Installation and maintenance instructions

Flue gas heat exchanger WT30/40

Buderus

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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 satisfactory operation.
- Only use the heat exchanger for its intended purpose.
- When installing and operating, observe all the regulations and standards applicable in your country.
- 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 heat exchanger serviced annually.
- Only use original spare parts.

Instructing the customer

- Explain to the customer how the heat exchanger works, and how to operate it.
- Tell the customer the particular things to bear in mind with regard to maintenance of the flue gas heat exchanger and the neutralisation system.
- 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 putting your own your own safety first, 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 (→ refer to the boiler operating instructions).
- 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 boiler (→ see technical documentation); the heat exchanger will shut down automatically.
- Open windows and doors.
- Inform an authorised contractor.

Risk of fire from explosive and flammable materials

- Flammable 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 (e.g. halogenated hydrocarbons from spray cans, solvents or cleaning agents, paints and adhesives). This prevents corrosion.
- Prevent heavy contamination of the combustion air/ambient air by dust, airborne seeds, etc.

1.2 Explanation of symbols

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

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 contain important information for situations in which there is no danger for persons or equipment.

2 Information about the product

2.1 Product overview

Combining the WT30/40 flue gas heat exchanger with a boiler creates a condensing unit that utilises the flue gas energy from the boiler to increase efficiency.

The main components of the WT30/40 flue gas heat exchanger are:

– Flue gas header: The boiler flue gases are collected here and led to the heat exchanger.
– Flue gas heat exchanger: The hot gases from the boiler flow through the heat exchanger, giving off heat to the water fed to the boiler.
– The lagging and casing reduce energy loss.

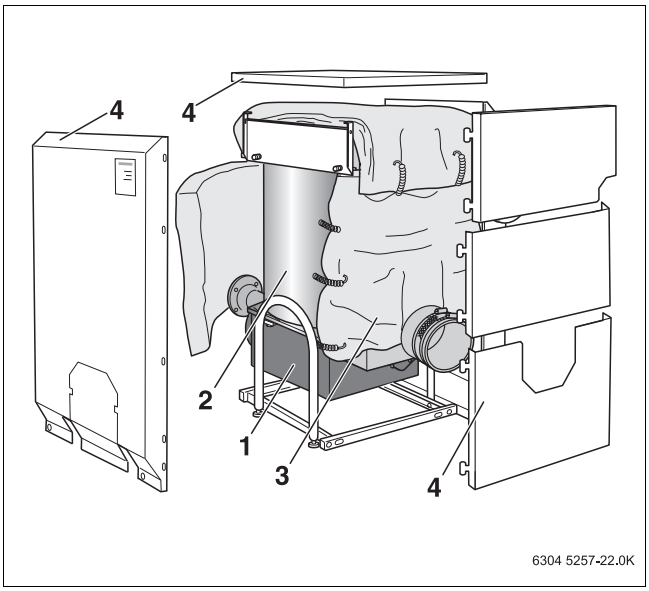

Fig. 1 Flue gas heat exchanger WT30/40

1 *Flue gas header*
2 *Flue gas heat exchanger*
3 *Lagging*
4 *Casing*

2.2 EU Declaration of Conformity

CE The design and operation of this product conform to the applicable European directives and supplementary national requirements. Its conformity has been verified. The Declaration of Conformity can be viewed at www.heiztechnik.buderus.de or alternatively can be requested from your nearest Buderus sales office.

2.3 Correct use

The flue gas heat exchanger is designed to utilise the flue gas energy of the boiler in order to increase the efficiency of the heating system.

The flue gas heat exchanger can be fitted in new or existing heating systems.

The resulting condensing unit can be operated for up to 4 weeks as an oil low-temperature boiler if a minimum return temperature of 60 °C is maintained.

The combination of WT30/40 flue gas heat exchanger and boiler conforms in design and operation to the requirements of DIN EN 303 and DIN EN 677.

