasoline or any other flammable or corrosive vapors and liquids.



**WARNING!**

### RISK TO LIFE

from explosion of flammable gases.  
After maintenance work leaks may occur in pipes and threaded fastenings.

- Make a thorough check for leaks.
- Use only approved leak testing agents to search for leaks.

Complete the maintenance protocol to confirm that all maintenance work has been conducted. Sign the maintenance protocol and discuss it with the owner of the heating system.

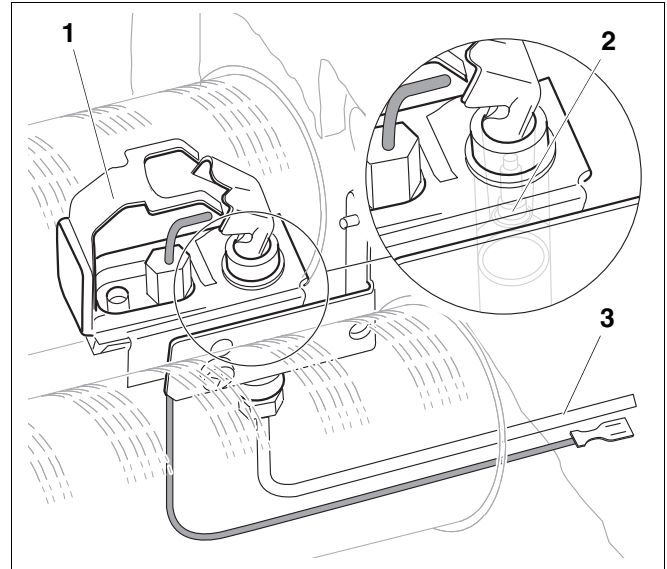
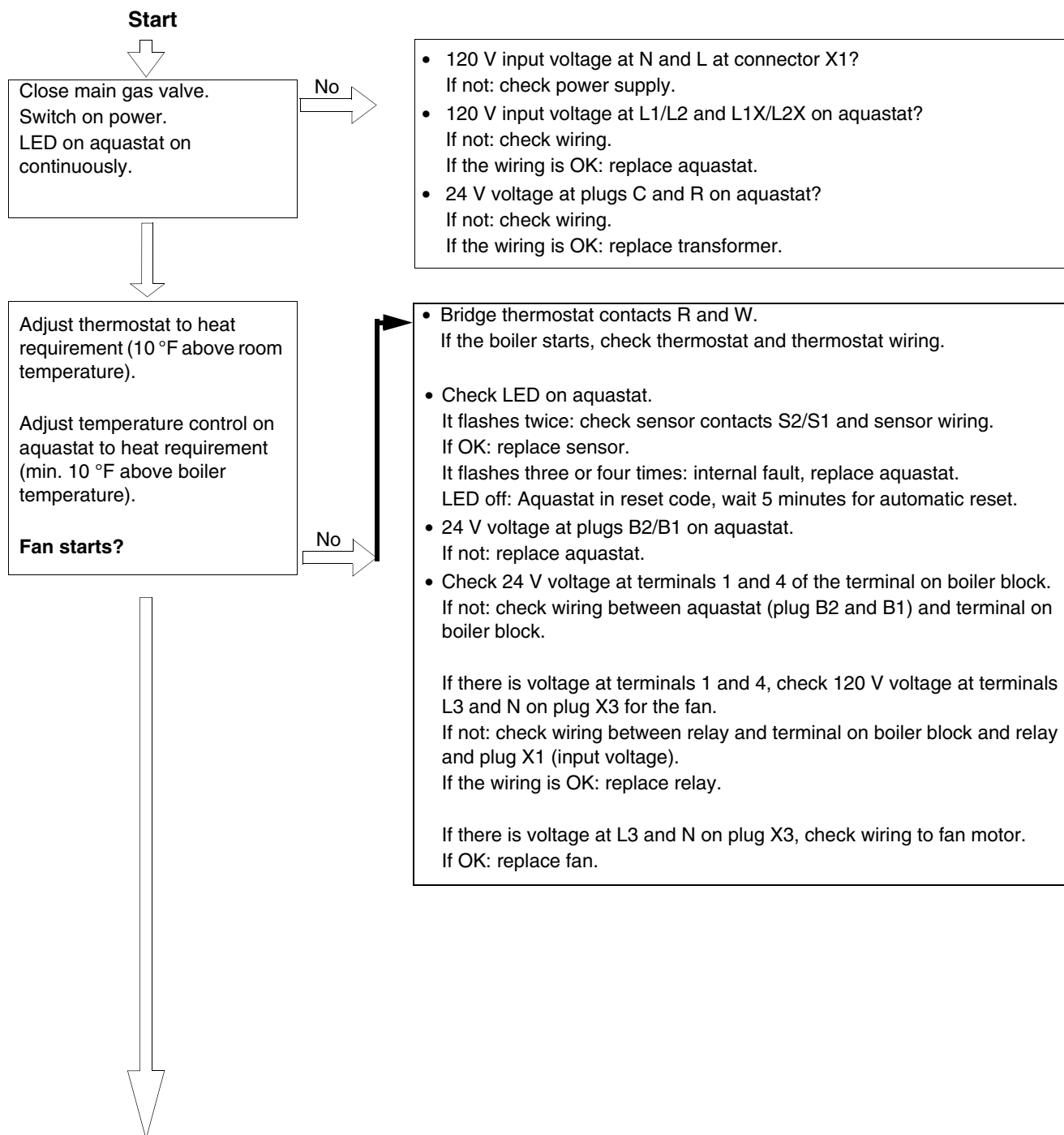


Fig. 55 Pilot burner unit

- 1 Pilot burner unit
- 2 Pilot gas orifice
- 3 Pilot gas line

## 11.7 Troubleshooting

Equipment required: Wiring diagram page 81 and voltage detectors for 120 VAC and 24 VAC.



↓

Ignition sparks visible between ignition electrode and flame guide.

No →

**Check S 8600 H automatic igniter.**

- Check 24 V voltage at terminals 3 and 4 (power supply to S 8600 H automatic igniter) of the terminal on boiler block.

If not:

- Check wiring between terminal on boiler block and S 8600 H automatic igniter.
- Check ignition wiring, ceramic insulator of ignition electrode and ignition gap, adjust if necessary.
- Check the ignition cable contact for signs of scorching or kinking.
- If OK: replace S 8600 H.

**Check flame guard.**

- 24 V voltage at terminals 2 and 3 of the terminal on boiler block?  
If not: check wiring between flame guard and terminal on boiler block.  
If OK: replace flame guard.

**Check air pressure switch.**

- Check 24 V voltage at terminals 1 and 2 of the terminal on boiler block.

If not:

- check wiring between air pressure switch and terminal on boiler block.
- Check correct adjustment of baffle in fan enclosure (see page 30).
- Check venting and combustion air line for correct cross-section.
- Check combustion air hose between fan housing and burner for correct cross-section.
- Check heat exchanger for blockages.
- If the length of the venting pipe or the combustion air pipe exceeds the maximum approved length as specified in → Tab. 10 to Tab. 11 on page 32 ?

If OK: replace air pressure switch.

