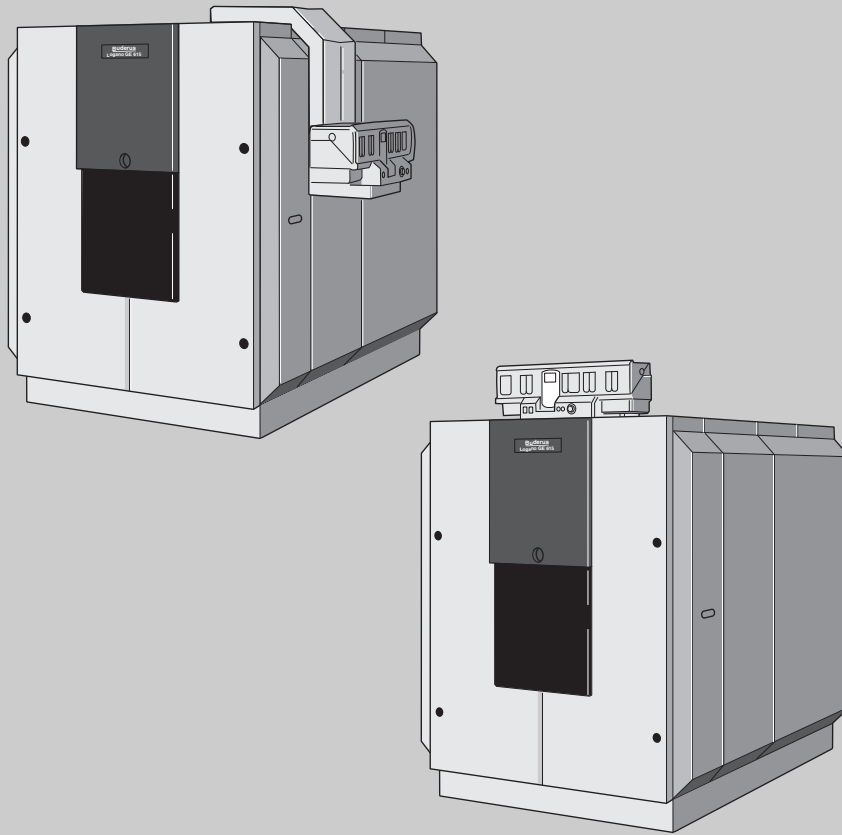


Installation and maintenance instructions

Calorific value forced
draft sectional boiler



Logano GE615

For installer

Please read thoroughly
prior to installation and
maintenance.

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1 General safety information and explanation of symbols

1.1 For your safety

Installation and operation

- Installation and commissioning must only be carried out by qualified installation engineers.
- Observe all instructions to ensure perfect functioning.
- Only use the boiler for its intended purpose.
- When installing and operating, observe all country-specific regulations and standards. These include local requirements in respect of positioning, the air inlet and outlet equipment and chimney, as well as fuel and electrical connections.
- Do not modify any parts that carry flue gas.

Maintenance and conversion

Customers are advised

- To sign an inspection/maintenance contract with an authorised contractor, and have the heating system serviced annually.
- The operator is responsible for the safety and environmental compliance of the heating system (federal legislation on emissions).
- Only use original spare parts.

Instructing the customer

- Explain to the customer how the heating system works, and how to operate it.
- **Inform the customer that he must not carry out any alterations or repairs.**



Read and observe the safety information and codes of conduct:

You endanger your life by not paying attention to your own safety, e.g. in the case of a fire.

- Never risk your own life. Your own safety is paramount.

If you can smell gas, there is a risk of an explosion

- Close the gas shut-off valve (→ page 45).
- Open window(s).
- Do not operate electrical switches.
- Extinguish all naked flames.
- **From outside the building:** call gas supplier and authorised contractor.

If you can smell flue gases, there is a risk of poisoning

- Switch off the heating system (→ page 45).
- Open windows and doors.
- Inform an authorised contractor.

Risk to life from electric shock.

- Electrical connections must only be made by a qualified electrician. Observe the wiring diagram!
- Before installation: Shut off power supply (230 V AC) to all poles on the boiler and all other components. Secure against unintentional reconnection.

Risk of fire from explosive and inflammable materials

- Inflammable materials or liquids (paper, thinners, paints, etc.) must not be used or stored near the boiler.

Caution: system damage

- Keep the combustion air/ambient air free from aggressive substances (halogenated hydrocarbons, for example, contained in spray cans, solvents or cleaning agents, paints and adhesives). This prevents corrosion.
- Prevent heavy contamination of the combustion air/ambient air by dust, airborne seed, etc.

1.2 Explanation of symbols



Safety information throughout the document is signalled by a warning triangle and a grey background.

Signal terms indicate the seriousness of the ensuing risk if measures for minimising damage are not taken.

- **Caution** means that slight material damage may occur.
- **Warning** means that minor injury or severe material damage may occur.
- **Danger** means that severe injury may occur. Very serious cases may result in death



Notes are identified in the text by this symbol. They are bounded by horizontal lines above and below the text.

Notes are included with important information for situations in which there is no danger for persons or equipment.

2 Product Information

2.1 Product overview

This boiler is a low temperature boiler that complies with DIN EN 303 for oil or gas combustion with modulating boiler water temperature control and no minimum return temperature.

The main components of the Logano GE615 fan-assisted boiler are:

- The boiler block transfers the heat generated by the burner to the heating water.
- The boiler shell and insulation prevent energy loss.
- The control panel monitors and controls all electrical boiler components.

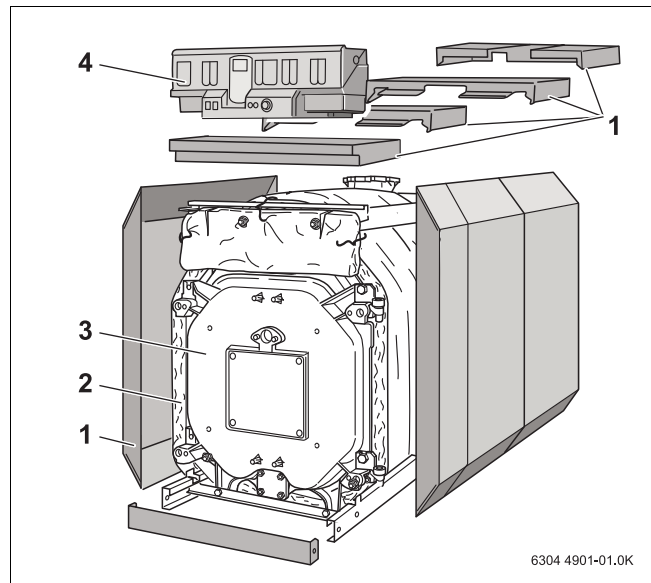


Fig 1 Logano GE615 forced draft boiler

- | | |
|---|----------------|
| 1 | Boiler casing |
| 2 | Insulation |
| 3 | Boiler block |
| 4 | Control device |

2.2 Correct use

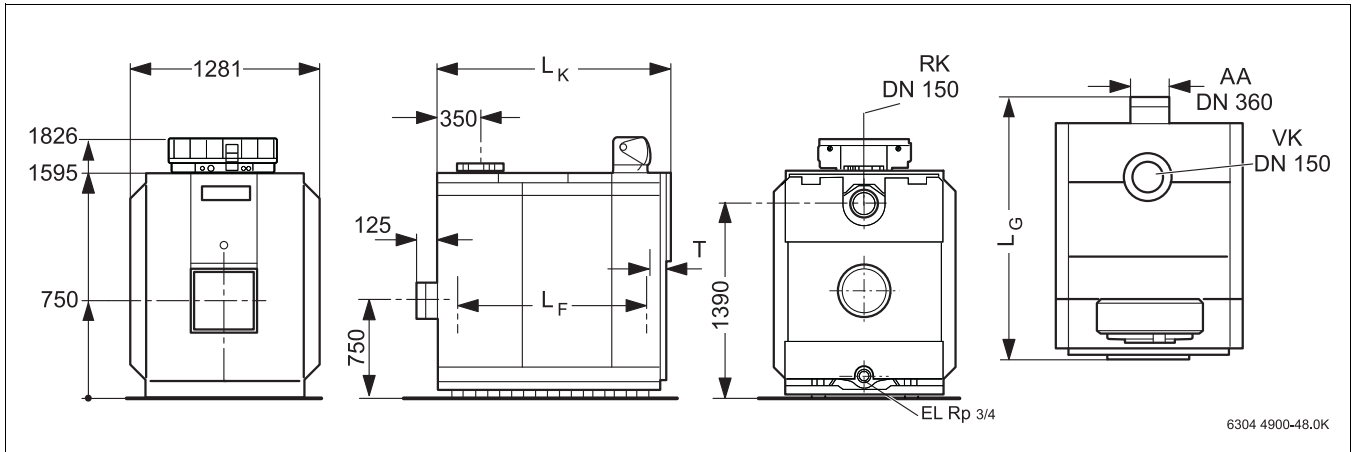
The Logano GE615 forced draft boiler is intended for generating heating water. You may use any type-tested oil or gas fired burners to EN 267 or EN 676 provided their operating range meets the boiler specification.

Using the boiler for any other purpose will be considered improper use. Buderus accepts no liability for any damage resulting as a consequence of such use.

2.3 EU Declaration of Conformity

CE The design and operation of this product conforms to European Directives and the supplementary national requirements. Its conformity is confirmed by the CE marking. You can view the Declaration of Conformity on the internet at www.buderus.de/konfo or request a copy from your local Buderus office.

2.4 Specifications



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Fig 2 Connections and dimensions

Specifications and dimensions									
Boiler rating	kW	570	660	740	820	920	1020	1110	1200
Boiler sections	Number	9	10	11	12	13	14	15	16
Rated output¹⁾	kW	511 – 570	571 – 660	661 – 740	741 – 820	821 – 920	921 – 1020	1021 – 1110	1111 – 1200
Combustion output	kW	546,6 – 616,2	610,7 – 713,5	707,0 – 800,0	792,5 – 886,5	878,1 – 994,6	985,0 – 1102,0	1092,0 – 1200,0	1188,0 – 1297,0
Overall boiler length (L_G)	mm	1926	2096	2266	2436	2606	2776	2946	3116
Length of boiler block (L_K)	mm	1804	1974	2144	2314	2484	2654	2824	2994
Loose boiler section transport unit	mm	Width 1096/height 1640/depth 170							
Boiler block transport unit	mm	Width 1096/height 1640/length L _K							
Combustion chamber length (L_F)	mm	1525	1695	1865	2035	2205	2375	2545	2715
Diameter of combustion chamber	mm	680							
Depth of burner door	mm	145							
Net weight²⁾	kg	2505	2747	2990	3232	3475	3710	3953	4147

Tab. 1 Specifications and dimensions

¹⁾ Note that in Switzerland, the values given - are not reached in practice in order to adhere to the LRV regulations.

²⁾ Weight excluding packaging 4 - 5 % lower.

Specifications and dimensions									
Water capacity	l	561	621	681	741	801	861	921	981
Gas content	l	922	1027	1132	1237	1342	1447	1552	1657
Flue gas temperature¹⁾ partial load 60 %	°C	140							
Flue gas temperature¹⁾ full load	°C	170 – 180							
Flue gas mass flow rate, oil, partial load 60 %	°C	0,1537	0,1778	0,1995	0,2207	0,2479	0,2750	0,2992	0,3234
Flue gas mass flow rate, oil, full load²⁾	kg/s	0,2320 – 0,2615	0,2592 – 0,3028	0,3001 – 0,3396	0,3364 – 0,3763	0,3727 – 0,4222	0,4181 – 0,4678	0,4635 – 0,5093	0,5043 – 0,5505
Flue gas mass flow rate, gas, partial load 60%	kg/s	0,1542	0,1785	0,2002	0,2215	0,2488	0,2760	0,3003	0,3246
Flue gas mass flow rate, gas, full load²⁾	kg/s	0,2328 – 0,2625	0,2602 – 0,3039	0,3012 – 0,3408	0,3376 – 0,3776	0,3741 – 0,4237	0,4196 – 0,4694	0,4652 – 0,5112	0,5061 – 0,5525
CO₂ content, oil	%	13							
CO₂ content, gas	%	10							
Required draught	Pa	0							
Hot gas resistance	mbar	2,4	3,4	4,2	4,2	4,1	4,5	5,4	5,8
Permissible flow temperature³⁾	°C	110 ⁴⁾ 100 – 120 ⁵⁾							
Permissible operating pressure	bar	6							
Maximum time constant T on thermostat	s	40							
Maximum time constant T on monitor/limiter	s	40							

Tab. 2 Specifications and dimensions

- ¹⁾ To DIN EN 303. The minimum flue gas temperature for the chimney calculation acc. to DIN 4704 is approx. 12 K lower.
- ²⁾ Full load details relate to the upper and lower rated output range.
- ³⁾ Safety limit (high limit safety cut-out). Max. possible flow temperature = safety limit (STB) – 18 K.
Example: Safety limit (STB) = 100 °C, max. possible flow temperature = 100 – 18 = 82 °C.
- ⁴⁾ Permitted flow temperature for Switzerland.
- ⁵⁾ According to country-specific standards and regulations (for all countries)

Country	Germany			
Fuels	EL heating oil DIN 51 603	LPG	Natural gas	Biogas (special conditions of use)
Comments	The boiler can only be operated with the specified fuels.			
Country	Austria			
Fuels	EL heating oil L heating oil ("Schwechat 2000" light oil)	LPG	Natural gas	Biogas (special conditions of use)
Comments	The boiler can only be operated with the specified fuels. The requirements acc. to Art. 15 a B-VG regarding emissions and efficiency are being met. If L heating oil ("Schwechat 2000" light oil) is being used, cleaning and maintenance must be carried out twice a year.			
Country	Switzerland			
Fuels	EL heating oil	LPG	Natural gas	Biogas (special conditions of use)
Comments	The boiler can only be operated with the specified fuels. The output figures shown in the table "Specifications and dimensions" are nominal output figures. In practice, some of these values will sometimes not be reached within the specified output range in order to adhere to LRV regulations.			
Country	Poland			
Fuels	EL heating oil	LPG	Natural gas	Biogas (special conditions of use)
Comments	The boiler can only be operated with the specified fuels. According to PN-91/21B-2414 (p.2.5), boilers with an output greater than 100 kW must be fitted on-site with a low water indicator (SYR type 933.1).			
Country	All countries			
Fuels	EL heating oil (viscosity max. 6,0 mm²/s bei 20 °C)	LPG	Natural gas	Biogas (special conditions of use)
Comments	The boiler can only be operated with the specified fuels. Carry out maintenance and cleaning procedures annually. Check that the entire system is functioning correctly. Rectify any defects immediately.			

Tab. 3 Fuels

2.5 Accessories

Please see the current sales information for details of accessories.

Use only original parts.

3 Regulations



Observe all standards and guidelines applicable to the installation and operation of this heating system in your country. The information on the rating plate has precedence and **MUST** be observed.

3.1 Boiler room



Caution: System damage caused by frost.

- Set up the heating system in a room safe from the risk of frost.

3.2 Quality of heating water

- For correct use and treatment of the fill and top-up water, you **MUST** observe the operator's log, which is included with the technical documentation.
- Enter the amount and quality of the fill water in the log.

Total boiler output Q kW	Ca(HCO ₃) ₂ concentration of the fill and top-up water mol/ m ³	Maximum fill and top-up water volume V _{max} m ³	Heating water pH value
100 ≤ Q ≤ 350	≤ 2,0	V _{max} = three times system volume	8,2 – 9,5
350 ≤ Q ≤ 1000	≤ 1,5		
100 ≤ Q ≤ 350	> 2,0	V _{max} = 0.0313 x Q / Ca(HCO ₃) ₂ with: Q in kW and Ca(HCO ₃) ₂ in mol/ m ³	
350 ≤ Q ≤ 1000	> 1,5		
Q > 1000	–		

Tab. 4 Requirements for fill, top-up and heating water

3.3 Disposal and recycling

- If any heating system components need to be replaced, they should be disposed of in an environmentally responsible manner, via an approved disposal site.
- Dispose of packaging in an environmentally responsible manner.

4 Installation

4.1 Checking delivery for completeness

The boiler can be delivered either as a pre-assembled block or in loose sections.

- After delivery, check all packaging for perfect condition.
- Check that the delivery is complete.

4.1.1 Delivery as a pre-assembled block

Component	Piece	Packaging
Boiler block	1	Pallet
Fittings	1	Case
Parts	1	Case
Casing Pack A	1	Case
Casing Pack B	1	Case
Insulation	1	Foil bag

Tab. 5 Scope of supply (pre-assembled block)

4.1.2 Delivery in loose sections

Component	Piece	Packaging
Front, rear, central sections with upper flow connection and burner door	1	Pallet
Central sections (depending on boiler size)	2 – 5	Pallet
Base unit fittings, 9 – 16 sections	1	Case
Supplementary fittings (contents depend on the size of the boiler)	1	Case
Parts	1	Case
Casing Pack A	1	Case
Casing Pack B	1	Case
Insulation	1	Foil bag
Anchor rod set with spring packs		

Tab. 6 Scope of supply (loose sections)

4.2 Tools and auxiliary materials

The following tools and auxiliary materials are required for the boiler assembly (the listed items are not contained in the scope of supply).

- Boiler compression tool 2.3
- Installation kit (accessory)
- Steel hammer and wooden or rubber mallet
- Half-round smoothing file
- Screwdriver (Philips and slotted head)
- Flat chisel, support wedge, flat iron
- Spanner size 13, 19, 24, 36 and size 19 Allen key
- Cleaning rags and cloth
- Fine emery cloth
- Wire brush
- 3-in-1oil
- Solvent (petrol or solution)
- Spirit level, ruler, chalk, straight edge

Sections	Compression tool(s) per boiler hub	Extension(s) per boiler hub	Length (total) mm
9 - 16	1	3	3080

Tab. 7 Boiler compression tool size 2.3 (complete in the toolbox)

4.3 Recommended wall clearances

Observe the recommended wall clearances for easier boiler installation, cleaning and maintenance. Adhere to the minimum clearances (in brackets) in all cases.

Take into account the space required for opening the burner door.

The burner door can be hung on the right or left.

The wall clearance on the hinge side must be at least the same as the amount by which the burner projects (AB). Recommended wall clearance AB + 100 mm.

If you do not observe the recommended minimum wall clearances, you will not be able to use the cleaning set (accessory) to clean the boiler. You could, however, use shorter (approx. 1 m) cleaning devices or perform wet cleaning.