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

2.4 Specifications

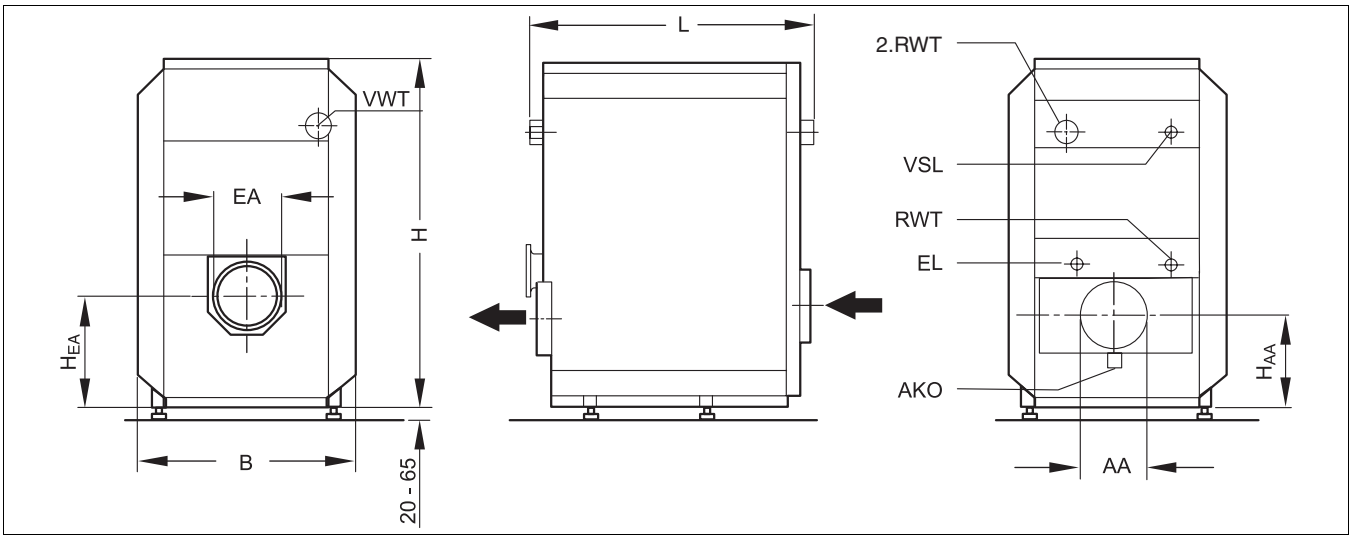

Fig. 2 WT30 connections and dimensions

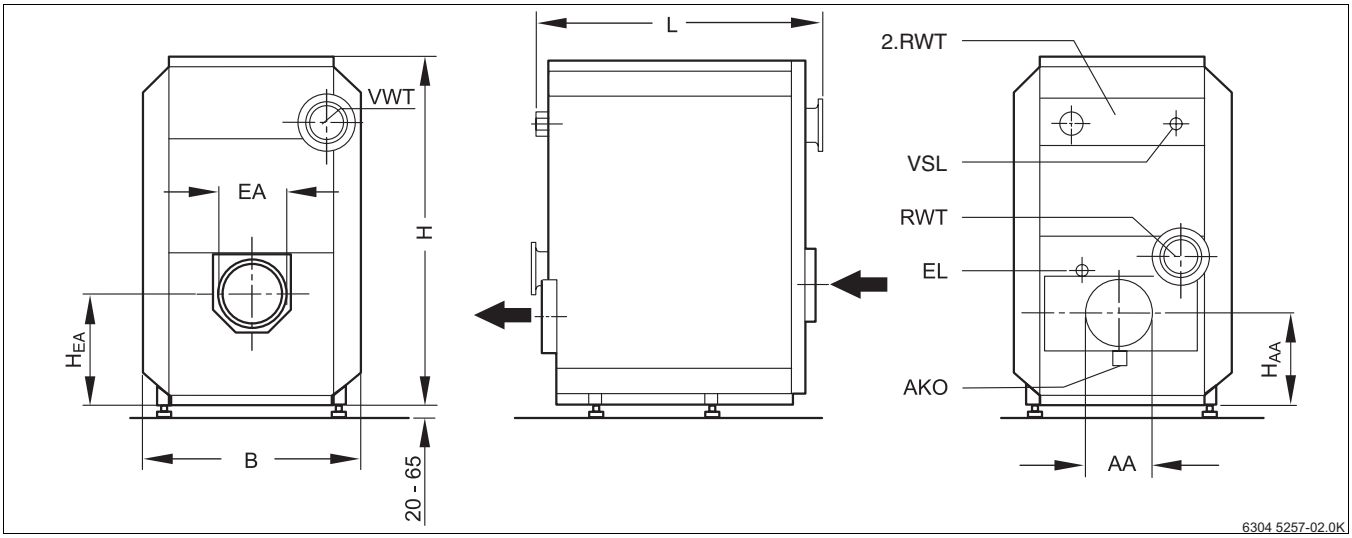

Fig. 3 WT40 connections and dimensions

Condensing unit	Boiler	Flue gas heat exchanger	Neutralisation
G215B-75	GE215-68	WT30 - 1 G1	1 x NE1.1
G215B-90	GE215-85	WT30 - 1 G1	1 x NE1.1
G315B-115	GE315-105	WT40 - 21 G1	1 x NE1.1
G315B-160	GE315-140	WT40 - 22 G1	1 x NE1.1
SE425B-90	SE425-80	WT40 - 23 S1	1 x NE1.1
SE425B-120	SE425-110	WT40 - 24 S1	1 x NE1.1

Tab. 1 Component allocation

The boiler's rated output and combustion output are different because the boiler is combined with a heat exchanger to form a condensing unit.

Condensing unit	Combustion output	Rated output		Flue gas mass flow rate		Flue gas temperature		Hot gas resistance		Available draught [2]
		55/30 [1]	75/60 [1]	55/30 [1]	75/60 [1]	55/30 [1]	75/60 [1]	55/30 [1]	75/60 [1]	
	kW	kW	kW	kg/s	kg/s	°C	°C	Pa [3]	Pa [3]	Pa [3]
G215B-75	71.4	75	69.3	0.0303	0.0304	55	80	60	70	50
G215B-90	85.7	90	83.1	0.0363	0.0365	55	80	70	80	50
G315B-115	109.5	115	106.2	0.0464	0.0467	55	80	100	110	50
G315B-160	152.4	160	147.8	0.0645	0.0649	55	80	150	170	50
SE425B-90	85.7	90	83.1	0.0363	0.0365	55	80	70	80	50
SE425B-120	114.3	120	110.9	0.0484	0.0487	55	80	100	110	50

Tab. 2 Specifications
[1] Flow/return temperature
[2] At 10 % CO_2
[3] 1 mbar = 100 Pa

Equipment type	Length	Height	Width	Flue gas				Connections		Weight
	L	H	B	EA	AA	H_{EA}	H_{AA}	RWT VWT	VSL EL	
	mm	mm	mm	mm [1]	mm [2]	mm	mm			kg
WT30-1-G1	840	1229	770	148	153	530	302	R1¼	R1/R1¼	110
WT40-21-G1	887	1229	780	178	183	425	285	DN65	R1	135
WT40-22-G1	887	1229	780	178	183	425	285	DN65	R1	135
WT40-23-S1	887	1229	780	198	183	785	285	DN65	R1	135
WT40-24-S1	887	1229	780	198	183	785	285	DN65	R1	130

Tab. 3 Dimensions and connections
[1] Outside diameter
[2] Inside diameter

Safety limits

– Max. permitted flow temperature: 120 °C
– Permissible operating pressure: 6 bar

2.5 Accessories (see also price list)

3 Regulations

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

3.1 Boiler room

Caution: System damage through frost.

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

3.2 Quality of heating water

- The operator's log enclosed with the specifications MUST be observed when using and treating fill and top-up water.
- Record the filling water quantity and composition in the operator's log.

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.

4 Installation

4.1 Checking delivery for completeness

- Upon delivery, check that the packaging is undamaged.
- Check that the delivery is complete.

Component	Quantity	Packaging
Heat exchanger block	1	Pallet
Casing	1	Carton
Lagging	1	Foil packaging
Technical documentation	1	Attached to heat exchanger block
Neutralisation system with accessories*		

Tab. 4 Scope of supply (block delivery)
** to be ordered separately*

4.2 Disposing of packaging

- Dispose of packaging in an environmentally responsible manner.