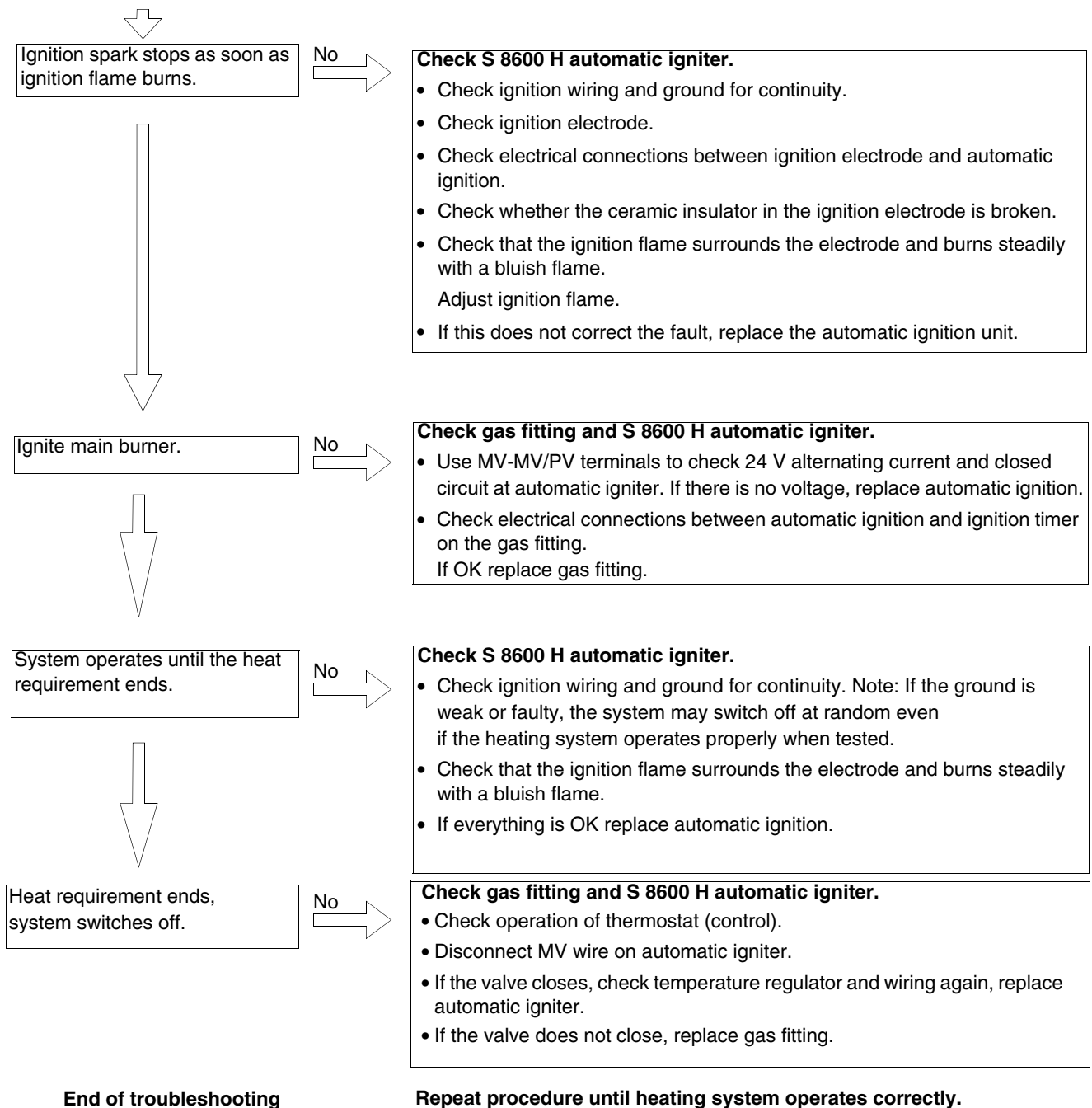
↓

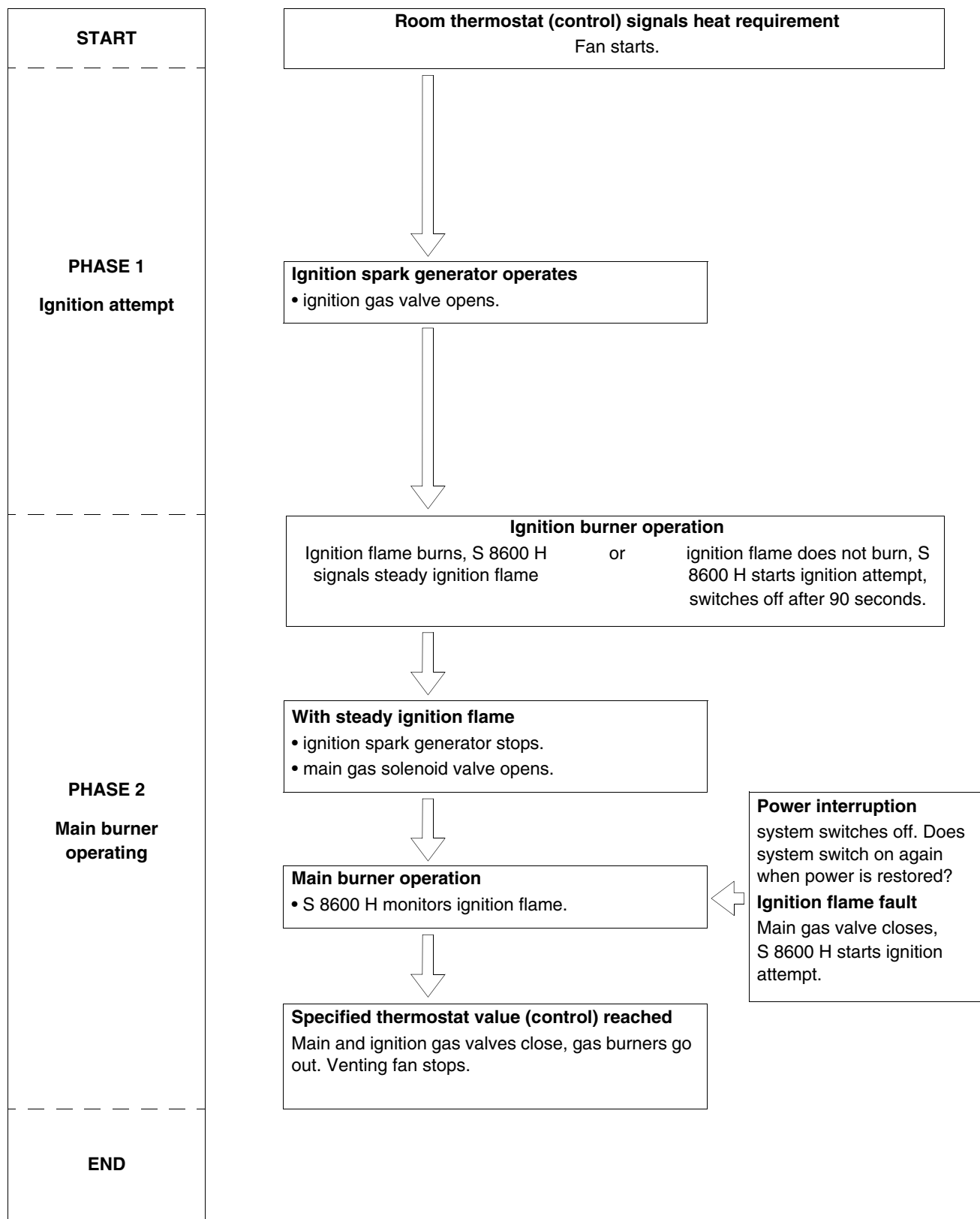
Open main gas valve.  
Ignition burner ignites.

No →

**Check gas fitting and S 8600 H automatic igniter.**

- Check that all manually operated baffles are open; check that gas connections and pressures are correct and that ignition gas nozzles are not blocked.
- Check electrical connections between automatic ignition and ignition timer on the gas fitting.
- Use MV-MV/PV terminals to check 24 V alternating current at the automatic ignition. If the voltage is correct replace gas fitting, otherwise replace automatic ignition.





## 11.8 Maintenance protocol

Please check off the maintenance work as it is completed and record the measured values.  
Follow the instructions on the following pages.

Maintenance work	Page	Date:	Date:
1. Inspection of the flue system including combustion air, inlet and outlet openings	page 48	<input type="checkbox"/>	<input type="checkbox"/>
2. Inspection of boiler	page 48	<input type="checkbox"/>	<input type="checkbox"/>
3. Inspection of burner	page 48	<input type="checkbox"/>	<input type="checkbox"/>
4. Cleaning boiler	page 50	<input type="checkbox"/>	<input type="checkbox"/>
5. Cleaning burner	page 54	<input type="checkbox"/>	<input type="checkbox"/>
6. Measuring gas supply pressure	page 37	_____inches W. C.	_____inches W. C.
7. Measuring manifold pressure	page 41	_____inches W. C.	_____inches W. C.
8. Checking for leaks in operating condition	page 37	<input type="checkbox"/>	<input type="checkbox"/>
9. Checking pilot and main burner flame	page 42	<input type="checkbox"/>	<input type="checkbox"/>
10: Check operation of venting fan.		<input type="checkbox"/>	<input type="checkbox"/>
11. Check maximum aquastat	page 54	<input type="checkbox"/>	<input type="checkbox"/>
12. Check the area around the boiler for flammable materials, gasoline or other corrosive liquids.	page 54	<input type="checkbox"/>	<input type="checkbox"/>
13. Confirm maintenance  Confirmation of correct maintenance  (company stamp, signature)		<input type="checkbox"/>	<input type="checkbox"/>

Datum:	Datum:	Datum:	Datum:	Datum:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____inches W. C	_____inches W. C	_____inches W. C	_____inches W. C	_____inches W. C
_____inches W. C	_____inches W. C	_____inches W. C	_____inches W. C	_____inches W. C
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 12 Parts lists

The following spare parts are available for Buderus heating systems. If there are more than one Buderus article numbers at one item number, these numbers are listed in the columns corresponding to the various models. In other cases the number of components is shown.

### Boiler block (→ Fig. 56)

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Boiler block complete	6301-	1252	1253	1254
20	Threaded stud M8x30 5.6	3719 064	4	4	4
30	Hex nut M8 with locking teeth	5834 410	4	4	4
40	Immersion well R $\frac{3}{4}$ "x100 compl.	5446 065	1	1	1
50	Gasket D41.7x55x1.5 AFM 34	86159 710	2	2	2
60	Plug G1 $\frac{1}{4}$ " left	6073 304	2	2	2
70	Floor panel	6301-	6439	6438	6437
80	Shield rear	6301-	6436	6435	6434
90	Snap nut 4.8	see Mounting material for boiler block	2	2	2
100	Washer A8.4	see Mounting material for boiler block	2	2	2
110	Sheet metal screw 4.8x22	see Mounting material for boiler block	2	2	2
120	Gasket kit PK-W11 310 ml cartridge	2037 038	-	-	-
	Mounting material for boiler block	63011750	-	-	-

Tab. 15 Boiler block

At item no. 10: Only complete boiler blocks are replaced, not individual parts.

At item no. 50: Between end part and supply connection or return connection or plug.

At item no. 120: For sealing between floor panel, shield and boiler block.