Boiler rating		Clearance A (mm)	
kW	Sections	re-commended	at least
570 - 820	9 - 12	2300	1400
920 - 1200	13 - 16	3000	1500

Tab. 8 Recommended and minimum wall clearances

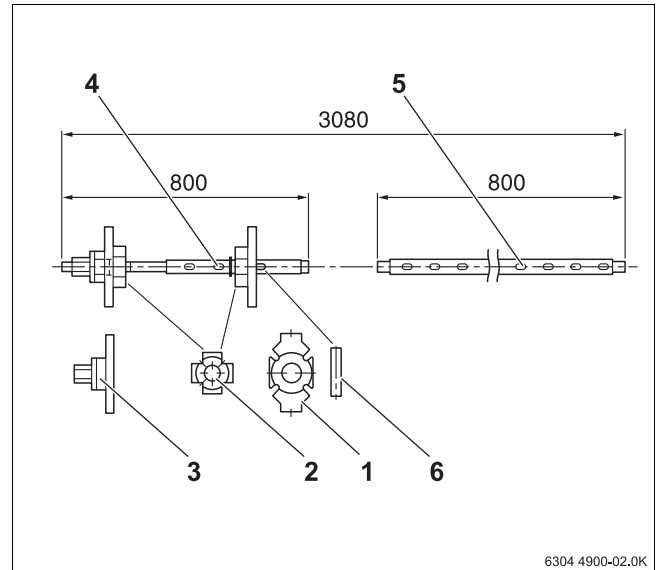


Fig 3 Boiler compression tool size 2.3 (dimensions in mm)

- 1 Mating flange
- 2 Additional flange
- 3 Compression unit
- 4 Pull rod
- 5 Extension
- 6 Wedge (size 2.3)

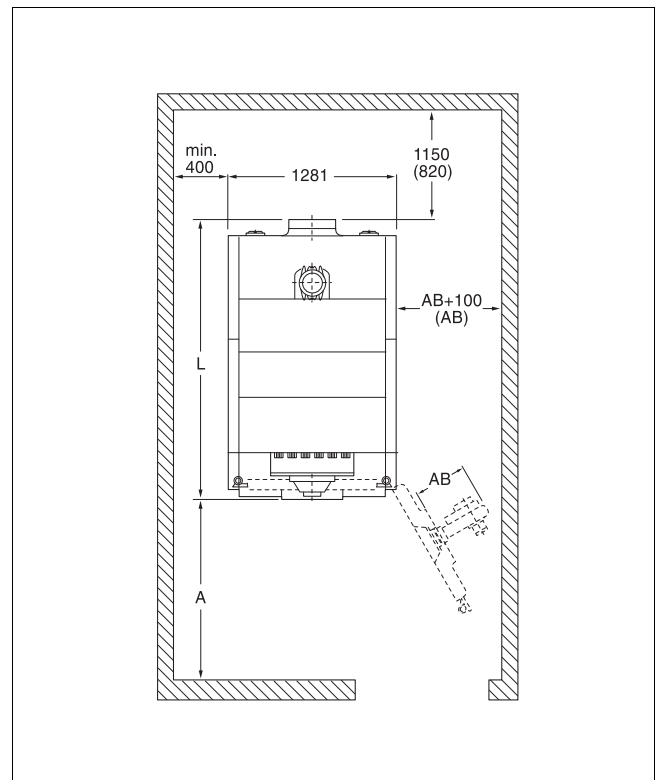


Fig 4 Boiler room with boiler (dimensions in mm)

4.3.1 Base and boiler plinth

Place the boiler on a 50 – 100 mm high base (observe wall clearances). The base must be flat and level. The front edge of the boiler should be flush with the edge of the base.



A sound-absorbing plinth is available as an accessory. The boiler plinth prevents the transmission of vibrations to the base.

If you are not using a boiler plinth (accessory), angled steel sections (100 x 50 x 8 mm) or flat steel sections (100 x 5 mm) must be put in place when installing the base.

Number of sections	L1 (base)	L2 (steel section)
9	1670	1470
10	1840	1640
11	2010	1810
12	2180	1980
13	2350	2150
14	2520	2320
15	2690	2490
16	2860	2660

Tab. 9 Base dimensions for angled/flat steel sections

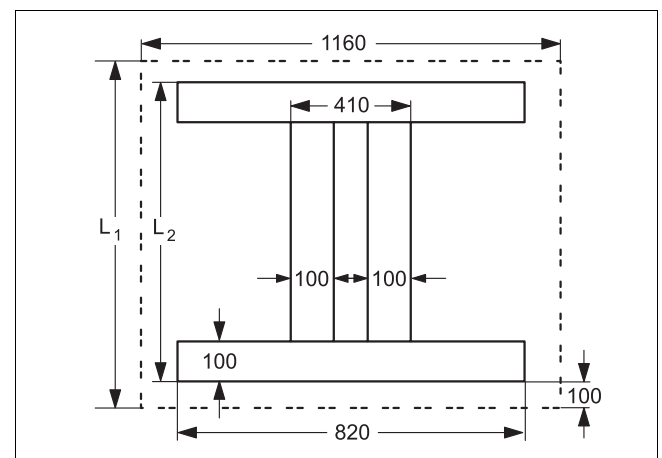


Fig 5 Base dimensions

4.4 Assembling the boiler block

A distinction is made between delivery as a pre-assembled block and delivery in loose sections. When delivered as a block, the boiler sections are already fully assembled and checked for leaks prior to despatch. If, because of physical limitations, a boiler block cannot be installed or brought inside the building, delivery in loose sections would facilitate assembly on site.

The following describes the assembly of the boiler block when delivered in loose sections.

For the further installation of a pre-assembled boiler block, → see section 4.5, page 19.

4.4.1 Arrangement of boiler sections



Caution: Risk of injury through inadequately secured boiler sections.

- Use only suitable means of transportation when handling the boiler sections, e.g. a sack truck with strap or a stair or step trolley.
- Prevent the boiler sections from sliding off when transporting them.
- Prevent the boiler sections from falling over using the installation aid (accessory) First screw the rear section firmly onto the installation aid (→ Fig. 7).

The boiler block is always installed from the back forwards, i.e. the rear section (→ Fig. 6, **3**) is always installed first, and the front section (→ Fig. 6, **8**) always installed last.

When assembling, observe the installation direction arrows (→ Fig. 6, **7**) for each boiler section.

Make sure you position the middle section with the upper flow connection (→ Fig. 6, **4**) correctly!

Install the boiler block according to the following instructions and illustrations.



The installation aid is available on request.

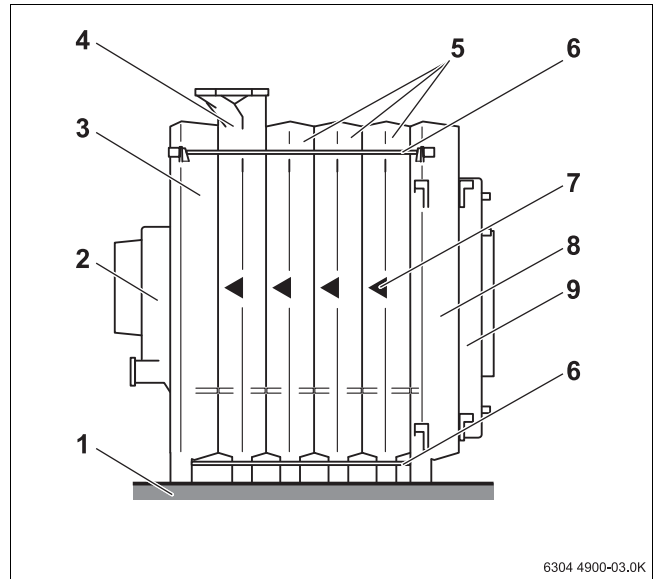


Fig 6 Assembled boiler block

- | | |
|----------|--------------------------------------|
| 1 | Base/sound-absorbing boiler plinth |
| 2 | Flue gas header |
| 3 | Rear section |
| 4 | Central section with flow connection |
| 5 | Centre section |
| 6 | Anchor rod |
| 7 | Installation direction arrow |
| 8 | Front section |
| 9 | Burner door with burner plate |

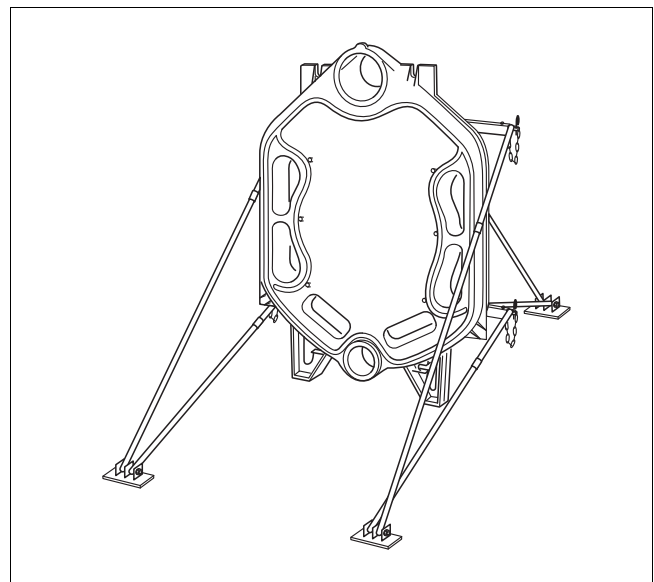


Fig 7 Rear section with fitted installation set

4.4.2 Joining the boiler block assembly

Preparation of boiler sections

- Remove nuts and washers from the studs on the hubs of the boiler sections before attaching the rear section and front section.
- Put the rear section in place and prevent from falling over using the installation aid (→ see Fig. 7 and separate installation aid instructions).
- File down any burrs on the hubs.

- Clean the packing grooves where required using a wire brush and cloth.



Caution: Risk of burning through flammable solvents.

- Observe the cleaning agent safety instructions.
- When using cleaning agents, avoid naked flames, incandescence and sparks.

- Clean the hub sealing faces with a rag soaked in white spirit.
- Evenly coat the hub sealing faces with red lead putty.



The next step involves preparing the nipples that will eventually seal the boiler sections.

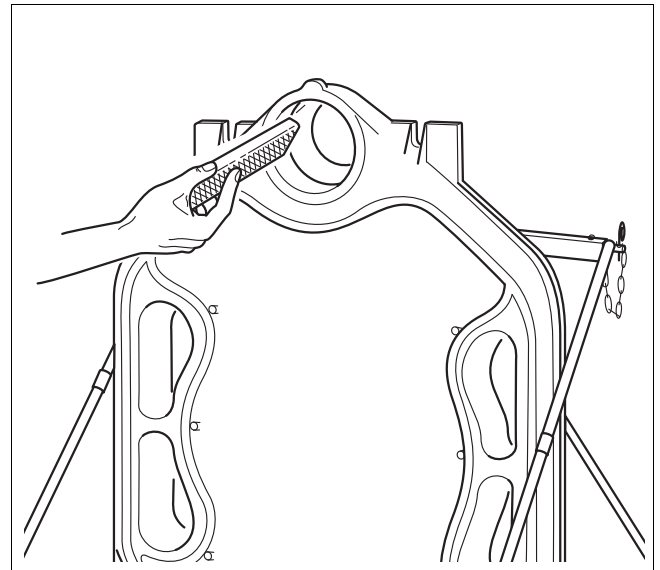


Fig 8 Deburring the hub

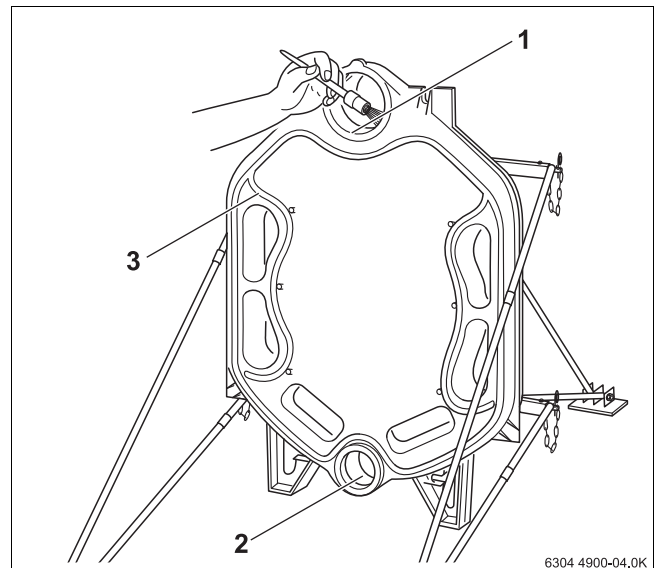


Fig 9 Coating the hub sealing faces

- 1 Upper hub sealing face
- 2 Lower hub sealing face
- 3 Packing groove

6304 4900-04,0K

- Clean nipple with a rag soaked in white spirit and coat evenly with red lead putty.
- Insert nipple directly into the upper (size 4, 181/70) and lower (size 2, 119/50) hub on the rear section.
- Rubber hammer nipple home with alternate heavy blows.



The upper nipple must protrude approx. 43 mm and the lower nipple approx. 32 mm out of the corresponding hubs.

- Use a file to remove any burrs.



The packing grooves must be clean and dry to enable the packing cord to adhere properly.



Caution: Risk to health through noxious vapours and skin contact during the processing of materials such as adhesives, adhesive bases or red lead putty.

- Observe processing and safety instructions on the material packaging.
- Ensure good ventilation in the installation area.
- wear work gloves to avoid skin contact.
- The product and its container must be treated as hazardous waste for disposal purposes.

- Coat the packing grooves with adhesive (adhesive base)

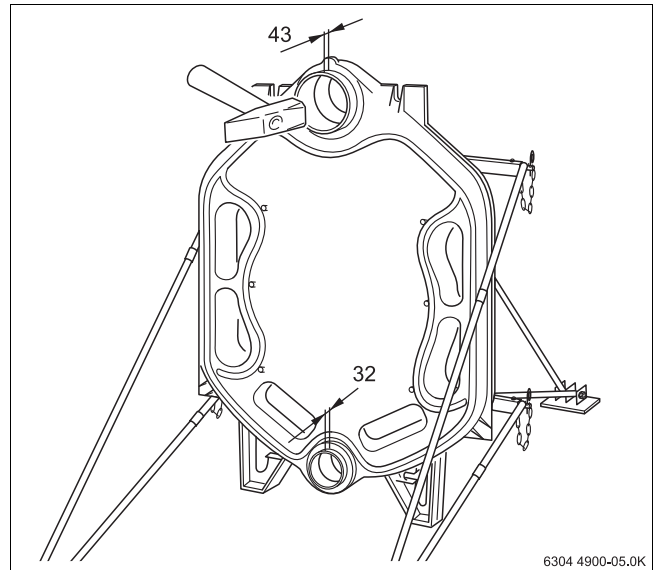


Fig 10 Driving nipples home

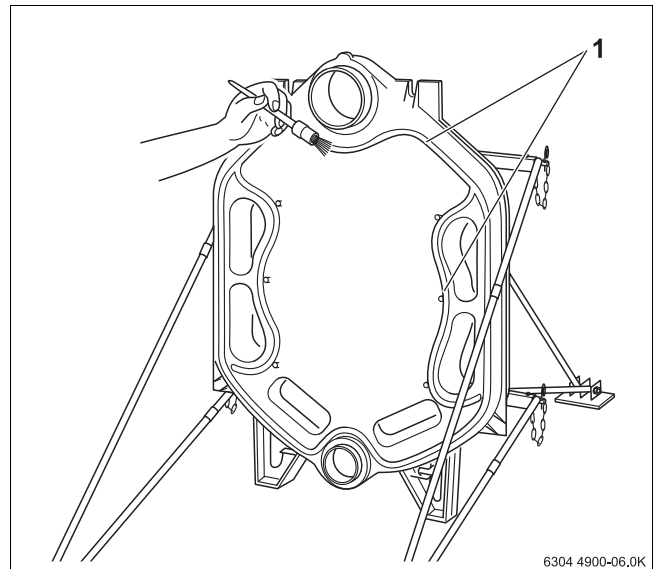


Fig 11 Coating the packing grooves with adhesive

1 Packing grooves

- Insert the flexible packing cord on the front of the rear section, starting around the upper hub, into the packing grooves, and press in lightly.
- At the butt joints, overlap the packing cord by approx. 2 cm and press firmly together.



Unroll the required length of packing cord (KM cord) from the roll supplied. Peel the backing paper from the packing cord when inserting into the packing groove (do not stretch).

- Do not allow the packing cord to overlap on the left- or right-hand joints (→ Fig. 12, 3).

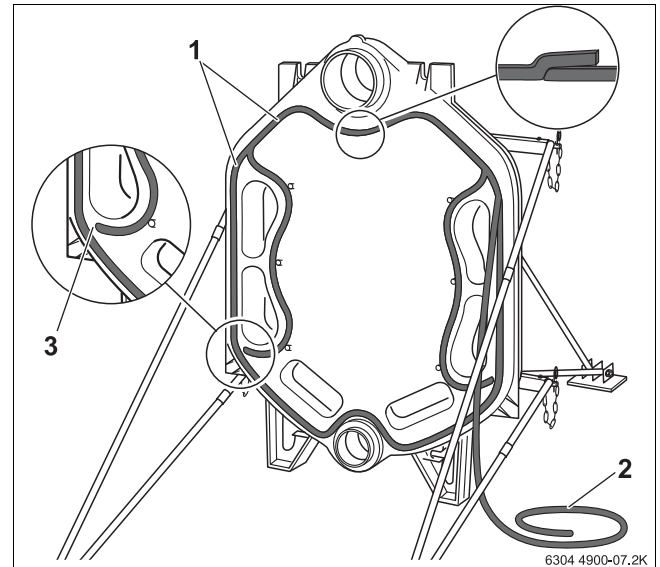


Fig 12 Inserting packing cord (KM cord)

- 1 Packing grooves
- 2 Packing cords
- 3 Joints

Prepare the first central section (with upper flow connection):

- File down any burrs on the hub.
- The packing springs must be clean and dry. Clean if necessary.



Caution: Risk to health through vapours released during the processing of materials, such as adhesives, adhesive bases or red lead putty.

- Observe processing and safety instructions on the material packaging.
- Ensure good ventilation in the installation area.
- Wear work gloves to avoid skin contact.
- The product and its container must be treated as hazardous waste for disposal purposes.

- Clean the hub sealing faces with a rag soaked in white spirit.
- Coat the hub sealing faces with red lead putty.
- Coat the packing springs with adhesive (adhesive base)

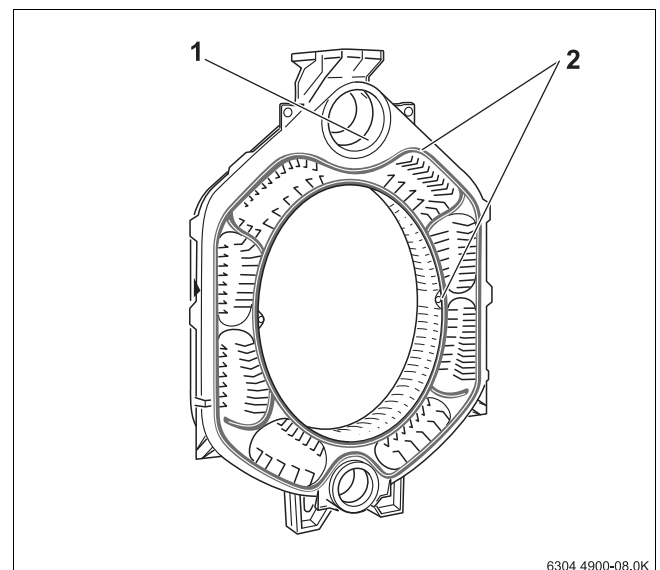


Fig 13 Preparing the central section

- 1 Hub sealing face
- 2 Sealing springs

- Position the central section with the flow connection so that the upper and lower hubs fit onto the nipples in the rear section. The installation direction arrow must point towards the back.