4.3 Tools and equipment

For the installation and maintenance of the flue gas heat exchanger, you will need standard central heating tools as well as oil, gas and water installation tools.

4.4 Setting up the flue gas heat exchanger

It is helpful to have a drain outlet in the boiler room.

- Set up the flue gas heat exchanger at the same level as the boiler.

The ground must be flat and level.

Observe the minimum clearances required for installation and maintenance when setting up the flue gas heat exchanger (→ Fig. 4).

- To ensure satisfactory ventilation, tilt the flue gas heat exchanger backwards slightly using the adjustable feet (→ Fig. 5).

Condensing unit	Length L_1 mm
G215B-75	1760
G215B-90	1880
G315B-115	2010
G315B-160	2170
SE425B-90	2510
SE425B-120	2510

Tab. 5 Length of boiler with flue gas heat exchanger

Ensure that the clips of the flue pipe sealing collars are located above the flue outlets of the boiler and the flue gas heat exchanger (one clip per flue outlet) before the flue outlets are levelled.To position the boiler and flue gas heat exchanger at right angles, see the information given in the data sheet (flue gas connection kit, scope of supply).

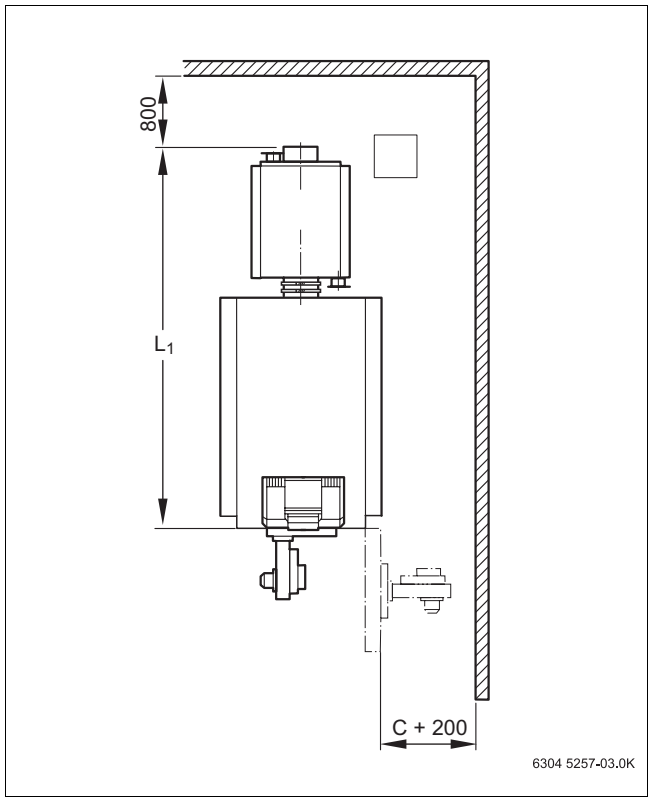

Fig. 4 Boiler room with boiler and flue gas heat exchanger (dimensions in mm)

c *Burner projection*

4.5 Rotating the flue gas header

Caution: Damage
from welding and grinding work.
- If carrying out any welding or grinding work, ensure that stainless steel surfaces are not damaged.
- Keep the flue outlets closed until installation.

The flue gas header can be rotated through 90°.

- Loosen four nuts from underneath and swivel the clamping angles outwards.

Danger: Danger to life
from escaping gases.
- Make sure the silicon gasket is positioned correctly.
- Replace any deformed silicon gaskets.

- Completely remove the flue gas header and place it on the frame after rotating through 90°.
- Level the flue gas header, swivel clamping angles inwards and tighten nuts.
  Fit the flue gas header so that it touches the sealing face at the front.
- Check all flue connections for leaks.

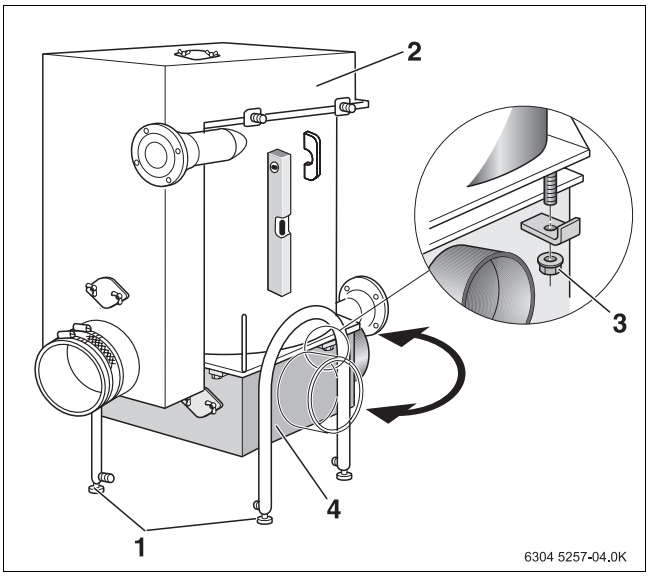

Fig. 5 Rotating the flue gas header through 90°

1 *Adjustable feet*
2 *Flue gas distributor*
3 *Nut (4x)*
4 *Flue gas header*

4.6 Making the flue gas connection

The flue gases must be led to the open air via flue pipes and flues in accordance with the guidelines applicable in your country.

Use only flues that conform to building regulations and are resistant to humidity.

Before commissioning the heating system, check that the flue gas system used is suitable for the boiler.

Observe the flue gas system manufacturer's installation instructions.

- Remove the protective cover in front of the flue outlet.
- Align boiler and flue gas heat exchanger flue outlets, keeping them 5 – 10 mm apart.
- Push the flue pipe sealing collar over both flue outlets and tighten using two clips.

After fitting the casing, place lagging over both flue outlets and fasten with two tension springs.

- Make flue gas connection between flue gas heat exchanger and flue.
- Check all flue connections for leaks.