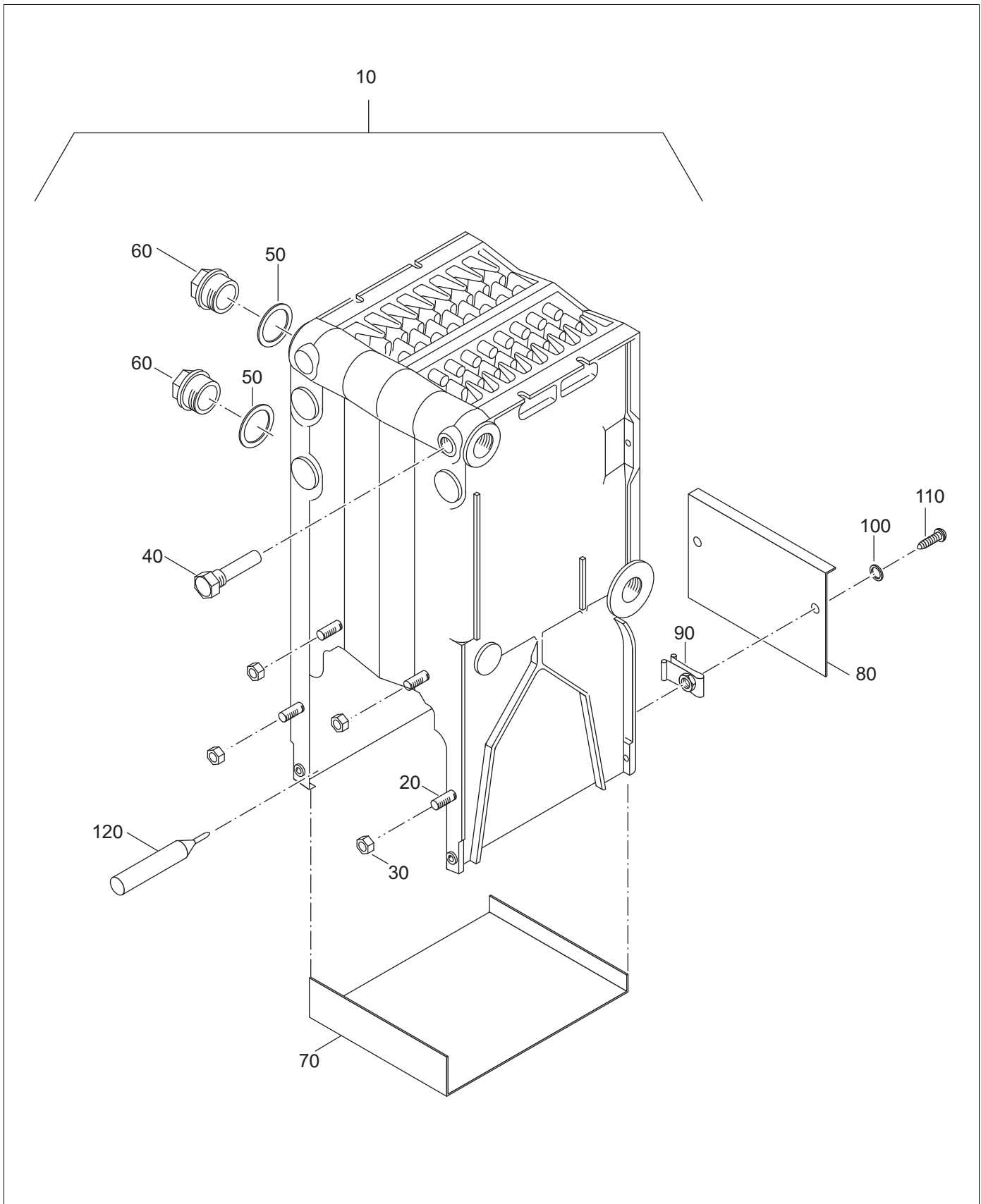


Fig. 56 Boiler block

## Boiler jacket (→ Fig. 57)

Item no.	Description	Buderus article number	Model 17 Quantity/ model	Model 23 Quantity/ model	Model 30 Quantity/ model
5	Logano GA124 nameplate	63013607	1	1	1
10	GA124 front panel	63016428	1	1	1
15	Stop bolt	Mounting material for boiler jacket	4	4	4
17	Stop socket	Mounting material for boiler jacket	4	4	4
20	Plug-in fuse	Mounting material for boiler jacket	2	2	2
22	Sheet metal screw ST3.9x13 A3T	Mounting material for boiler jacket	2	2	2
30	Side panel left/right GA124	63016425	2	2	2
35	Panhead screw ST3.9x9.5	Mounting material for boiler jacket	12	12	12
40	Hood front GA124	63016426	1	1	1
45	Cover – hood front	63016429	1	1	1
50	Hood rear GA124	63016427	1	1	1
60	Holder	9105 285	1	1	1
70	Angle 3x30/20x463 complete	63012813	1	1	1
80	Rear panel GA124	63029221	1	1	1
90	Hex head nut M8	5834 410	2	2	2
100	Hex head nut M10	5834 422	2	2	2
110	Boiler block insulation	6301-	1721	1722	1723
120	Clip - insulation	476378	5	5	5
	Mounting material for boiler jacket	63013095	-	-	-

Tab. 16 Boiler jacket

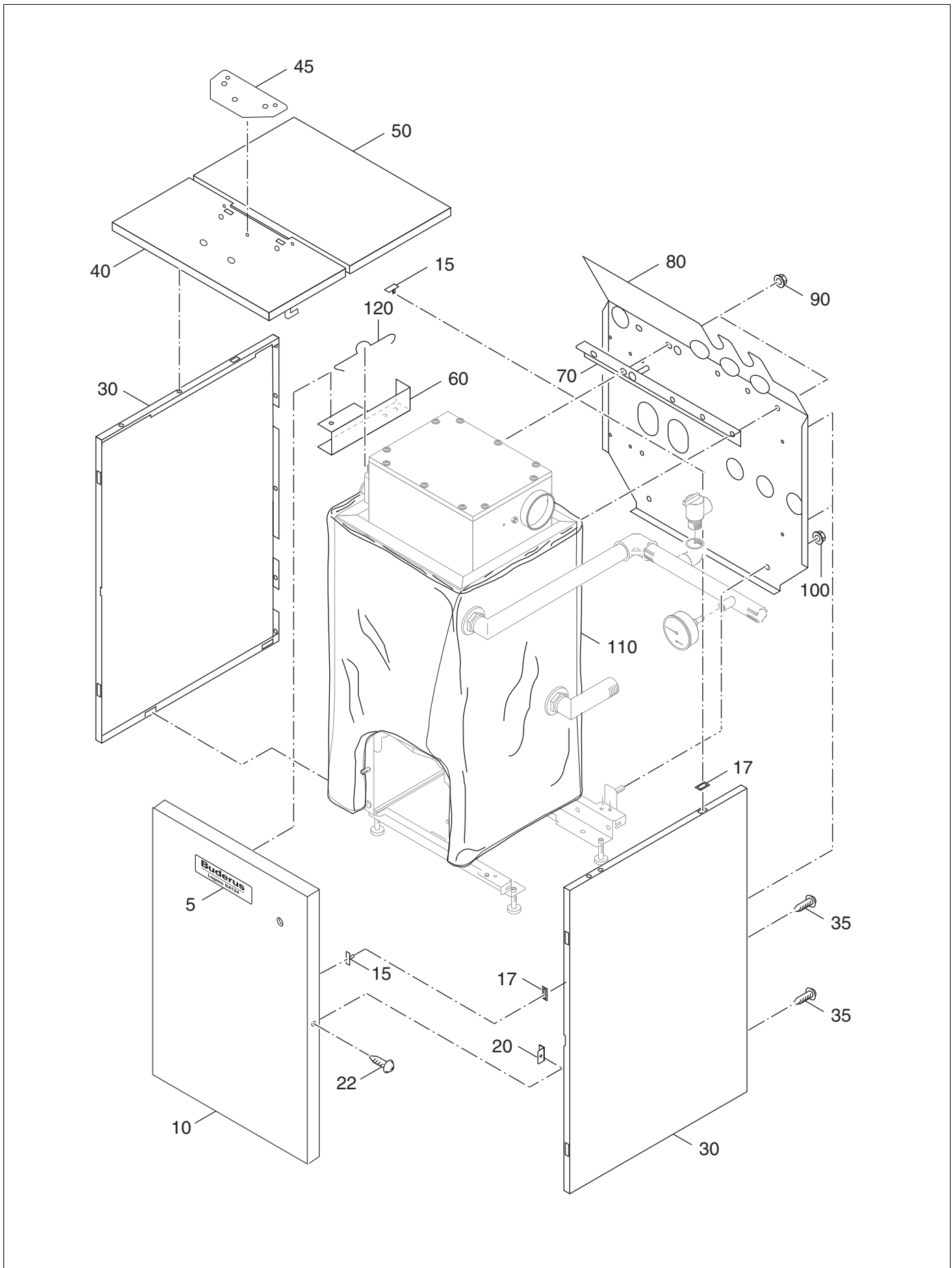


Fig. 57 Boiler jacket

**Boiler block – attachment parts (→ Fig. 58)**

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Boiler rail front	9038 156	1	1	1
15	Boiler rail rear	63015479	1	1	1
50	Hex screw M8x12	see Mounting material Boiler block	4	4	4
60	Foot M10x51	5871596	4	4	4
70	Spacer DN 8x8	5176 794	4	4	4
80	Distance pin M8x63.5	475485	2	2	2
110	Snap nut 4.8	see Mounting material Boiler block	4	4	4
120	Sheet metal screw ST4.8x22	see Mounting material Boiler block	4	4	4
130	Venting fan housing	6301-	6446	6445	6444
135	Fan base plate	6301-	6449	6448	6447
140	Adjustment baffle	63016443	1	1	1
141	Hex screw M6x12	see Mounting material Boiler block	1	1	1
142	Washer Ø 6.4	see Mounting material Boiler block	1	1	1
143	Serrated lock washer Ø 6.4	see Mounting material Boiler block	1	1	1
144	Hex nut M6	see Mounting material Boiler block	1	1	1
150	Cover - venting fan housing	6301-	6442	6441	6440
151	Hose set DN 4x2x880 silicone	63016451	1	1	1
152	Pressure monitor	6301-	6020	6019	6019
153	Fan connection wiring	63016491	1	1	1
160	Panhead screw ST3.9x9.5	see Mounting material Boiler block	22	24	24
180	Hose DN 80x1050	63014249	1	1	1
185	Hose clip 70–90	195069	4	4	4
210	Venting fan pressure reducer	63011683	1	1	1
215	Venting fan RLH 108	63016433	1	1	1
231	Annular baffle D58x37	6301-	1799	6893	-
232	Gasket set 58.5x66x7.5	63016582	1	1	1
233	Connector Ø 77/75x48	63016450	1	1	1
240	Flue pipe D60x73 with gasket	63011684	1	1	1

