



INSTALLATION AND CONNECTIONS

KWB Classicfire Typ CF1

CF1

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1 General Information

1.1 About this manual

This manual contains all the required information for installation by technicians. The chapter sequence corresponds to the recommended workflow. For further queries please contact your sales partner or KWB Customer Service.

KWB – Kraft und Wärme aus Biomasse GmbH including its country representatives and authorised competence partners are hereinafter referred to as KWB.

Our objective is to constantly improve our products and manuals – we would appreciate your comments and suggestions.

You can find all contact data on the KWB home page www.kwb.at.

Original manual – Subject to change. No responsibility accepted for errors and omissions!



1.2 Explanation of the Formatting

Work steps	<p>We use different symbols for the requirements, the actual work steps and the results</p> <ul style="list-style-type: none"> ↘ Requirement → Work step ↳ Result
Side text	Keywords at the left of the text columns help you identify the contents of the paragraph.
Cross references	You can recognise a reference to another section in this document by an arrow and the page number in square brackets. Example: About this manual [► 5]

1.3 Please note

1.3.1 Grading of the safety instructions

KWB protects you in the documents with the most internationally secure and modern warning system. Signal words, colours and texts change with increasing danger:

NOTE	General information We use this display to indicate and describe important information .
 CAUTION	Beginning hazard We use this display to indicate and describe beginning hazards . If these stated hazards are not observed, injuries, property damage and environmental damage can occur.
 WARNING	Medium hazard We use this display to indicate and describe hazards. If this warning is not observed, severe or fatal injuries can occur.

**DANGER****Serious hazard**

We use this display to indicate and describe **hazards**. If this warning is not observed, severe or fatal injuries occur!

1.3.2 General safety instructions

- **Do not alter the system in any way!**
- Close all provided covers before you place the system into operation!
- Unplug the connector before you perform any service or open the control!
- Always disconnect the power supply to the boiler and conveyor system (main switch) before you enter the fuel storage room.

NOTE**Proper installation by specialists**

- ↳ The entire installation, integration and commissioning of the heating system may only be carried out by expert specialists of KWB or their partners.
- All the work must conform to the specifications stated in the KWB manuals and local regulations.

Comply with the safety instructions

NOTE**Please comply with the safety instructions**

Your system has been tested for safety and it satisfies the applicable standards, directives and regulations.

Failure to comply with the safety instructions or improper use poses danger of material damage. In addition, failure to comply with the safety instructions or improper use also poses a life-threatening hazard!

Please read and follow the manual

NOTE**Please read the instructions carefully before installation or commissioning!**

Compliance with the instructions and proper installation or commissioning is a prerequisite for a warranty provided by KWB.

- If you are unsure about anything, please refer to the instructions or contact the KWB customer service.
- ↳ You will find all instructions for our heating systems in the KWB PartnerNet: <http://partnet.kwb.net/>

1.3.3 Qualification of the installation personnel

**CAUTION****Assembly and installation by unqualified personnel may lead to material damage and injuries!**

- ↳ The following applies for assembly and installation:
- Comply with the directions and notes in the instructions.
- Have the work on the system only carried out by personnel with appropriate technical skills.



Assembly, installation, commissioning and maintenance must only be carried out by qualified persons:

- Heating engineers / building services engineers
- Electrical installation engineer
- KWB Customer Service

The installation personnel must have read and understood the directions in the documentation.

1.3.4 Protective equipment of the assembly personnel

To the extent necessary or required by regulations, personal protective equipment must be used. Such obligations may also refer to the use of hazardous materials or personal protective equipment.

	<p>During transport, installation and assembly:</p> <ul style="list-style-type: none"> • Suitable work clothes • Protective gloves • Safety footwear (at least protection class S1P)
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1.4 Legal

Intellectual Property

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All catalogues, brochures, diagrams, drawings, manuals and control and adjustment programmes etc. are protected as intangible property and always remain the intellectual property of KWB. Any use, reproduction, distribution, publication, processing and/or other transfer to third parties requires the prior written consent of KWB.

When operating the contractual goods, the installation, operating and other technical regulations and instructions from KWB must be strictly observed and adhered to.

NOTE

Warranty

- The manufacturer's KWB warranty specifies proper installation and commissioning of the system as a prerequisite. Defects and damage due to improper installation, commissioning and operation are excluded from the warranty!
- The manufacturer's instructions must be complied with to ensure proper system function. Knowledge of the manuals is a prerequisite.
- Use only original parts or parts that have been expressly approved by the manufacturer.
- If something is not clear, please look it up in this manual or contact the KWB customer service.

Liability / Warranty

Any change and / or modification of the contractual goods or in the operation of the contractual goods not expressly authorised by KWB in writing or their operation in conjunction with other devices or accessories the compatibility of which has not been expressly confirmed by KWB, any inappropriate operation/use (e.g. the use of fuels and/or water not in accordance with standards which do not correspond to VDI 2035 or ÖNORM H 5195-1; inappropriate and / or

excessive use) leads to the exclusion of the warranty. Any liability or warranty for compatibility of the contractual goods with other products, systems, plants or parts, as well as the suitability thereof for a specific use shall be excluded unless expressly permitted in writing.

Intended use

KWB boilers heat water for central heating systems. The application, operation, maintenance and repair of KWB systems must, without exception, be performed as described in the instructions.

Only the fuels specified in the Operating instructions in Section **Intended fuels** [► 79] may be used without exception.

Any other use shall be deemed IMPROPER. The responsibility for resultant damage shall lie with those who operate and use the system.

1.5 Structural measures

NOTE

Establishing the constructional requirements

- Compliance with the locally applicable regulations, and proper execution of the structural measures lies solely within the system owner's sphere of responsibility and is a prerequisite for the guarantee and warranty requirement.
KWB does not accept any liability, nor does it offer any warranties for any type of constructional measures.
- Comply with all locally applicable, legal, submission, construction and implementation regulations when creating the structural requirements! In addition, comply with KWB installation guidelines!
- Without laying claim to an exhaustive treatment of the issue at hand and without suspension of any conditions imposed by the authorities, we recommend the Austrian preventative fire protection directive TRVB H118 and the ÖKL technical bulletin No. 56 and No. 66 in the applicable version.

1.5.1 Boiler room requirements

Floor:

- Concrete, bare or tiled
- Even, horizontal
- Dry
- Able to carry max. load
- Non-flammable (Flammability classification A1 pursuant to EN 13501)

Customer-provided fire protection

Building part	Fire protection design according to EN 13501
Floor, walls	fire resistant: REI 90
Bearing walls, floors, roofs	fire resistant: REI 90
Horizontal supports and other supports	R 90
Boiler room door	fire retardant: EI ₂ 30 c opening in escape direction, closing automatically
Connecting door to the fuel storage room	fire retardant: EI ₂ 30 c; closing automatically
Heating room windows	fire retardant: E 30; not to be opened

- NO storage of flammable agents in the boiler room.

Fire extinguisher	<ul style="list-style-type: none"> • NO direct connection to rooms in which flammable gases or liquids are stored (Garage, storeroom etc).
Lighting, electrical system	<ul style="list-style-type: none"> • Place a portable fire extinguisher of the specified size (at least 6 kg fill weight EN 3) outside of the boiler room next to the boiler room door. • Make sure permanently installed lighting and an electrical supply line to the heating system are available. • Place the light switch at an easily accessible location outside the boiler room next to the boiler room door. • Leave sufficient reserve cable in the boiler room in case you wish to connect the boiler with other bus participants.
Ventilation	<ul style="list-style-type: none"> • Two air vents must be installed; one close to the ground and one close to the ceiling; the air intake opening must lead directly into the open. If other rooms must be crossed to do this, this air duct must have an envelope according to EI 90 (EN 13501)! • The size of the non-closing opening is dependent on the rated power of the heating system: Calculate the opening with 5 cm² per kW, but no less than 400 cm². • Fit a protective grille with a non-flammable mesh width <5 mm on the outside of ventilation openings into the open. • When installing the openings and air ducts, you must ensure that no outside and weather-related influences (leaves, snow, ...) impair the air flow. • Do not use any chlorine-containing cleaning or operating agents (e.g. chlorine gas plant for swimming pools) or hydrogen halides in the boiler room. • Keep all boiler air intake openings free of dust. • If not specified otherwise in the applicable provisions regarding the structural equipment of the boiler room, the following standards apply for the design and dimensioning of the air ducts:
Note on standards:	ÖNORM H 5170 – Construction and fire-protection requirements
Frost protection	<ul style="list-style-type: none"> • Provide frost protection for all water lines and district heating pipes.
Room temperature	<ul style="list-style-type: none"> • Ensure a minimum temperature of 10°C in the boiler room as stipulated in EN 12831. Lower temperatures change the lubricating characteristics to an extent that the reliable operation of the drive aggregates would no longer be ensured. • Ensure a maximum temperature of 40 °C.
Safety	<p>→ Do not store flammable materials in the boiler room. Avoid direct connections to rooms in which flammable gases or liquids (e.g. parking garage) are stored.</p> <p>→ No flammable items must be placed on the boiler for drying purposes (e.g. clothing, ...).</p> <p>→ The system must be protected against damage from and nesting of animals (rodents, ...).</p>
Protection against rodents and other animals	
Sea level	→ Please contact the manufacturer if the boiler is to be installed at more than 2000 metres above sea level.

1.6 Implementation advice

1.6.1 Notes on standards

The installation and commissioning of the system must be carried out in accordance with fire protection and building-code regulations. If not regulated otherwise on a national level, the following standards and regulations apply in their most recent version:

General standards for heating systems

EN 303-5	Heating boilers for solid fuels, manually and automatically stoked boilers, nominal heat output up to 500 kW
EN 12828	Heating systems in buildings - Design for water-based heating systems
EN 13384-1	Chimneys - Thermal and fluid dynamic calculation methods Part 1: Chimneys serving one heating appliance
ÖNORM H 5151	Design of central hot water heating system with or without hot water generation
ÖNORM M 7510-1	Directives for the inspection of central heating systems Part 1: General requirements and one-time inspections
ÖNORM M 7510-4	Directives for the inspection of central heating systems Part 4: Simple inspection of boiler systems for solid fuels

Standards for building code-related installations and safety-related equipment

ÖNORM H 5170	Heating system - Requirements to building and safety technology as well as fire and environmental protection
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Standards for heating water generation

ÖNORM H 5195-1	Prevention of damage from corrosion and lime scale formation in hot water heating systems with operating temperatures of up to 100 °C (Austria)
VDI 2035	Prevention of damage in hot water heating systems (Germany)
SWKI BT 102-01	Water quality for heating, steam, cooling and a/c systems (Switzerland)
UNI 8065	Technical standard regulating hot water generation. DM 26.06.2015 (Ministerial order with minimum requirements) Comply with provisions of the standard and the respective amendments.

Regulations and standards for permissible fuels

1. BImSchV	First ordinance of the German Federal Government for the execution of the German Federal Emission Protection Regulation (BImSchV) (Ordinance on Small and Medium Combustion Plants) – as promulgated on 26 January 2010, BGBl. 2010 Part I No.4
EN ISO 17225-3	Solid biofuels, fuel specifications and classes Part 3: Wood briquettes for non-industrial use
EN ISO 17225-5	Solid biofuels, fuel specifications and classes Part 5: Log wood for non-industrial use

1.6.2 Heating system installation and approval

The boiler must be operated in a closed heating system. The installation is based on the following standards:

Note on standards

EN 12828 – Heating systems in buildings

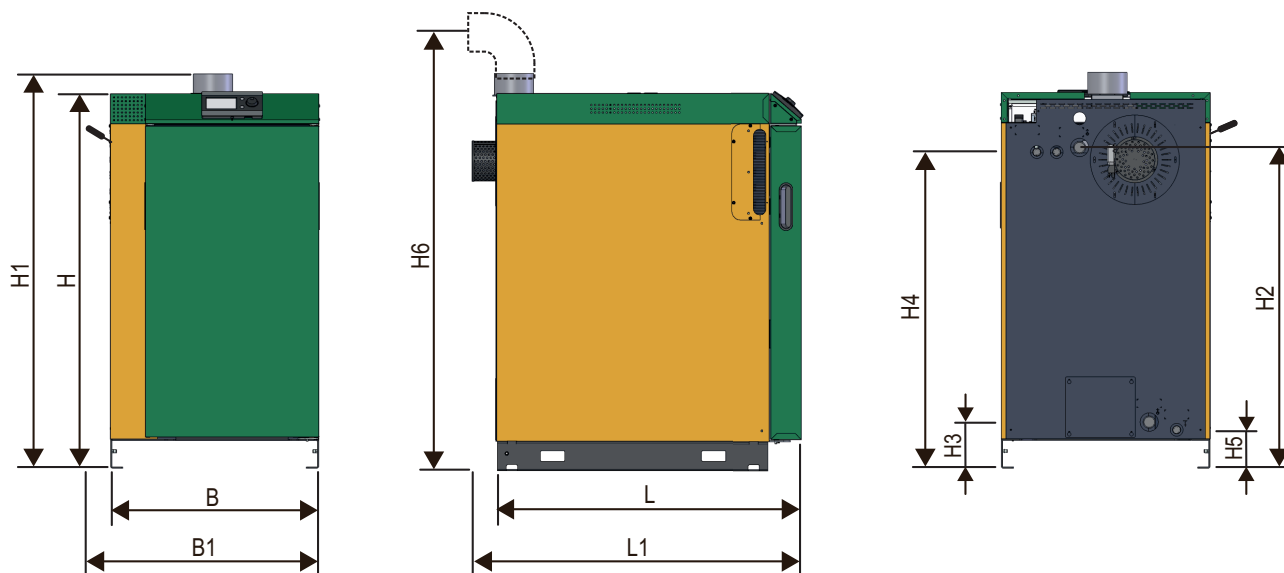
Note: Every heating system must be approved!

The installation or conversion of a heating system must be reported to the supervisory authority (monitoring authority) and must be approved by the building authority:

- **Austria:** report to the building authority of the municipality / magistrate
- **Germany:** report to the chimney sweep/building authority

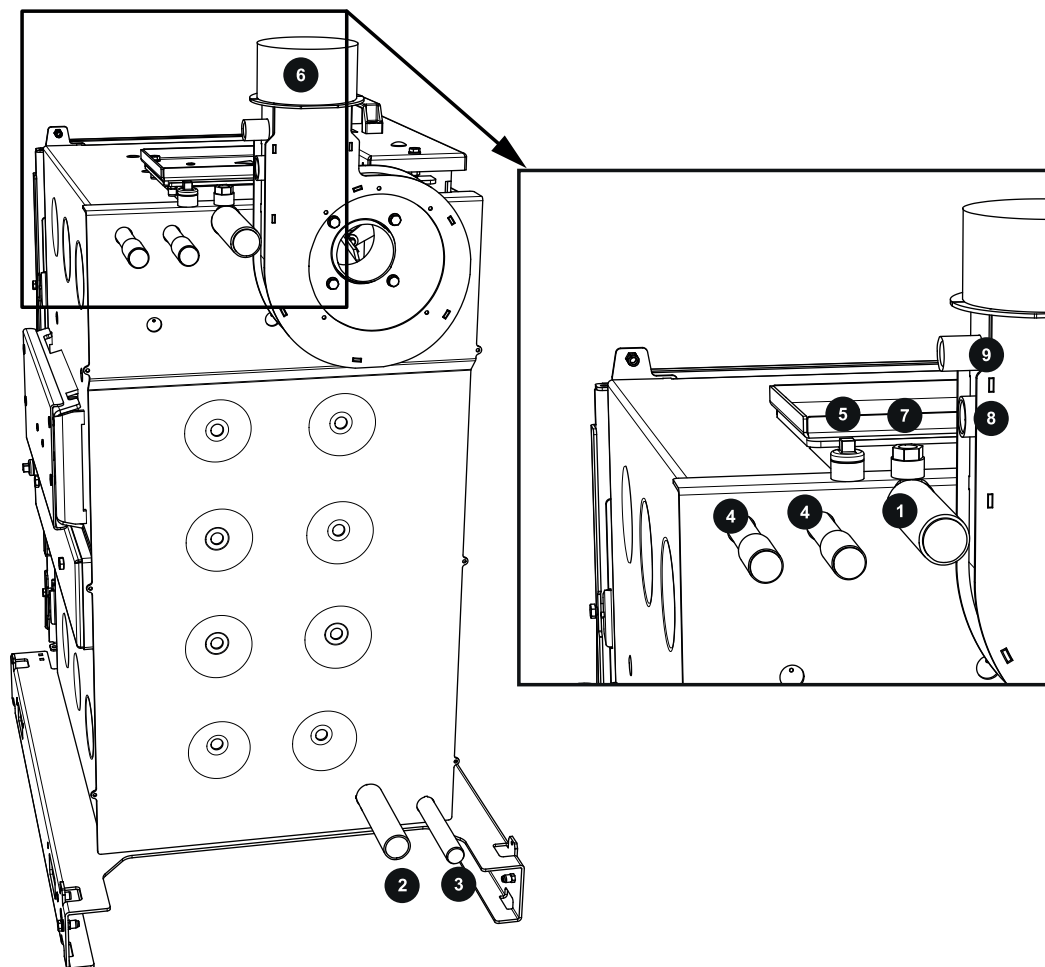
2 Technology

2.1 KWB Classicfire type CF1 dimensions



Dimensions	Designation	Value
L	Boiler length	1000 mm
L1	Total length incl. induced draught fan	1080 mm
B	Width, boiler	685 mm
B1	Boiler width incl. lever for heat exchanger cleaning	790 mm
H	Boiler height	1235 mm
H1	Total height incl. exhaust gas nozzle	1300 mm
H2	Connection height, forward flow	1055 mm
H3	Connection height, return flow	150 mm
H4	Connection height, thermal safety valve	1040 mm
H5	Connection height, emptying	125 mm
H6	Connection height, exhaust gas pipe	1450 mm

2.2 Components and connections



Item	Designation	Value
1	Connection, boiler forward flow	1 inch
2	Connection, boiler return flow	1 inch
3	Connection, emptying	1/2 inch
4	Connections, thermal safety valve	1/2 inch
5	Immersion sleeve for thermal discharge safety valve (to be provided on the part of the building site)	1/2 inch
6	Connection, exhaust pipe	129 mm
7	Immersion sleeve for boiler temperature sensor and safety temperature limiter (STL)	1/2 inch
8	Connection, broadband lambda probe	3/4 inch
9	Connection, exhaust temperature sensor	1/2 inch

3 Before you begin

3.1 Screw connections, dimensions

Take the following information into account during the entire assembly process:

Information on screw connections

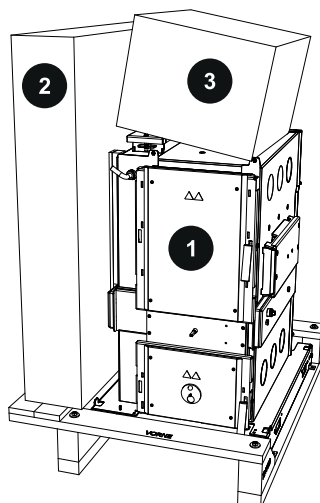
Generally, we use hexagonal nuts with flange for fastening. You can also first use a washer, then a lock washer and then a nut.