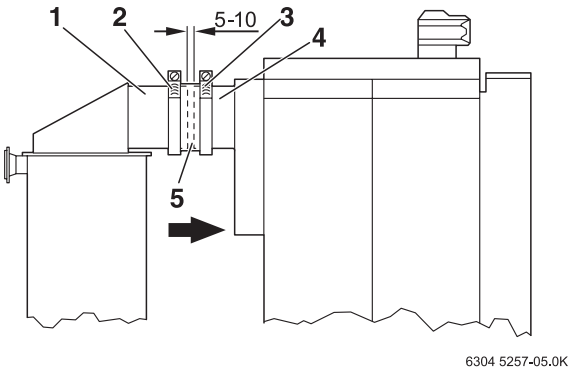

Fig. 6 Making the flue gas connection

1 *Flue outlet (flue gas heat exchanger)*
2 *Clip*
3 *Clip*
4 *Flue outlet (boiler)*
5 *Flue pipe sealing collar*

4.7 Installing the flue gas heat exchanger

Connect the flue gas heat exchanger in series with the boiler. This requires only one pressure safety device, and no additional protection against excess temperature.

- To ensure satisfactory ventilation, tilt the flue gas heat exchanger backwards slightly using the adjustable feet.
- Connect water pipe connections, ensuring that they are free of stress.

Gate valves must be provided in the flow and return pipes.

Caution: System damage through leaks.

- Before putting the heating system into operation, it must be checked to ensure that no leaks will occur during operation.
- Observe the boiler installation and maintenance instructions when commissioning.

- Insert the dowel for the hose clip into the hole in the leg.
- Press the expanding pin into the dowel until the hose clip is firmly in place.
- Fasten the plastic condensate drain hose[1)] to the AKO condensate outlet with the hose clip.
- Insert drain hose through the hose clip, shape like a siphon and clamp tight with nut and bolt.

1) Neutralisation system accessory

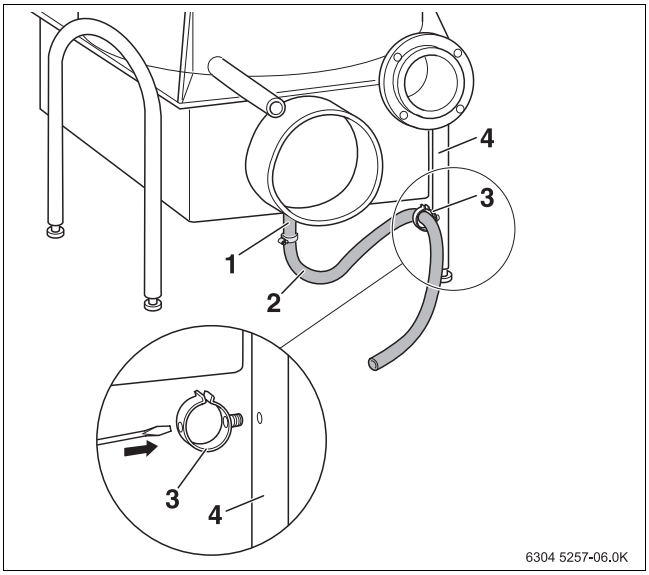

Fig. 7 Condensate drain

1 *AKO condensate drain*
2 *Plastic condensate drain hose*
3 *Hose clip*
4 *Leg*

4.8 Installing the casing and insulation

The folded edges of the beams must face outwards on the WT30, and inwards on the WT40.

- Fasten the top right and left beams to the tabs on the upper frame using two nuts each.

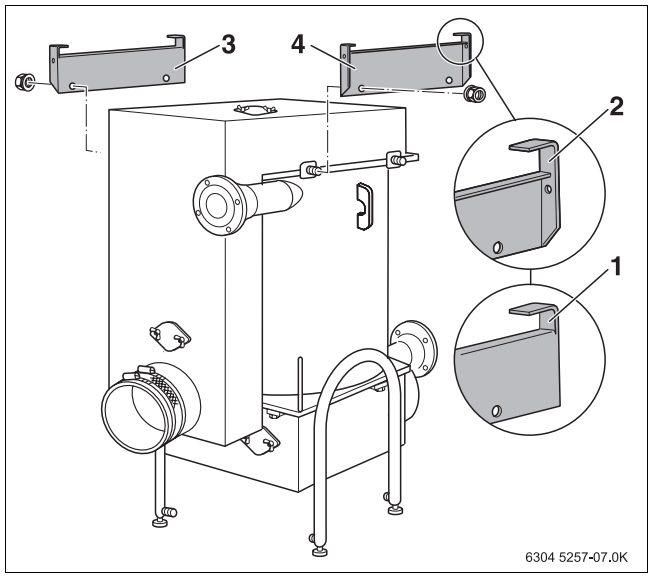

Fig. 8 Fitting the upper beams

1 *Folded edge on WT40*
2 *Folded edge on WT30*
3 *Top right beam*
4 *Top left beam*

Make sure the slots of the side beams are toward the front (Fig. 9).

- Hook the holes on the bottom right and left side beams onto the threaded bolts and fasten with nuts.
- Screw the front and back cross-beams with two self-tapping screws each onto the side beams in such a way that they protrude to the same extent right and left.

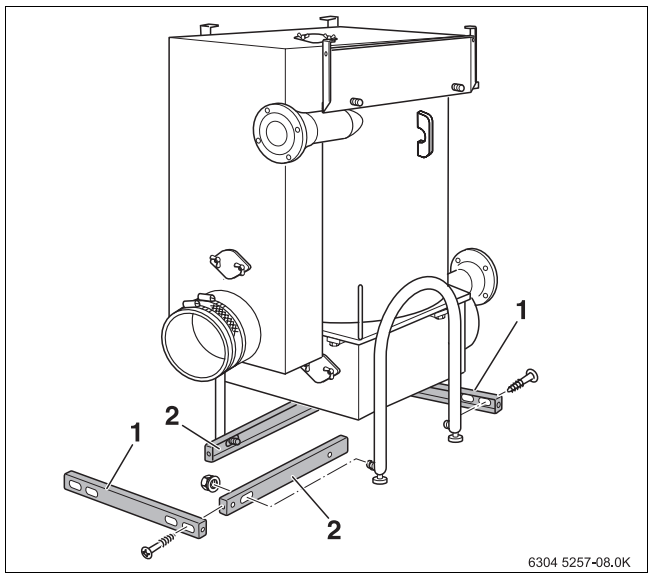

Fig 9 Fitting the side beams and cross-beams

1 *Cross-beams (front and rear)*
2 *Bottom side beams (right and left)*

- Place cutouts in the insulation over the flue outlets and over the flow and return connections and wrap insulation around the body of the unit.
- Fasten insulation in overlapping fashion with three tension springs.
- Trim cutouts in the insulation if necessary.