## Boiler block – attachment parts (→ Fig. 58)

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
260	Sealing ring D41.7x55x1.5 AFM 34	86159710	2	2	2
270	Supply elbow R1xNPT1 L = 357	5407 352	1	1	1
280	Return elbow R1xNPT1 L = 92	5407 350	1	1	1
290	B-kit G/GA 124 US/CA	63037069	1	1	1
	Contents:				
	1 supply manifold G/GA124				
	1 elbow 1				
	1 elbow 3/4 I/A				
	1 boiler drain 3/4				
	1 relief valve 3/4Mx3/4F 30PSI				
	1 temperature/pressure gauge 1/4 NPT				
	4 feet M10x51				
	Mounting material for boiler	63016501	-	-	-
	Contents:				
	4 snap nuts 4.8 SNU2212				
	4 sheet metal screws DIN7981 C ST4.8x22				
	1 hex screw ISO4017 M6x12 8.8				
	1 washer DIN125 A6.4				
	1 hex nut ISO4032 M6 8				
	1 lock washer DIN6797 A6,4				
	24 panhead screws ST3.9x9.5				
	2 lock washers DIN 6797 A5.3				
	1 cable clip 2.5x92 - Ty - 23M				

Tab. 17 Boiler block

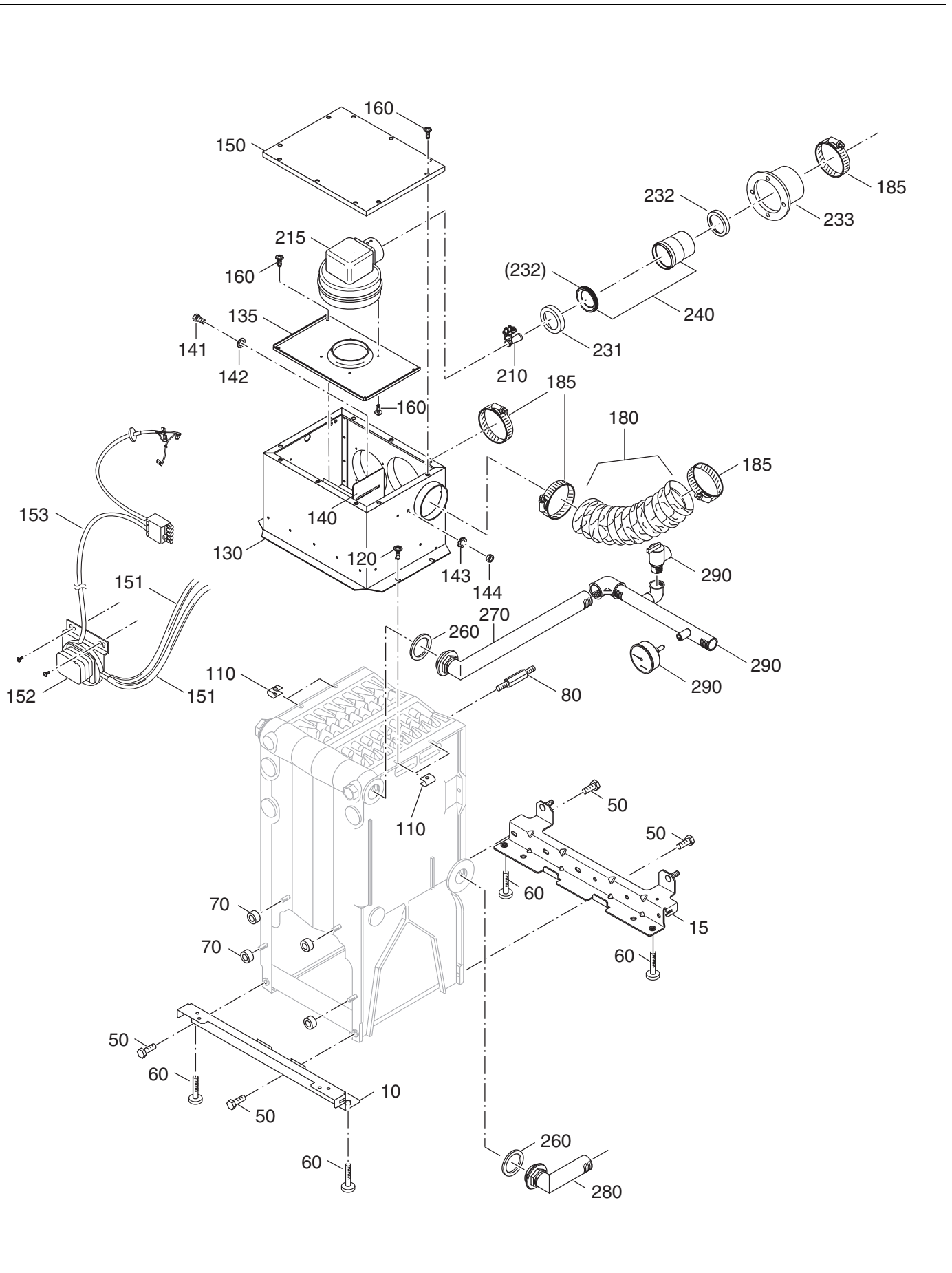


Fig. 58 Boiler block – attachment parts

## Switch box (→ Fig. 59)

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Switch box GAW 027 00 "US"	63015739	1	1	1
20	Terminal bar 4 mm <sup>2</sup> 4-pin	see Mounting material GAW 027 US	1	1	1
30	Sheet metal screw F ST3.5x16 A3K	see Mounting material GAW 027 US	5	5	5
40	Relay 24V AC 1xS 120V AC/15A	63015750	1	1	1
50	Sheet metal screw F ST3.5x6.5 A3K	see Mounting material GAW 027 US	10	10	10
60	Holder GA124 (mounting plate)	-	1	1	1
70	Aquastat relay L7148F	63015742	1	1	1
80	Sheet metal screw C ST3.5x22 A3K	see Mounting material GAW 027 US	5	5	5
90	Burner unit cover plate "US" compl.	63015747	1	1	1
100	Lock washer A4.3 A3K	see Mounting material GAW 027 US	5	5	5
110	Hose line AWG 2x18 063/076	63015745	1	1	1
120	Wiring harness GAW 022/024/026/027	63015746	1	1	1
130	Temperature sensor 209659B	63015749	1	1	1
140	Blank for 1/4 annular sensor	7060 110	1	1	1
150	Compensator spring	5446 800	1	1	1
160	Sensor holder	7060 986	1	1	1
170	Transformer 120V/24V "US" compl.	63015748	1	1	1
180	Automatic igniter S 8600H1006	63015743	1	1	1
190	Panhead screw ST3.9x9.5 A3E	see Mounting material GAW 027 US	5	5	5
200	Connection line	63015744	1	1	1
210	Sheet metal screw C ST2.9x16 A3K	see Mounting material GAW 027 US	5	5	5
220	Plug 3-pin black 93.923.4354	5493 464	1	1	1
230	Socket 3-pin black 93.031.3253.0	7060 911	1	1	1
240	Plug 3-pin green/black	5493 465	1	1	1
250	Socket 3-pin green	7060 912	1	1	1
260	Sheet metal screw C ST2.9x22 A3K	see Mounting material GAW 027 US	4	4	4
270	Socket 5-pin black	7060 913	1	1	1
280	Sheet metal screw F ST3.5x9.5 A3K	see Mounting material GAW 027 US	2	2	2
	Mounting material for GAW027 US	63015810	-	-	-