Information on dimensions

All dimensions are provided in millimetre (mm) unless specified otherwise.

3.2 Scope of delivery

The boiler is delivered on a pallet together with its casing/insulation, control and accessories. The components are partially packaged in cardboard.



1	Boiler
2	Casing / insulation
3	Control system

Accessories (without illustration):

- Induced draught fan and seals
- Cleaning devices

3.3 Bringing in the parts

- Handle the packaging units with care:
The casing parts might get scratched!

3.3.1 Door width

The following door widths are required to move a KWB Classicfire type CF1 into the room:

Unobstructed door width

KWB Classicfire type CF1	
Door width at least	700 mm
Door height at least	1400 mm

3.3.2 Weights

**WARNING**

Fatal crushing (pulled muscles) caused by heavy components! Inappropriate lifting/transporting can lead to fatal injury and serious damage to the equipment.

- **Only trained staff** may lift/transport heavy components!
- **Keep the component weight in mind – handle accordingly:**
 - Verify transport securing devices BEFORE lifting / transporting!
 - Keep the centre of gravity in mind - always secure components to prevent slipping and tilting!
 - Select stable bases, suitable tools and assistance from staff!
 - Lift with your back straight, NOT too heavy.
 - Use your personal protection equipment[PSA].
 - In difficult areas ensure that people and system are safe!

Weights KWB Classicfire type CF1

Type	Weight [kg]	
	15 kW	20 kW
Boiler body	367 kg	367 kg
Total weight	455 kg	465 kg

3.4 Temporary storage

If the installation is carried out at a later point in time:

- Store the components dust-free and dry at a protected location

Note: Humidity and frost may damage the components, particularly electrical parts!

3.5 Tools

Supplied tools

NO tools are supplied.

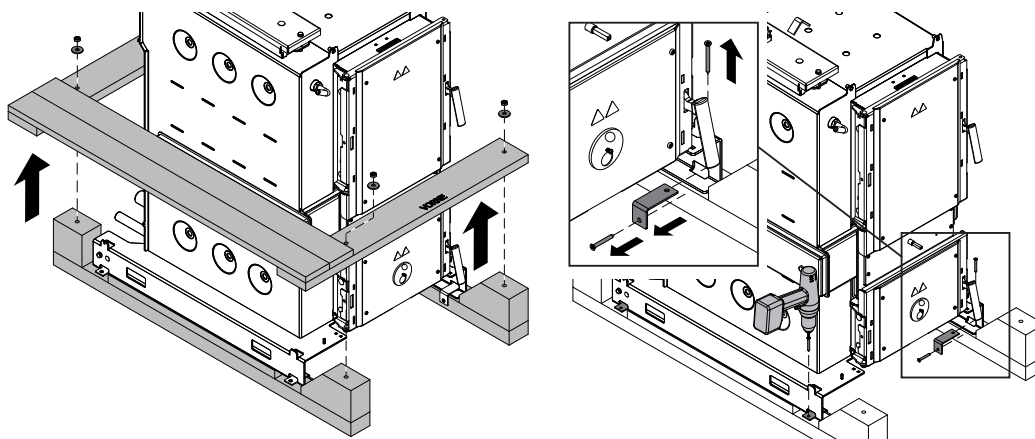
Required tools (NOT supplied):

- Silicone and silicone gun
- Cutter (knife)
- A cordless screwdriver is recommended.

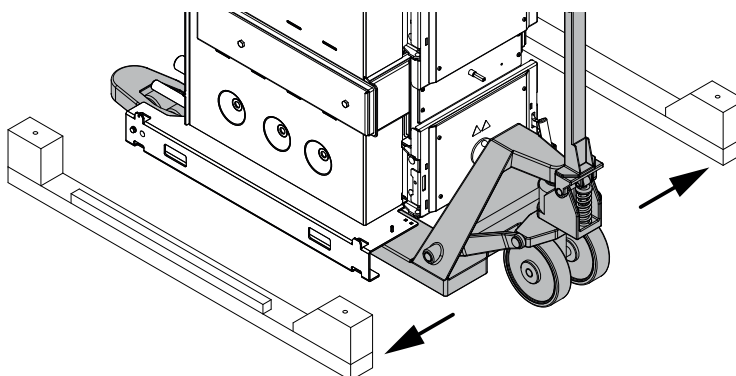
3.6 Set-up in the boiler room

3.6.1 Remove the boiler from the palette

- Lift the cardboard box containing the casing from the palette
- Take the cardboard box containing the boiler control and store it in a safe place



- Remove nuts M10 with shims from the upper frame of the palette
- Remove the upper frame of the palette
- Remove the wooden screws (T30) and the clamping angles

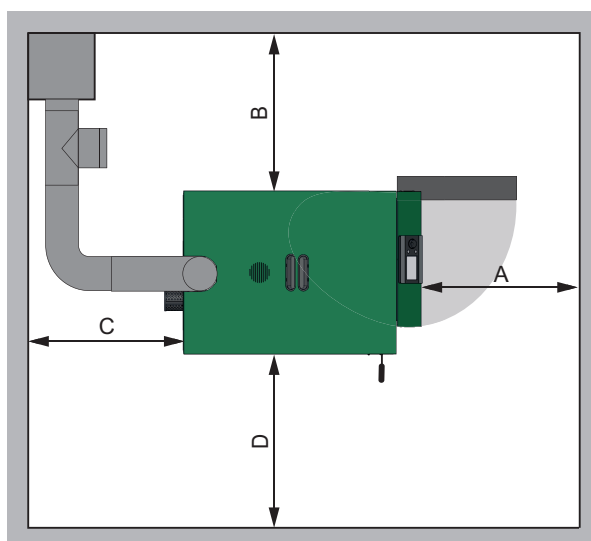


- Lift the boiler using a lifting truck or a similar lifting aid with the respective payload and remove the lower struts of the palette
- Transport the boiler to the intended place in the boiler room

Note: Observe recommended distances in the boiler room!

3.6.2 Recommended distances in the boiler room

- Generally, the system should be placed so that it can be approached from all sides and permits quick, trouble-free maintenance!
- Regional regulations regarding necessary maintenance areas for the chimney inspection must be complied with in addition to the specified minimum distances!
- Always comply with the respectively applicable standards and regulations when installing the system!
- Comply with additional standards for acoustic insulation (ÖNORM H 5190 - Acoustic insulation measures)!

Recommended distances:

Dimensions	Designation	Value
A	Clearance – front side to wall	80 cm
B	Clearance – boiler side to the wall	20 cm
C	Clearance – rear side to the wall	40 cm
D	Clearance – boiler side to the wall	50 cm
-	Minimum room height	200 cm

4 Prepare boiler

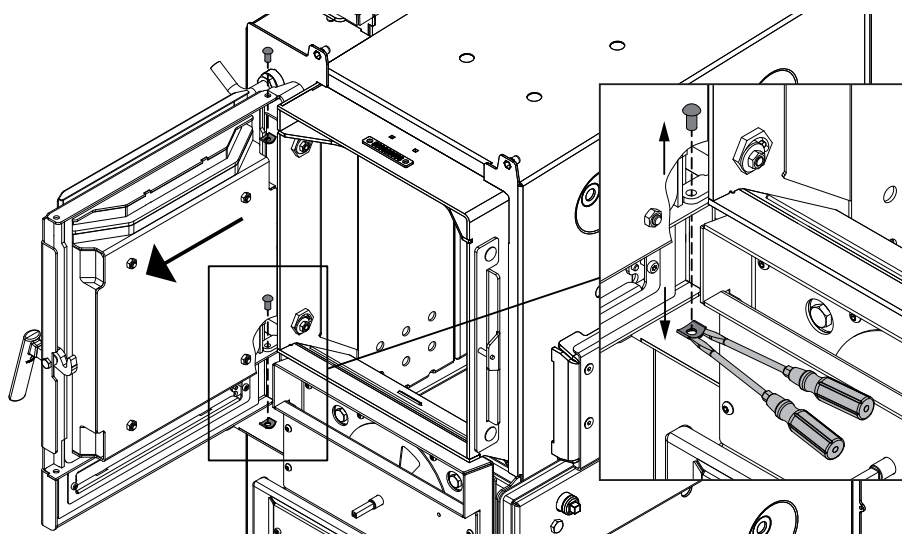
4.1 Change door hinges (if required)

The boiler is delivered with the door hinges on the right. If the side with the door hinges needs to be changed, please proceed according to the following steps.

Changing the hinge of the fill room door

The changing of the door hinge is shown below using the fill room door as an example. Perform these steps in the same way to change the combustion chamber door hinge!

→ Open fill room door

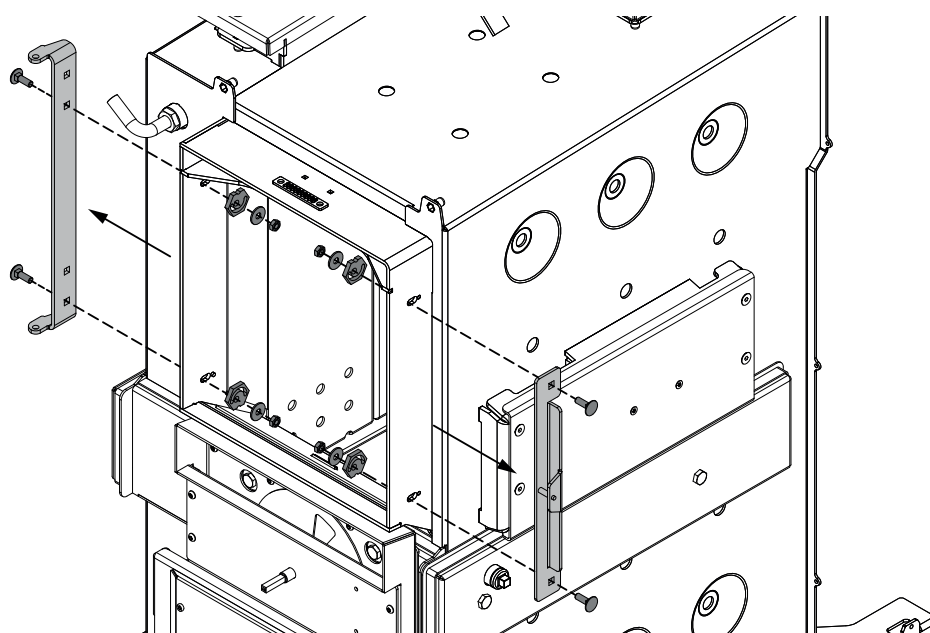


→ Loosen the pin retention at the top and bottom door hinge bolts

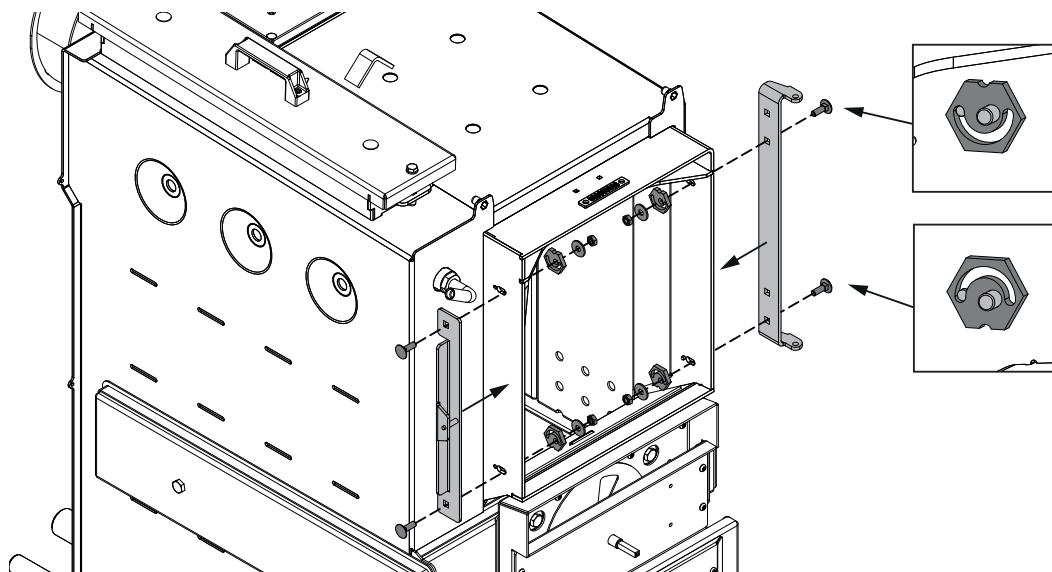
↳ Bend the safety plate slightly outward to be able to remove it, e.g. using two screw drivers

→ Remove the top and bottom hinge bolts

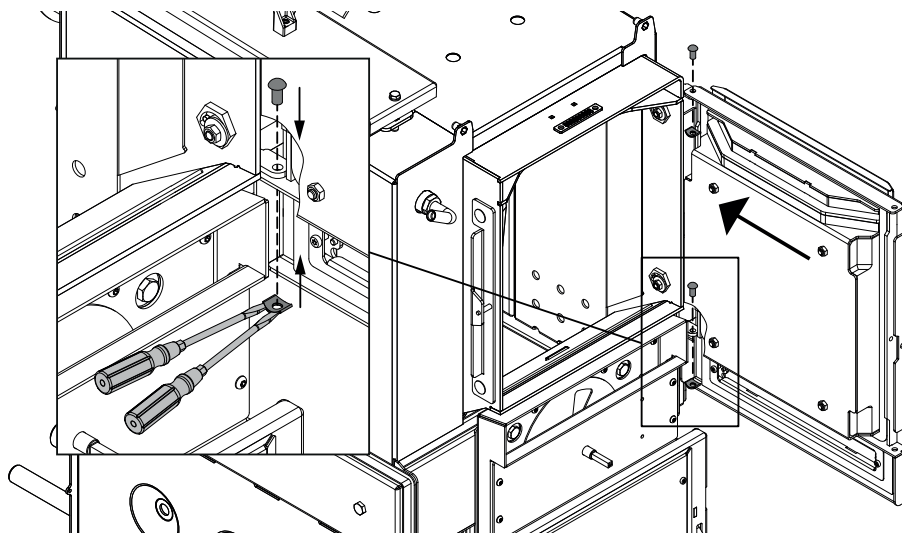
→ Remove fill room door



- Dismantle the locking plate and hinge
 - ↳ To achieve this, loosen the eccentric clamp and self-locking nut M8
- Install the hinge on the opposite side



- Re-install the eccentric clamp as illustrated on the top and bottom and fasten with insulating washer and self-locking nut M8
- Install the locking plate on the opposite side
- Fasten the insulating washer and self-locking nut M8 as shown on the top and bottom using the eccentric clamp

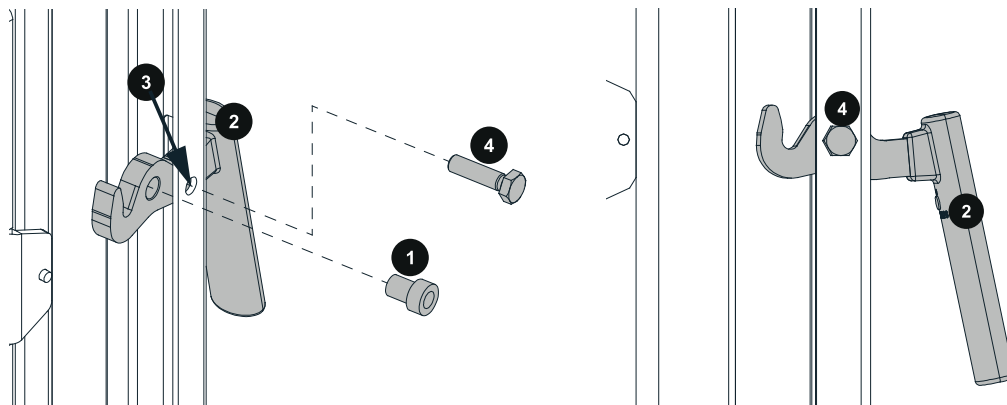


- Install the door with the hinge on the other side
- Fasten using the top and bottom hinge bolts
- Re-install the pin retention at the top and bottom hinge bolts
 - ↳ Use, for example, two screw drivers for this

Note: If the door hinges were switched, the doors must be inspected for leak tightness and adjusted, if required (see **Checking the seal of the doors** [► 19] and **Adjusting the doors** [► 20]).