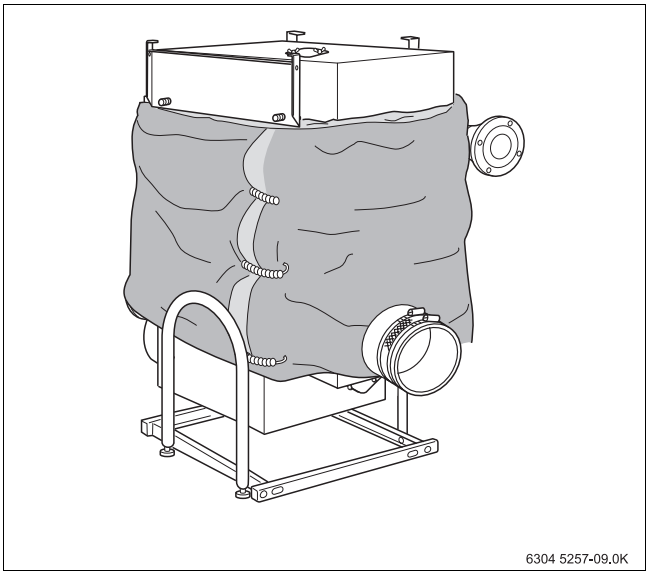

Fig. 10 Fitting the insulation

When fitting the insulation, be careful not to cover the clean-out openings on the top and sides of the flue gas distributor.

- Working from above, place the insulation over the flue gas distributor and push the right and left side ends behind the beams (Fig. 11).
- Fasten the insulation to the wrap-round insulation at front and rear with two tension springs.

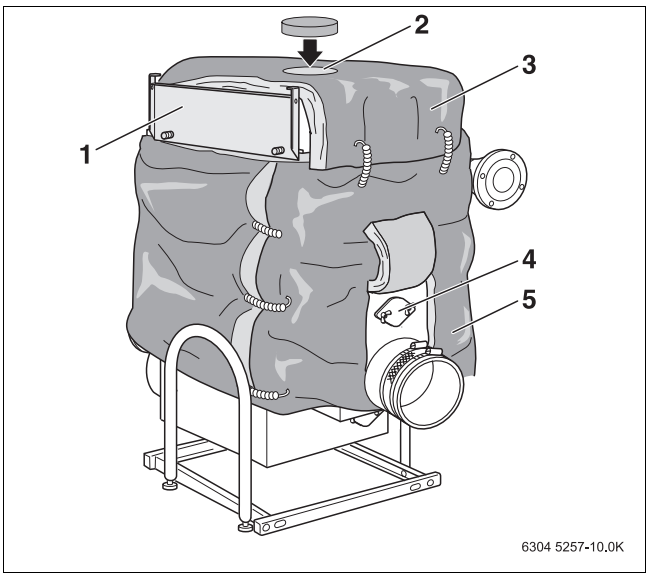

Fig. 11 Fitting the insulation/flue gas distributor

1 *Beam*
2 *Top clean-out opening*
3 *Insulation/flue gas distributor*
4 *Side clean-out opening*
5 *Wrap-round insulation*

On the side panels, be careful not to cover the opening for the flow heat exchanger (VWT).

- Hook the tops of the right and left side panels into the beams and push forward as far as they will go.
- Screw the right and left side panels into the cross-beam using two self-tapping screws each.

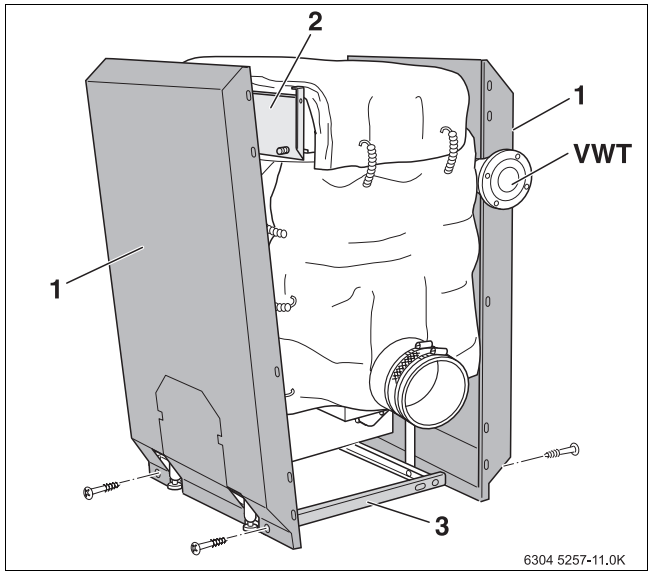

Fig. 12 Fitting the side panels

1 *Right and left side panels*
2 *Beam*
3 *Cross-beam*

On a flue gas header which has been turned through 90°, the fillet must be removed from the right or left-hand side panel to make room for the flue outlet (Fig. 13).

- Unscrew the two self-tapping screws from the fillet and side panel.
- Pull out the top, left and right fillet tabs and remove fillet.

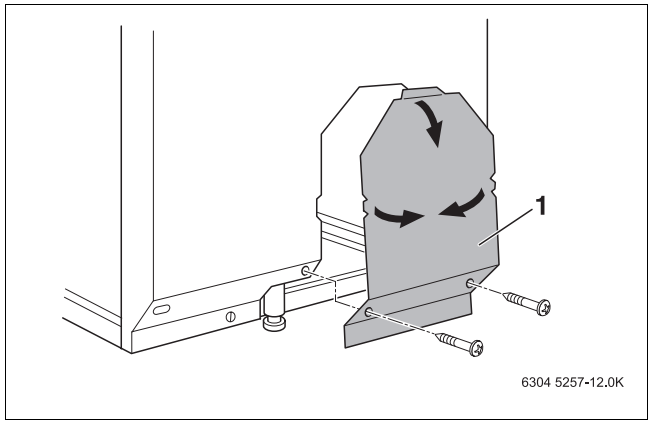

Fig. 13 Removing the fillet

1 *Fillet*

- Lay the upper rear panel against the right and left folded edges of the side panels and screw onto the folded edges of the side panels using one self-tapping screw on each side.
- Screw the lower rear panel to the right and left folded edges of the side panels with two self-tapping screws on each side.