Tab. 18 Switch box

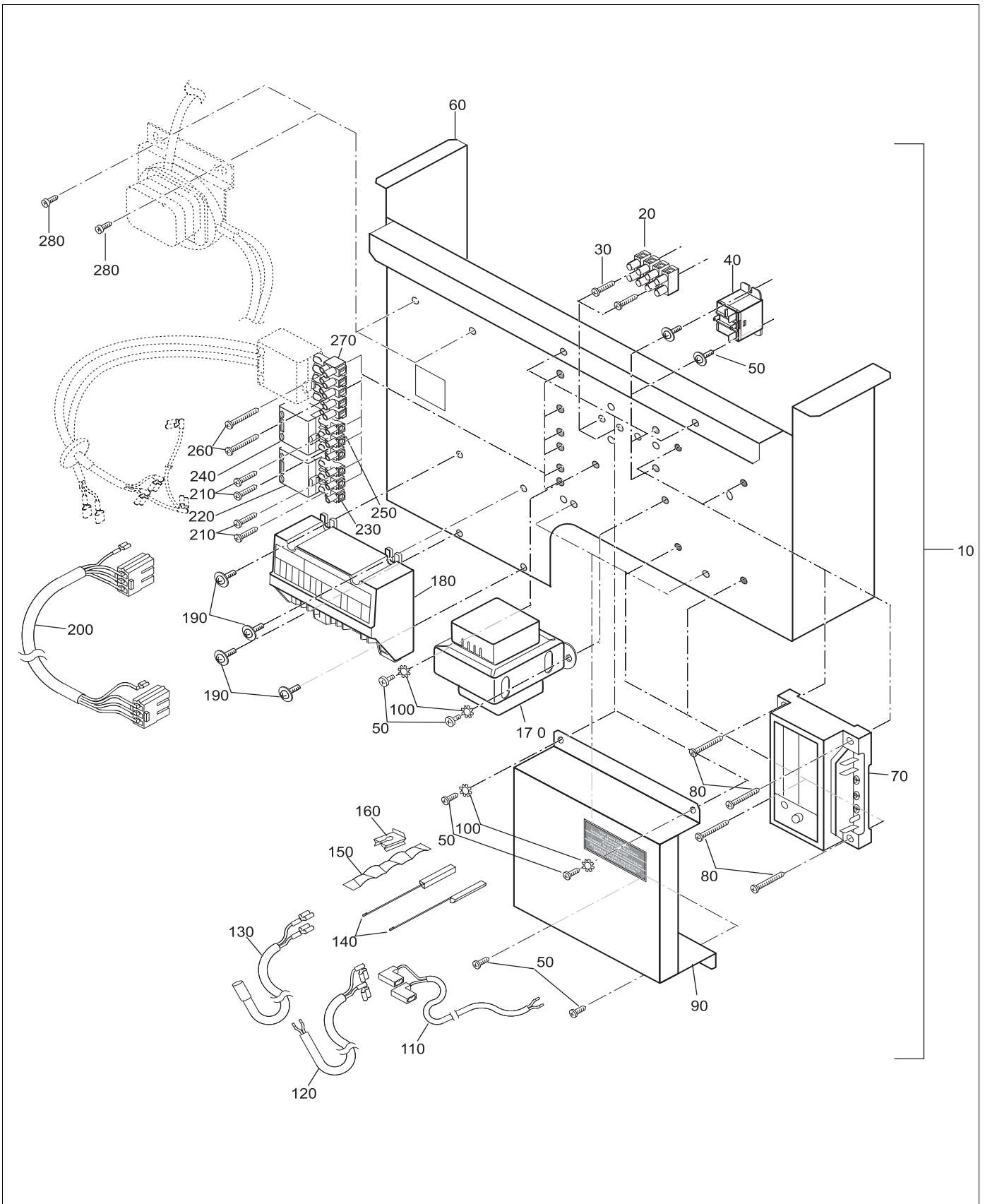


Fig. 59 Switch box

## Housing for burner (→ Fig. 60)

Item no.	Description	Buderus article number	Model 17 Quantity/ model	Model 23 Quantity/ model	Model 30 Quantity/ model
10	Flame guard 128 °C compl. (with screws)	63015665	1	1	1
20	Screw C M4x16 ST A3K	See burner mounting set	1	1	1
30	Housing cover CE124 compl. "US" with gasket, view glass and screws	6301-	5561	5562	5563
40	Panhead screw ST3.9x9.5 A3T	5947 754	14	16	16
50	Housing cover gasket	See housing gasket set	1	1	1
60	View glass compl. with retainer, gasket and screws	7100 256	1	1	1
70	Bush diameter 44 mm slit	63011272	1	1	1
80	Housing frame CE124 compl. "US" with gasket and screws	6301-	5564	5565	5566
90	Housing frame gasket	See housing gasket set	1	1	1
100	Gasket 125x20x2 mm	See housing gasket set	2	2	2
110	Housing cover bottom	-	1	1	1
120	Screw CE M5x12 CombiTorx Set with 15 pieces	63010217	-	-	-
130	See housing gasket set	6301-	0821	0845	0846
140	Glue Elastosil E 41 in 90 ml tube	63011270	1	1	1

Tab. 19 Housing for burner

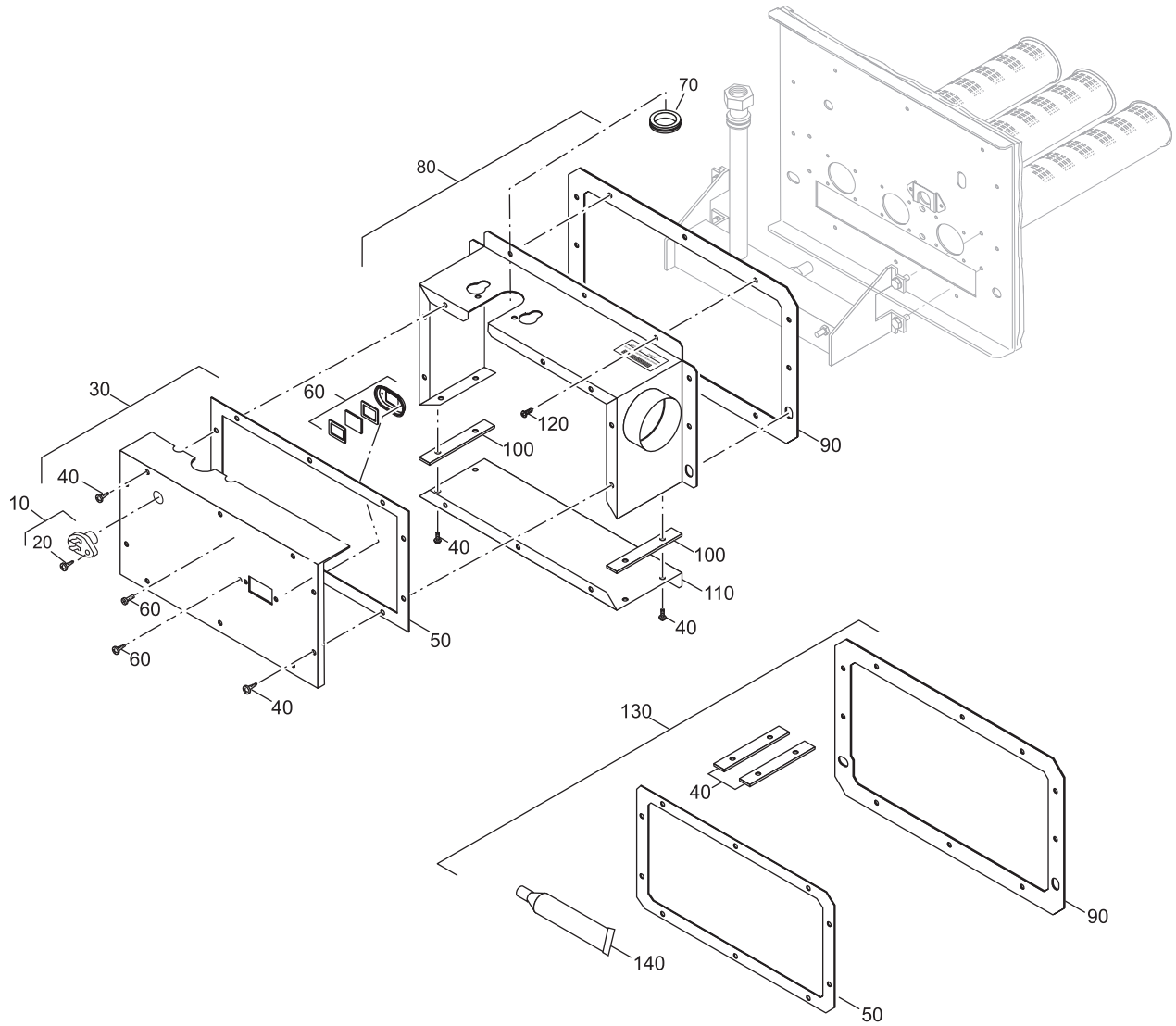


Fig. 60 Housing for burner

## Gas fitting group VR 8204 H (→ Fig. 61)

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Pipe section compl. 151 lg AE124X/CE124X "US" for 3 and 4 sections	5176 736	1	1	–
10	Pipe section compl. 241 lg AE124X/CE124X "US" for 5 sections	5176 737	–	–	1
20	Screw 8x32x1¼	See burner mounting set	2	2	2
30	Screw 8x32x½	See burner mounting set	6	6	6
40	Fittings VR8204H 1006 ½" NPT compl. "US"	63015667	1	1	1
50	O-ring D22.22x2.62	5483 082	1	1	1
60	Pipe unit with flange G1 44 mm compl. with O-ring, screws and gasket	63015557	1	1	1
70	Gasket D21x30x3	5959 282	1	1	1