4.2 Mounting the door handles

The door handle installation is shown below using the fill room door as an example. Perform these steps in the same way to install the door handles for the combustion chamber door!

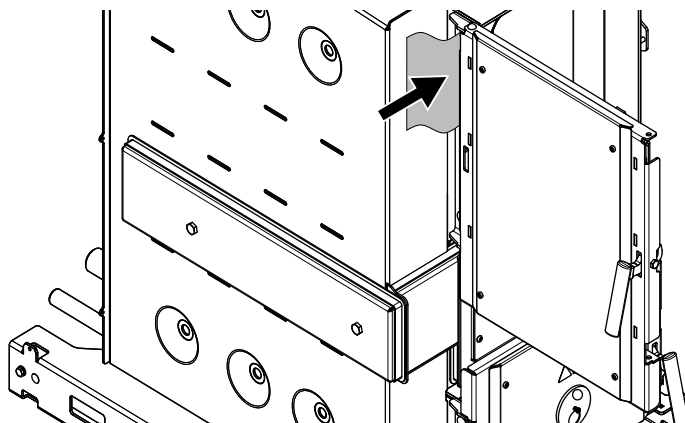


- Insert the collar bush (1) in the door handle (2) and position the door handle (2) at the respective bore hole (3)
- Fasten the door handle (2) with a hexagon head screw M8 x 30 (4)

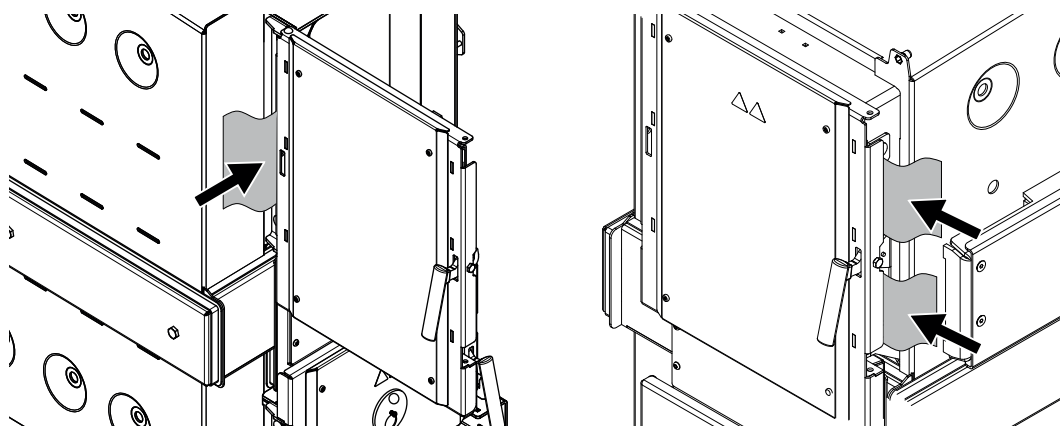
4.3 Checking the seal of the doors

Note: The door tightness check is shown below using the fill room door as an example. Perform the same steps when checking the tightness of the combustion chamber door!

- Push a piece of paper between door and boiler (at the side of the door hinge in the upper part of the door).



- Close the door.
- Try to pull out the sheet of paper.
 - ↳ If the sheet cannot be pulled out:
Door is tight and correctly adjusted!
 - ↳ If the sheet can be pulled out:
Door is not sealed tightly and must be newly adjusted!
- Increase the contact pressure at the eccentric clamp (see section "**Türen einstellen**" [► 20]).
- After adjusting the door, check its tightness again.

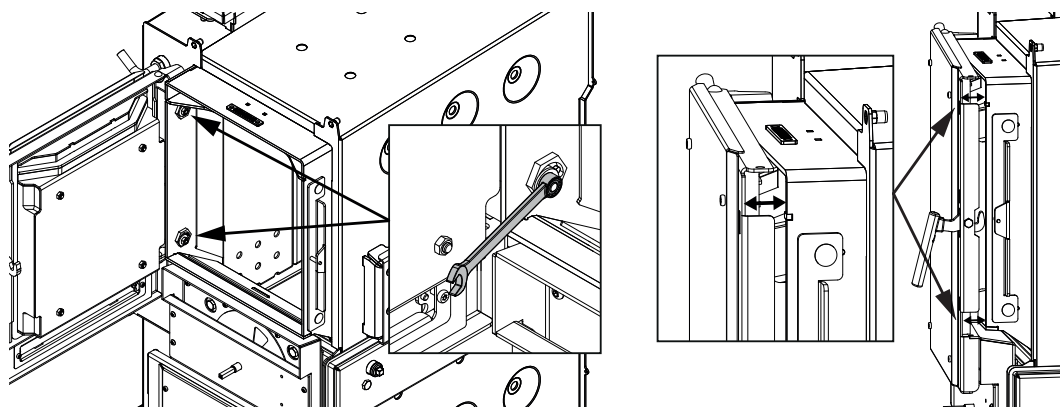


→ Repeat the same approach at the door hinge side in the lower part of the door and on the door handle side.

4.4 Adjusting the doors

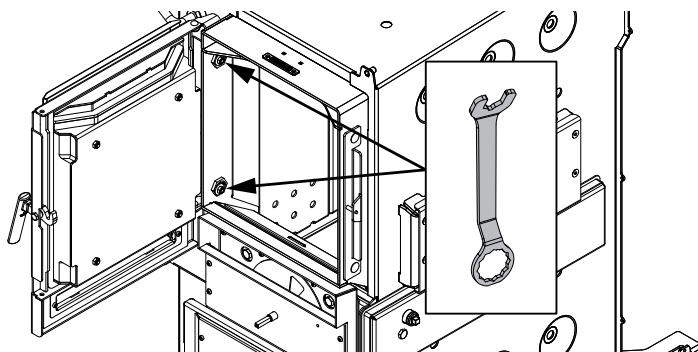
Note: The adjustment of the doors is explained below using the fill room door as an example. Perform the same steps when adjusting the combustion chamber door!

→ Loosen the self-locking nuts M8 at the eccentric clamps at the top and bottom using a hexagonal wrench (wrench opening 13 mm).



→ Close the door.

↳ With a gap of approx. 2 – 3 cm, a noticeable resistance must be felt.



→ If the resistance is too low or too high, move the eccentric clamp backward or forward using the supplied wrench (WO 32 mm).

↳ The hinge plate is shifted as a result of the eccentric clamp moving and it is possible to adjust the contact pressure.

Attention: Both eccentric clamps (top and bottom) must be adjusted in the same way!

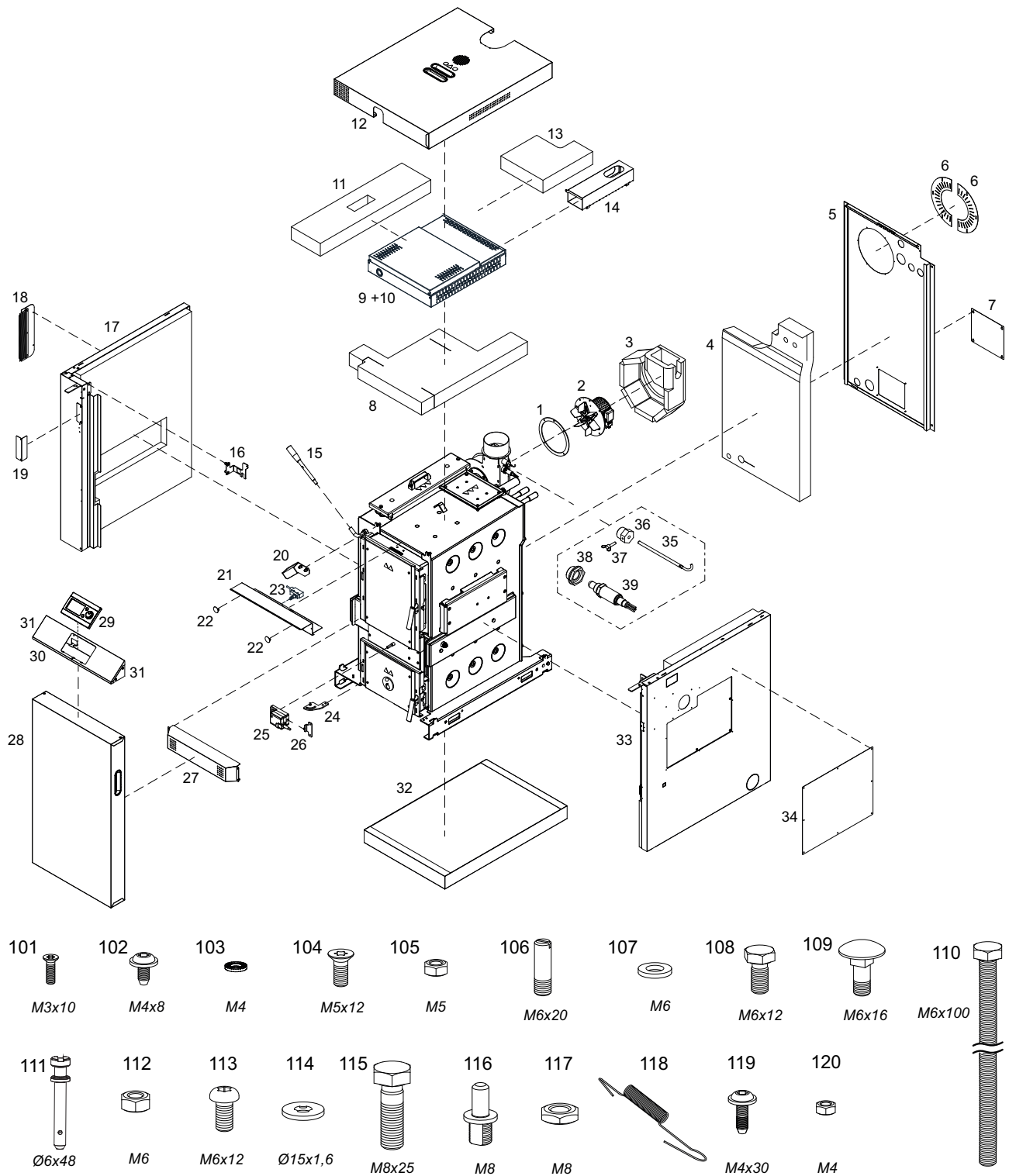
- Close the door.
- If it is not possible to close the door, move the eccentric clamps somewhat forward.
Attention: Both eccentric clamps (top and bottom) must be adjusted in the same way!
- Re-fasten the self-locking nuts M8.

It is also possible to shift the locking plate on the door handle side using the eccentric clamp and thus adjust the contact pressure on this side.

5 Installation

5.1 Mounting the boiler

5.1.1 Installation overview

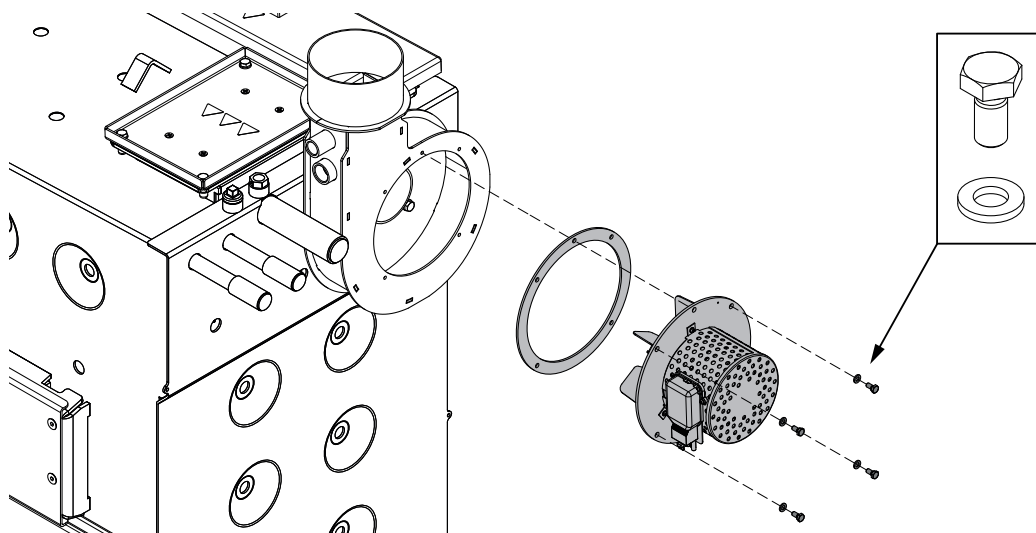


Item	Pcs.	Designation	Item	Pcs.	Designation
1	1	Glass-fibre seal, induced draught fan	21	1	Cover with door contact switch
2	1	Induced draught fan SPG ø180	22	2	Plastic plug
3	1	Induced draught housing heat insulation	23	1	Door contact switch
4	1	Rear part insulation	24	1	Insulation door mounting
5	1	Rear part	25	1	Servomotor
6	2	Induced draught cover	26	1	Torque support, servomotor
7	1	Boiler return flow cover	27	1	Air flow control cover
8	1	Boiler top heat insulation	28	1	Insulation door
9	1	Control box, full	29	1	KWB Exclusive control unit
10	1	Control box, cover	30	1	Control unit, bracket
11	1	Heat insulation, cleaning cover	31	2	End caps, control unit mounting bracket
12	1	Top casing part	32	1	Floor insulation
13	1	Heating insulation, reversal chamber cover	33	1	Side part, right
14	1	Cable duct	34	1	Cover
15	1	Lever for heat exchanger cleaning	35	1	Exhaust temperature sensor
16	1	Control box mounting bracket	36	1	Socket, exhaust temperature sensor
17	1	Side part, left	37	1	Wing screw, exhaust temperature sensor
18	1	Cover with brush	38	1	Socket, broadband lambda probe
19	1	Cover for the heat exchanger cleaning lever	39	1	Broadband lambda probe
20	1	Stop for the heat exchanger cleaning lever			

Item	Designation		Item	Designation	
101	Counter-sunk head screw M3 x 10	T10	111	Bolt Ø 6 x 48	
102	Lens head screw M4 x 8, black galv.	T20	112	Hexagon nut M6	SW10
103	Contact disk M4		113	Lens head screws M6 x 12	T30
104	Counter-sunk head screw M5 x 12	T25	114	Lock washer, polyethylene Ø 15 x 1,6	
105	Hexagonal nut M5		115	Hexagonal screw M8 x 25	SW13
106	Headless screw M6 x 20		116	Bolt M8	
107	Insulating washer M6		117	Hexagonal nut M8 flat	SW13
108	Hexagonal screw M6 x 12	SW10	118	Tension spring	

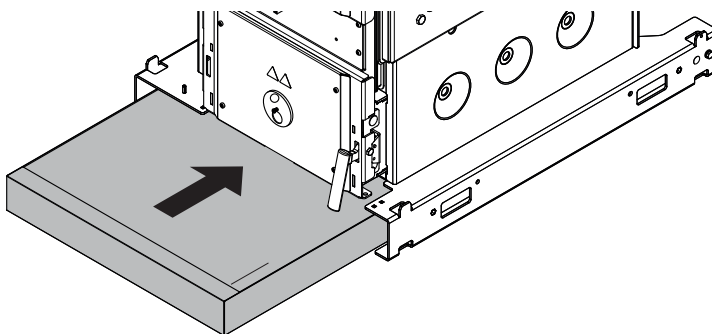
Item	Designation	Item	Designation
109	Saucer head screw M6 x 16	119	Lens head screw M4 x 30, galv.
110	Hexagonal screw M6 x 100	SW10	120 Hexagonal nut M4

5.1.2 Mount the induced draught fan

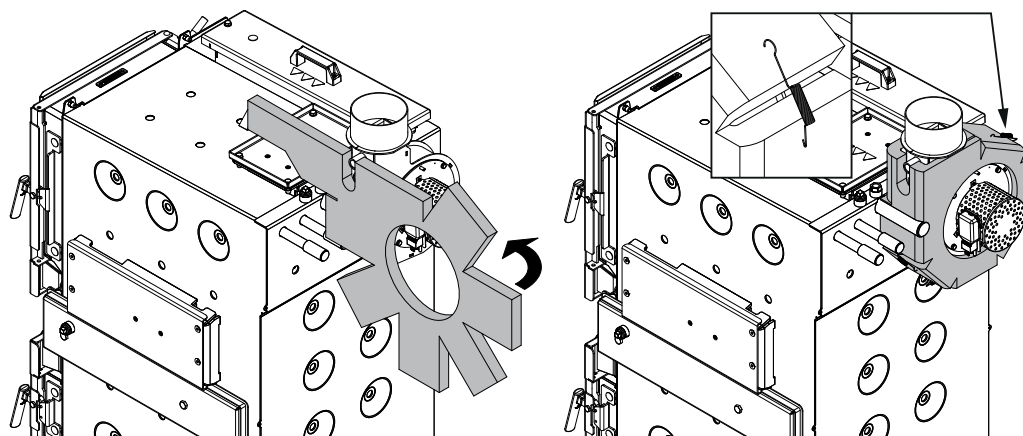


- Hook the glass-fibre seal for induced draught fans into the headless screw
- Fasten the induced draught fan with four hexagonal screws M6 x 12 incl. washers