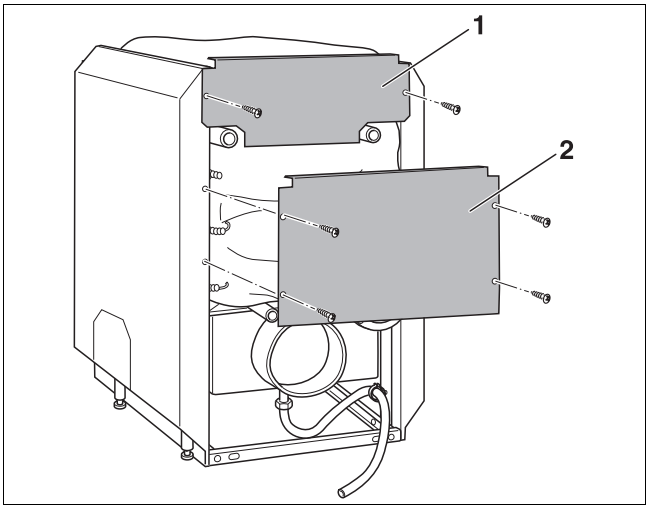

Fig. 14 Fitting the rear panel sections

1 *Upper rear panel section*
2 *Lower rear panel section*

- Place the hood with two hooks on top of the folded edges of the right and left side panels, and push forward until the hooks engage in the slots.
- Screw the back of the hood into the upper rear panel using two self-tapping screws.

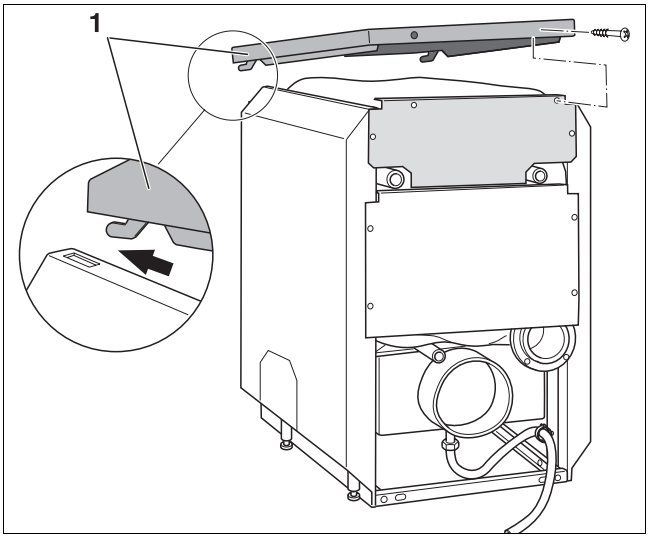

Fig. 15 Fitting the hood

1 *Hood*

The front panel sections are combined in different ways depending on the condensing unit (Fig. 16, Fig. 17, Fig. 18). The front panel sections are fitted in sequence from bottom to top (e.g. B, C, A, see Fig. 16)

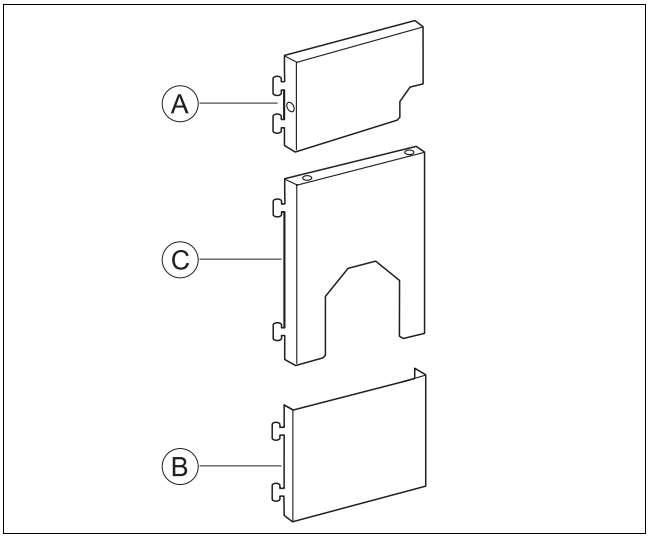

Fig. 16 Front panel sections G215B (WT30)

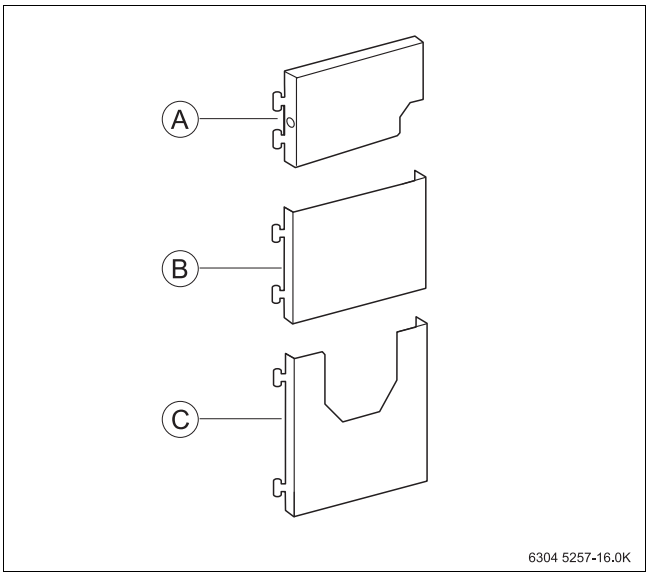

Fig. 17 Front panel sections GE315B (WT40)