To make installation easier, place the boiler section to be fitted onto the nipple on the upper hub first. The boiler section can then be adjusted accordingly on the lower hub.

- Drive first central section onto the rear section using a wooden or a rubber mallet.



Before the nipples are inserted in the next central section, the part-assembled boiler block must be pulled together using the boiler compression tool.



Using a size 2.3 boiler compression tool (→ Fig. 3, page 10).

- Push flange bearings with clamping nuts onto the pull rods.
- Push a pull rod through the upper and lower hubs on the boiler block.
- Push mating flanges onto the pull rods and secure each with wedge.
- Hold the pull rod in the middle of the hubs and slightly draw together the compression tools using the clamping nut.



Caution: Boiler damage by pulling the boiler sections together incorrectly, or excessive compression.

- Ensure that the nipples are positioned straight in the boiler sections after being hammered in and that they have not been damaged.
- Never compress more than one nipple joint at a time.
- Stop compressing when the hubs meet.

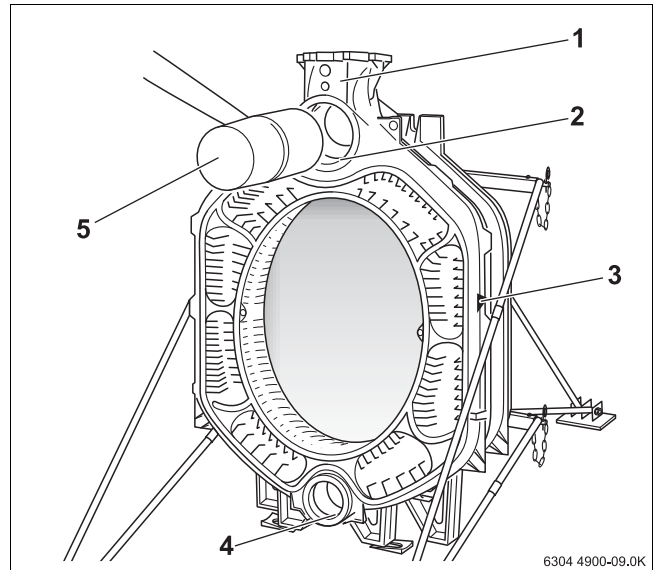


Fig 14 Knocking the central section into place

- 1 Flow connection
- 2 Upper hub
- 3 Installation direction arrow
- 4 Lower hub
- 5 Wooden or rubber mallet

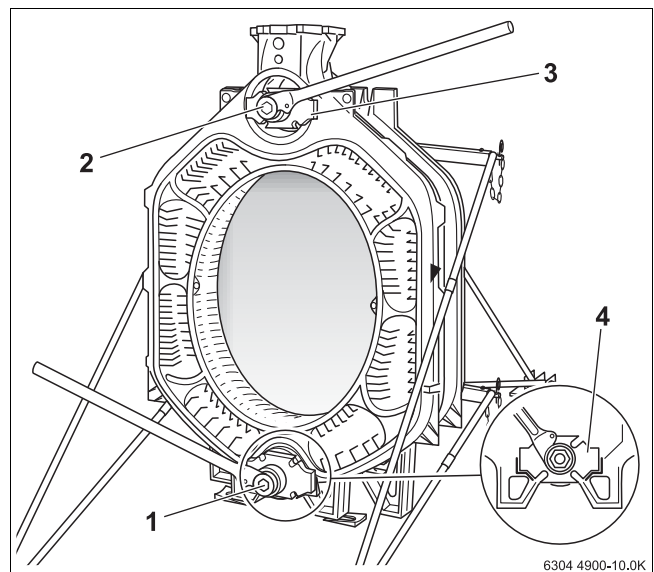



Fig 15 Using the boiler compression tool

- 1 Boiler compression tool (lower hub)
- 2 Boiler compression tool (upper hub)
- 3 Flange bearings (top)
- 4 Flange bearings (bottom)


- Place ratchet wrench onto clamping nut and compress boiler sections by tightening evenly.



Caution: Risk of accident
from material fatigue. Improperly used or poorly maintained compression tools may break.

- Never work directly in front of the compression tool while it is being tensioned.
- Ensure that no one is standing in front of the compression tool.

- Release and remove the boiler compression tool.
- Check nipples are seated correctly.



Caution: Compression tool damage
The compression tool may be damaged or destroyed if you compress pull rods with loose threaded connections.

- Always check the pull rods before each use and tighten as necessary. The pull rod is correctly positioned if it is fully inserted and no thread is showing.
- Always keep the thread clean. Dirty threads may damage the compression tool during compression.
- Always grease threads thoroughly.

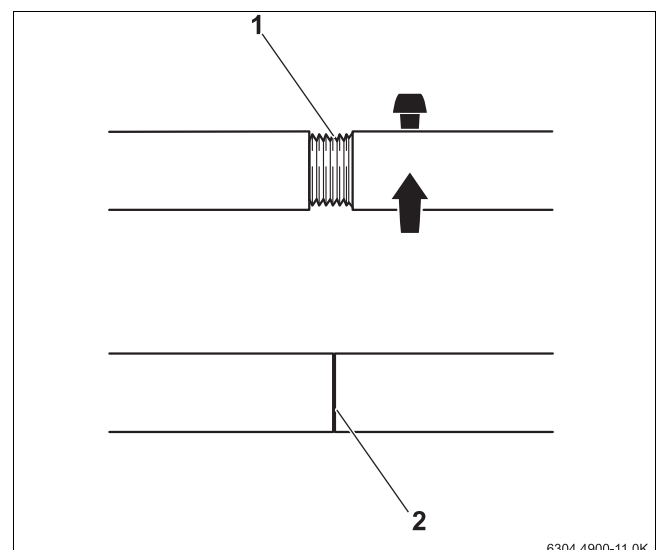


Fig 16 Boiler compression tool 2.3

- 1** Threaded connection on the pull rods (loosened)
- 2** Threaded connection on the pull rods (correct position)

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Fig. 17 shows the central section with flow connection. The nipples for fitting the next central section are inserted into the corresponding hubs. The packing cord has already been inserted into the packing groove. As with the rear section (→ Fig. 12, page 15), there is also a break in the elastic packing cord here. The boiler section has been equipped with foot wedges for ease of installation. The boiler section foot wedges are also used later for final levelling of the boiler block.

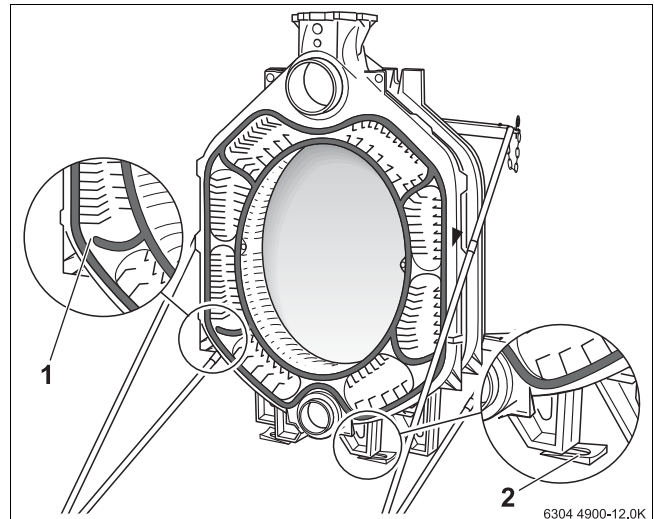


Fig 17 Using the boiler section foot wedges

- 1 Packing cord (with break)
- 2 Boiler section foot wedge

Assemble all other boiler sections as described. The front section is fitted last.



After the front section is attached, loosen the compression tool but do not remove it. Insert the anchor rods first.



Caution: System damage through excessively low contact pressure.

- Do not compress the spring pack. Only use the spring pack in its original state.

- Insert the anchor rods (with spring packs fitted) into the cast lugs on the top left and right and bottom left and right, next to the boiler block hubs.
- Put a nut onto each of the threaded anchor rods and tighten by hand.
- Now tighten the nuts on the anchor rods 1 to 1½ turns.
- Level the boiler block vertically and horizontally on the base/silencing plinth (→ see section 4.3.1, page 11). Use the boiler section foot wedges provided for this purpose. (Fig. 17, page 18).
- Remove boiler compression tool.

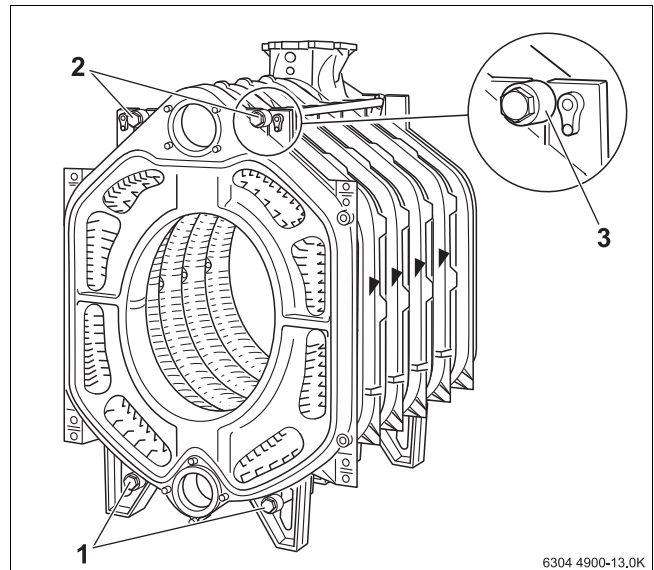


Fig 18 Inserting the anchor rods

- 1 Anchor rods (bottom)
- 2 Anchor rods (top)
- 3 Anchor rod with spring pack

The next step describes the installation of the feed pipe (→ see section 4.6, page 20).

4.5 Setting up the boiler block - (when supplied as a pre-assembled block)

- Cut through the straps.
- Remove pallet.



Warning: Danger to life from falling loads.

- Observe the transport information on the data sheet (attached to boiler block) when lifting the boiler block off the pallet.

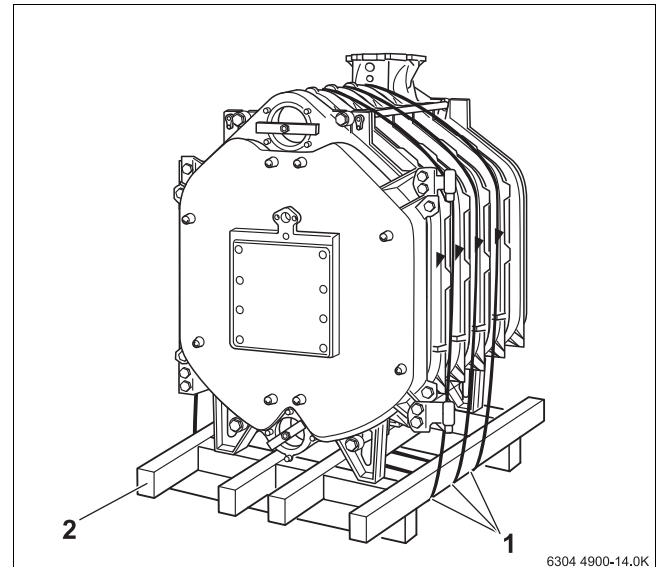


Fig 19 Boiler block on pallet

- 1 Securing straps
- 2 Pallet

Level the boiler block vertically and horizontally on the base/silencing plinth. Use the boiler section foot wedges provided for this purpose.

Once the boiler block is levelled, remove the transport stay from the upper and lower hubs.



The following pages describe the installation of the feed pipe, sensor well and outer steam tube. The installation steps are the same, regardless of whether delivery is as a pre-assembled block or in loose sections.

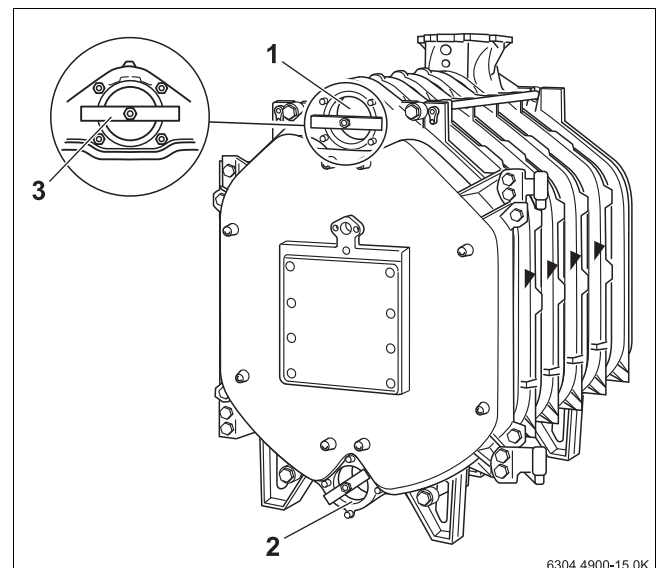


Fig 20 Removing transport stay

- 1 Upper hub
- 2 Lower hub
- 3 Transport stay

4.6 Inserting the feed pipe (parts case)

On boilers with 9 – 11 sections the feed pipe is in 2 parts; on boilers with 12 – 16 sections, it comes in 3 parts.

- Push the flat gasket over the feed pipe.
- Push the feed pipe from the front into the upper boiler hub.
- Close off with dummy flange.



Place the lug on the feed pipe connection endplate into the recess on the upper boiler hub so that the escape openings on the feed pipe are positioned at the correct angle.

- Place the lug on the feed pipe connection endplate into the recess on the upper boiler hub.

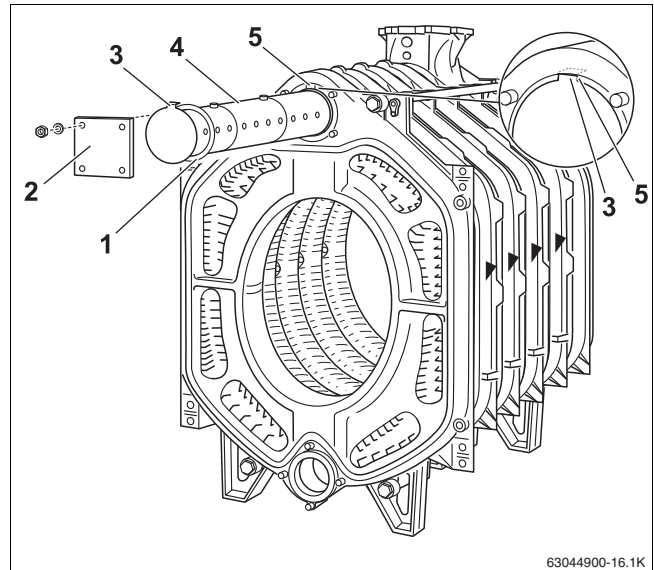


Fig 21 Sealing in the feed pipe

- 1 Flat gasket
- 2 Dummy flange
- 3 Lug
- 4 Feed pipe
- 5 Recess in upper boiler hub

4.7 Sealing the sensor well (fittings case)

Sensor well R 3/4 "

- Seal sensor well R 3/4 " from the front (length 110 mm) into the upper R 3/4 " tapped hole in the flow connection.

Sensor well R 1/2 "

- Seal sensor well R 1/2 " from the front (length 110 mm) into the lower R 1/2 " tapped hole in the flow connection.

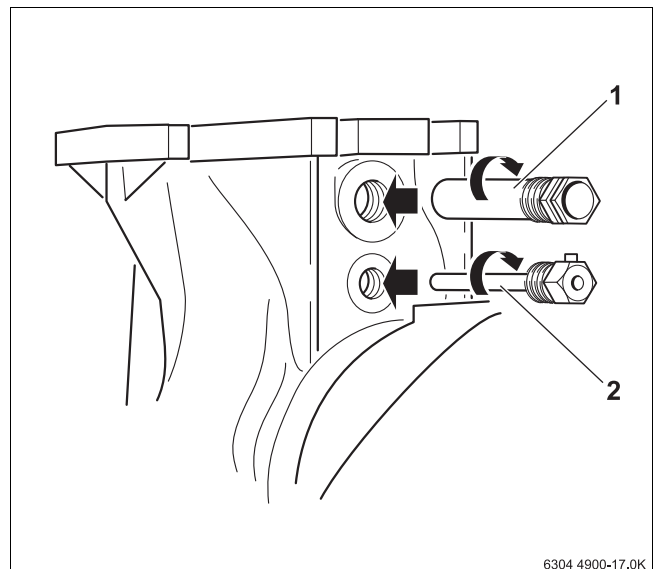


Fig 22 Sealing the sensor wells

- 1 Sensor well R 3/4 "
- 2 Sensor well R 1/2 "

4.8 Inserting the outer steam tube (fittings case)

- Fit the flange (length of edge: 130 mm) with R 3/4 " tapped hole for the drain connection onto the rear lower boiler hub.
- Fit customer-supplied boiler drain valve.

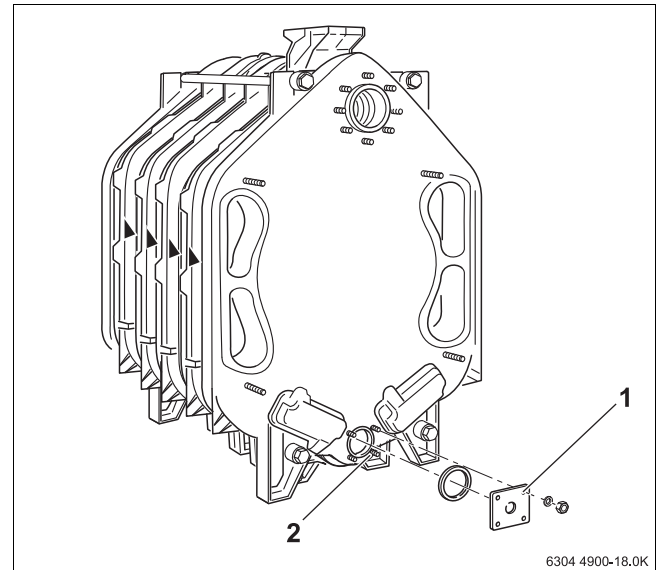


Fig 23 Fitting the flange

- 1 Drain connection
- 2 Lower boiler hub (rear)

- Push **outer steam tube element with spring (L3) first** into the lower boiler hub.
- Hook the other outer steam tube elements (L₂) onto each other as shown in Fig. 25 (detail).
- Hook on the outer steam tube element with the handle (L₁) last.
- Close off lower boiler hub with flat gasket and dummy flange.



The length and number of outer steam tube elements depend on the boiler rating, and can be worked out using → Tab. 1 below.