5.1.3 Install the casing

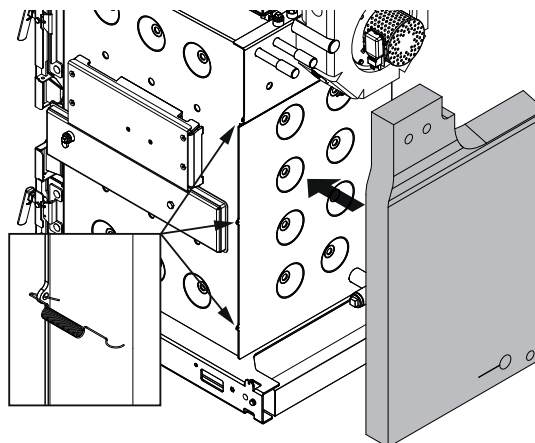


- Push the floor insulation from the front under the boiler



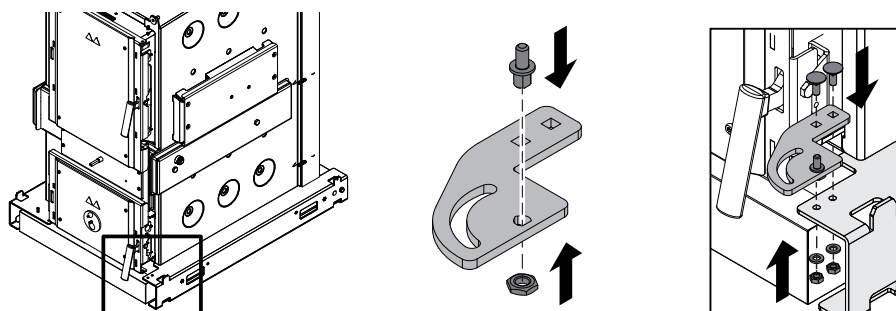
→ Thread in the heat insulation at the induced draught fan housing and fasten with tension springs

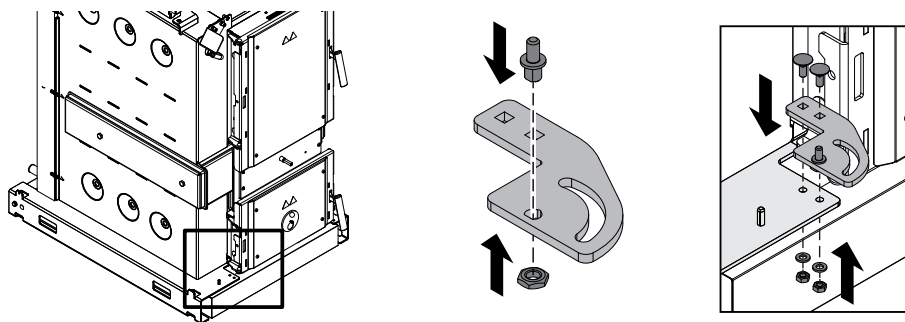
↳ Position the small recess on top at the connections for the broadband lambda probe and the exhaust gas temperature sensor



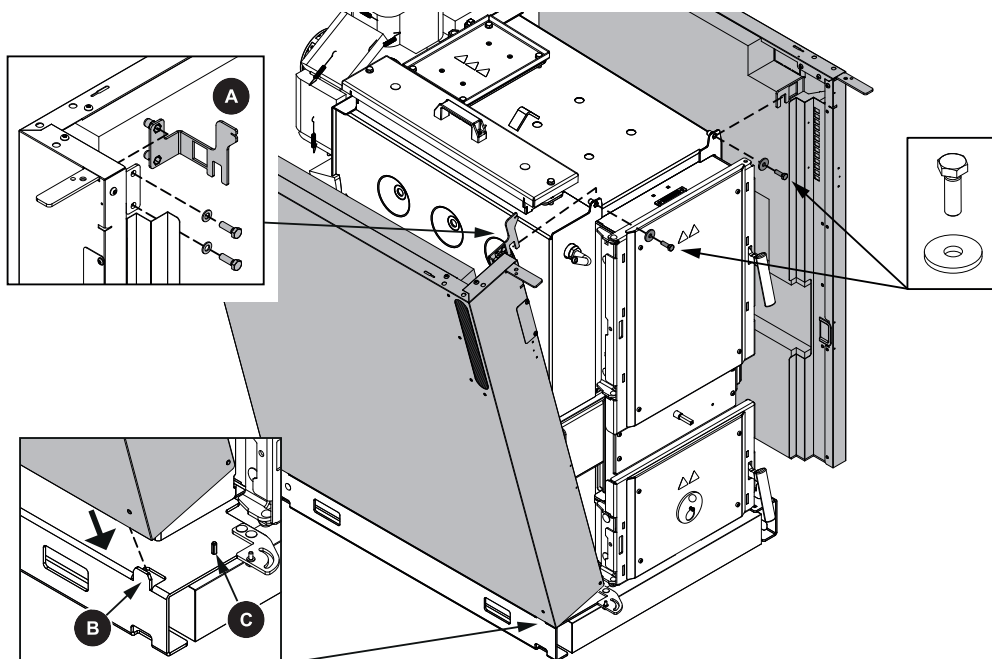
→ Position the rear heat insulation at the rear wall and fasten to the boiler using tension springs

Door hinge on the right

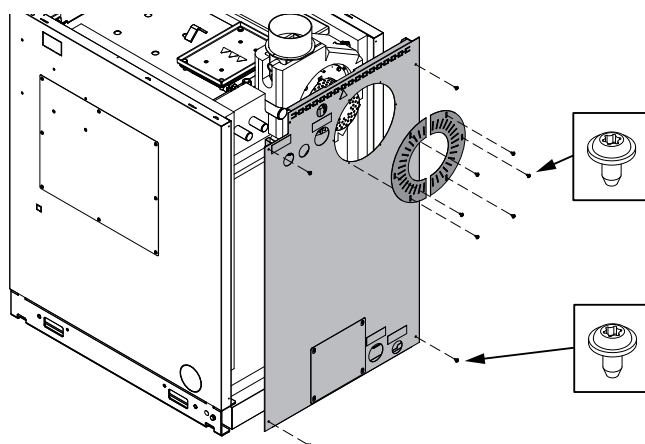


Door hinge on the left

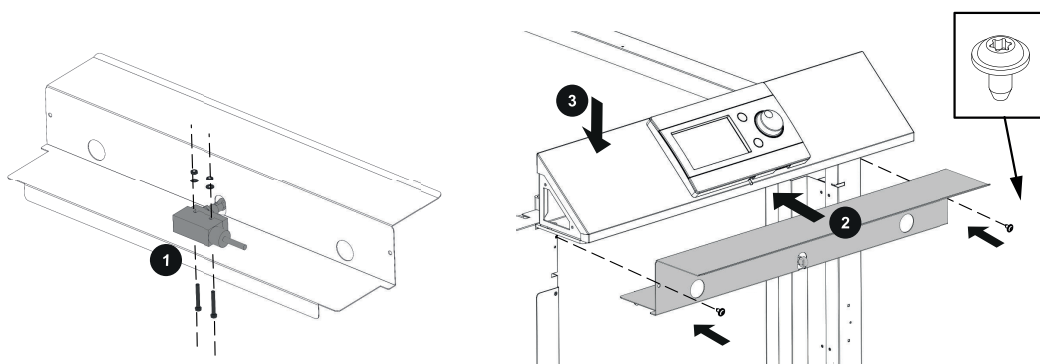
- Screw in bolt M8 and nut as illustrated at the supplied door mounting plate
- Place the entire door mounting on the boiler floor and fasten with two saucer head screws M6 x 16 incl. washers and nuts from the above.



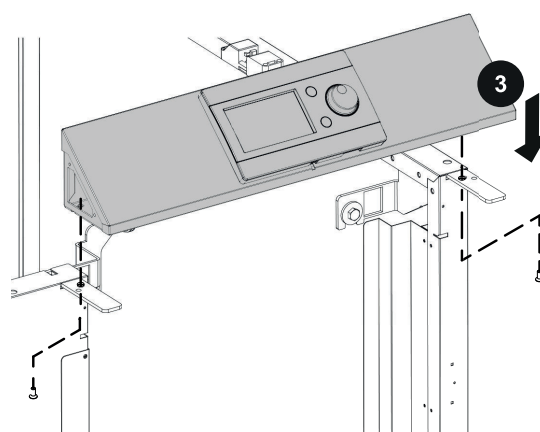
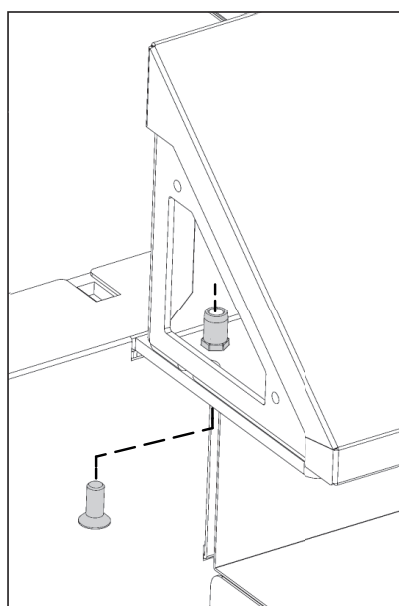
- Fasten mounting bracket (A) with two hexagonal screws M8 x 25 incl. washers at the left side panel
- Fasten side panels to the left and right of the boiler
 - ↳ In this process, first insert the bottom part into the side tabs (B) of the boiler floor
- Hook the left side part additionally into the front securing bolt (C)
- Fasten the side parts to the boiler using the mounting brackets
 - ↳ Screw the two hexagonal screws M8 x 25 only loosely in



- Hook in the rear panel and fasten with the four lens-head screws M4 x 8
- Fasten the induced draught covers with six lens head screws M4 x 8

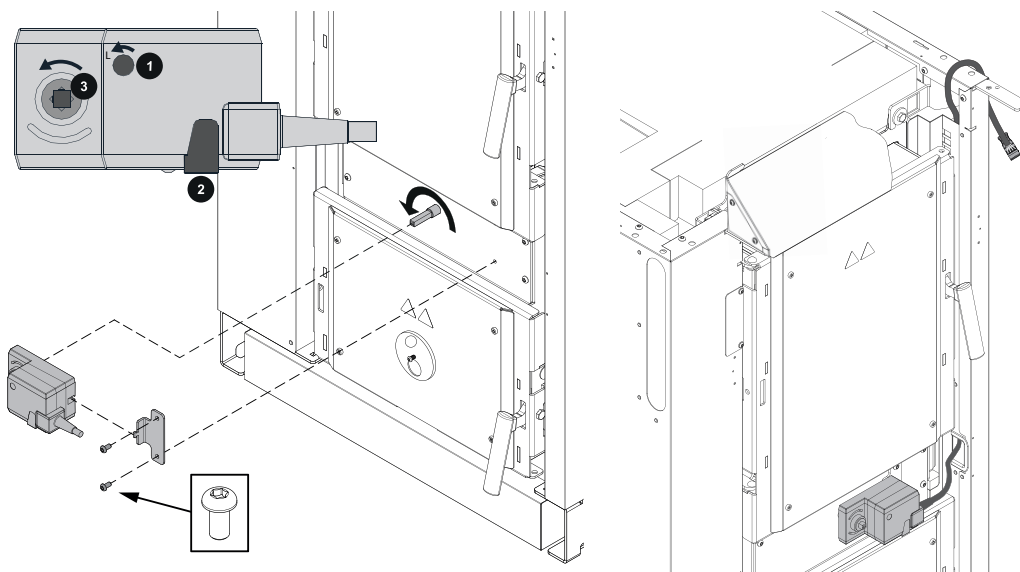


- Install the door contact switch from the "control" package at the cover (1) using 2 lens-head screws M4 x 30, insulating washers and nuts
- Fasten the cover including door contact switch with the lens head screws M4 x 8 (2)

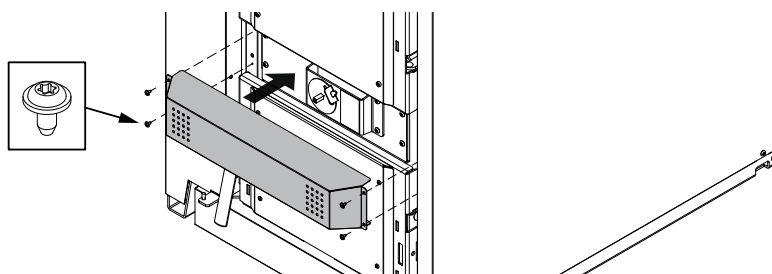


- Mount the control unit on the control unit mounting bracket. Fasten the control unit mounting bracket using counter-sunk head screws M5 x 12 left and right at the retaining clips (3)

5.1.4 Installing the ventilation control



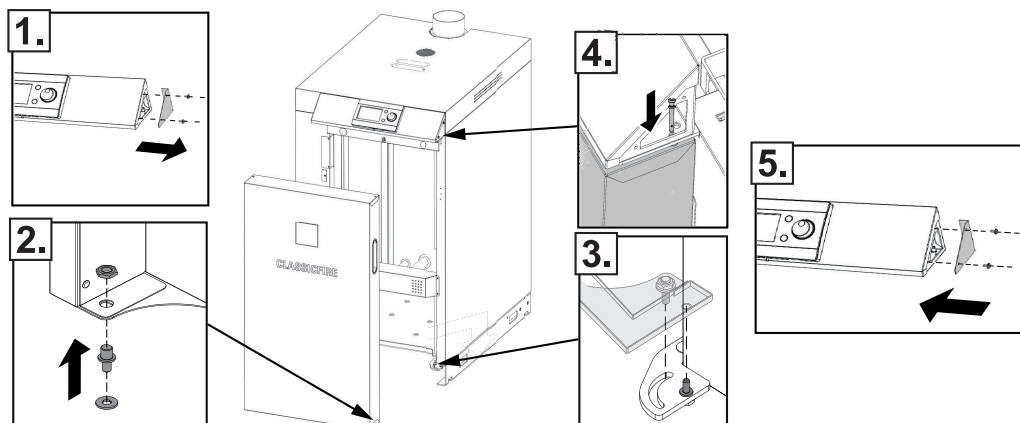
- Move slider for the ventilation control all the way to the left till you reach the stop
- Switch the rotation direction of the servomotor (1) to left (L)
- Press the unlock button (2) and turn the drive for the shaft to the ventilation (3) to the left all the way to the stop
- Slide the servomotor onto the shaft and fasten the torque support using two lens head screws M6 x 12
- Route the servomotor cable through the cable duct upward



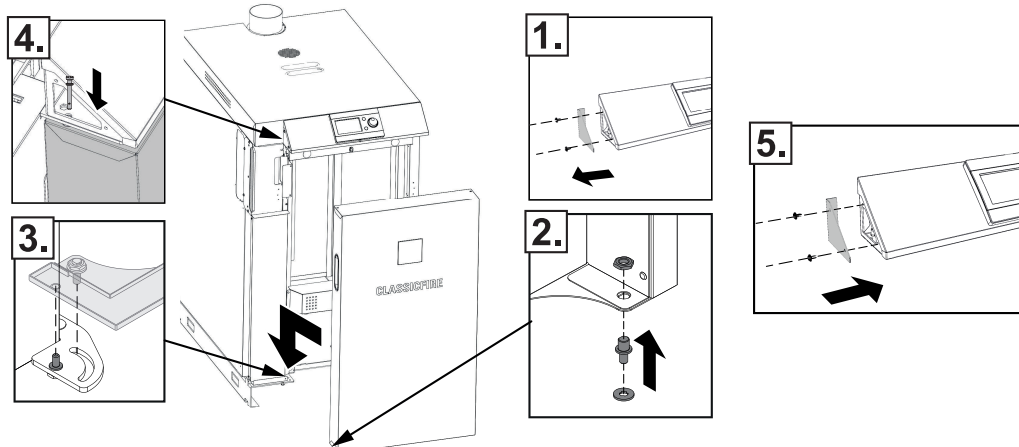
- Fasten the ventilation cover with four lens head screws M4 x 8