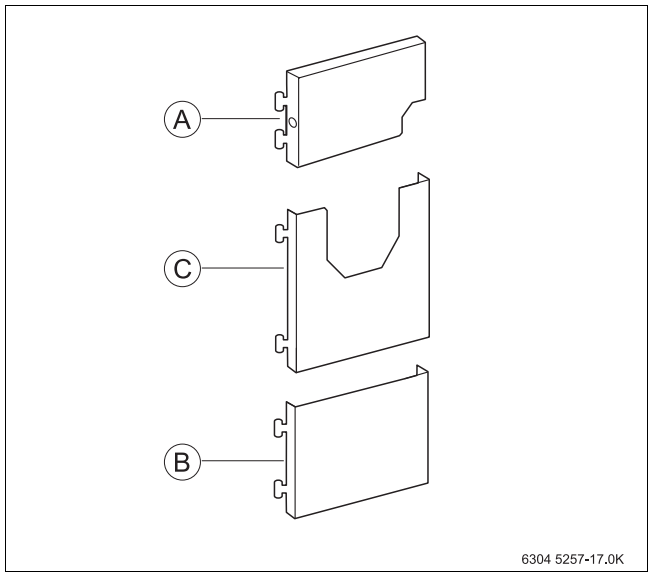

Fig. 18 Front panel sections SE425B (WT40)

- Hook all three front panel sections into the slots in the folded edges of the right and left side panels.

Data plates 2 and 3 are enclosed with the technical documentation. Data plate 2 must be compared with data plate 1 on the machine block and attached to the casing as the specific conditions will allow. Affix data plate 3 with the data for the entire condensing unit to the boiler casing.

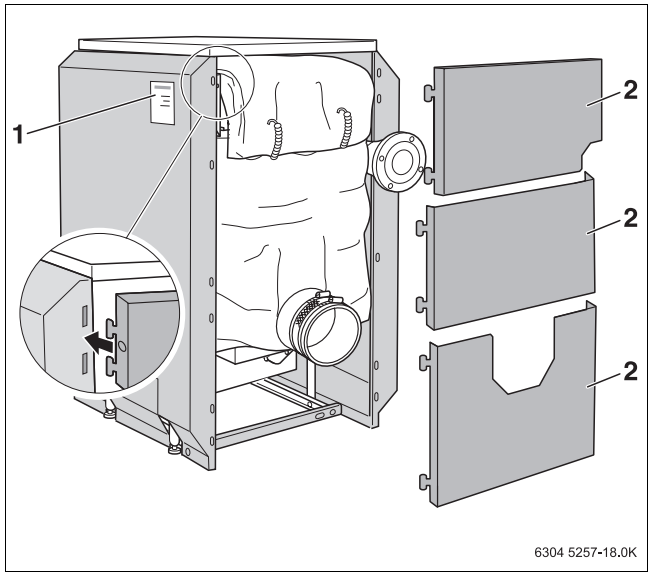

Fig. 19 Fitting the front panel sections

1 *Data plate 2*
2 *Front panel sections*

4.9 Installing the neutralisation system

Refer to the separate neutralisation system manual.

Observe ATV worksheet A251: "Condensate from condensing boilers".

Arrange the neutralisation system in such a way that there are no kinks in the hoses.

The height difference between the outlet and the drain must not exceed 2.0 metres.

- Check whether there is granulate in the neutralisation holder.
- Connect the hoses.
- Connect to the electricity supply.
- Check all connections for leaks.

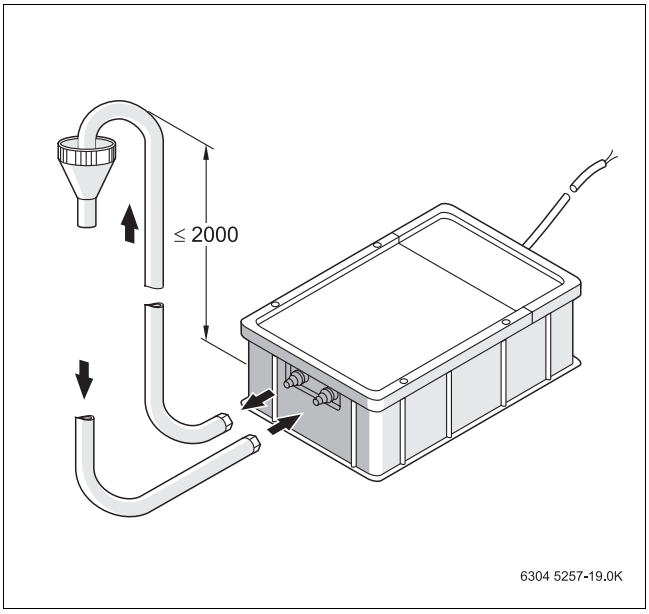

Fig. 20 Installing the neutralisation system

5 Commissioning

5.1 Before commissioning

Caution: System damage
from corrosion and sludge.

- It is essential to flush the entire heating system before filling with heating water.

5.2 Starting up the condensing unit

Start-up of the condensing unit must be carried out according to the user manuals for the boiler, burner and electronic heating circuit controller. The flue gas heat exchanger then starts up automatically at the same time.

- Note the combustion output of the condensing unit (→ Tab. 2) when setting the burner.

5.3 Shutting down the condensing unit

Shutdown of the condensing unit must be carried out according to the user manuals for the boiler, burner and electronic heating circuit controller. The flue gas heat exchanger shuts down automatically at the same time.

6 Maintenance

The operator is obliged to arrange to have the heating system cleaned and maintained on an annual basis.

The entire condensing unit including the neutralisation system must be serviced once a year.

The condensing unit must be serviced in accordance with the boiler and burner documentation.

The resulting condensing unit can be operated for up to 4 weeks as an oil low-temperature boiler if a minimum return temperature of 60 °C is maintained. After using as a low-temperature boiler and after changing the fuel from oil to gas, the flue gas heat exchanger must be cleaned carefully.

6.1 Cleaning the flue gas heat exchanger

The flue gas heat exchanger can be cleaned with brushes and/or by a wet method. Only Buderus cleaning brushes[1)] (or plastic brushes) may be used for cleaning.

1) Accessory – order separately

6.1.1 Cleaning the flue gas heat exchanger with cleaning brushes

- Fully dismantle the flue gas distributor.
- Remove any turbulators placed in the hot gas flues.
- Push the cleaning brush right through the hot gas flue so that it emerges from the end, then pull it up again.