Tab. 20 Fitting group VR 8204 H

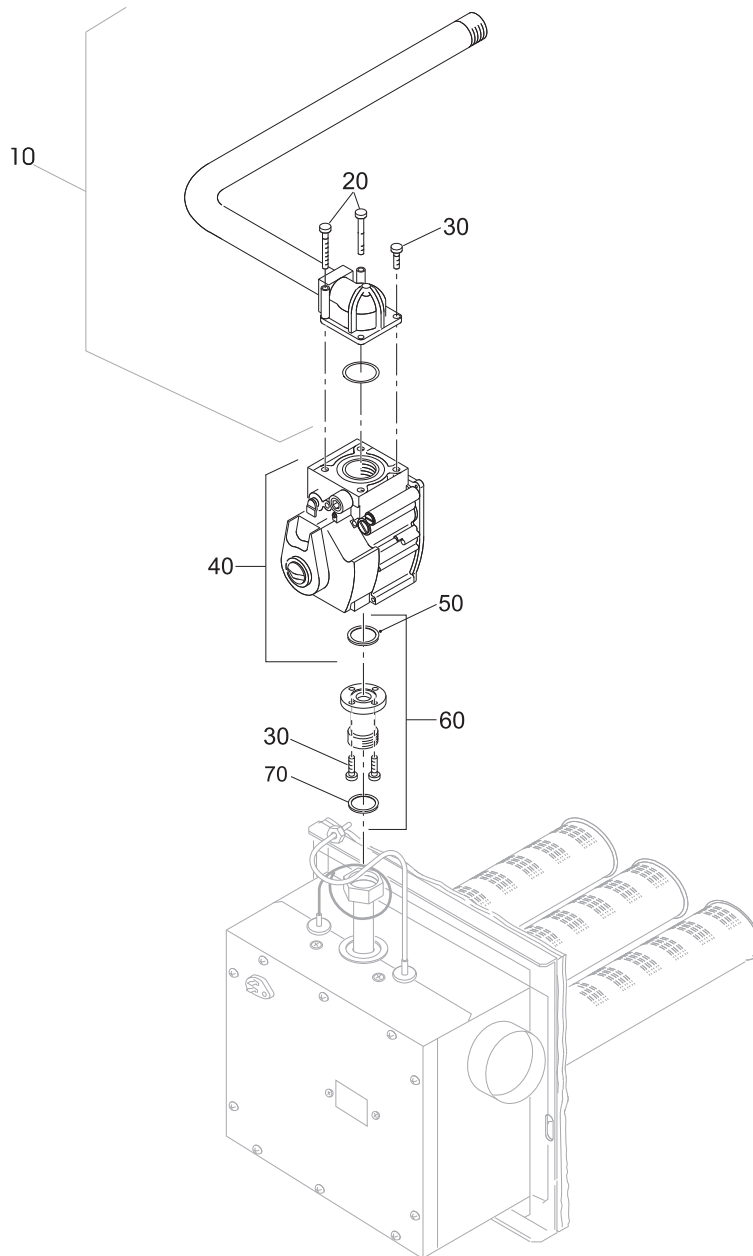


Fig. 61 Fitting group VR 8204 H

**Ignition burner (→ Fig. 62)**

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Ignition burner Q3451 E compl. "US" (with screws, ignition burner holder, ignition gas nozzle EG and ignition cable)	63015767	1	1	1
20	Screws 8x32x3/16	See burner mounting set	1	1	1
30	Ignition burner holder	See burner mounting set	1	1	1
40	Ignition gas nozzle EG BCR 20	5181 648	1	1	1
40	LPG nozzle - BBR 12	5176 998	1	1	1
50	Ignition gas screws D4	5181 672	1	1	1
60	Ignition gas line DA4 CE124 compl. "US" (with screws and bush)	6301-	5548	5549	5550
70	Screw CE M4x12 A3K CombiTorx	See burner mounting set	1	1	1
80	Screw CE M5x12 A3K CombiTorx	See burner mounting set	1	1	1

Tab. 21 Ignition burner

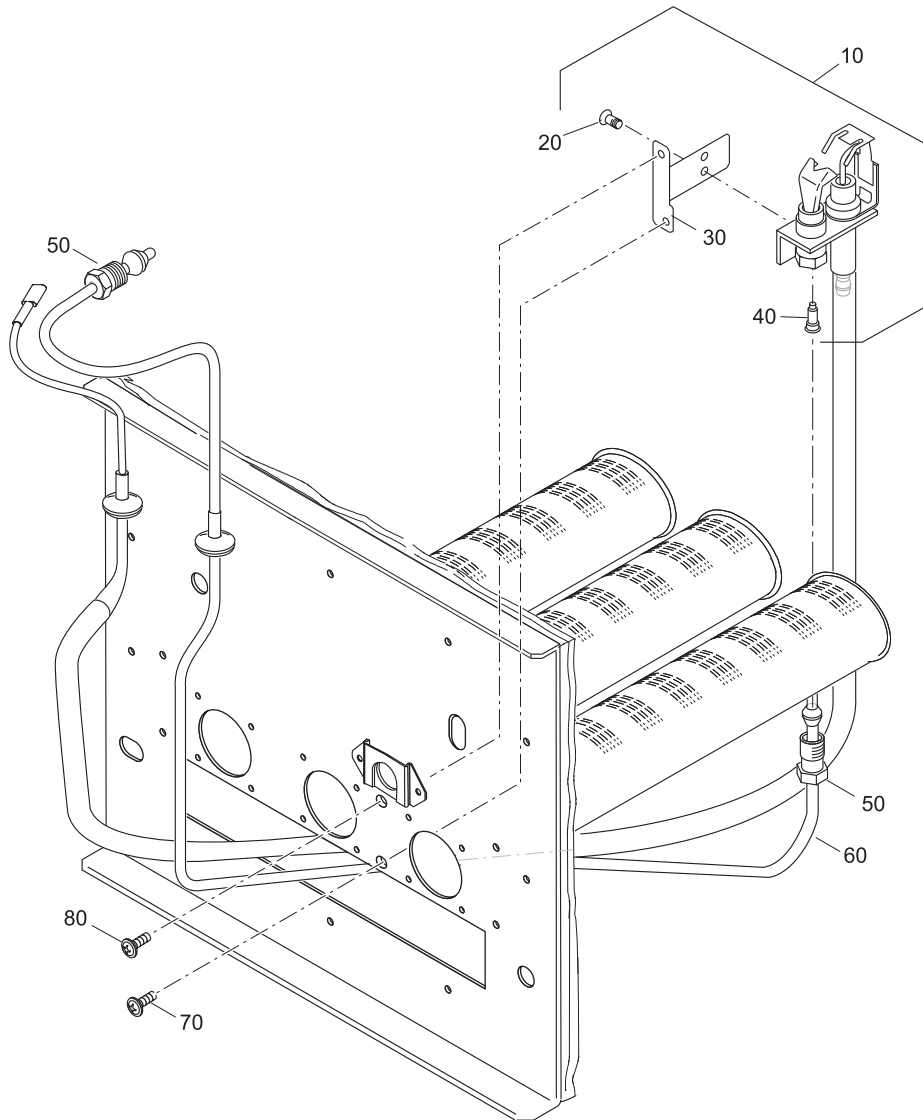


Fig. 62 Ignition burner

**Burner grate (→ Fig. 63)**

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Burner grate CE124 compl. with main gas nozzle "US"	6301-	5516	5517	5518
20	Sealing ring 13x18x1.5 mm	5883 094	2	3	4
	The main gas nozzles are suitable for operation at altitudes between 0 and 8500 feet. The appropriate gas conversion parts are required for operation at altitudes above 8500 feet.				
30	Main gas nozzle 2,65 mm hole SW16 48 mm for model EG G20 0–8500 feet	5484 392	2	-	-
30	Main gas nozzle 2.50 mm hole SW16 48 mm for model EG G20 0–8500 feet	5484 380	-	3	4
40	Insulation "US"	6301-	5528	5529	5530
50	Ceramic glue Thermofix tube 115 g	2037 312	1	1	1
60	Air baffle CE124 5 sections top/bottom	63011005	-	-	1
70	Screw CE M5x12 CombiTorx	See burner mounting set	-	-	2
80	Screw CE M4x12 CombiTorx	See burner mounting set	-	-	2
90	Glass pane Tempax 30x30.3.3 mm	5447 620	1	1	1
	Burner mounting set GA124	63015551	-	-	-