5.1.5 Installing the casing door

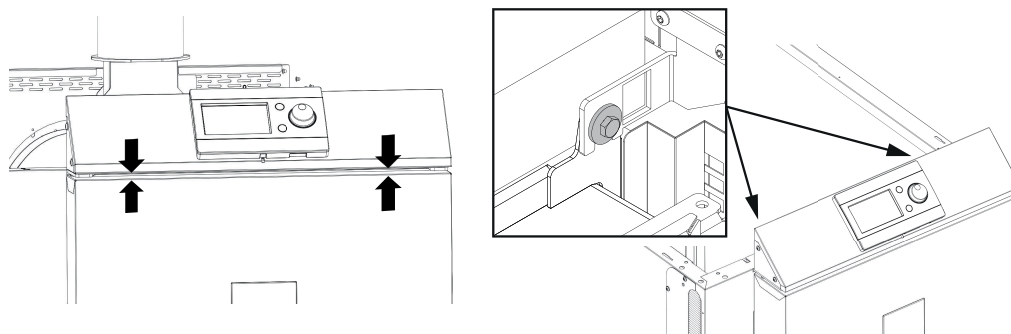
Door hinge on
the right



Door hinge on
the left



- Install the end caps of the control unit mounting bracket on the respective sides (1)
- Fasten the bolt M8 including the polyethylene lock washer from below with the hexagonal nut at the insulation door (2)
- Hook the insulation door into the bolt of the door mounting below (3)
- Position the insulation door accordingly at the top and fasten with hinge bolts (4)
- Replace the end cap (5)

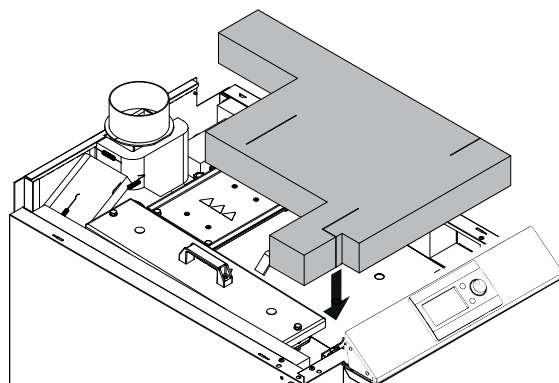


- Measure the distance between insulation door and control unit on the left and on the right with the insulation door closed
 - ↳ Both distances must be identical

↳ Adjust side panels, if required

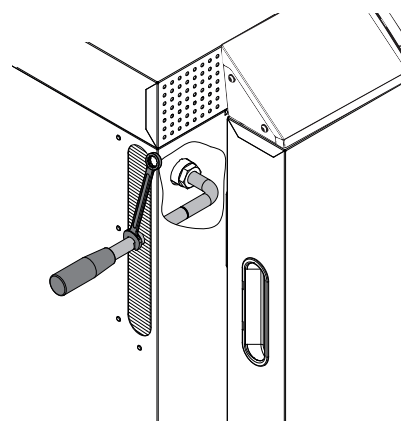
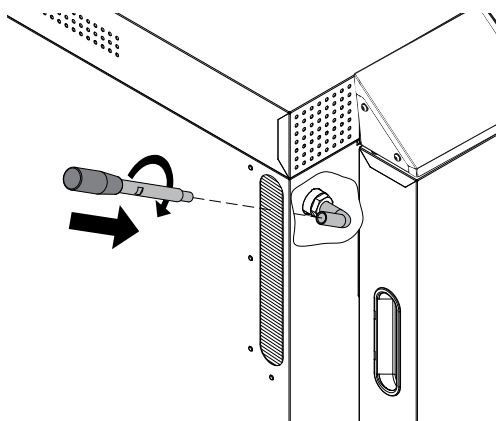
→ Tighten the hexagonal screws M8 x 25 at both retaining clips

→ Fasten the plug at the cover cutouts (with the door contact switch)



→ Place the heat insulation on the boiler

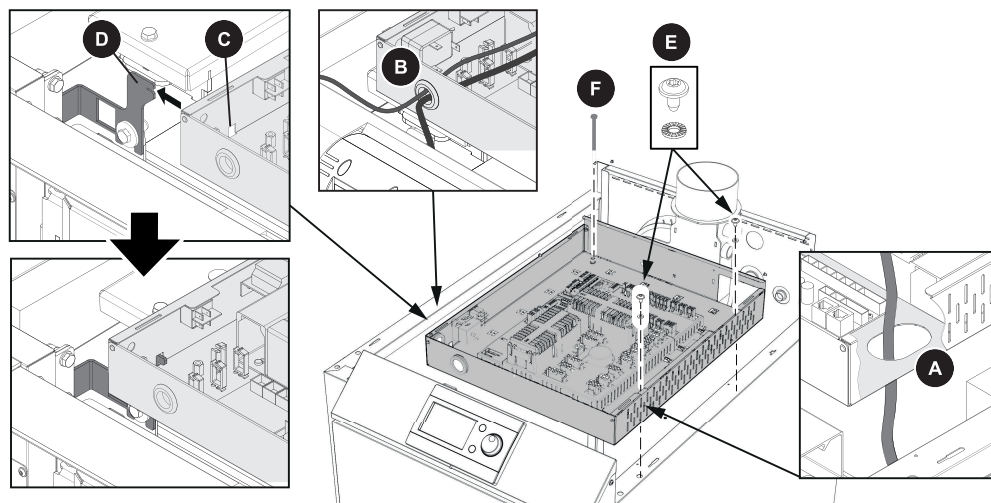
5.1.6 Installing the lever for heat exchanger cleaning



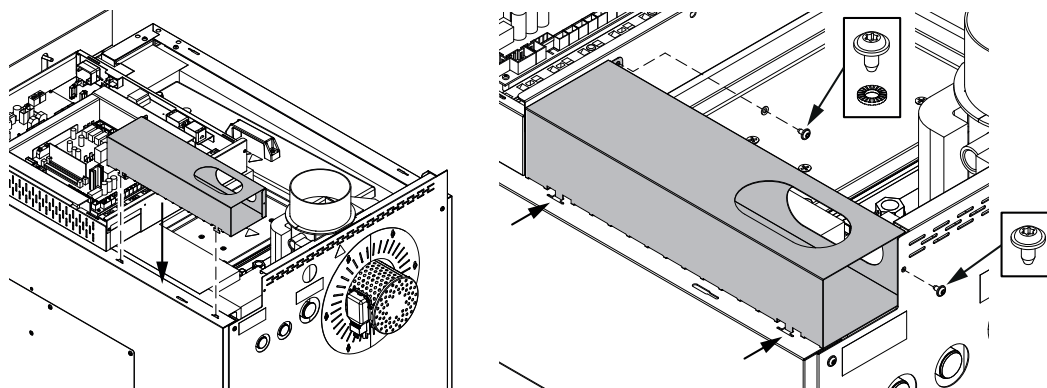
→ Insert the heat exchanger cleaning lever into the opening on the side as illustrated and tighten through turning

→ Push the heat exchanger cleaning lever down and tighten at the flattened spot with a wrench (wrench opening 13 mm)

5.1.7 Installing the control box

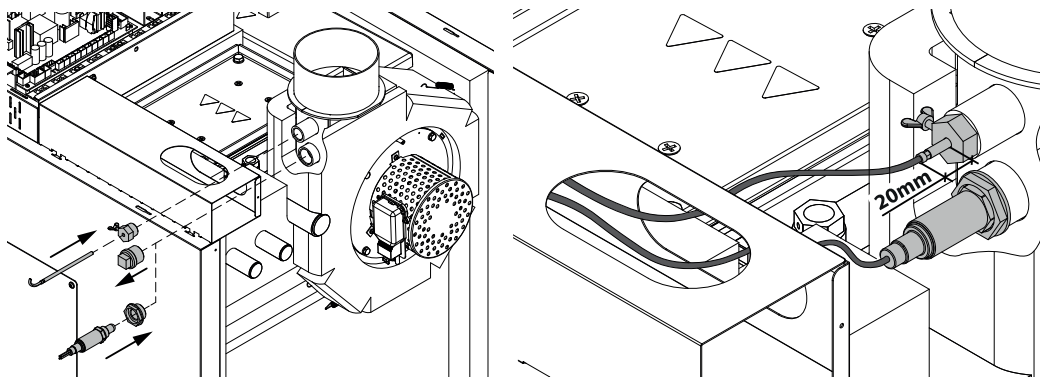


- Thread the servomotor cable (A) through the opening at the bottom of the control box
- Thread the door contact switch cable to the control unit (B) through the opening in the front of the control box and connect with the control unit
- Place the control box on the boiler
 - ↳ While doing this, thread the cutout (C) at the front left of the control box into the slot of the retaining clip (D)
- Fasten the control box with two lens head screws M4 x 8 incl. contact disks (E)
- Align the control box horizontally at the rear left using the hexagonal screw M6 x 100 (F)
- Fasten the control box cable to the strain relief using a cable tie

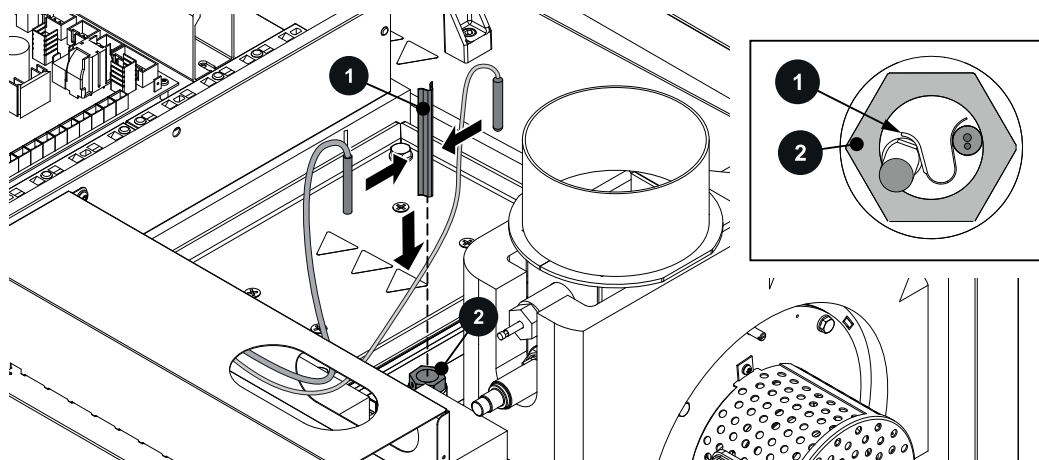


- Position a cable duct at the panel on the right side panel
 - ↳ Thread the cable duct fastening hooks into the intended openings at the side panel
- Fasten the cable duct at the rear of the control box using lens head screws M4 x 8 incl. contact disk
- Fasten the rear panel to the cable duct using lens head screws M4 x 8

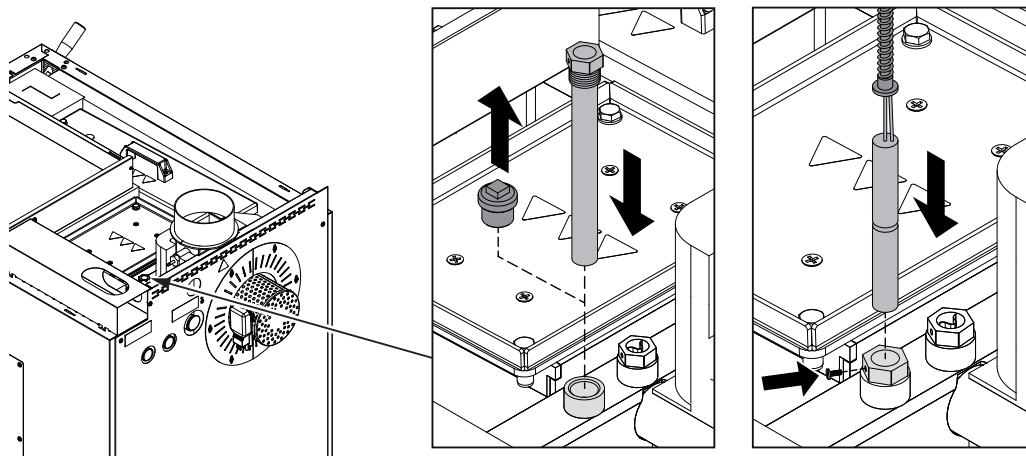
5.1.8 Installing the broadband lambda control and sensors



- Remove the pre-installed socket from the broadband lambda probe
- Screw the socket into the induced draught box and tighten it slightly
- Screw the broadband lambda probe into the socket and tighten slightly with a hexagonal wrench (WO 22 mm)
- Insert the exhaust gas temperature sensor so that about 20 mm still project from the sleeve and fix it in position with the wing screw
- Route the cables from the broadband lambda probe and exhaust gas temperature sensor via the cable duct to the control box
 - ↳ Stow any excess lengths in the cable duct

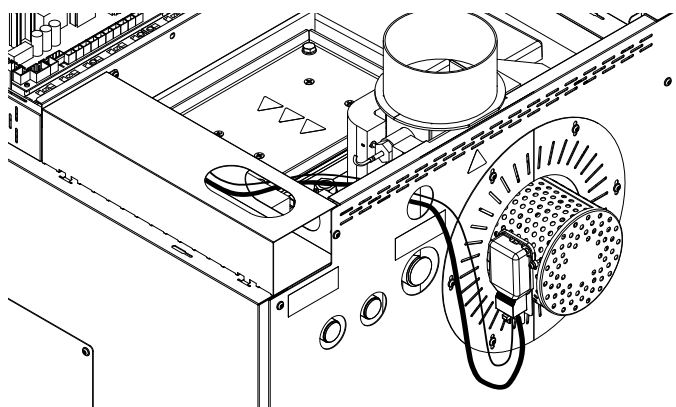


- Route the capillary tube from the control box via the cable duct towards the rear
- Insert the boiler temperature sensor, safety temperature limiter (STL) and capillary tube with pressure spring (1) into the pre-installed immersion sleeve (2) at the boiler forward flow
- **Note:** The thermal discharge safety is not part of the scope of delivery!



- Remove the pre-installed blind plug at the boiler forward flow and seal the immersion sleeve of the thermal discharge safety valve
- Slide the sensor and metal hose sheathing into the immersion sleeve and secure with a slotted screw

5.1.9 Attach the induced induced draught fan cable



- Route the induced draught fan cable via the cable duct through the round cutout in the rear part of the induced draught
 - ↳ Stow any excess lengths in the cable duct
- Attach both cables for the induced draught fan and fasten with cable binders

5.2 Electrical connection and wiring

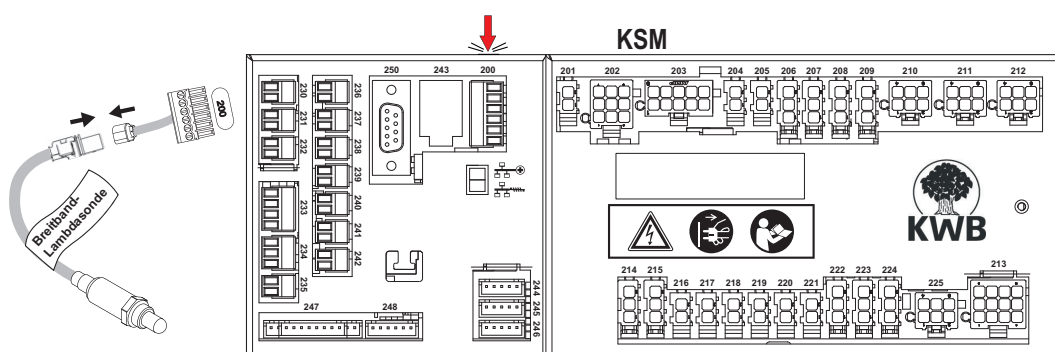


WARNING

Life-threatening electrical voltage

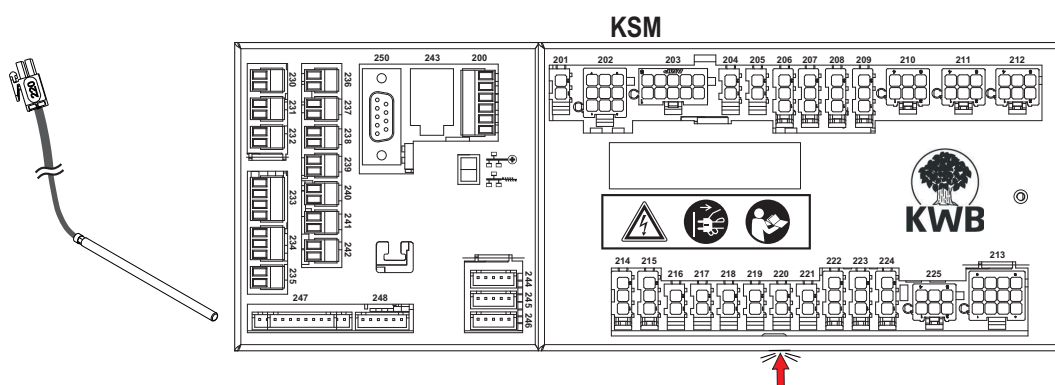
- ↳ When working with electrical components, the following applies:
- The electrical installation may only be carried out by qualified specialists who have the required training and expertise!
- Comply with applicable standards and regulations!
- ↳ Unauthorized persons are not permitted to work on electrical components!

- The cables are already connected to the respective Boiler signal module [KSM] or Boiler power module [KPM]. The sensors or extension cables are at the rear of the control box.
- Connect the broadband lambda probe with the extension cable.
- Check whether the broadband lambda probe is connected to the Boiler signal module [KSM] with plug 200.