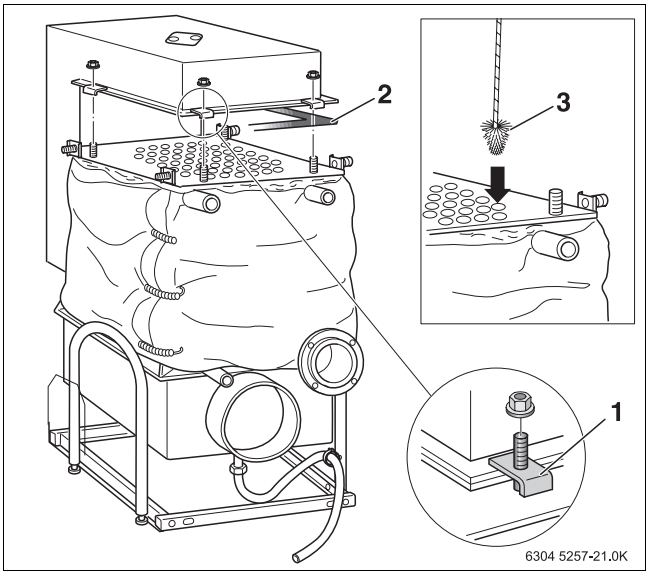

Fig. 21 Cleaning the flue gas heat exchanger

1 *Clamping angle*
2 *Silicon gasket*
3 *Cleaning brush*

6.1.2 Wet cleaning (chemical cleaning)

When wet cleaning, use a cleaning agent appropriate to the degree of soiling (encrustation or soot).

Follow the instructions for the cleaning product.

- Carry out checking and wet cleaning via the clean-out openings.

Danger: Danger to life
from escaping gases.
- Make sure the silicon gasket is positioned correctly.
- Replace any deformed silicon gaskets.
- Check all flue connections for leaks.

6.1.3 Cleaning the neutralisation system

Observe ATV worksheet A251: "Condensate from condensing boilers".

Change the granulate in the neutralisation system once a year.

Caution: Risk of burning
from used granulate containing acid.
- Observe manufacturer's safety instructions when changing the granulate.

- Carry out all maintenance operations according to the checklist on page 5.

The flue gas heat exchanger is largely immune to faults. If faults occur in the heating system, follow the instructions for the boiler, the burner and the electronic heating circuit control.

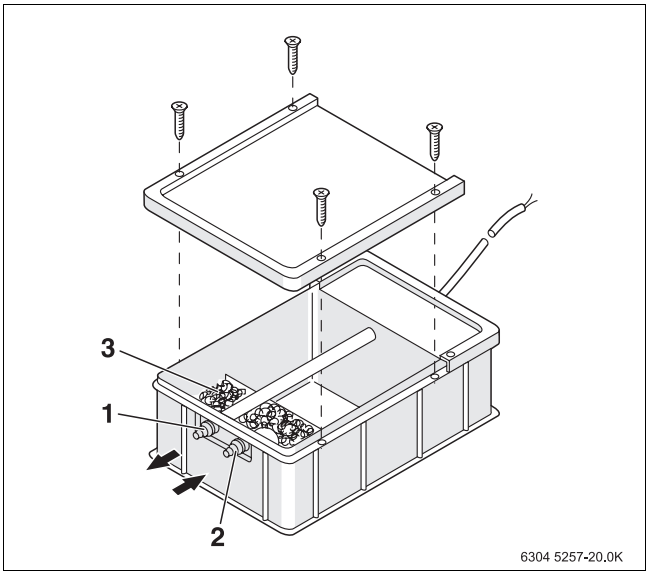

Fig. 22 Cleaning the neutralisation system

1 *Outlet*
2 *Intake*
3 *Granulate*

6.2 Checklist – Condensing unit with neutralisation system

Maintenance work carried out must be marked with an "X" in the corresponding column and confirmed by entering the date and a signature in the field with the corresponding number.

Burner and boiler maintenance must be carried out according to the relevant maintenance manual.

	Condensing unit	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**
1.	Disconnect the heating system from the electricity supply.								
2.	Close fuel stop valve, clean boiler according to maintenance manual								
3.	Remove the hood of the flue gas heat exchanger (→ Fig. 15)								
4.	Open the clean-out cover on the flue gas distributor, check and clean the flue gas distributor, if necessary remove the flue gas distributor completely (→ Fig. 11, Fig. 19)								
5.	Remove front panel/casing (→ Fig. 12, Fig. 15, Fig. 19)								
6.	Open clean-out cover in flue gas header, check/clean secondary heating surfaces on the flue gas heat exchanger (→ Fig. 11)								
7.	Unscrew neutralisation drain hose (AKO condensate drain) (→ Fig. 7)								
8.	Flush AKO condensate drain (→ Fig. 7)								
9.	Clean/replace silicon gaskets on clean-out covers and flue gas distributor (if necessary)								
10.	Close clean-out cover, screw shut, fit flue gas distributor and hood (if applicable)								
11.	Fit front panel/casing								
12.	Check flue pipe for leaks								
13.	Check the operation of the safety equipment								
14.	Check the operation of the control equipment								
15.	Start up the heating system according to the operating manual								
16.									
17.									
18.									
19.									
20.									
	Neutralisation system								
1.	Isolate neutralisation system from power supply								
2.	Detach drain hose and pump hose from the granulate container (→ Fig. 20)								
3.	Remove container cover from neutralisation system (→ Fig. 22)								
4.	Remove old granulate (dispose of with domestic waste – container can be upended through 180°), clean container								
5.	Fill with new granulate (approx. 7 litres)								
6.	Screw container cover onto the neutralisation system (→ Fig. 22)								
7.	Plug electrical connection cables into the neutralisation system								
8.	Connect hoses and check for leaks								
9.	Put the neutralisation system into operation								
10.									
11.									

Tab. 6 Checklist

Licensed company **01** Date:	Licensed company **02** Date:	Licensed company **03** Date:	Licensed company **04** Date:
Licensed company **05** Date:	Licensed company **06** Date:	Licensed company **07** Date:	Licensed company **08** Date:

Tab. 7 Continuation

Your local installer:

Buderus

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www.buderus-commercial.co.uk

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