Elements		9	10	11	12	13	14	15	16
L ₁	480 mm	1	–	–	1	–	1	–	–
	650 mm	–	1	1	–	1	–	1	1
L ₂	510 mm	1	1	–	2	2	–	–	3
	680 mm	–	–	1	–	–	2	2	–
L ₃	450 mm	1							

Tab. 10 Length and number of outer steam tube elements

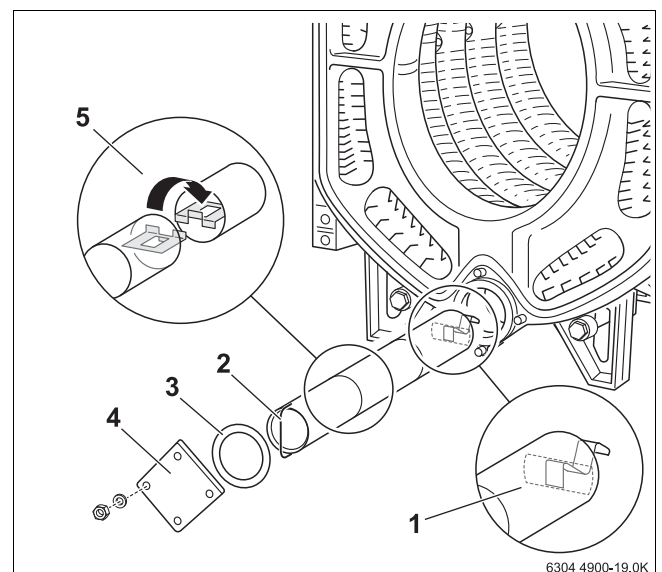


Fig 24 Inserting the outer steam tube

- 1 Outer steam tube element L3
- 2 Outer steam tube element L1
- 3 Flat gasket
- 4 Dummy flange
- 5 Outer steam tube element L2

4.9 Boiler block pressure test (only when supplied in loose sections)

A boiler block pressure test must be carried out (only when supplied in loose sections). If supplied as a pre-assembled block, the pressure test has already been carried out in the factory.

For the further installation of a pre-assembled boiler block, (→ see section 4.11.4, page 25).

4.9.1 Preparing for pressure test



Caution: Risk of accident as a result of ignoring the safety regulations.

- Observe the relevant country-specific standards, work safety legislation and regulations for carrying out pressure tests.

- Close off flow and return connections (flow connection flange with air vent valve).



Caution: System damage through overpressure.

- The boiler block must not be connected to the heating system pipework during the pressure test.

- Slowly fill the boiler block with water via the fill and drain connection. Vent the boiler block via the boiler flow connection with air vent.

4.9.2 Carry out a pressure test

Carry out a pressure test with a test pressure of 8.6 bar (in accordance with the requirements of the European Pressure Vessel Directive).

Use a pressure gauge class 1.0 to measure the pressure.

- Drain water via fill and drain valve (→ Fig. 23, [1], page 21) prior to connecting the water systems or if a hub joint is leaking.

4.9.3 Leaking hub joints

If leaking hub joints are detected during the pressure test, proceed as follows.

- Remove feed pipe and outer steam tube.
- Undo nuts on anchor rods and remove anchor rods.
- Separate the boiler block at the leak location by driving (knocking) in flat wedges or chisels between the sections at the points provided at the top and bottom (→ Fig. 25).
- It is vital that a new nipple and packing cord are used during reassembly.
- Pull the boiler block together again using the boiler compression tool.
- Repeat the leak test.

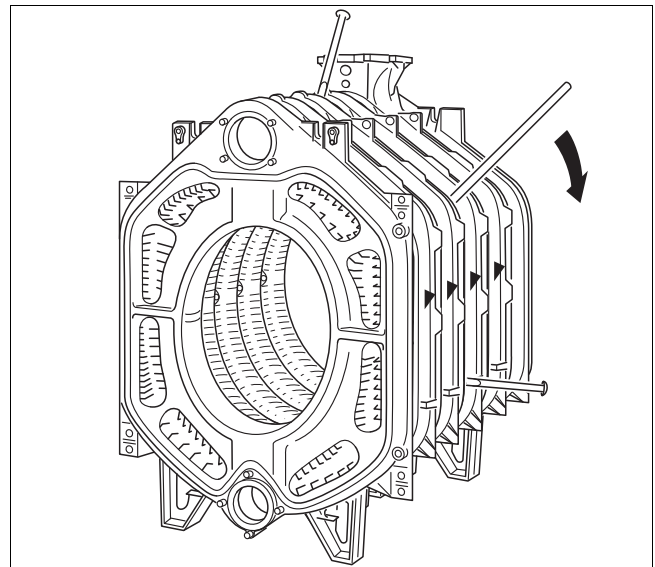


Fig 25 Separating the boiler block

4.10 Boiler water connections

Observe the following note regarding the boiler connection to the pipework. These notes are important for fault-free operation.



Caution: System damage through leaking connections.

- Secure the supply pipes free of stress to the boiler connections.
- Make sure the customer has a WRAS approved method for filling the system.



Caution: System damage caused by deposits, local overheating, noise and corrosion.

- Flush the existing heating system thoroughly before the boiler is connected to the pipework.
- To prevent boiler damage we recommend a desludging unit to be incorporated into the heating system return.

The weld neck flange (with welded-on pipe) is fitted to the upper boiler hub if the return is connected at a later stage. The weld neck flange and flat gasket are shown in Fig. 27.

- The flow connection flange is required for connecting the flow at a later stage.



A boiler safety set is available on request.

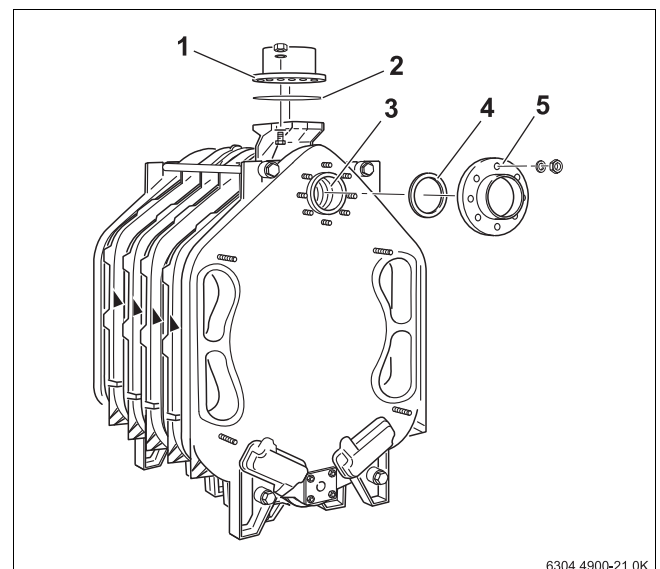


Fig. 26 Fitting a connection flange

- | | |
|----------|--------------------------------------|
| 1 | Flow connection flange |
| 2 | Flat gasket |
| 3 | Upper boiler hub (return connection) |
| 4 | Flat gasket |
| 5 | Weld neck flange |

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4.11 Installing fittings and burner door (delivery in loose sections)

If delivered as a pre-assembled block, the burner door, flue gas header and two clean-out covers are already installed.

4.11.1 Positioning the flue gas header

The GP packing cord (fibre glass cord with silicon casing) is used to seal the joint between boiler and flue gas header.

- Stick the GP packing cord (approx. 1500 mm long) into the groove on the rear section using Silastik adhesive.
- Insert the packing cord in such a way that the packing cord joint is in the upper part of the groove.
- Place the flue gas header onto the four threaded studs on the rear section and secure using washers and nuts.

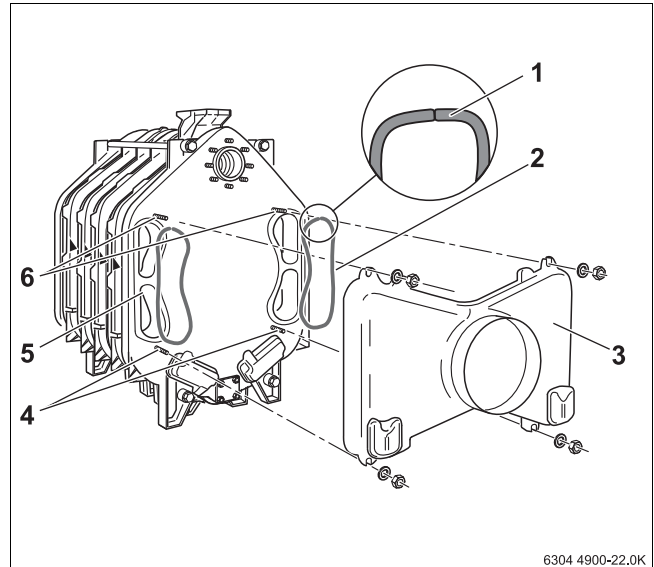


Fig 27 Positioning the flue gas header

- 1 Packing cord joint in the upper part of the groove
- 2 Packing cord
- 3 Flue gas header
- 4 Studs
- 5 Rear section
- 6 Studs

4.11.2 Screwing clean-out cover onto rear section

Fig. 28 shows the fully equipped rear section with the clean-out covers on the flue gas header and the clean-out covers on the rear section.

- Stick the GP10 packing cord (approx. 800 mm long) in the groove on the rear section using Silastik adhesive (packing cord joint at the top).
- Secure the clean-out covers on the rear section with washers and nuts.

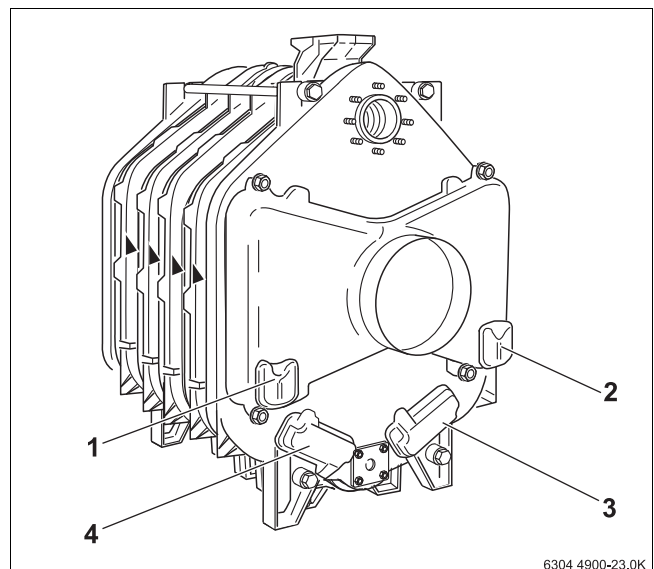


Fig 28 Securing the clean-out covers

- 1 Clean-out cover on the flue gas header
- 2 Clean-out cover on the flue gas header
- 3 Clean-out cover on the rear section
- 4 Clean-out cover on the rear section

4.11.3 Fitting the burner door

In the factory, the burner door hinge lobes are fitted on the right-hand side. For left-hand closing, dismantle the hinge lobes from the right-hand side and reassemble them on the left-hand side of the burner door.

- Place a few drops of Silastik adhesive, 15 – 20 cm apart, in the packing grooves on the front section.
- Insert GP packing cord into the packing groove on the front section. Position the packing cord joint at the side.
- Screw each hinge pin (right-hand closure) to the front section with two hexagon bolts M12 x 55. For left-hand closing, secure accordingly on the left-hand side.
- Hook the burner door hinge lobes into the hinge pins.

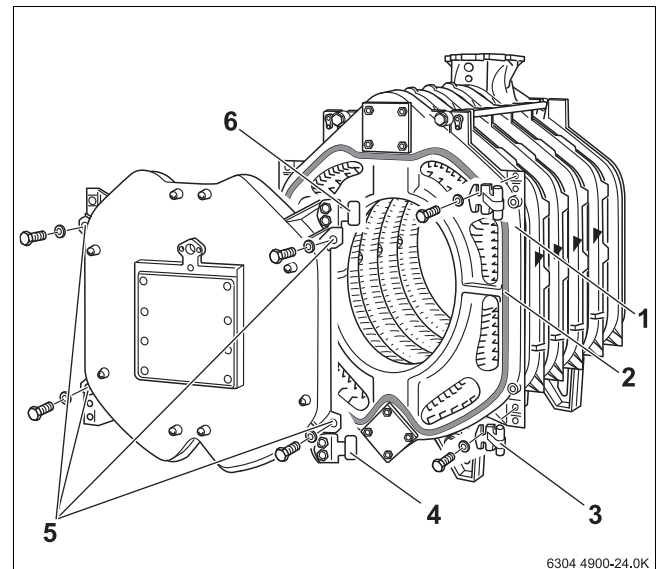


Fig 29 Fitting the burner door

- 1 Hinge pin (top)
- 2 Packing cord joint (side)
- 3 Hinge pin (bottom)
- 4 Hinge lobe (bottom)
- 5 Holes in the burner door
- 6 Hinge lobe (top)

4.11.4 Inserting the hot gas baffles



The boiler, which consists of 16 sections, does not contain any hot gas baffles.



A distinction is made between hot gas baffles with a sickle profile and those with a corrugated profile.

The hot gas baffles with a sickle profile come in two parts. If equipping a hot gas flue with sickle-profile baffles, you **MUST** ensure that the two baffle parts are hooked together.

→ Fig. 31, page 26 shows the baffle parts hooked together.

- Take hot gas baffles from the fittings case and insert into the hot gas flue according to the inscription on them (→ see Fig. 30, Fig. 31, page 26, Fig. 32, page 26 and Tab. 1, page 5).

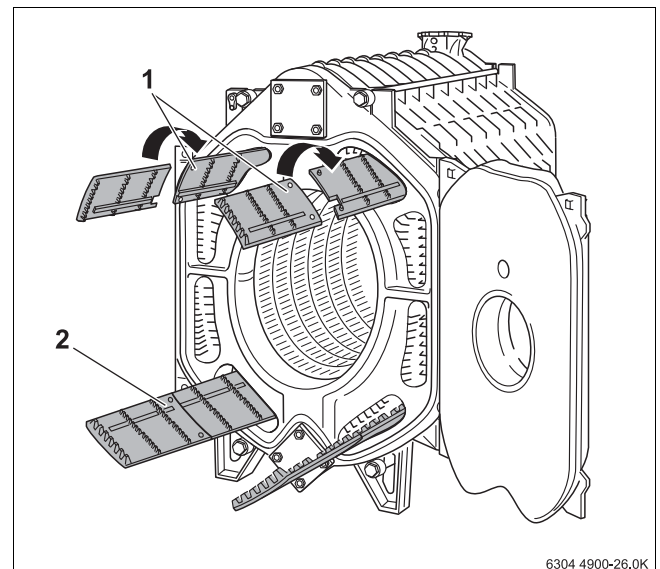


Fig 30 Inserting the hot gas baffles (boiler block with 9 sections)

- 1 Hot gas baffles with sickle-profile (baffle part)
- 2 Hot gas baffles with sickle profile (hooked together)

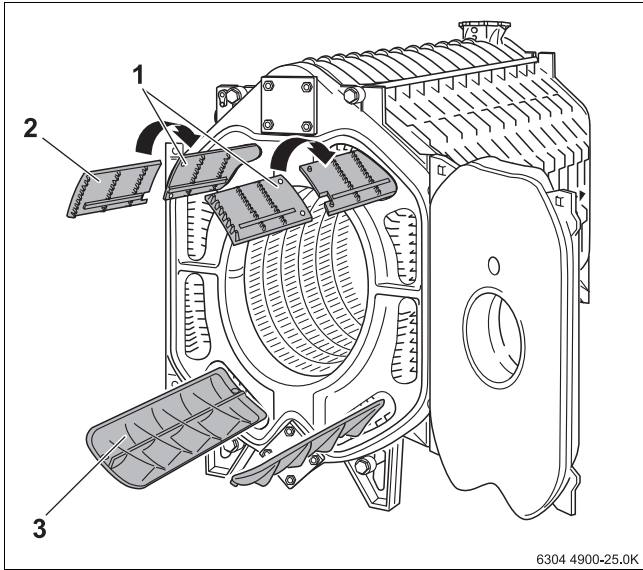


Fig 31 Inserting the hot gas baffles (boiler block with 13 sections)

- 1 Hot gas baffles with sickle-profile (baffle part)
- 2 Hot gas baffles with sickle-profile (baffle part)
- 3 Hot gas baffle with corrugated profile

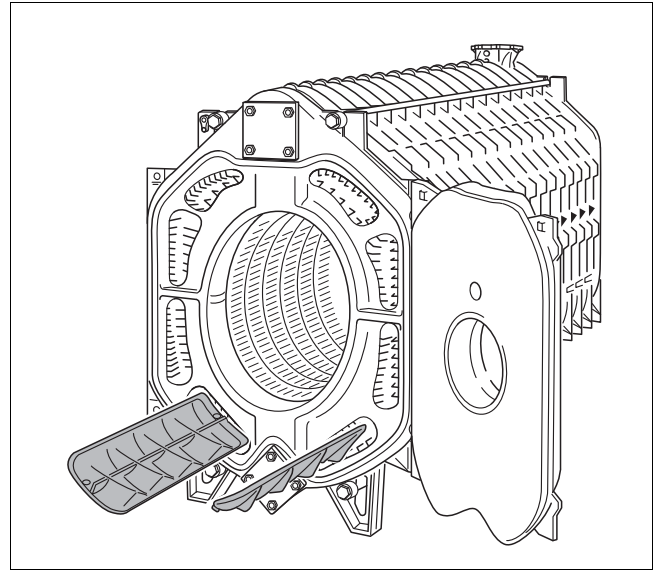


Fig 32 Inserting the hot gas baffles (boiler block with 15 sections)

Number of sections	Number of hot gas baffles			
	Top left	Top right	Bottom left	Bottom right
9	2 x sickle profile	2 x sickle profile	2 x sickle profile	2 x sickle profile
10	2 x sickle profile	2 x sickle profile	2 x sickle profile	2 x sickle profile
11	2 x sickle profile	2 x sickle profile	2 x sickle profile	2 x sickle profile
12	1 x corrugated profile	1 x corrugated profile	2 x sickle profile	2 x sickle profile
13	2 x sickle profile	2 x sickle profile	1 x corrugated profile	1 x corrugated profile
14	1 x corrugated profile	1 x corrugated profile	1 x corrugated profile	1 x corrugated profile
15	–	–	1 x corrugated profile	1 x corrugated profile
16	–	–	–	–


Tab. 11 Number of hot gas baffles

4.12 Filling the heating system and checking for leaks

Before commissioning the heating system, check for leaks to prevent problems during operation. Pressurise the heating system to 1.3x bar permissible operating pressure (observe the safety pressure of the safety valve).

On sealed systems the pressure gauge needle (Fig. 33, **Item 2**) must be within the green range (Fig. 33, **Item 3**). Set the red needle (Fig. 33, **Item 1**) on the pressure gauge to the required system pressure.

- Check the system water pressure.



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through over pressure during leak testing. Pressure, control and safety equipment may be damaged through excessive pressure.

- When you carry out a leak test, make sure that no pressure, control or safety equipment is fitted which cannot be isolated from the boiler water chamber.