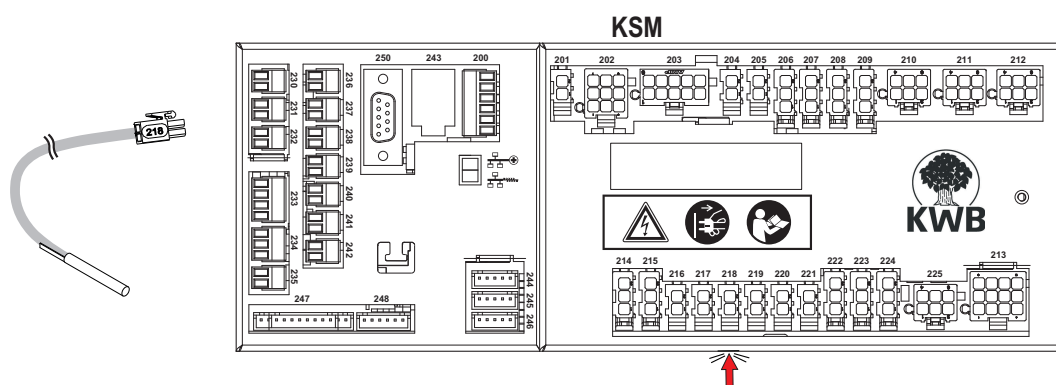
Connector	Pins	Description	Function
200*	6	6-pin connection sensor	Broadband lambda probe

- Check whether the exhaust gas temperature sensor is connected to the Boiler signal module [KSM] with plug 220.



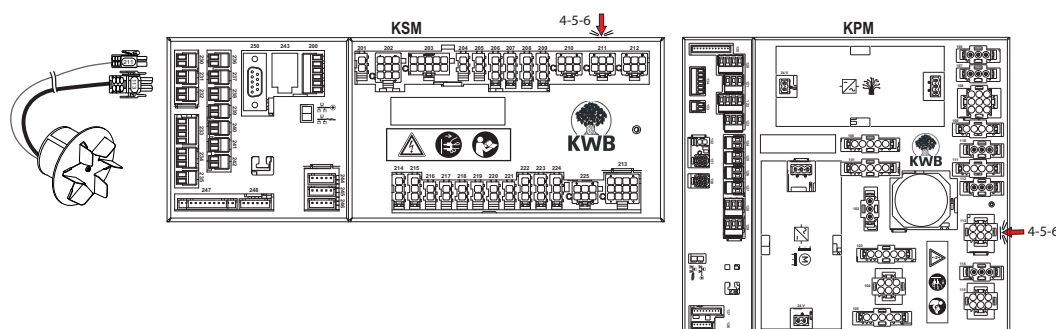
Connector	Pins	Description	Function
220	2	2-pin connection sensor type K	Exhaust gas temperature

- Check whether the boiler temperature sensor is connected to the Boiler signal module [KSM] with plug 218.



Connector	Pins	Description	Function
218	2	2-pin connection sensor PT1000	Boiler forward flow temperature

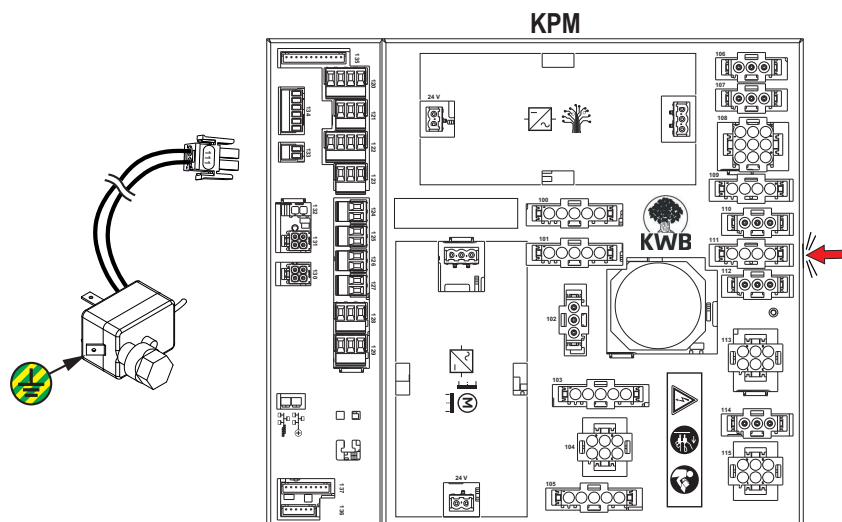
- Check whether the induced draught fan is connected to the Boiler signal module [KSM] with plug 211 (induced draught speed 4-5-6) and to the Boiler power module [KPM] with plug 113 (induced draught 4-5-6).



Connector	Pins	Description	Function
211	3	3-pin connection sensor	Induced draught, fan speed (4-5-6)
113	6	6-pin supply 230 V _{AC}	Heat exchanger cleaning (1-2-3) and induced draught (4-5-6)

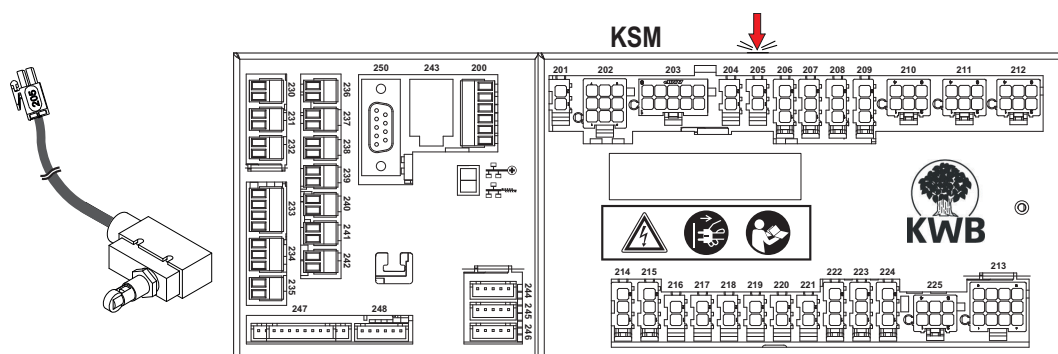
- Check whether the exhaust safety temperature limiter (STL) is connected to the Boiler power module [KPM] with plug 111.

↳ The safety temperature limiter (STL) creates a cable loom together with the power supply.



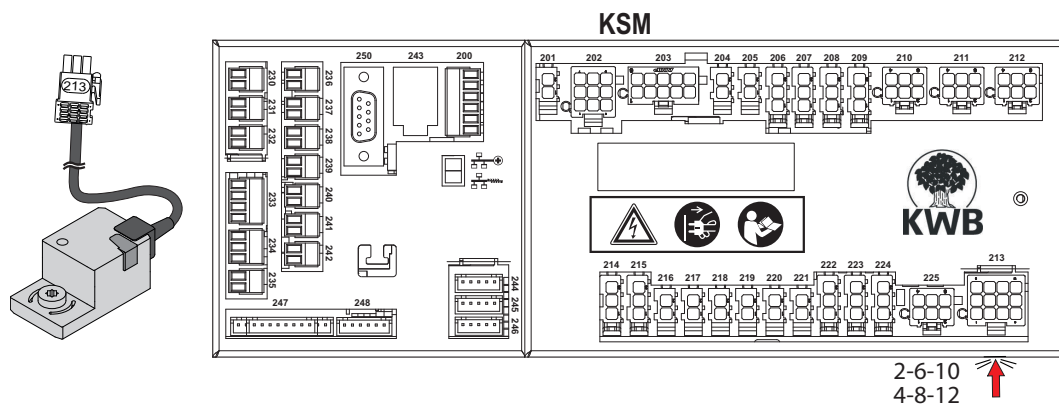
Connector	Pins	Description	Function
111	2	2-pin digital input 230 V _{AC}	Safety temperature limiter (STL)

→ Check whether the door contact switch is connected to the Boiler signal module [KSM] with plug 205.



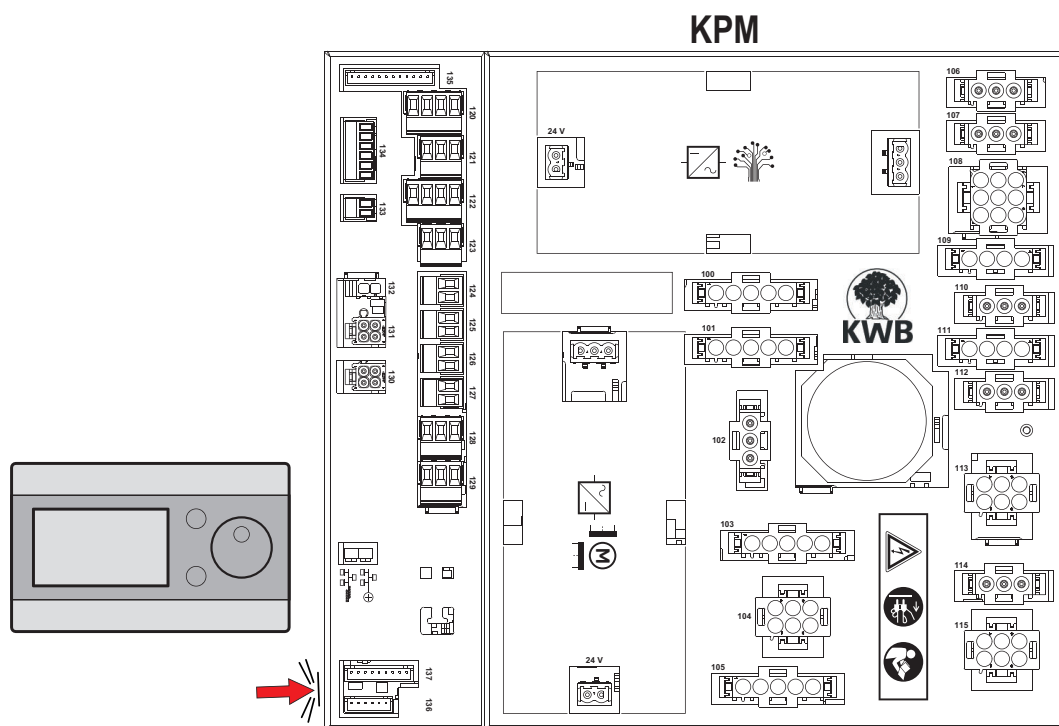
Connector	Pins	Description	Function
205	2	2-pin connection sensor	Door contact

→ Connect the air shutter servomotor with the Boiler signal module [KSM] using plug 213 (2-6-10 and 4-8-12).



Conne- tor	Pins	Description	Function
213	12	10-pin connection sensor & actuator	Slider for secondary air: OPEN/CLOSED (2-6-10) and position (4-8-12).

→ Connect the control unit cable (from plug 137) with the Exclusive control unit.

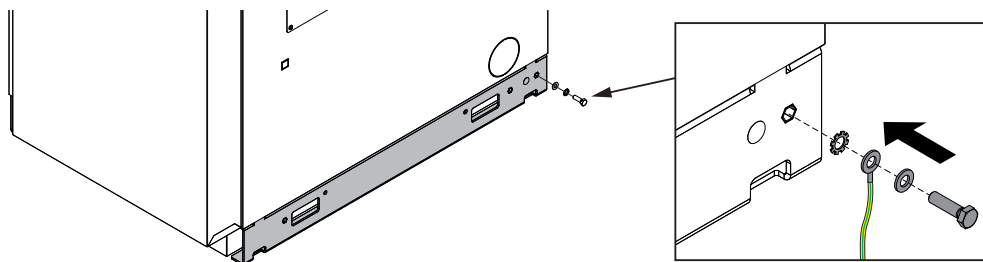


Conne- tor	Pins	Description	Function
137	9	Bus flat connector (3 + 4 = unused; 9 = shield)	House bus [IN] + 24 V _{DC} control unit and boiler bus [IN] + 24 V _{DC} control unit Only to be used for the boiler control unit!

→ Wire the components according to the electrical wiring connection diagram

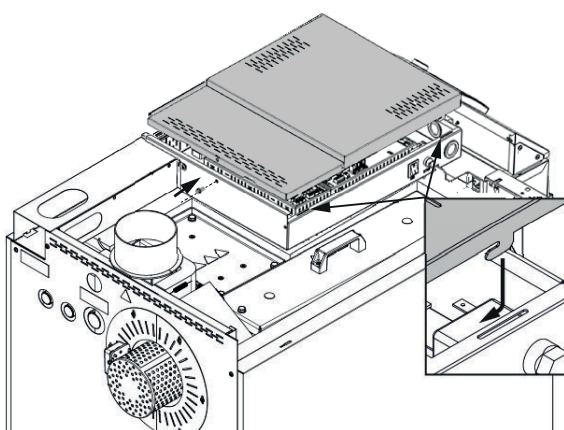
↳ **Note:** The wiring must be carried out with flexible sheathed cables and must comply with the regionally specified standards and regulations!

5.2.1 Equipotential bonding



→ Carry out the equipotential bonding at the boiler bottom in compliance with applicable standards and regulations!

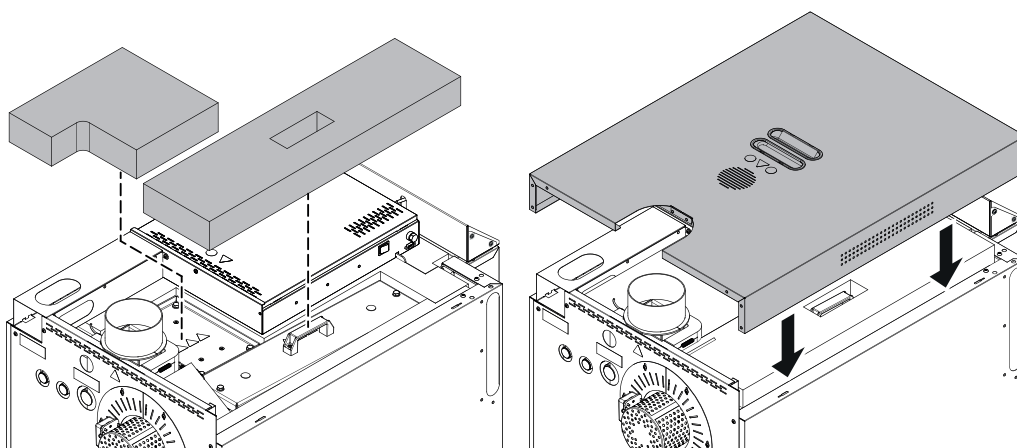
5.2.2 Final tasks



→ Replace the control box cover

↳ Thread in the fastening hook of the cover into the respective openings at the control box

→ Fasten the control box cover using hexagonal screws M5 x 12



→ Place the heat insulation onto the reversal chamber cover and cleaning cover

→ Place the top casing part in its position

6.1 Stickers

Hazard due to missing safety sticker

- Safety stickers save lives! They protect you against injuries and prevent damage to property and equipment!
- Ensure the correct use of the heating system: Attach ALL stickers as indicated in the instructions!
- Give the unused stickers to the operator of the heating system and instruct the operator regarding the possible hazards and/or consequences!
- Order any missing or incorrect stickers from KWB.

→ Attach the stickers .

27-8000075

→ Order missing stickers under the above listed article number (left)!

6.1.1 Stickers on the front part

→ Attach the sticker *Maintenance overview* to the inside of the casing door.