Tab. 22 Burner grate

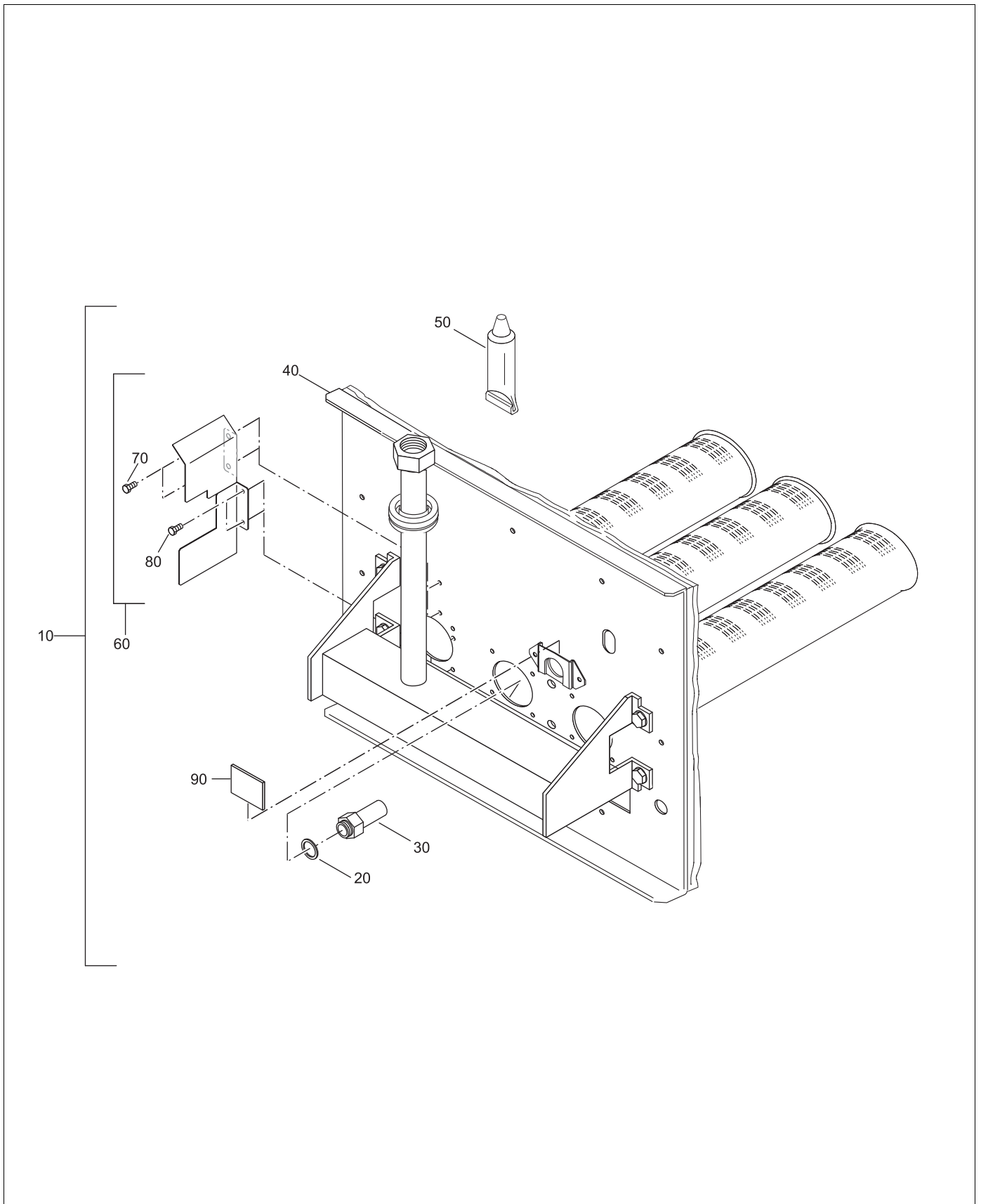


Fig. 63 Burner grate

**USER NOTE**

The complete burner is supplied only in the model for natural gas G20 for 0-8500 feet. If a different model of burner is wanted, the corresponding gas conversion parts must be included in the order. The replaced parts must remain with the heating system for a possible future reconversion.

**Gas burner CE124 (→ Fig. 64)**

Item no.	Description	Buderus article number	Model 17 Quantity/model	Model 23 Quantity/model	Model 30 Quantity/model
10	Gas burner CE124 G20 "US"	6301-	5513	5514	5515
	LP kit. GA124 (G31) 0-8500 "US/CA"	6303-	7804	7805	7805
	LP kit. GA124 (G31) 8501-12000 "US/CA"	6303-	7807	7808	7808
	NG kit. GA124 (G20) 0-8500 "US/CA"	6303-	7806	7812	7812
	NG kit. GA124 (G20) 8501-12000 "US/CA"	6303	7810	7811	7811

Tab. 23 Burner types, gas conversion parts

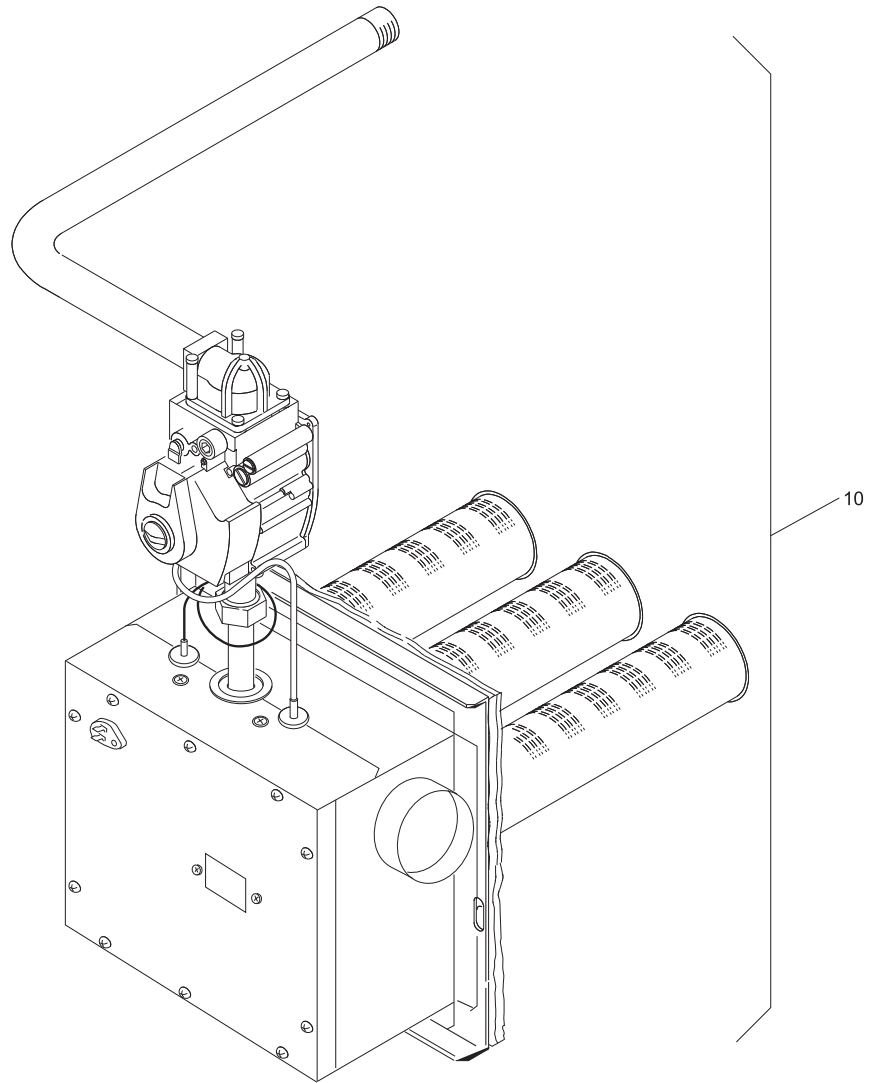


Fig. 64 Gas burner CE124

## 13 Specifications

Main gas orifice identification and rated orifice pressure for natural gas

Boiler size	Number of nozzles	Main gas orifice identification for altitudes [feet]		Rated manifold pressure [in. W.C.]
		0–8500 ft <sup>1)</sup>	8501–12000 ft <sup>2)</sup>	
17	2	265	260	3.6
23	3	250	245	3.6
30	4	250	245	3.5

Tab. 24 Main gas orifice identification and rated manifold pressure for natural gas

Main gas orifice identification and rated orifice pressure for LP gas

Boiler size	Number of orifices	Main gas orifice identification for altitudes [feet]		Rated manifold pressure [in. W.C.]
		0–8500 ft <sup>2)</sup>	8501–12000 ft <sup>2)</sup>	
17	2	175	170	8.9
23	3	160	155	9.9
30	4	160	155	9.5