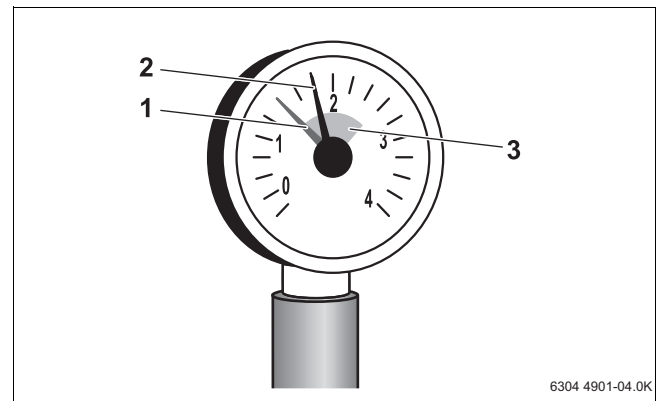


Fig 33 Pressure gauge for sealed systems

- 1** Red needle
- 2** Pressure gauge needle
- 3** Green range

- Shut off the pressure expansion vessel from the system by closing the cap valve.
- Check the connections and pipework for leaks.
- Open the mixing and shut-off valves on the hot water (primary) side.
- Fill the system via an approved filling link.

4.12.1 Filling the heating system

Filling and refilling of the heating circuit must be carried out by a method that has been approved by the Water Regulation Advisory Scheme (WRAS), for the type of heating appliances, i.e. Domestic (in-house) Fluid Category 3. Non-Domestic (other than in-house) Fluid Category 4. Depending on the Fluid Category the approved method should comprise of the following:

1. Requirements Fluid Category 3 systems (fig see right)
 - Control valve (stop valve) including a double check valve on the mains cold water supply pipe
 - Temporary connection to be removed after filling (filling loop)
 - Control valve (stop valve) on the heating system pipework

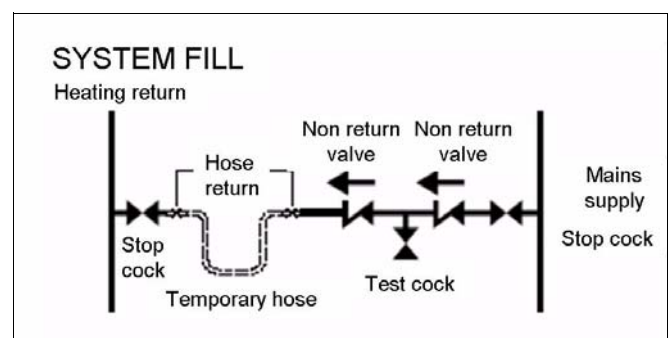


Fig 34 Requirements Fluid Category 3 systems

2. Requirements Fluid Category 4 systems (fig see right)

- Control valve (stop valve) on the mains cold water supply pipe
- Strainer
- Verifiable Backflow Prevention Device with reduced pressure Zone (RPZ valve assembly) incorporating a Type BA air gap
- Tundish
- Control valve (stop valve) on the heating system pipework

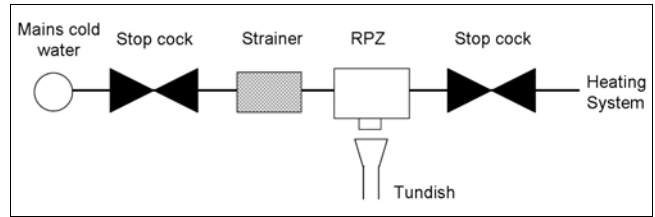



Fig 35 Requirements Fluid Category 4 systems

- Open the cap of the automatic air vent by one full turn to allow air to escape.
- Slowly fill the heating system. Observe the pressure gauge whilst filling.
- Close the water tap and the boiler drain valve once the required operating pressure has been reached.
- Bleed the system via the radiator bleed valves.
- Top up with water if the pressure drops as a result of bleeding the system.
- Take the hose off the boiler drain valve.



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through frequent topping up.

- The heating system may be damaged, depending on water quality, by corrosion or scaling if you frequently need to top-up the heating water.

- Enquire from your installer, whether you can use your public water untreated or whether you need to treat it before filling your system.
- Notify your installer, if you need to regularly add top-up water to your system.

4.13 Installing the burner

This section explains how to install the burner.



Caution: System damage through incorrect burner.

- Only use burners that conform to the technical requirements of the boiler (→ see section 2.4, page 5).

- Close burner door and secure with four hexagon bolts M16 x 140 at the positions shown.
- Tighten hexagon bolts evenly and diagonally.
- Cut or drill burner plate on site to match the blast tube diameter.
- Drill holes for fastening the boiler using the burner connecting flange as a template.



Predrilled burner plates are available on request (optional extra).

- Screw burner plate onto the burner door (seal with GP packing cord; diameter 10 mm).
- Screw the burner to the burner plate.
- Cut out insulating rings to match the blast tube diameter.
- Fill the remaining gap between burner door insulation and blast tube with the modified insulation rings.
- Connect the sight glass blower connection to the burner to ensure the sight glass remains clear of deposits.

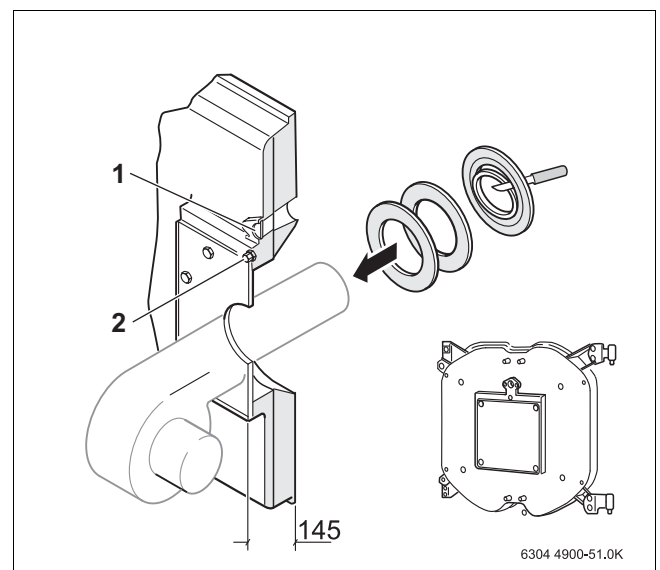


Fig 36 Installing the burner

- 1 Sight glass
- 2 Blower connection

4.14 Boiler flue connections

This section describes how the boiler flue connections are made.

4.14.1 Fitting the flue pipe sealing collar (accessory)



For better sealing of the boiler/flue pipe, we recommend that you use the flue pipe sealing collar (accessory).

- Push the flue pipe as far as possible onto the flue gas header outlet.
- Place the flue pipe sealing collar around the flue pipe and flue gas header outlet so that it overlaps at the top.
- Place jubilee clips over the flue pipe sealing collar. One of the jubilee clips must press onto the flue gas header outlet and one onto the flue pipe.
- Tighten jubilee clips. The flue pipe sealing collar must fit smoothly and firmly in place.



Retighten the jubilee clips if required.

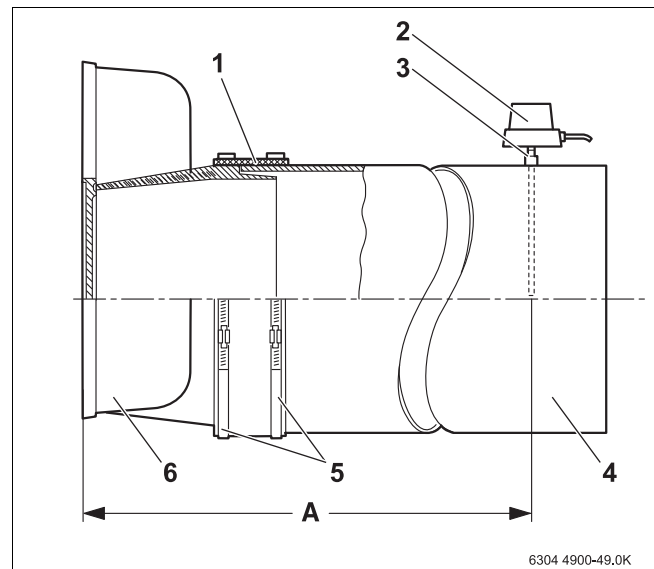


Fig 37 Fitting the flue pipe sealing collar

- | | |
|---|-----------------------------|
| 1 | Flue pipe sealing collar |
| 2 | Flue gas temperature sensor |
| 3 | Coupling |
| 4 | Flue pipe |
| 5 | Jubilee clips |
| 6 | Flue gas header |

4.14.2 Fitting the flue gas temperature sensor (accessory)

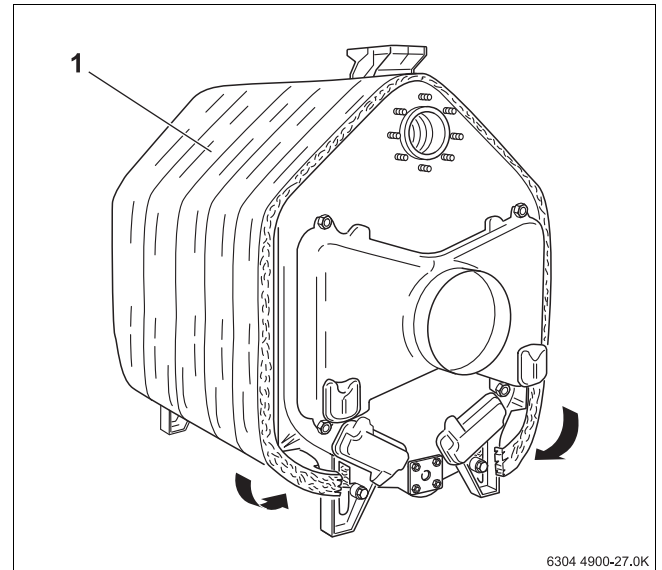
- Weld the coupling into the flue pipe at a distance of $2 \times$ flue pipe diameters (A) from the flue gas header.
- Fit the flue gas temperature sensor as described in the separate installation manual.

4.15 Fitting the boiler casing

4.15.1 Fitting the insulation

The insulation provided corresponds to the boiler size.

- Arrange the insulation on the boiler block as shown in the diagram in → Fig. 39 (the figures to the left of the boiler blocks represent the number of boiler sections).
- Push insulation under the boiler block. The boiler section feet are placed in the cut-outs in the insulation.



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Fig 38 Boiler block with insulation

1 Insulation

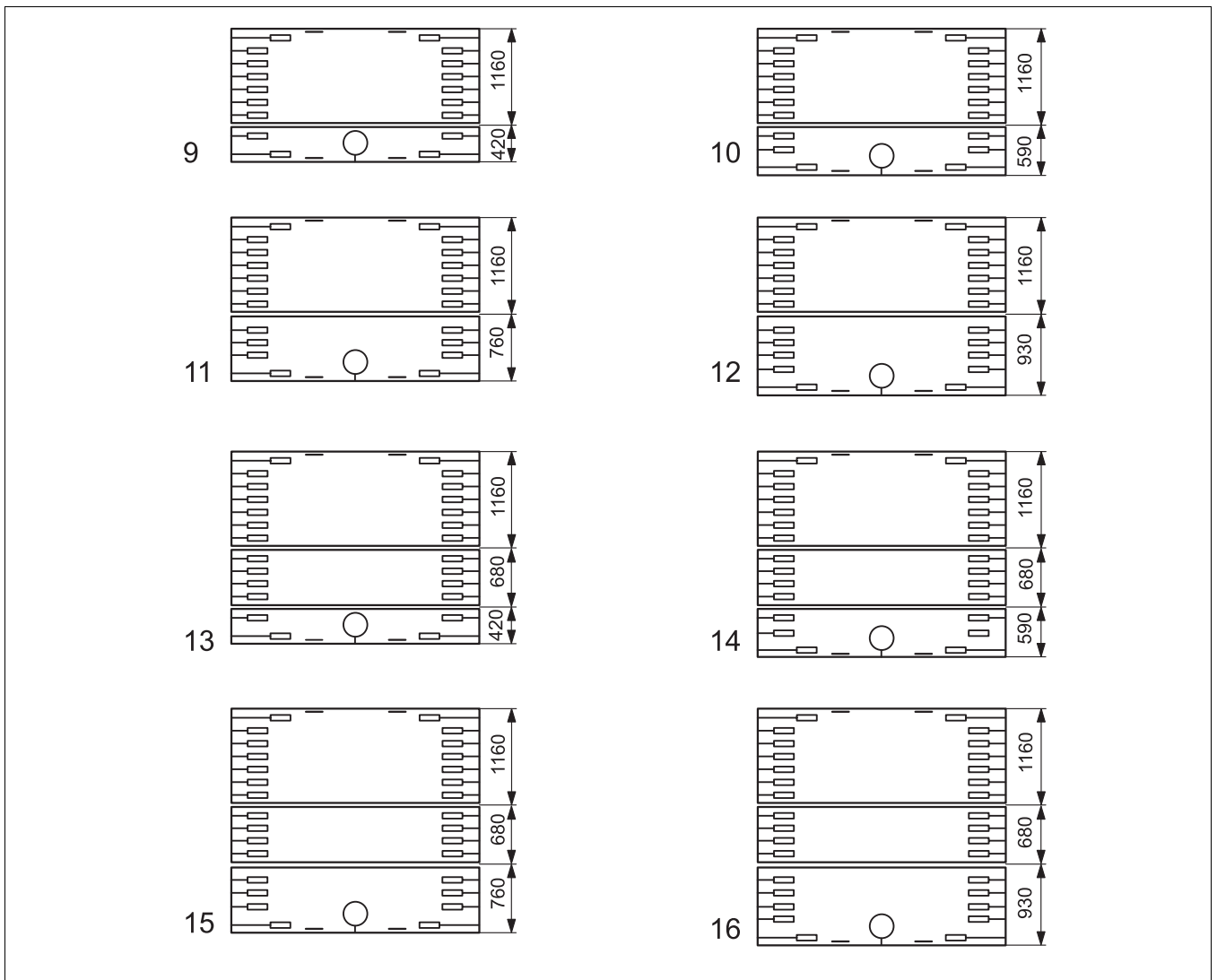


Fig 39 Insulation for the various boiler sizes (dimensions in mm)

4.15.2 Fitting the cross bars

- Place top front cross bars onto the cast lugs and screw in place with hexagon bolts (M8 x 12). The folded edge on the front bar must face forwards.
- Place top rear cross bars onto the cast lugs and screw in place with hexagon bolts (M8 x 12). The folded edge of the rear cross bar must point towards the back.
- Place lengthways bars from the side onto the cross bars and screw in place with self-tapping screws. The folded edges of the of the lengthways bars must face towards the back, while the slotted holes are positioned towards the centre of the boiler.

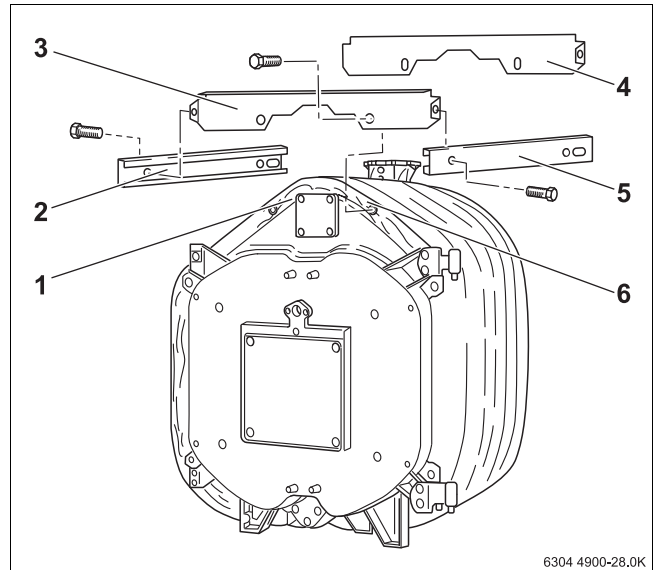


Fig 40 Fitting cross bars and lengthways bars

- 1 Cast lug
- 2 Lengthways bar
- 3 Cross bar (top front)
- 4 Cross bar (top rear)
- 5 Lengthways bar
- 6 Cast lug

- Screw each lower cross bar to the end section feet with hexagon bolts.

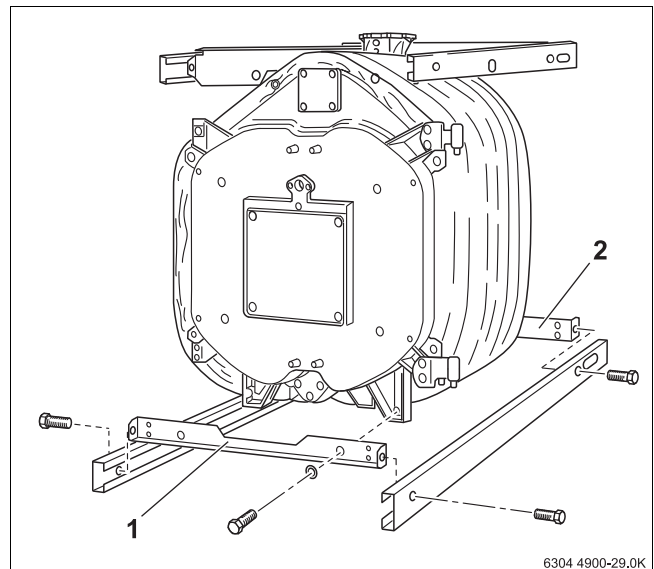


Fig 41 Fitting the lower cross bars

- 1 Cross bar (bottom front)
- 2 Cross bar (bottom rear)

- Place lower lengthways bars from the side onto the cross bars with the folded edges facing inwards and the slotted hole towards the rear, and screw in place with self-tapping screws.
- Push rear section insulation onto the flue outlet. The cut-out for the boiler return must point upwards.
- Hook the rear section insulation onto the top rear bar with two tension springs.
- Close the slit below the flue outlet with tension springs.

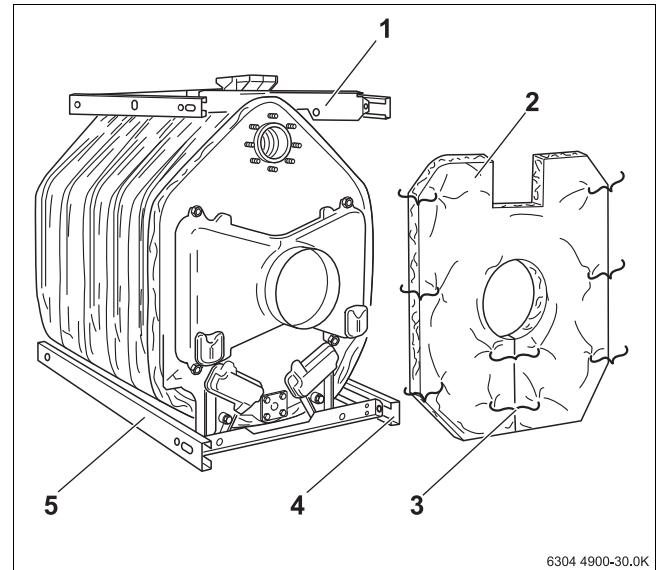


Fig 42 Fitting lower lengthways bars and insulation

- 1 Top rear bar
- 2 Rear section insulation
- 3 Tension springs
- 4 Lower lengthways bar
- 5 Lower lengthways bar

- Push rectangular insulation onto the top front bar.
- Fasten insulation with 3 tension springs.
- Feed burner cable over the insulation, down the side of the boiler block.