[illegible]

6.1.2 Stickers on the top part

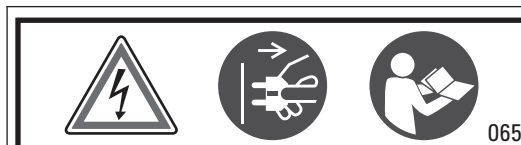
Attach the sticker with the plug assignment of the KWB Comfort 4 cover of the control box.
Make sure it is clearly visible:

101) Spannungsgrenzwert Klemm 20kV/10kV	134) Heiße Züge	247) Eingetragene Kesselbau nach 97/23/EG
102) Abgrenzung Spannungsgrenzwert für Zonen	135) Kesselbau I/II	248) Kesselbau I/II/III
103) Zonenabgrenzung zu Stützpunkt	Heiße Züge (1) + 2,4 kV, Belegungsart für Stützpunkt	249) Kesselbau I/II/III, z.B. für Stützpunkt
104) Zonenabgrenzung für Stützpunkt	Heiße Züge (1) + 2,4 kV, Belegungsart für Stützpunkt	
105) Stützpunkt-Leistung von 122	250) Landstrom	
111) Stützpunkt-Temperatur/Leistung (STP)	251) Spannung (Licht) (L+S)	
112) Normenzone/Leistung (1+2) und 122	252) Leistung (Licht) (L+S)	
120) Wächter für Rückschlusshaltung	253) Leistung (Licht) (L+S) und 122	
121) Kesseltemperatur	254) Leistung (Licht) (L+S) und 122	
122) Kesseltemperatur	255) Leistung (Licht) (L+S) und 122	
123) Kesseltemperatur/Leistung (L+S) und 122	256) Leistung (Licht) (L+S) und 122	
124) Kesseltemperatur/Leistung (L+S) und 122	257) Leistung (Licht) (L+S) und 122	
125) Kesseltemperatur/Leistung (L+S) und 122	258) Leistung (Licht) (L+S) und 122	
126) Kesseltemperatur/Leistung (L+S) und 122	259) Leistung (Licht) (L+S) und 122	
127) Kesseltemperatur/Leistung (L+S) und 122	260) Leistung (Licht) (L+S) und 122	
128) Kesseltemperatur/Leistung (L+S) und 122	261) Leistung (Licht) (L+S) und 122	
129) Kesseltemperatur/Leistung (L+S) und 122	262) Leistung (Licht) (L+S) und 122	
130) Kesseltemperatur/Leistung (L+S) und 122	263) Leistung (Licht) (L+S) und 122	
131) Kesseltemperatur/Leistung (L+S) und 122	264) Leistung (Licht) (L+S) und 122	
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133) Kesseltemperatur/Leistung (L+S) und 122	266) Leistung (Licht) (L+S) und 122	
134) Kesseltemperatur/Leistung (L+S) und 122	267) Leistung (Licht) (L+S) und 122	
135) Kesseltemperatur/Leistung (L+S) und 122	268) Leistung (Licht) (L+S) und 122	
136) Kesseltemperatur/Leistung (L+S) und 122	269) Leistung (Licht) (L+S) und 122	
137) Kesseltemperatur/Leistung (L+S) und 122	270) Leistung (Licht) (L+S) und 122	
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142) Kesseltemperatur/Leistung (L+S) und 122	275) Leistung (Licht) (L+S) und 122	
143) Kesseltemperatur/Leistung (L+S) und 122	276) Leistung (Licht) (L+S) und 122	
144) Kesseltemperatur/Leistung (L+S) und 122	277) Leistung (Licht) (L+S) und 122	
145) Kesseltemperatur/Leistung (L+S) und 122	278) Leistung (Licht) (L+S) und 122	
146) Kesseltemperatur/Leistung (L+S) und 122	279) Leistung (Licht) (L+S) und 122	
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149) Kesseltemperatur/Leistung (L+S) und 122	282) Leistung (Licht) (L+S) und 122	
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157) Kesseltemperatur/Leistung (L+S) und 122	290) Leistung (Licht) (L+S) und 122	
158) Kesseltemperatur/Leistung (L+S) und 122	291) Leistung (Licht) (L+S) und 122	
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160) Kesseltemperatur/Leistung (L+S) und 122	293) Leistung (Licht) (L+S) und 122	
161) Kesseltemperatur/Leistung (L+S) und 122	294) Leistung (Licht) (L+S) und 122	
162) Kesseltemperatur/Leistung (L+S) und 122	295) Leistung (Licht) (L+S) und 122	
163) Kesseltemperatur/Leistung (L+S) und 122	296) Leistung (Licht) (L+S) und 122	
164) Kesseltemperatur/Leistung (L+S) und 122	297) Leistung (Licht) (L+S) und 122	
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175) Kesseltemperatur/Leistung (L+S) und 122	308) Leistung (Licht) (L+S) und 122	
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179) Kesseltemperatur/Leistung (L+S) und 122	312) Leistung (Licht) (L+S) und 122	
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324) Kesseltemperatur/Leistung (L+S) und 122	457) Leistung (Licht) (L+S) und 122	
325) Kesseltemperatur/Leistung (L+S) und 122	458) Leistung (Licht) (L+S) und 122	
326) Kesseltemperatur/Leistung (L+S) und 122	459) Leistung (Licht) (L+S) und 122	

Example of a plug assignment

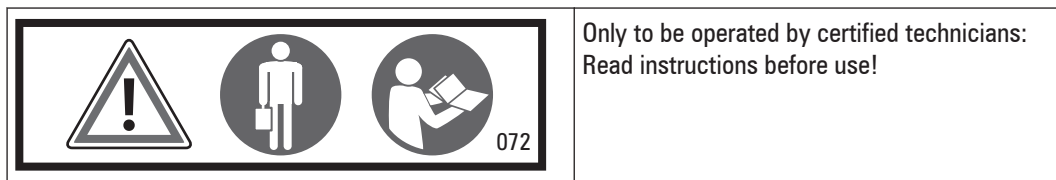
Attach the following stickers on the cover of the control box making sure they are clearly visible:

Electrical voltage!



Attention electrical voltage!
Disconnect plug before opening and read instructions!

Expert knowledge



6.1.3 Stickers on the rear side

→ Attach the sticker *Thermal discharge safety valve* above the connections for the thermal discharge safety valve and make sure they are clearly visible:

Thermal discharge safety valve

Inflow	Discharge	Stickers on both thermal discharge safety valve pipes: The thermal discharge safety valve assumes a cold water pressure of 2–3.5 bar and triggers at a boiler temperature of 95 °C!
2–3,5 bar 071	95 °C 068	

6.1.4 Stickers for the storage room

→ Always ensure that the storage room warnings are attached to the door of the storage room in the language being used!

	Stickers on the door to the log wood storage room (example representation)
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6.1.5 Type plate sticker

Kraft und Wärme aus Biomasse GmbH A-8321 St. Margarethen/Raab, Industriestraße 23c	
Type Fuel extractor	KWB Powerfire Typ TDS 200
SN Year	000-0000000/0 2013
Fuel	wood chips B1 (EN 303-5) P45B (EN 14961-4) wood pellets (EN 14961-2)
Rated thermal output (RTO)	199,0 199,0 kW
min. thermal output	59,7 59,7 kW
Fuel thermal output at RTO	211,9 212,4 kW
max. operating pressure	3,5 bar
max. operating temperature	90 °C
Water content	610,0 Ltr
Max. allowed power input	5100 W
Electrical connection	3+N 400 VAC 50Hz 16 A
Test standard boiler class	EN 303-5 4 4
CO at rated power	14 5 mg/m³ (13% O₂)
Dust at rated power with cyclone	33,0 - mg/m³ (13% O₂)
Dust at rated power	35,0 26,0 mg/m³ (13% O₂)
VKF-NR	18889

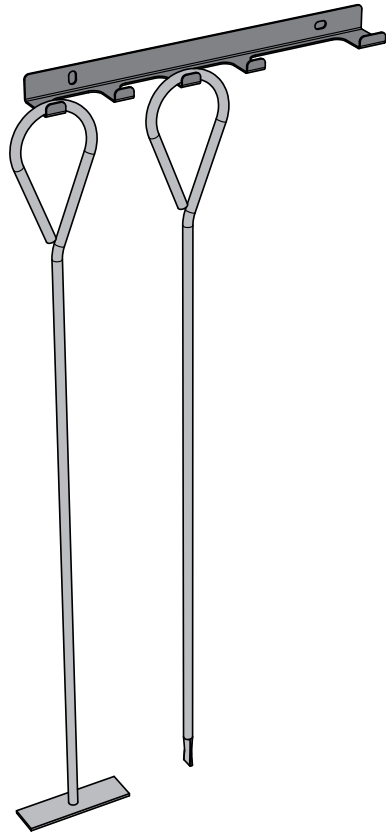
Type plate example

You will find the type plate with the instructions attached to one of the cover sheets.

→ Attach the type plate to the boiler casing in a **visible location**.

This sticker is absolutely required for the operating permit!

6.2 Bracket for cleaning tools



→ Install the bracket for the cleaning tools on the wall using anchor bolts.

6.3 Completion of Assembly

→ Leave the construction site in a clean condition.

7 Connections

7.1 Water

Important: The system and the boiler water must meet several requirements that reduce or prevent corrosion in the system for guarantee and warranty claims to remain valid.

Air-tight	→ The heating system must be configured as a closed circuit!
Standards	→ With respect to the condition of the fill water you must strictly comply with VDI 2035 and ÖNORM H 5195! (Italy: UNI 8065; Switzerland: SWKI BT 102-01)
Corrosion	→ Regarding corrosion, it is necessary to keep an eye on the water conductivity in addition to strictly keeping oxygen from entering into the system.
pH value	→ A pH-value between 8.2 and 10.0 should be targeted. If the heating water comes into contact with aluminium, a pH-value between 8.0 and 8.5 should be targeted.
Decoupling	→ Ensure the oxygen impermeability of the parts used for the acoustic transmission decoupler of the water connections!
Limiting thermostat	→ Protect plastic lines for underfloor heating or district heating pipes from excessive temperatures. Use a limiting thermostat for the circulation pumps.
Safety group	→ Always use a safety group.
Mud strainer	→ To prevent deposits caused by limescale and rust mud, we recommend the installation of a mud strainer in the return flow and a microbubble trap in the forward flow.
Buffer storage tank	A sufficiently large buffer storage tank is absolutely required. Usable minimum buffer volume 1,000 l

7.1.1 Combination with buffer storage tank

Comply with the regional specifications for the use of a buffer storage tank! Some subsidy policies require the installation of buffer tanks.

Tip: You can find information regarding individual subsidy policies on the KWB Homepage.

General It has certain benefits if the heat generated by the log wood boiler is distributed to a buffer tank, e.g.

- Better fuel utilization
- Greater user friendliness with regard to refill intervals
- Largely independent of current heating needs
- Less soiling of boiler and exhaust gas unit

As the lowest continuous heat output of the boiler is greater than 50% of the rated heat output, as boiler manufacturer we specify that the KWB Classicfire log wood boiler must always be connected to a buffer tank with sufficiently large storage volume pursuant to EN 303-5:2012, Chapter 4.4.6.

For some countries, there are recommendations for the storage volume which we list below. The specified values apply if the rated heat output of the boiler corresponds to the heat output requirements of the building and if a max. of 50% of the rated heat output can be distributed to the heated building in partial load operation.

The buffer tank volume can be calculated using the following formula pursuant to EN 303-5:2012:

$V_{Sp} = 15T_B \times Q_N(1 - 0.3 \times Q_H/Q_{min})$	
V_{Sp}	Buffer tank volume in [l]

Q_N	Rated boiler output in [kW]
T_B	Combustion period of the boiler in [h]
Q_H	Heating load of the building in [kW]
Q	Lowest boiler output in [kW] ¹⁾ _{min} ¹⁾ The lowest heat output of the boiler is the lowest value of the heat output range in the technical specifications. If the lowest heat output is provided, the rated heat output must be inserted ($Q_{min} = Q_N$)

General

	Unit	KWB Classicfire type CF1 15 kW	KWB Classicfire type CF1 20 kW
Recommended buffer tank volume:	[l]	1500	1500

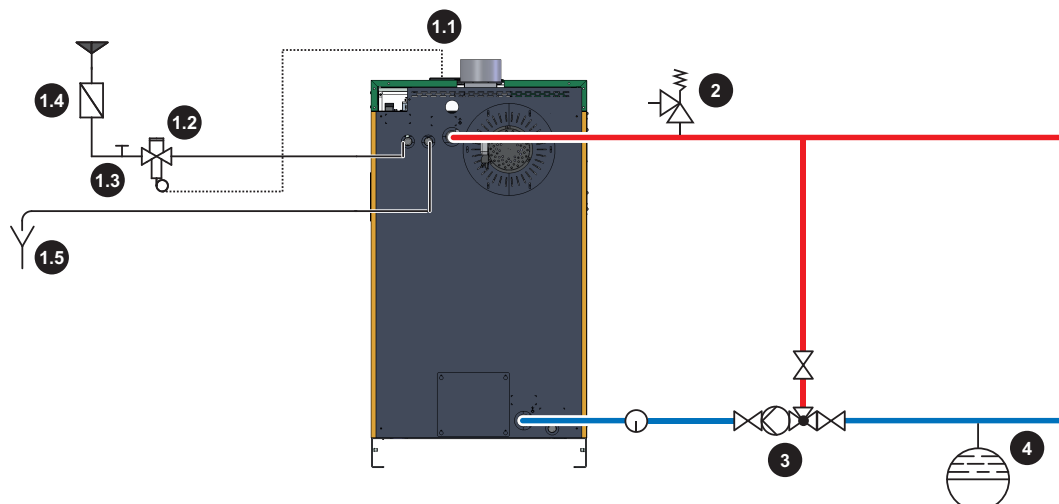
Germany

The 1st BImSchV (Ordinance on Small and Medium Combustion Plants of 26 January 2010, BGBl. I p. 38) specifies a minimum water heat storage volume of 55 litres per kilowatt rated heat output, a water heat storage tank with a volume of twelve litres per litre fuel fill room is recommended.

	Unit	KWB Classicfire type CF1 15 kW	KWB Classicfire type CF1 20 kW
Recommended buffer tank volume:	[l]	1000	1500

Please contact your installer or the KWB Customer Service regarding the correct dimensions of the buffer tank and the line insulation (e.g. pursuant to ÖNORM M 7510 or Directive UZ37).

7.1.2 Connection of hydraulic safety equipment



1	Thermal discharge safety valve	2	Safety valve
1.1	Sensor of the thermal safety discharge valve	3	Return flow boost
1.2	Thermal safety valve (opens at approx. 94-98 °C)	4	Membrane expansion tank
1.3	Cleaning valve (Tee connector)		
1.4	Dirt catcher		
1.5	Free discharge without counter-pressure		

7.1.3 Mounting the return flow boost



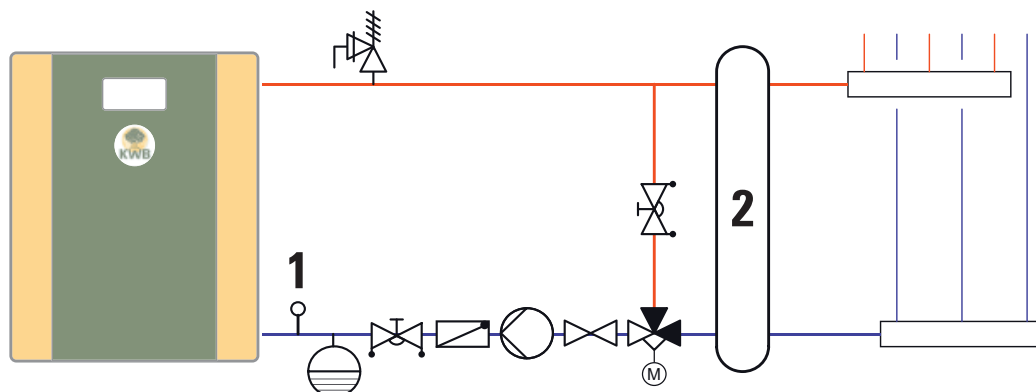
WARNING

Unforeseeable consequences caused by improper work on the heating system

→ Work on the heating system (boiler connection, buffer tank, heating circuits ...) may only be performed by qualified experts!

External return flow boost

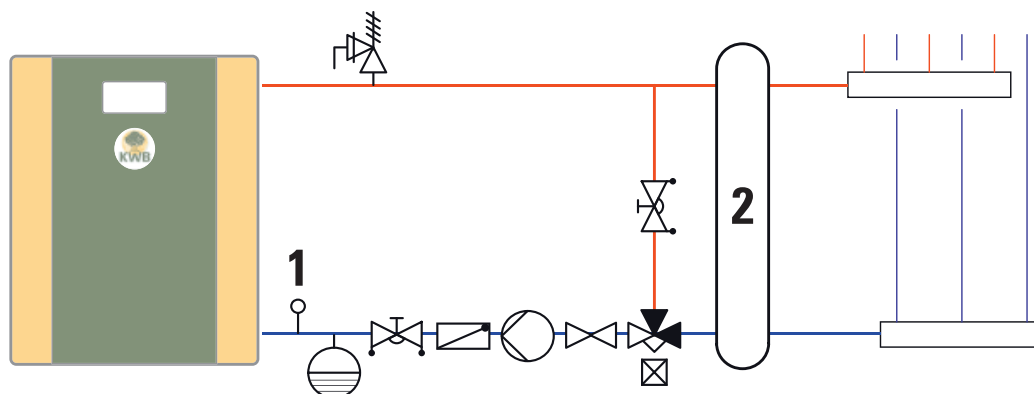
Motor mixing valve



1	Sensor for return flow temperature	2	Buffer
---	------------------------------------	---	--------

- Used when installing a buffer
- Return flow temperature at least 60 °C
- No distributor short-circuit

Thermal mixer valve



1	Sensor for return flow temperature	2	Buffer
---	------------------------------------	---	--------

- Used when installing a buffer
- Configurable thermal valve 40–70°C: We normally recommend values between 50 and 60°C.
- No distributor short-circuit

7.1.4 Installing the thermal safety valve



CAUTION

Risk of overheating - possible risks for people and system!

→ You must comply with all specifications!

If the temperature exceeds 94-98 °C, the thermal discharge safety valve opens and cold water is introduced into the safety heat exchanger.

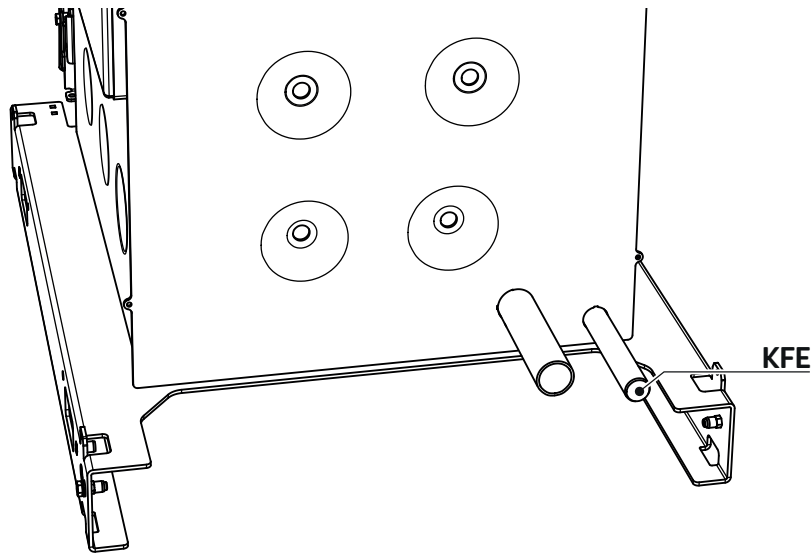
- The connection of the thermal discharge safety valve must be carried out pursuant to ÖNORM / DIN EN 303-5 and in accordance with the schematics shown in section **Connection of hydraulic safety equipment** [► 44].
- Check whether the sensor for the thermal discharge safety valve has been installed correctly (see section **Installing the broadband lambda control and sensors** [► 32]).
- The discharge safety valve must be connected with a pressurized cold water supply network (temperature ≤ 15 °C) through an unblockable connection.
- Install the thermal discharge safety valve at least 100 mm above the ground (reason: legionella prevention).
- The cold water must have a pressure of 2-3.5 bar!
- The piping system must be temperature-resistant!
- The discharge into the channel must be safe: Hot steam may cause injuries and damage!
- Install the piping such that it can be disassembled to ensure that subsequent maintenance and repair work is possible!
- When installing the discharge ensure a >1% slope!