Tab. 25 Main gas orifice identification and rated manifold pressure for LP gas

1) factory setting

2) use conversion parts only as directed by the technical documentation



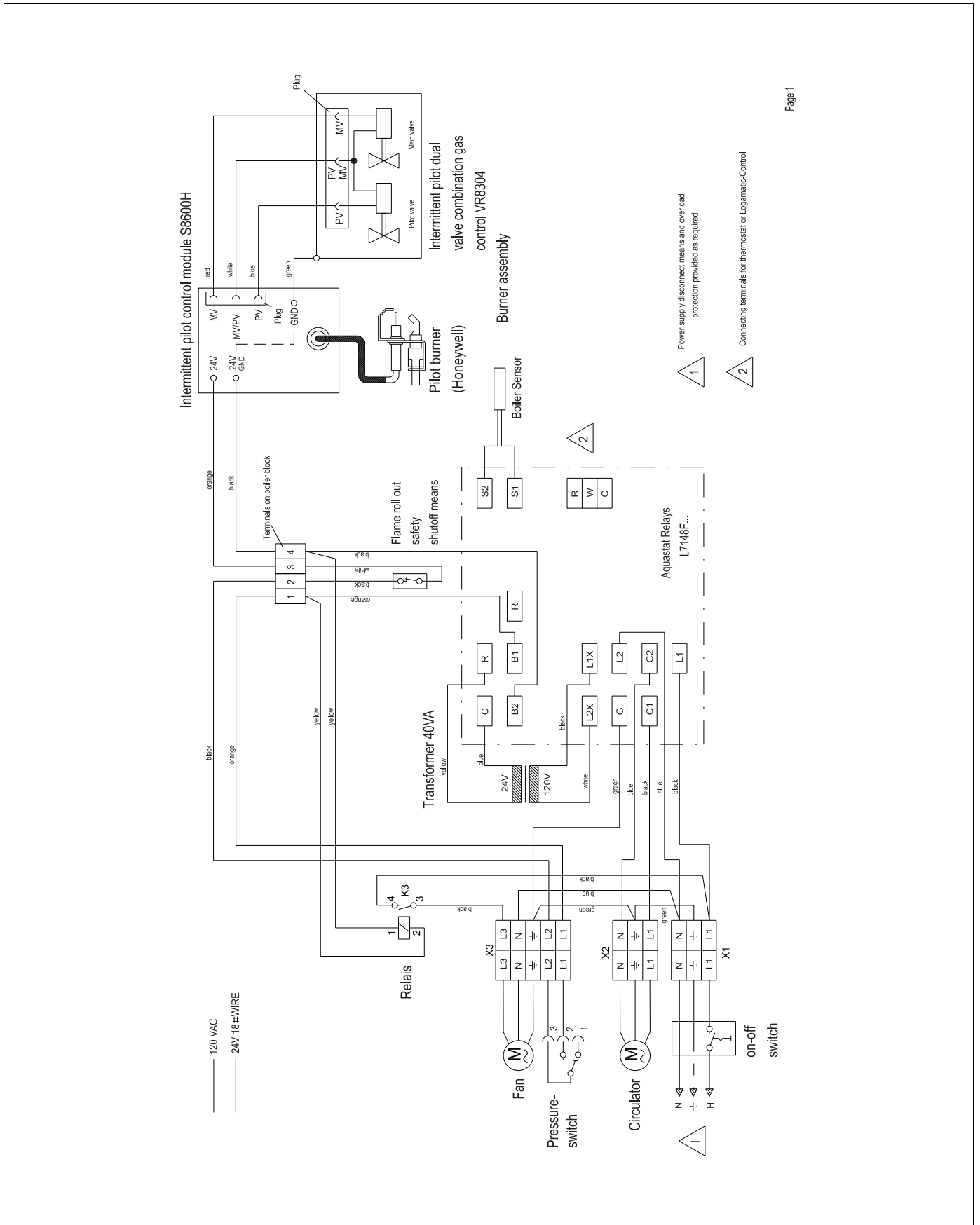
### USER NOTE

If the installation location is over 8500 feet above sea level, please contact Buderus for the required conversion components.

Do not attempt to convert the boiler without the approved Buderus parts and the relevant technical documentation.

The technical documentation is included with the conversion parts (accessories).

# 14 Wiring diagrams



Page 1

Fig. 65 Wiring diagram – Model GA124

Wiring Schematic GA 124

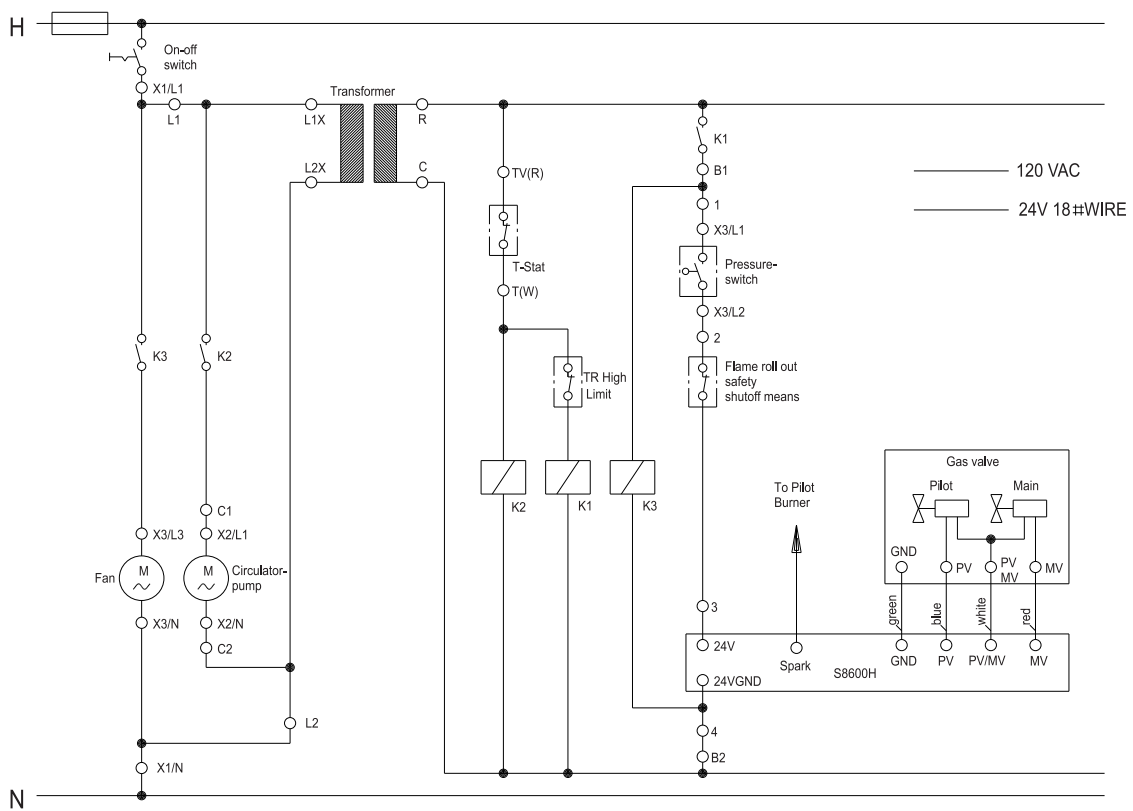


Fig. 66 Wiring diagram – Model GA124

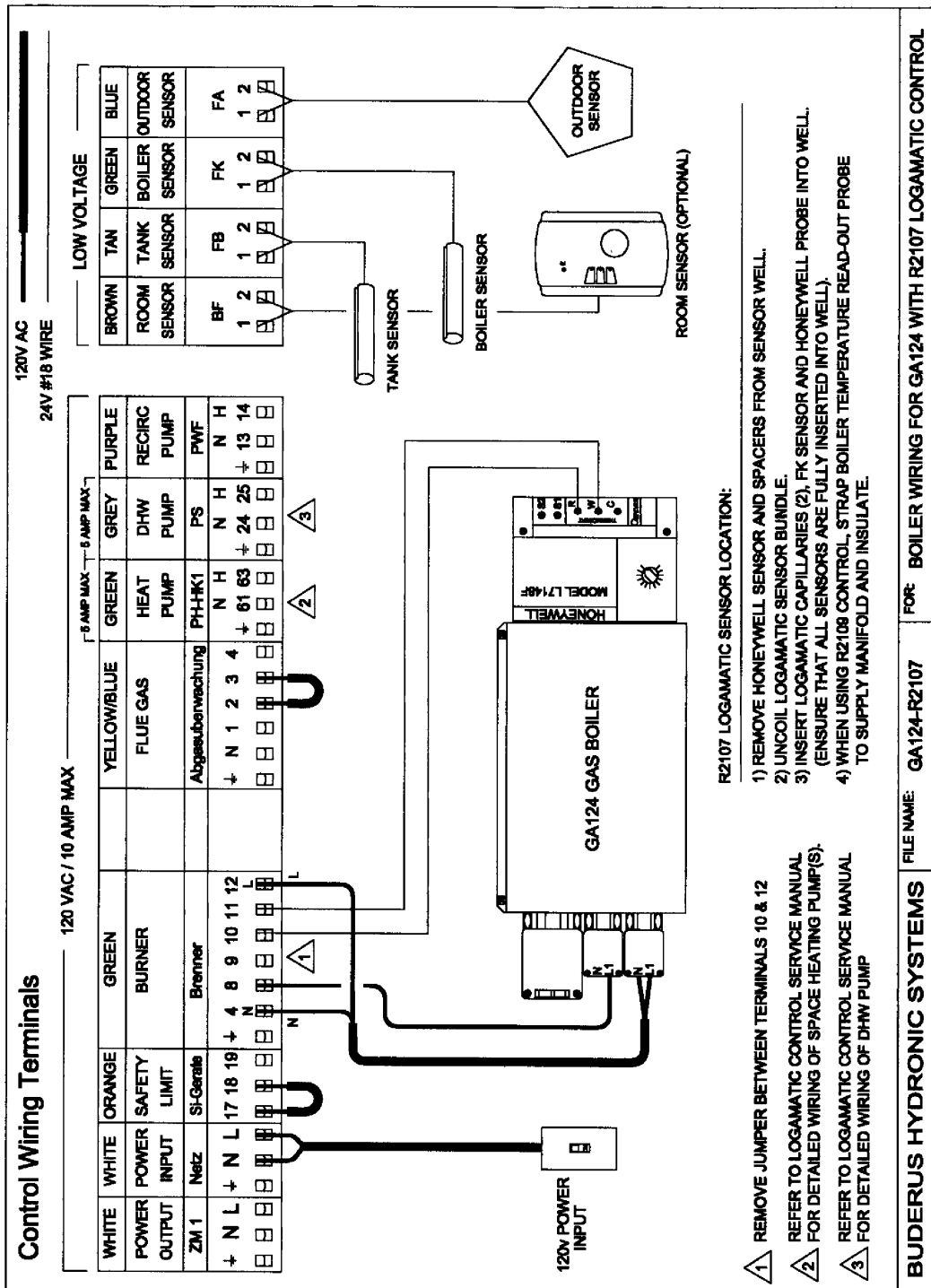


Fig. 67 Wiring diagram – GA124 with Logamatic 2107 or Logamatic 2109 control

Heating Contractor:

PRODUCTS MANUFACTURED BY

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