To prevent damage to the burner cable while opening the burner door, the burner cable must always be fed down the hinge side – whichever side the burner door may be hung on.

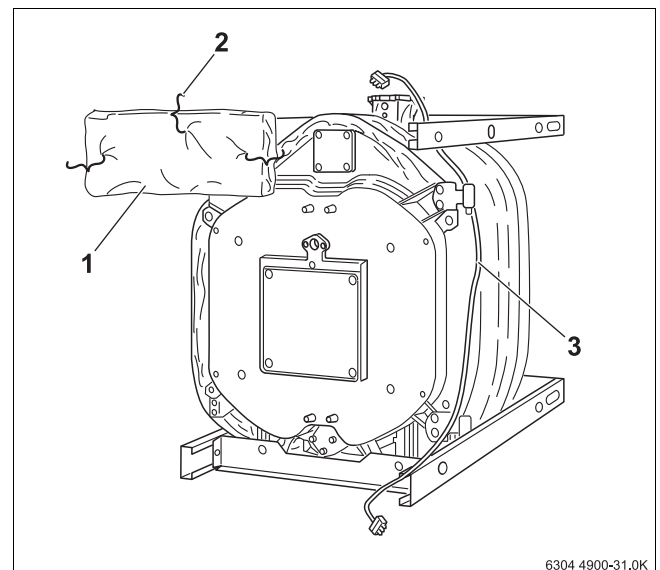


Fig 43 Fitting the rectangular insulation and burner cable

- 1 Insulation
- 2 Tension springs
- 3 Burner cable

- Depending on which side the door closes, screw the burner cable strain relief to the left or right hand side of the lower cross bar (→ Fig. 44 – for right-hand burner door closure).
- Push front plinth panel from the front into the lower lengthways bars and screw them together.
- Fit the rear plinth panel in the same way.

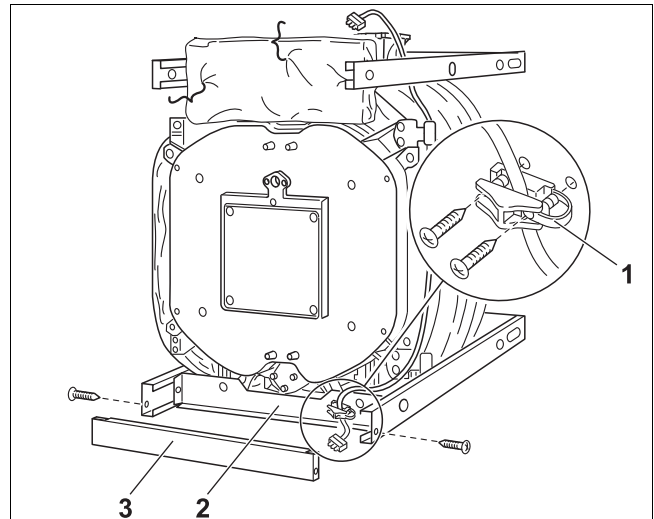


Fig 44 Fitting the burner cable strain relief and plinth panels

- 1 Burner cable strain relief
- 2 Lower cross bar
- 3 Front plinth panel



Please see → Fig. 47, page 35 for the arrangement of the side sections and hoods.

- Push the lower folded edge of the first side panel section behind the lower lengthways bar, lift slightly and hook the top of the section into the slots on the upper lengthways bar.
- Push the lower folded edge of the remaining side panel sections behind the lower lengthways bar, lift slightly and hook the upper folded edge over the upper lengthways bar.

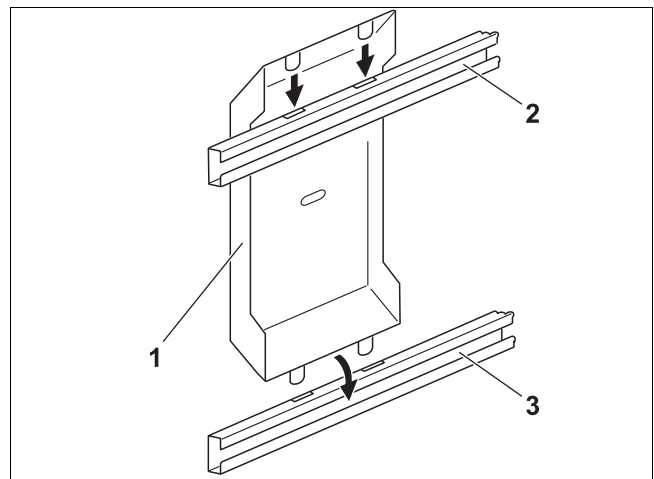


Fig 45 Fitting the side panel section

- 1 First side panel section
- 2 Upper lengthways bar
- 3 Lower lengthways bar

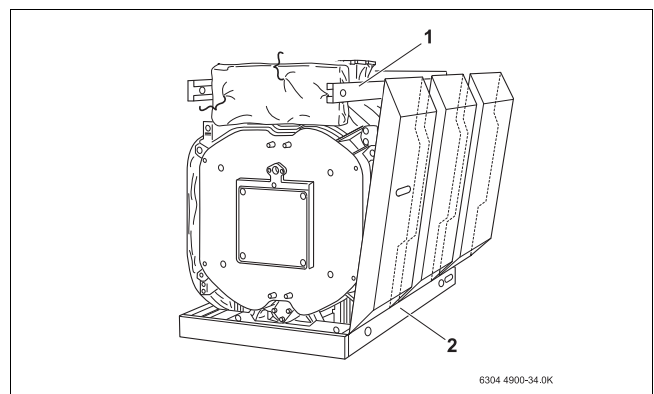


Fig 46 Fitting the remaining side panel sections

- 1 Upper lengthways bar
- 2 Lower lengthways bar

4.15.3 Fitting side panels and hoods

- Fit the side panels (left) and hoods (right) as shown in the diagram.

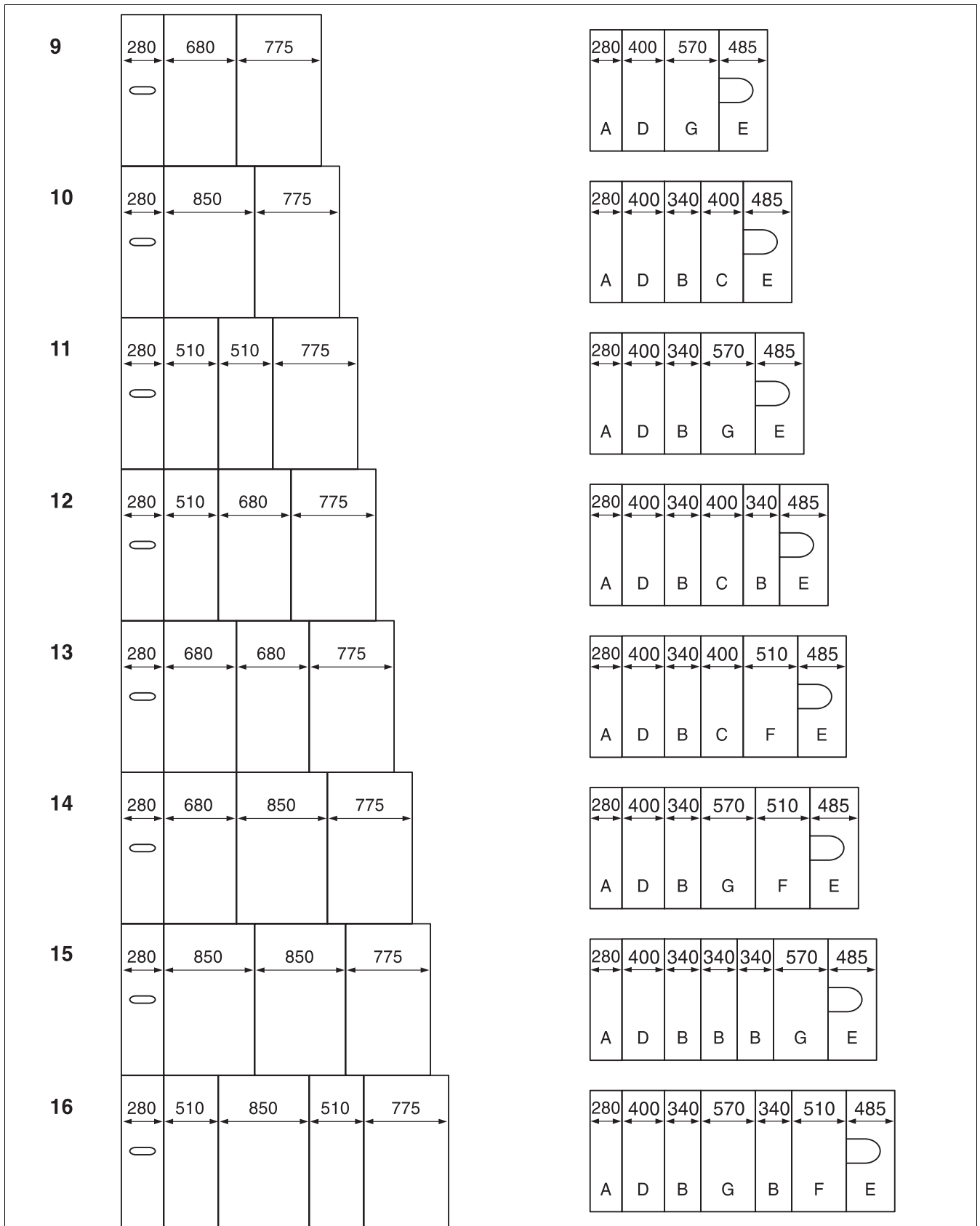


Fig 47 Arrangement of side panels (left) and hoods (right) for the various boiler sizes (dimensions in mm)

- Hook the front hood "A" into the slots on the lengthways bar and push forwards.
- Screw rear of hood "A" to each lengthways bar using one self-tapping screw.

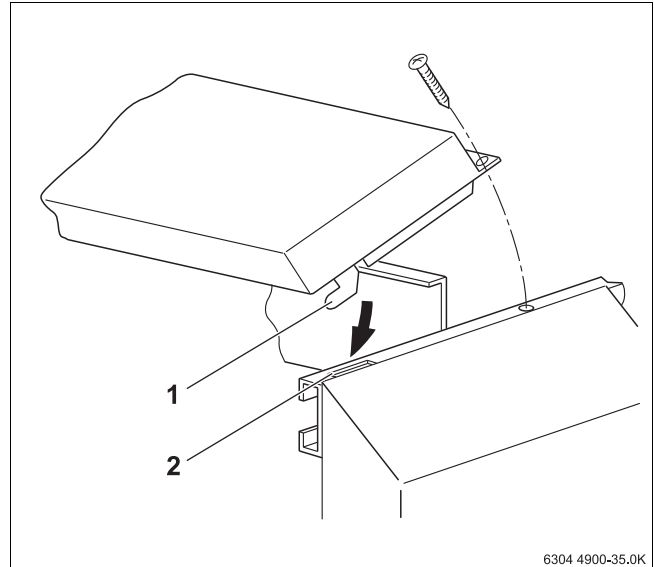


Fig 48 Fitting the front hood "A"

- 1** Haken
- 2** Slot in lengthways bar

- Push folded edge of 400 mm wide hood "D" under the front hood.

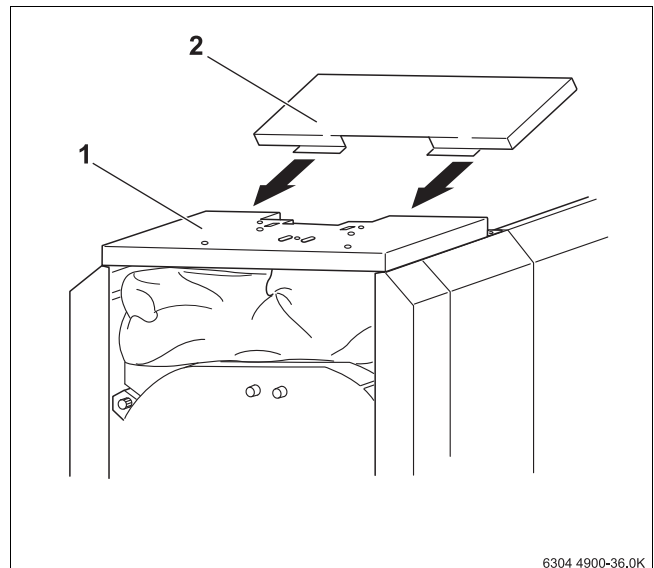


Fig 49 Fitting hood "D"

- 1** Front hood
- 2** Hood "D"



Before the remaining hood sections are put in place, the control panel must be fitted, the capillary tubes fed to the sensor wells and the sensors placed in the sensor wells (→ see section **4.16.1**, page **38** ff.).

- Screw the upper boiler rear panel to the rear of the hood and the side panels.
- Screw the lower boiler rear panel with the cut-out for the fill and drain connection down onto the side panels.

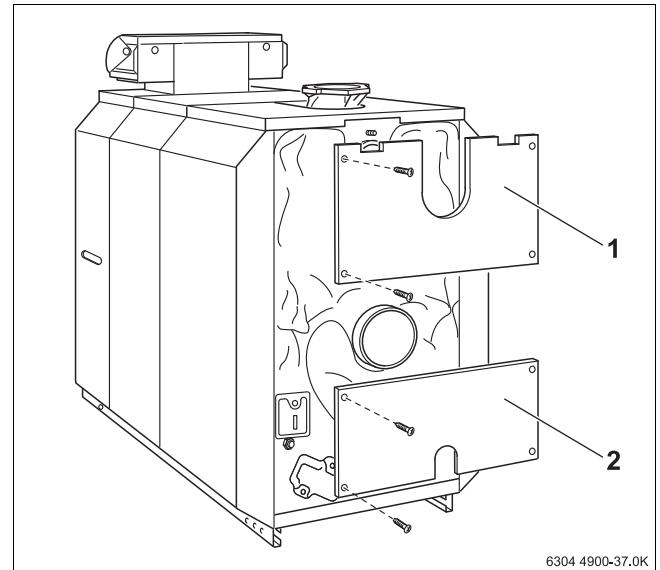


Fig 50 Fitting the upper and lower boiler rear panels

- 1** Upper boiler rear pane
- 2** Lower boiler rear panel

- Screw left/right front panel section to the cast lug on the burner door, using four hexagon bolts for each.
- Hook burner door panel into the cut-outs in the front panel.

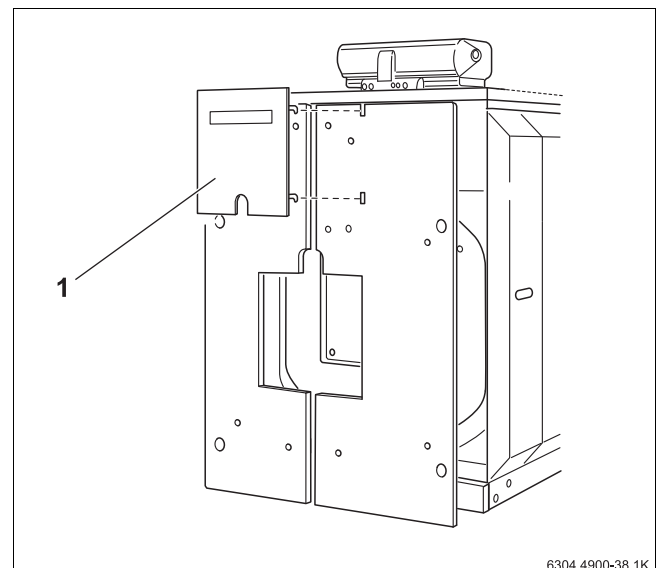


Fig 51 Fitting the left and right front panel

- 1** Burner door panel

4.16 Making an electrical connection

This section explains how to install a Logamatic 4000 series control panel and a temperature sensor set.



Warning: Danger to life from electric shock.

- Electrical work must only be carried out by registered electricians in possession of the necessary qualifications.
- Before opening the panel, isolate all poles of the mains power supply and secure against unintentional reconnection.
- Observe all installation instructions.

4.16.1 Fitting the control panel

Figure 52 shows the control panel and front cover hood "A" from behind.

- Loosen both screws on the terminal cover. Lift off the terminal cover.

Putting the control panel in place

- Fit the control panel at the front by inserting the hooks into the oval holes in the front boiler cover.
- Pull the control panel forwards and then tip back. The flexible hooks must latch into the rectangular openings at the rear of the front boiler cover.
- Screw the base of the control panel on the left and right of the cable duct on the front boiler hood using two self-tapping screws.

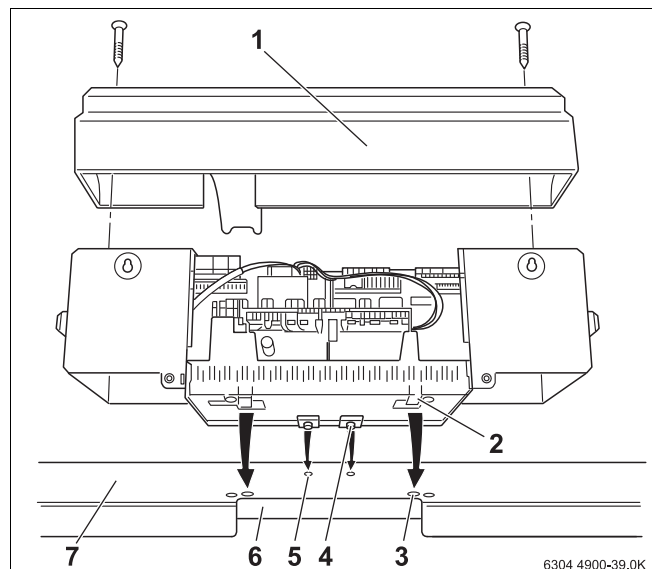


Fig 52 Fitting the control panel

- | | |
|----------|--|
| 1 | Terminal cover |
| 2 | Flexible hook |
| 3 | Rectangular openings in the front boiler cover |
| 4 | Push-in hooks |
| 5 | Oval holes in front boiler cover |
| 6 | Cable duct |
| 7 | Front boiler cover |

Connecting mains power



Caution: Equipment damage through damaged capillary tubes.

- Ensure that the capillary tubes are not bent or crushed when unrolling and laying them.

- Route the capillary tubes through the cable duct and unroll to the required length.
- Feed capillary tubes to the boiler test ports.
- Feed each sensor into the corresponding sensor well and secure it with its sensor holder (detailed view in → Fig. 53 has been turned through 180°).
- Screw cable duct (see detailed view → Fig. 54) on the left and right of the boiler rear panel.



Make a secure electrical connection to EN 50165 or the relevant international installation standards and local regulations.

- Make an electrical connection in accordance with the wiring diagram. Take care to ensure correct cable and capillary tube routing.



Secure all cables with cable clips.

- Insert cable clips with cable inside into the clip frame and secure by clamping it with the tab.

Fitting the rear panel section and terminal cover

- If necessary, push/cut the knock-out section out of the rear panel section.
- Hook the lower hook on the rear panel section into the clip frame and apply pressure at the top until the side hooks click into place.
- Screw terminal cover onto the control panel base again.

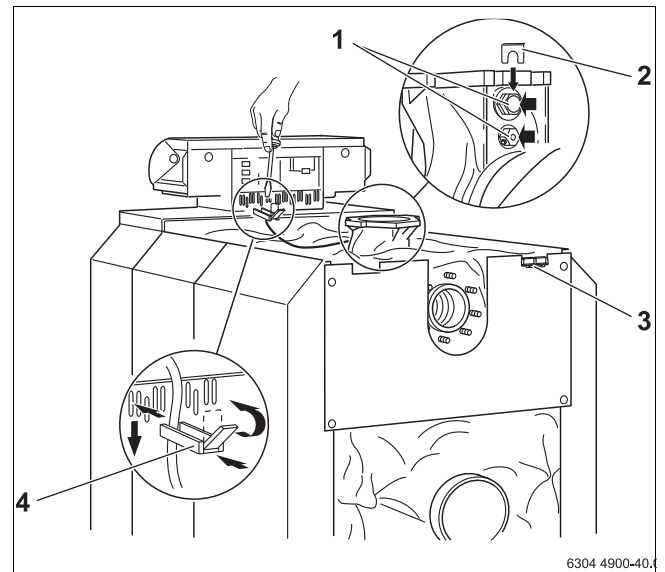


Fig 53 Fastening the electrical leads

- 1 Sensor wells
- 2 Sensor holder
- 3 Cable duct
- 4 Cable clip

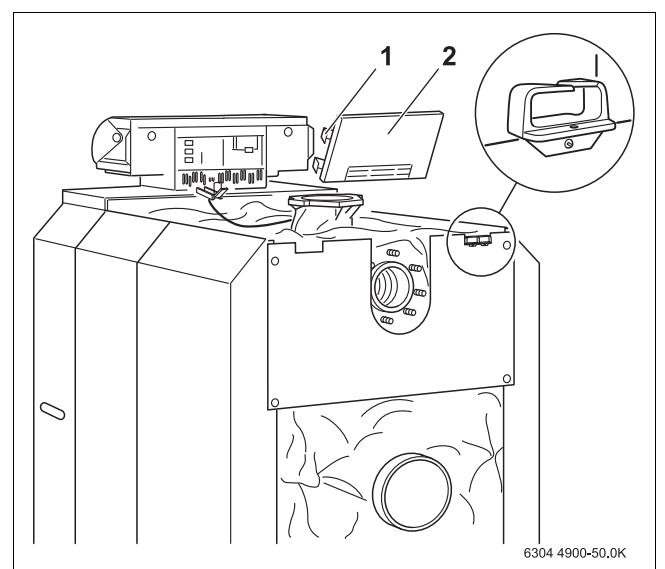


Fig 54 Fitting the rear panel section

- 1 Side hook
- 2 Rear panel section (control panel)

4.16.2 Installing the temperature sensor set

Both sensor wells have already been sealed in the flow (→ see section 4.7, page 20).

The sensors (controller sensor TRK, sensor STB and Logamatic sensor FK or thermometer sensor) are inserted into the sensor wells.



The STB sensor differs from the controller sensor in that it has a side recess.

The sensors must be arranged as follows:

- Push controller sensor TRK out of the sensor holder by pressing it gently.

- Feed controller sensor into sensor well R $\frac{1}{2}$ " and secure with a screw.
- Feed both sensors, STB (high-limit safety cut-out) and Logamatic FK, and the two sensor blanking pieces into sensor well R $\frac{3}{4}$ " and fix in place.



If using control panel 4212, the sensors must be fed into the R $\frac{3}{4}$ " sensor well. The R $\frac{1}{2}$ " sensor well is not assigned if using this control panel.

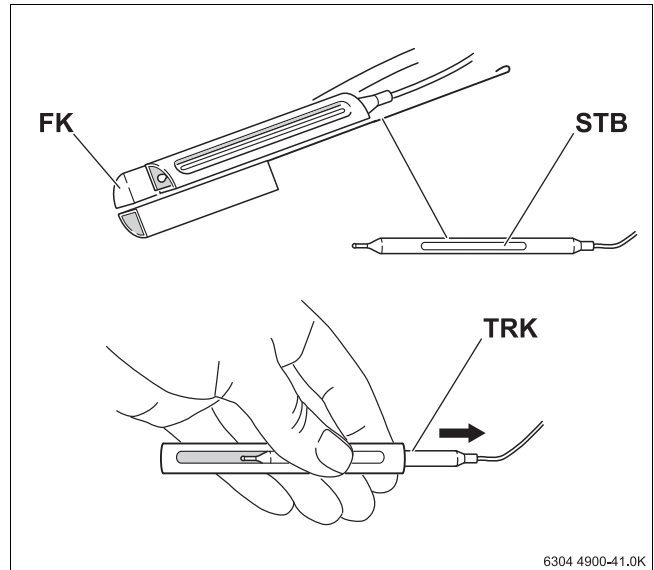


Fig 55 Temperature sensor set

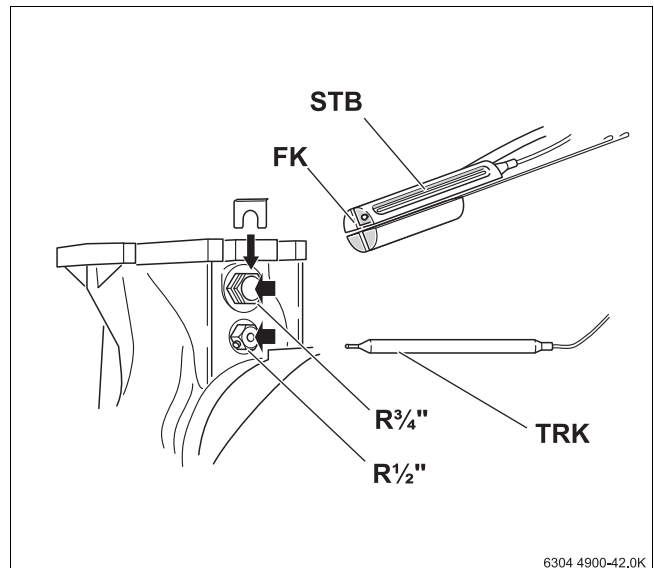



Fig 56 Installing the temperature sensor set

5 Start up the heating system

This chapter describes the commissioning of the boiler with a control panel in the Logamatic 4000 series. The commissioning process for the different types of control panel is the same.

- Complete the commissioning report during commissioning (→ see section 5.4, page 43).




Caution: Boiler damage
Through contaminated combustion air.

- Ensure adequate ventilation.
- Do not use or store chlorinated cleaning agents or halogenated hydrocarbons (as contained in spray cans, solvents or cleaning agents, paints and adhesives for example) in the boiler room.
- Do not operate the heat generator when heavy dust contamination is present, e.g. following building work inside the boiler room.


- A burner dirtied during building work must be cleaned before being commissioned.

5.1 Making the heating system operational

- Create the normal required operating pressure for commissioning (sealed heating systems) or set the required capacity (open heating systems).
- Check that the hot gas baffles have been inserted correctly.



For information on the quality of the heating water → see section 3.2, page 8.



Caution: System damage
through temperature stresses.

Temperature stresses can cause cracks if you fill your heating system when hot. This will cause the boiler to leak.

- Only fill the system when cold (the flow temperature should be no more than 40 °C).
- Only fill the system via a WRAS approved method.

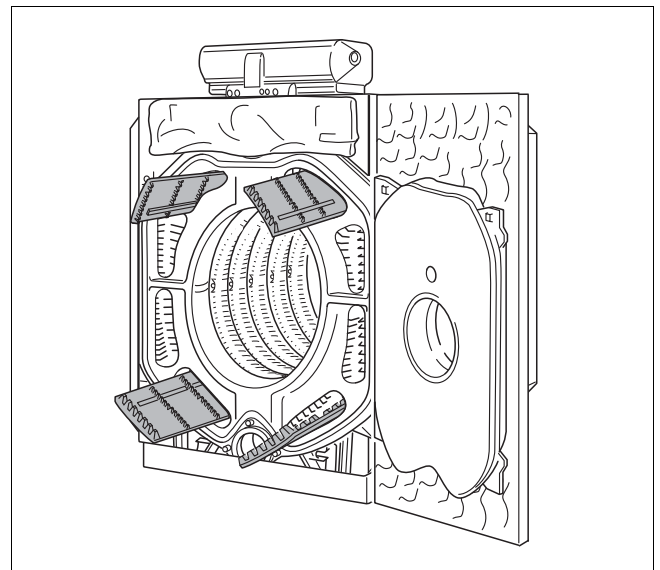


Fig 57 Checking that hot gas baffles are seated correctly

5.1.1 Creating operating pressure (sealed heating systems)

On sealed heating systems the pressure gauge marker must be within the green field.

- Set the red needle on the pressure gauge to the required operating pressure (at least 1 bar pressure).
- Only fill the system via a WRAS approved method.
- Vent the heating system during filling.

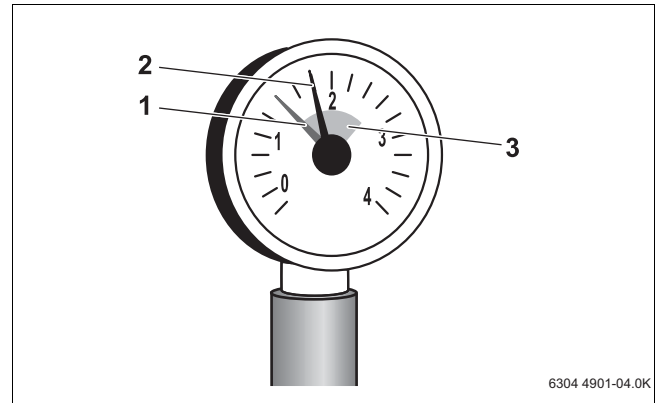


Fig 58 Pressure gauge for sealed systems

- 1 Red needle
- 2 Pressure gauge needle
- 3 Green field

5.1.2 Setting the capacity (open vented heating systems)

In open systems, the hydrometer needle must lie within the red field.

- Set the green needle on the hydrometer to the required capacity.
- Top up the heating water or drain via the boiler fill and drain valve until the required capacity has been reached.

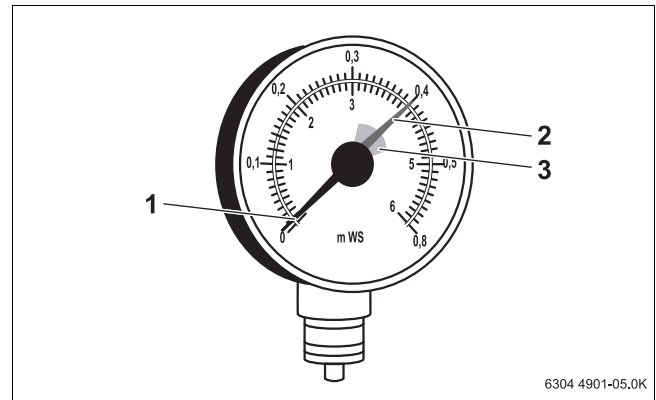


Fig 59 Hydrometer for open systems

- 1 Hydrometer needle
- 2 Green needle
- 3 Red field

5.2 Start up the control panel

Please see the accompanying technical documentation for the 4000 series control panel for information about on how to start it up.

5.3 Commission the burner

- When commissioning the burner, follow the instructions in the technical documentation enclosed with the burner.
- Fill out the burner commissioning report.

5.4 Commissioning report

- Sign all commissioning work as completed and enter the relevant date.

	Commissioning steps	Page	Comments (signature)
1.	Carry out pressure test on items delivered separately.	page 22	
2.	Filling the heating system	page 27	
3.	Check heating system for leaks - enter fill water amount and quality in operator's log (included with the technical documentation).	page 27	
4.	Check the position of the hot gas baffles (the 16-section boiler has no hot gas baffles)	page 41	
5.	Start up the control panel	See control panel documentation	
6.	Check the flue pipe for leaks.		
7.	Commission the burner	See burner documentation	
8.	Check the flue gas temperature		
9.	Check the flue pipe for leaks		
10.	Check the soundness of the hot-gas side of the boiler		
11.	Enter the fuel used in the corresponding table in the operating instructions		
12.	Provide the system user with information and hand over all relevant technical documentation		
13.	Confirm correct commissioning		
	Company stamp/signature/date		

Tab. 12 Commissioning report



Enter the relevant fuel in the table in the operating instructions.

5.5 Operating conditions for Buderus G and GE cast iron boilers

5.5.1 Operating conditions GE 615

Thermostream technology is a unique feature of Buderus cast iron boilers. Return water is preheated and mixed within the boiler before it comes in contact with the heated surface of the combustion chamber. The Thermostream technology ensures there is an even temperature distribution in the boiler and avoids condensate forming within the combustion chamber. This reduces thermal stress, the main cause of failure of normal cast iron boilers. The benefit of this technology is that if the minimum boiler operating temperature of the boiler is maintained (see table below), there is no need for a conventional shunt pump to be installed, saving the cost of a pump, the electricity it consumes and the breakdown it can cause. The minimum boiler operating temperature as shown in the table below must be reached within 10 minutes and then be maintained while the burner is running.

Boiler controls	Minimum flow rate through the boiler	Minimum return water temperature	Minimum boiler operating temperature for oil	Minimum boiler operating temperature for gas	Other conditions
Buderus 4000 with control over all heating circuits	none	none	50 degrees ¹⁾	50 degrees ¹⁾	none
Where the Buderus control is not controlling the heating circuits ie External control (BMS) or Constant temperature control with Buderus 4212 with ZM427	none	none	50 degrees ¹⁾	60 degrees ¹⁾	none

Tab. 13

1) This temperature has to be reached within ten minutes of the burner starting and has to be maintained whilst the burner is firing.


This operating condition can be easily achieved by the controls monitoring the boiler temperature and reducing the flow rate through the boiler until the required temperature is reached. This is then maintained by continuing to control flow based on the boiler temperature. The controls can reduce the flow rate by closing the valves on the mixed heating circuits or by modulating the boiler primary pumps or by closing the motorised butterfly valves or by having a motorised valve in the boiler return on a single boiler installation. The Buderus 4000 series controls can manage this process or it can be done by the BMS.

If it is not possible for the controls to regulate the flow sufficiently to meet this operating condition then a shunt pump circuit must be fitted to avoid the type of thermal stress that all boilers would experience in these conditions. This shunt pump circuit can be controlled either with a Buderus 4000 control or with a Buderus 4212 fitted with a ZM427 module. Failure to ensure that the operating condition is maintained may lead to thermal stress in the boiler and eventual failure of the sections which would be outside the scope of the warranty.

6 Shutting down the heating system

6.1 Standard shutdown

- Switch the ON/OFF switch on the control panel OFF (position "0").
This switches the boiler and all its components OFF (for example the burner).
- Close the main fuel shut-off valve.



Caution: System damage caused by frost
The heating system can freeze up in cold weather if it has been switched off, either.

- Leave the heating system switched on all the time.
- or: Drain the heating system and DHW pipework at the lowest possible point to protect the heating system against freezing whilst it is switched off.

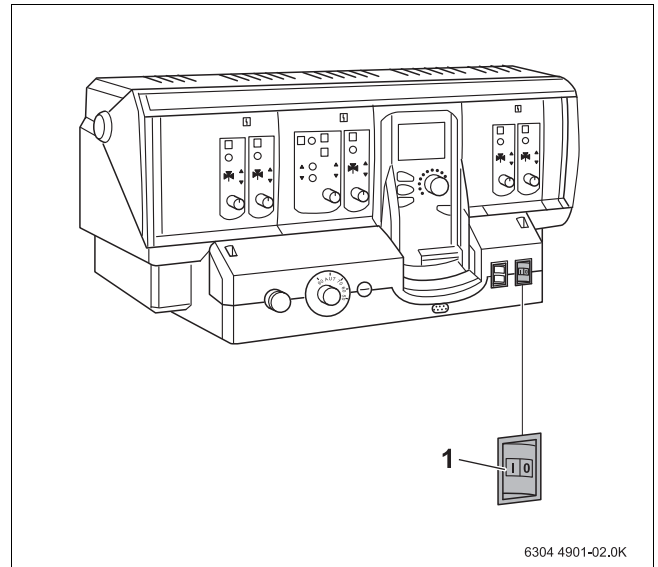


Fig 60 Switching off the heating system

1 ON/OFF switch

6.2 Emergency measures

In the event of an emergency, e.g. a fire, proceed as follows:

- Never risk your own life. Your own safety is paramount.
- Close the main fuel shut-off valve.
- Isolate the heating system from the mains power supply using the heating system emergency stop switch or the corresponding domestic fuse.

7 Heating system inspection and maintenance

7.1 Why is regular maintenance important?

Heating systems should be regularly maintained for the following reasons:

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

Offer an annual inspection and as-required maintenance contract to your customer. The activities that must be contained in a contract can be found in the inspection and maintenance report (→ see section 7.6, page 53 ff.).



Only use original spare parts. You may order spare parts from the spare parts catalogue.

7.2 Preparing the boiler for cleaning

- Shut down the heating system (→ see section 6.1, page 45).



Warning: Danger to life from electric shock.

- Before opening the panel: Isolate all poles of the mains power supply and secure against unauthorised re-connection.



Warning: Danger to life through the explosion of volatile gases.

- Work on gas components must only be carried out by qualified and authorised personnel.

Opening the burner door



Caution: Damage to the casing parts by opening the burner door.

- Unhook the front side panel sections before opening the burner door.

- Using the hand hole, lift the side panel sections slightly and remove. Do not remove the front panel sections (burner door casing).
- Using a spanner, loosen the burner door fixing screws from the side.
- Open the burner door.

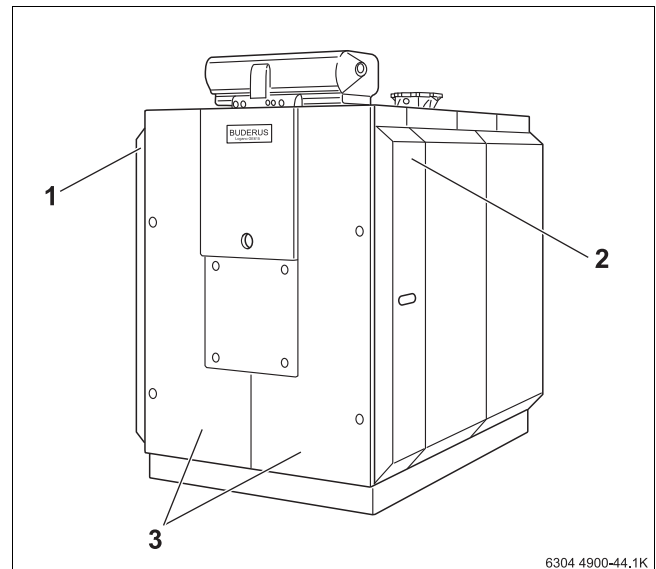


Fig 61 Opening the burner door

- 1 Front side panel section (left)
- 2 Front side panel section (right)
- 3 Front panel section (burner door casing)

7.3 Cleaning the boiler

The boiler can be cleaned with brushes and/or by a wet method. Cleaning equipment is available as an accessory.

7.3.1 Cleaning the boiler with cleaning brushes

- Remove the hot gas baffles from the hot gas flues.



The 16-section boiler does not contain any hot gas baffles (→ see section 4.11.4, page 25 ff.).

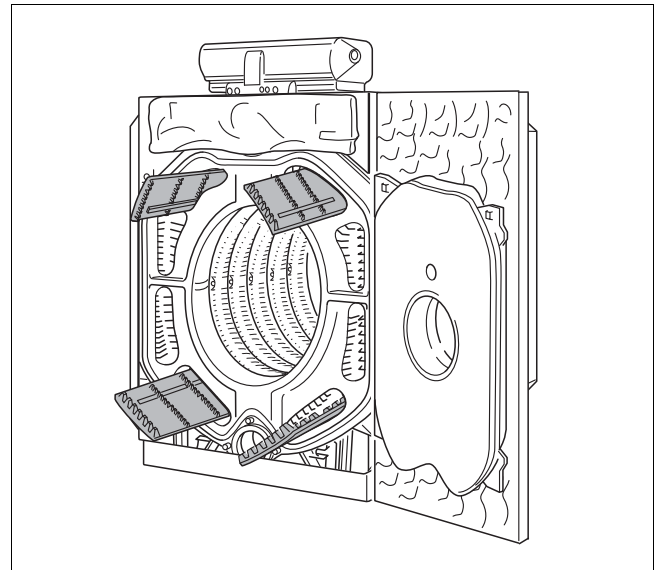


Fig 62 Removing the hot gas baffles

- Remove lower boiler rear panel.
- Loosen tension springs below the flue outlet (→ see Fig. 42, page 33).
- Fold both ends of the insulation upwards and fasten with the tension springs.
- Remove the clean-out covers from the flue gas header.

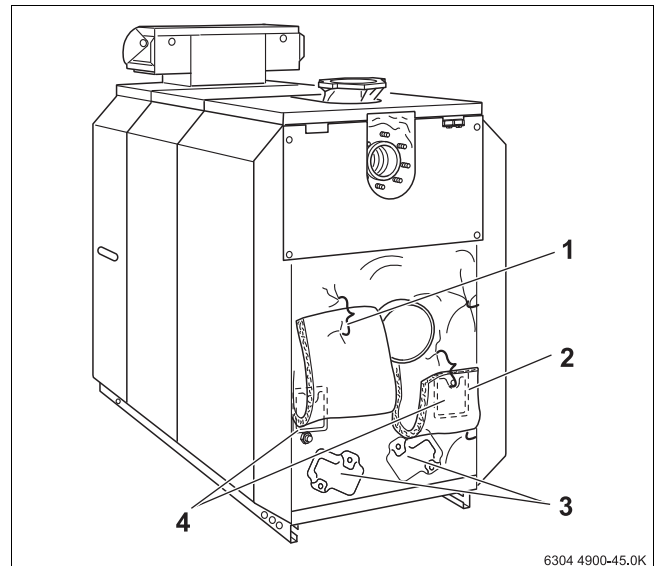


Fig 63 Removing the clean-out covers

- 1 Insulation (folded upwards)
- 2 Insulation (folded upwards)
- 3 Clean-out cover on the rear section
- 4 Clean-out cover on the flue gas header

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Cleaning brushes (optional extra)

Using the cleaning brushes ensures optimum cleaning of the boiler.

The various brush types available are shown in → Fig. 64.

For brush dimensions and where to use the brushes, please see → Tab. 1.

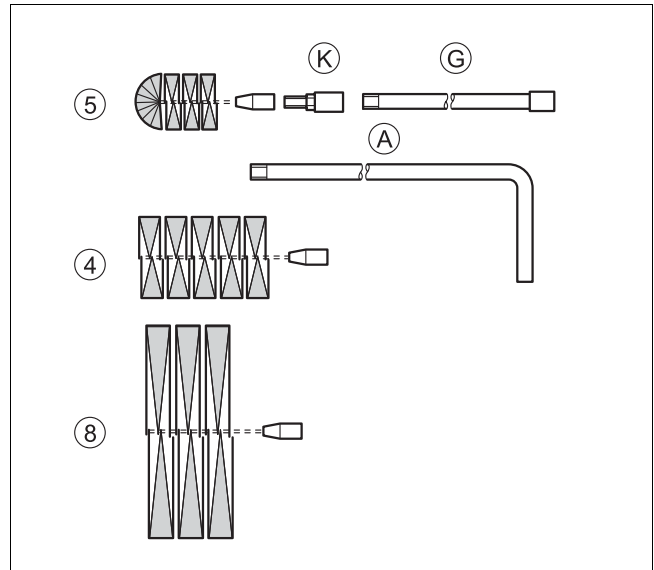


Fig 64 Cleaning brushes

No. of sections	Brush ID	Brush dimensions (diameter in mm)	Used in	Shaft designation K = adapter	Längen der Stangen in mm
9 - 11	4	75x110	Secondary heating surface	A + K	2000
	5	60x73	Secondary heating surface		
	8	200x80	Combustion chamber		
12 - 14	4	75x110	Secondary heating surface	A + K	2500
	5	60x73	Secondary heating surface		
	8	200x80	Combustion chamber		
15 - 16	4	75x110	Secondary heating surface	A + G + K	2000 + 1000
	5	60x73	Secondary heating surface		
	8	200x80	Combustion chamber		

Tab. 14 Brush dimensions and brush application locations

- Clean the upper and lower hot gas flues with cleaning brushes 4 and 5.
- Clean the combustion chamber with cleaning brush 8.
- Remove the combustion residues by sweeping them forwards through the combustion chamber opening and through the clean-out openings on the rear section and the flue gas header → Fig. 63, page 47.
- Check packing cords on the clean-out openings and burner door. Replace damaged or hardened packing cords.



Packing cords are available from your nearest branch.

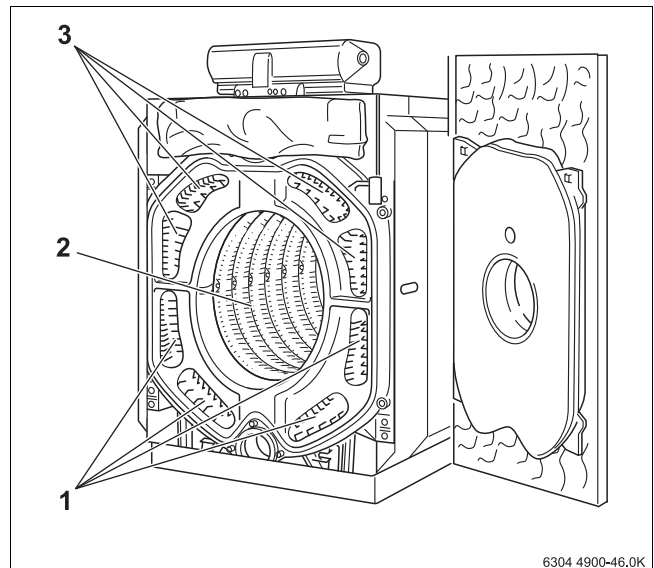


Fig 65 Cleaning the hot gas flues

- 1 Lower hot gas flues
- 2 Combustion chamber
- 3 Upper hot gas flues

- Clean hot gas baffles with the cleaning brushes.
- Insert hot gas baffles into hot gas flues (→ Fig. 30, page 25 and Fig. 31 and Fig. 32, page 26).
- Seal clean-out covers and burner door. Tighten screws evenly. Hook the front side panels back in place. Put sealing plug back in place if necessary.
- Fold the rear section insulation down and pull together under the flue outlet using tension springs.
- Put the lower boiler panel back in place.

7.3.2 Wet cleaning (chemical cleaning)

When wet cleaning, use a cleaning agent commensurate with the degree of soiling (encrustations or soot).

Proceed in the same sequence as if cleaning with cleaning brushes (→ see section 7.3.1, Seite 47).



Follow the cleaning agent and cleaning equipment instructions. In some circumstances you may need to proceed differently from the method described here.

- Cover the control panel with plastic to prevent the ingress of spray.
- Spray cleaning agent evenly into the hot gas flues.
- Close burner door and start the heating system.
- Heat the boiler water temperature to at least 70 °C.
- Shut down the boiler.
- Allow boiler to cool, open burner door.
- Brush out the hot gas flues.

7.4 Checking the operating pressure

A distinction is generally made between open and sealed systems. In practice, open heating systems are seldom installed.



For information on the quality of the heating water (→ see operator's log).



Caution: System damage

Depending on water quality, the heating system may be damaged by corrosion or scaling if you frequently top-up the heating water.

- Vent the heating system.
- Check the heating system for leaks and the expansion vessel for proper functioning.
- If water loss occurs frequently, locate the cause and rectify the problem without delay.



Caution: System damage through temperature stresses

Temperature stresses can cause cracks if you fill your heating system when hot. This will cause the boiler to leak.

- Only fill the system when cold (the flow temperature should be no more than 40 °C).
- During operation, only fill the heating system via an approved WRAS method.

7.4.1 Checking the operating pressure (sealed systems)

On sealed heating systems the pressure gauge needle must be within the green field.

Ensure that the red pressure gauge needle is set to the required operating pressure.



Create an operating pressure (overpressure) of at least 1 bar.

- Check the heating system operating pressure.

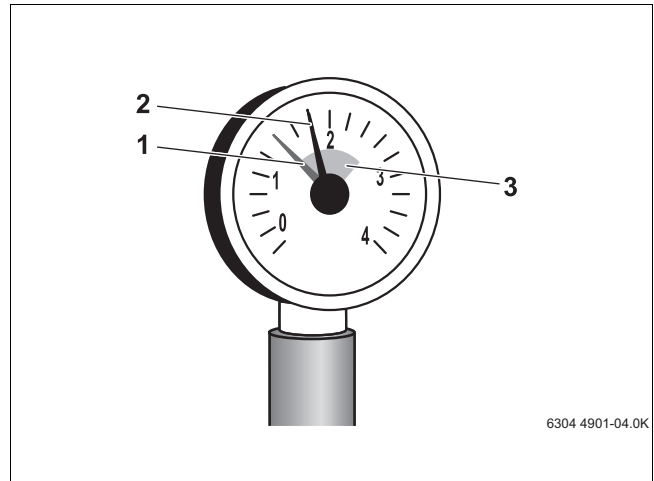
The operating pressure is too low if the pressure gauge needle indicates below the green field. The system needs to be topped up with water.

- Top up with water until the desired operating pressure is reached.
- Vent the heating system during filling.

7.4.2 Checking the fill level (open systems)

In open systems, the hydrometer needle must lie within the red field.

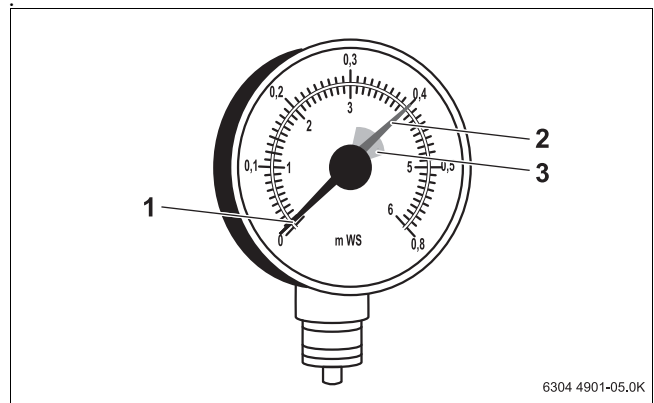
- Check that the hydrometer needle is within the red field.
- Top up with water if the hydrometer needle is below the red field.



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Fig 66 Pressure gauge for sealed systems

- 1 Red needle
- 2 Pressure gauge needle
- 3 Green field



6304 4901-05.0K


Fig 67 Hydrometer for open systems

- 1 Hydrometer needle
- 2 Green needle
- 3 Red field

7.5 Filling the heating system and checking for leaks

Before commissioning the heating system, check for leaks to prevent problems during operation. Pressurise the heating system to 1.3x bar permissible operating pressure (observe the safety pressure of the safety valve).

- On sealed systems the pressure gauge needle (Fig. 68 Item 2) must be within the green range (Fig. 68, Item 3). Set the red needle (Fig. 68, Item 1) on the pressure gauge to the required system pressure.
- Check the system water pressure.



Caution: System damage through over pressure during leak testing. Pressure, control and safety equipment may be damaged through excessive pressure.

- When you carry out a leak test, make sure that no pressure, control or safety equipment is fitted which cannot be isolated from the boiler water chamber.

- Shut off the pressure expansion vessel from the system by closing the cap valve.
- Check the connections and pipework for leaks.
- Open the mixing and shut-off valves on the hot water (primary) side.
- Fill the system via an approved filling link.

7.5.1 Filling the heating system

Filling and refilling of the heating circuit must be carried out by a method that has been approved by the Water Regulation Advisory Scheme (WRAS), for the type of heating appliances, i.e. Domestic (in-house) Fluid Category 3. Non-Domestic (other than in-house) Fluid Category 4. Depending on the Fluid Category the approved method should comprise of the following:

- 1 Requirements Fluid Category 3 systems (Fig. 69 see right)
 - Control valve (stop valve) including a Double check valve on the mains cold water supply pipe
 - Temporary connection to be removed after filling (filling loop)
 - Control valve (stop valve) on the heating system pipe-work

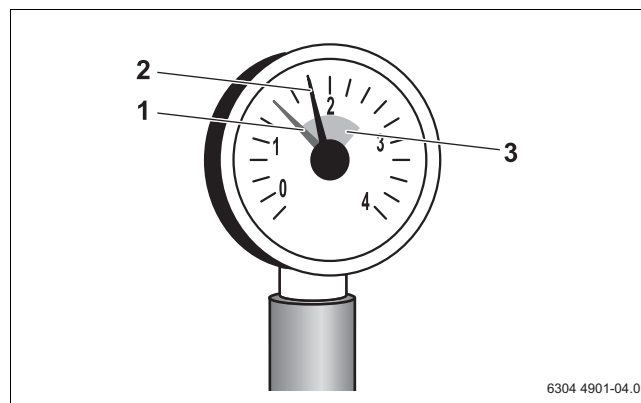


Fig 68 Pressure gauge for sealed systems

- 1 Red needle
- 2 Pressure gauge needle
- 3 Green range

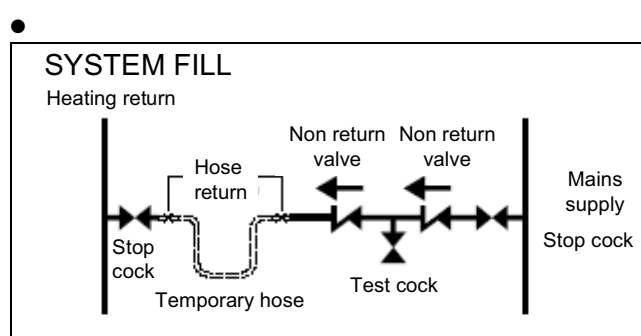


Fig 69 Requirements Fluid Category 3 systems

2 Requirements Fluid Category 4 systems (Fig. 35 see right)

- Control valve (stop valve) on the mains cold water supply pipe
- Strainer
- Verifiable Backflow Prevention Device with reduced pressure Zone (RPZ valve assembly) incorporating a Type BA air gap
- Tundish
- Control valve (stop valve) on the heating system pipe-work
- Open the cap of the automatic air vent by one full turn to allow air to escape.
- Slowly fill the heating system. Observe the pressure gauge whilst filling.
- Close the water tap and the boiler drain valve once the required operating pressure has been reached.
- Bleed the system via the radiator bleed valves.
- Top up with water if the pressure drops as a result of bleeding the system.
- Take the hose off the boiler drain valve.

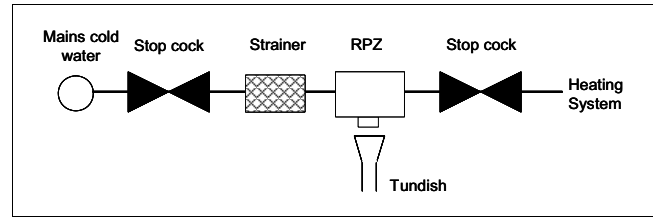



Fig 70 Requirements Fluid Category 4 systems

	<p>Caution: System damage through frequent topping up.</p> <p>The heating system may be damaged, depending on water quality, by corrosion or scaling if you frequently need to top-up the heating water.</p>
---	--

- Enquire from your installer, whether you can use your public water untreated or whether you need to treat it before filling your system.
- Notify your installer, if you need to regularly add top-up water to your system.

7.6 Inspection and maintenance reports

- Sign all inspection work as completed and enter the relevant date.

The inspection and maintenance reports are also designed as templates.

	Inspection work	Page	Date: _____	Date: _____	Date: _____
1.	Check the general condition of the heating system		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Visual and functional check of the heating system		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Check all the gas and water components of the system for: <ul style="list-style-type: none"> - Leaks during operation - Leak test - Visible signs of corrosion - Signs of ageing 		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Check the combustion chamber and heating surfaces for contamination. Shut down the system first.	48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Check the burner (see burner documentation)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Check the flue gas pipe for proper functioning and safety (see burner documentation)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Check water pressure and inlet pressure of the diaphragm expansion vessel on sealed heating systems	49ff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Check water pressure and inlet pressure on open heating systems	49ff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Check the DHW cylinder and corrosion protection anode for proper functioning (see DHW cylinder documentation)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Check the control panel setting (see control panel documentation)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Record the final checks of the inspection work, incl. measurements and test results		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Confirm the professional inspection				
			Company stamp/ signature	Company stamp/ signature	Company stamp/ signature

Tab. 15 Inspection report



If during inspection work conditions are identified that require maintenance, this must be carried out on an as-required basis. If the water level is topped up, the quality of the water must correspond to that noted in the enclosed operator's log.

	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature

Tab. 16 Continuation

	As-required maintenance work	Page	Date: _____	Date: _____	Date: _____
1.	Shutting down the heating system	44	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Remove and clean the hot gas baffles	47	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Clean the hot gas flues (heating surfaces)	48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Clean the combustion chamber	48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Clean the flue gas header	48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Insert the hot gas baffles	25ff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Check gaskets/packing cords on the burner and burner door and replace if required	48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Start up the heating system	41	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Record the final checks of the maintenance work, incl. measurements and test results		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Check functioning and safety in operation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Confirm the professional inspection				
			Company stamp/ signature	Company stamp/ signature	Company stamp/ signature

Tab. 17 Maintenance report

	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature

Tab. 18 Continuation

8 Faults

Faults in the heating system are displayed on the control panel display. For further information on the fault displays please refer to the service instructions of the control panel concerned.



Caution: System damage caused by frost.

The heating system can freeze up in cold weather if it has been switched OFF through a fault shutdown.

- Rectify the fault immediately and restart the heating system.
- If this is not possible: Drain the heating system and DHW pipework at the lowest point.

Burner faults

A burner fault is also indicated by the fault lamp on the burner. For further information on burner faults, please refer to the burner technical documentation.



Caution: System damage

Repeated pressing of the reset button can damage the ignition transformer on the burner.

- Do not press the reset button more than three times in a row.

To reset burner faults:

- Press burner reset button.

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In the UK and IE, Buderus is a brand name of
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