Please also see

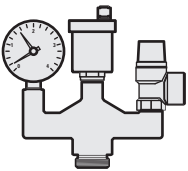
📄 Installing the broadband lambda control and sensors (► 32)

7.1.5 Installing filling/emptying connections

The KWB Classicfire type CF1 has a 1/2" connection for the boiler filling or emptying [KFE] at the rear.



The tap for filling & emptying is NOT included in the scope of delivery!

7.1.6 Installing the safety group (option)

The standard requires installation of a pressure control valve. KWB offers a safety group with automatic bleeder and pressure gauge (manometer).

→ Install the KWB safety group in the forward flow.

Among other things, the safety group must be installed at the boiler or in direct vicinity to the boiler to make sure it is accessible and that there are NO shut-off devices between the boiler and the safety valve!

7.1.7 Safety valve

When the boiler pressure reaches 3 bar, the safety valve opens and discharges hot (!) heating system water!

You must comply with EN ISO 4126-1:2013 requirements, diameter according to EN 12828 or national standard.

Among other things, the safety valve must be installed at the boiler or in direct vicinity to the boiler to make sure it is accessible and that there are NO shut-off devices between the boiler and the safety valve!

7.1.8 Ventilation

→ Only use high quality ventilation valves:

- in the boiler forward flow
- at the highest point of the distribution network **and**

- at the head of the buffer tank.

This will reduce the risk of corrosion **and** facilitates the bleeding of the system significantly!

7.1.9 Dimensioning the buffer-charging pump

During boost operation, a peak output of 25 kW is reached. Accordingly, the buffer charging group must be adjusted to the peak output of 25 kW.

Volume flow [m³/h]

Spread via the boiler [K]	Boiler output boost operation [kW]
	25
10	2.15
15	1.43
20	1.07

Please see additional specifications in the **Technical data table** in the attachment to this document.

The specifications apply for average local conditions and must be checked by a qualified heating equipment technician. The pump selection is based on friction values and the delivery height in the planned pipe system.

7.1.10 Expansion tank dimensions



CAUTION

No effect if installed incorrectly

- It must be impossible to close off the path between the expansion tank and heat source (boiler ...)!
- The expansion tank must be installed in the boiler return flow – BEFORE the first valve!

System volume

Use a membrane type expansion tank for pressure compensation within the heating system pursuant to EN 13831. Calculate the dimensions in accordance with EN 12828 annex D; to give an idea regarding size: usually expansion tanks are used with a gross volume of approx. 10% of system volume.

Water content KWB Classicfire type CF1 15–20 kW (litres)

15 kW	20 kW
90 l	90 l

These specifications are to be supplemented by the fill quantities of the heating system lines, radiators etc.!

7.1.11 Hydraulic diagrams

KWB offers an extensive selection of hydraulics schematics.

Note: This document is available for download in the KWB PartnerNet.

7.1.12 Fill water

NOTE

Please comply with: ÖNORM H 5195 + VDI 2035

KWB assumes ÖNORM H 5195-1 / -2 for the initial filling and subsequent filling. You must also comply with local requirements (e.g. VDI 2035 - in part, these are stricter)!

The water quality is a significant factor for the smooth operation of the heating system. Deposits caused by limescale and rust mud can block pumps, damage boilers, reduce flow volumes, cause corrosion and lead to poor efficiency.

We assume that the heating system possesses flushing nozzles for forward flow and return flow as well as a standard-compliant heating protection program ("BWT AQA therm" or equivalent).

Purging

NOTE! Purge the system twice before commissioning!

Ventilation

When refilling make-up water you must first bleed the refilling hose before connecting it to prevent air from entering the system.

System book

The system operator is responsible for maintaining a system book (see section **Logs [► 49]**, Forms). In this section, the respective steps are to be documented – from the planning to commissioning to maintenance.

7.1.12.1 Requirements for fill water

Limit values for fill-up or make-up water

	Austria	Germany	Switzerland
Total hardness	≤ 1.0 mmol/l	≤ 2.0 mmol/l	< 0.1 mmol/l
Conductivity	–	< 100 µS/cm	< 100 µS/cm
pH value	6.0 – 8.5	6.5 – 8.5	6.0 – 8.5
Chloride	< 30 mg/l	< 30 mg/l	< 30 mg/l

Additional requirements for Switzerland

The fill-up and make-up water must be demineralised (de-salted):

- As a result, the water will no longer contain any materials that might form deposits in the system.
- This way, the water is no longer electroconductive which prevents corrosion.
- Also, the process removes all neutral salts such as chlorides, sulphates and nitrates which attack corroding materials under certain conditions.

If part of the system water gets lost, e.g. due to repairs, the supplementary water must also be demineralised. It is not sufficient to soften the water. Before filling the systems, it is necessary to carry out a professional cleaning and purging of the heating system.

Check:

- After eight weeks, the pH-value of the water must be between 8.2 and 10.0. If the heating water comes into contact with aluminium, a pH-value between 8.0 and 8.5 should be targeted.
- Annually – the owner must log the readings

Test intervals

Condition	Intervals (ÖNORM)	Intervals (VDI)
Heating system with a water content <5000 l	2 years	1 year
Heating system with a water content ≥5000 l	1 year	
Work on the heating system (loss of water)	Additional test after 4-6 weeks in heating mode	

Tip: The standard provisions permit the use of completely decalcified water – this means you can save a considerable amount of calculation time by always calculating to a value of zero. Due to inaccuracies during the rinsing process, you will never actually reach a value of 0.0, but your calculations will always fall in a safe range!

7.1.12.1.1 Commissioning the heating system

Based on the requirements of ÖNORM H 5195-1:2010

- Rinse the heating system with at least two times the quantity of the system water quantity.
- Top up the system water quantity with appropriately prepared water.
- Run the heating system for 72 hours at a minimum of 60 °C feed temperature immediately after this filling process.
This will accelerate the exhaust process and prevent corrosion.
- Hand over the "System and Test Log for Heating Water" (Appendix A) and the "Rinsing Log" (Appendix C) to the system operator.
Include the product and safety data sheet if you added protective substances.
- Tell the operator that the heating water should be checked after 4-6 weeks in heating mode!

7.1.12.2 Fill water with frost protection



CAUTION

Frost damage due to heating system failure

In a house with average insulation, the heating water can freeze within 5 days at low temperatures if the control system of an automatic heating system fails.

- Mix antifreeze into the heating system water according to the enclosed instructions or ensure regular checks!

Comply with:
ÖNORM H
5195-2

- The water–antifreeze mixture has a lower thermal capacity and a higher flow resistance.
- Increase the forward flow temperature by 1–2 °C in order to compensate for these changes. The heating curve can usually be left unchanged.

Tip: Place the heating system into operation at least once a week.



CAUTION

Risk of rust due to false water preparation

- If you use antifreeze in the fill water, the fill water must NO longer undergo osmotic treatment (desalting)!

7.1.12.3 Logs

You can find forms here:

- ÖNORM H 5195-1:2010 Appendix A and Appendix C
- VDI 2035 Appendix C and VDI 4708 sheet 1

7.1.12.3.1 Rinsing Log

Operator:					System type:						
Location (+building/block):					System name/object:						
Date:		Telephone:			Technician:						
Date	Junction No.	Room	Cleaning agent	System part	Rinsing start	Rinsing end	× 0	Problem	Line designation	✓ 0	
Product & Safety sheet available:					0 = not completed		× = clean		✓ = completed		
Yes <input type="checkbox"/> / No <input type="checkbox"/>											

7.1.12.3.2 System and Test Log for Heating Water

Operator:		Location (+ building/block):	
System type:		Commissioning date:	
Total heat generation capacity:	kW	Water content of the system:	l
Heating capacity of the smallest heat generator:	kW	Specific water content of the system:	l/kW
Water content of the smallest heat generator:	l	Max. operating temperature:	°C
Heating system rinsing pursuant to EN 14336 completed:		Yes <input type="checkbox"/> / No <input type="checkbox"/>	

Material (put check mark)	Steel	Stainless steel	Cast iron	Aluminium	Copper	Organic ma- terials	Alloys
Heat generator							
Expansion container							
Armatures							
Pipework							
Heat emission							

Water meter reading at the filling spot BEFORE filling: Z =		m ³
Water meter reading at the filling spot AFTER filling: Z _{new} =		m ³
Volume / Fill quantity: V = Z _{new} - Z	m ³	Date:
Completed emptying:		Date:
Preparation after emptying:		Date:

During first commissioning:

Parameters	Unit	Guidance values (VDI 2035)	Analysis values Fill water	Analyses values Heating water	Measuring processes
Total hardness	mmol/l (°dH)	See: Requirements for fill water [► 48]			Analytic ready-to-use test
pH value	—	8.2 to 10.0 ^{a)}			pH meter
Conductivity	µS/cm	<1500			
Iron	mg/l				Analytic ready-to-use test
Copper	mg/l				Analytic ready-to-use test
Aluminium	mg/l				—
Chloride	mg/l				Analytic ready-to-use test
Ammonium	mg/l				Analytic ready-to-use test

Parameters	Unit	Guidance values (VDI 2035)	Analysis values Fill water	Analyses values Heating water	Measuring processes
a) For systems with Al or Al alloys: 8.2 to 8.5 (9.0)					
Comments:					

During maintenance and inspection:

Parameters	Unit	Guidance values (VDI 2035)	Analysis values Fill water	Analyses values Heating water	Measuring processes
Total hardness	mmol/l (°dH)	See: Requirements for fill water [► 48]			Analytic ready-to-use test
pH value	—	8.2 to 10.0 ^{a)}			pH meter
Conductivity	µS/cm	<1500			
Iron	mg/l				Analytic ready-to-use test
Copper	mg/l				Analytic ready-to-use test
Aluminium	mg/l				—
Chloride	mg/l				Analytic ready-to-use test
Ammonium	mg/l				Analytic ready-to-use test
a) For systems with Al or Al alloys: 8.2 to 8.5 (9.0)					
Comments:					

Additives: Type:	Manufacturer:	Supplier

Pressure			
* To determine by the planner pursuant to VDI 4708 sheet 1 ($>p_{a,min}$; $<p_{e,max}$).	System pressure	$p_{Anl} =$	bar
	Maximum final pressure *	$p_{e,max} =$	bar (Ü)
For a membrane pressure expansion container	Gas pressure *	$p_0 =$	bar (Ü)
For pump or compressor pressure control	Set pressure system *	$p_{set} =$	bar (Ü) \pm bar
Pressure control commissioned pursuant to manufacturer requirements:			Yes <input type="checkbox"/> / No <input type="checkbox"/>

Actions required:

Product & Safety sheets available: Yes ☐ / No ☐

Next inspection date:

Signature and stamp of the inspecting / commissioning company:

Date of the inspection:

7.2 Electrical system



CAUTION

Quality of the electrical installation

- ↳ The applicable directives, particularly *EN 60204-1 Electrical equipment of machines – general requirements* must be complied with when performing the installation work.
- In addition, please ensure that there is no possibility of damage to electrical system components due to heat radiation!

The entire system-internal wiring is done in the factory or by the installation personnel. After installation, the mains connection and the external cabling of all system parts (e.g. heating circuit pumps, mixing valves, sensors, remote communication devices, remote switches, analogue remote control units, ...), and, if there is a network, the bus cabling of the heating circuit modules and the digital remote control units must be carried out by a qualified electrical installation company.

NOTE

Possible damage because cabling has been installed too loosely

- Secure all cables in the cable duct with cable ties!
- ↳ You ensure electrotechnical safety with this kind of strain relief.



WARNING

Life-threatening electrical voltage

- The electrical installation may only be carried out by qualified specialists who have the required training and expertise!
- If required, shut down the system completely at the main switch.
- Unplug the mains plug before you start working on the system!
- ↳ Also comply with local regulations!

7.2.1 Electrical connections - boiler

Establishing the mains connection

230 V_{AC}
13 A — **C**
025

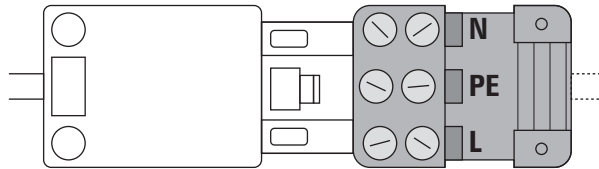
- ↳ The mains connection and the connection of pumps, motor mixers and other heating system components may only be performed by companies licensed to install electrical equipment!
- The power supply (mains connection) must be protected with max. 13A type C on the side of the customer!
- The mains connection of the KWB Classicfire type CF1 is provided via a pre-installed 3-pin plug-in connector in the control box.

Opening the control cabinet

For specialized personnel only!



- Read the instruction manual completely before you unplug the connector and remove the cover of the control box. Secure the system against being switched on again!
- Place the cover on a stable surface to avoid scratches and other damage!
- Unscrew the screws of the cover and remove the control box cover.



- Open the prepared (Wieland) connector and connect the voltage supply according to the N, PE and L labelling to the connector!

Connect the return flow boost

- Place the sensor for the return flow temperature at an appropriate spot directly on the return flow.
- Connect the sensor with plug-in slot 217 on the KWB Comfort 4 board:

217	2	2-pole connection sensor PT1000	Return flow temperature
-----	---	---------------------------------	-------------------------

7.2.2 Heating system electrical connections

7.2.2.1 Buffer storage tank

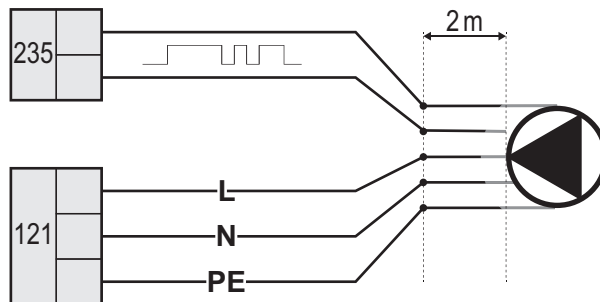
7.2.2.1.1 Charging the buffer storage tank directly from the boiler

Pump

Connection to the Boiler signal module [KSM] and Boiler power module [KPM]:

We recommend using a pump with [PWM1] activation of the speed control.

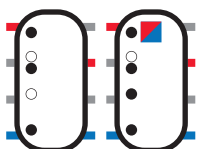
- Install the buffer charging pump:



If using a pump without [PWM1] activation, the 235 plug is not connected.

Connector	Pins	Description	Function
121	3	3-pole supply 230 V _{AC} , max. 200 W	Boiler circuit pump
122	4	4-pin power supply 230 V _{AC}	Quick charging valve
235	2	2-pin connection, actuator	Boiler circuit pump PWM1

Sensors



The standard configuration requires 3 sensors (WITHOUT domestic hot water preparation) or 4 sensors (WITH domestic hot water preparation) for the buffer tank.

- Use sensors S1–S3–S5 or S1–S3–S4–S5 depending on the buffer tank diagram.

- Route the sensor such that you can subsequently change the sensor positions.
Allow for sufficient reserve cable!

Connection at the Boiler signal module [KSM]:

Note: The operation of a domestic hot water circulation pump is only possible if connecting to aHeat management module [WMM].

Conne- tor	Pins	Description	Function
238	2	2-pole connection sensor PT1000	Buffer storage tank temperature 1
239	2	2-pole connection sensor PT1000	Buffer storage tank temperature 2
240	2	2-pole connection sensor PT1000	Buffer storage tank temperature 3
241	2	2-pole connection sensor PT1000	Buffer storage tank temperature 4
242	2	2-pole connection sensor PT1000	Buffer storage tank temperature 5

Connection at the Heat management module [WMM]:

330	2	2-pole connection sensor PT1000	Buffer storage tank 1 temperature
331	2	2-pole connection sensor PT1000	Buffer storage tank 2 temperature
332	2	2-pole connection sensor PT1000	Buffer storage tank 3 temperature
333	2	2-pin connection sensor PT1000	Buffer storage tank 4 temperature
334	2	2-pole connection sensor PT1000	Buffer storage tank 5 temperature

7.2.2.1.2 Charging the buffer storage tank indirectly from the boiler

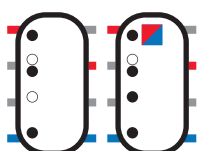
Connection at the Heat management module [WMM]:

Pump

- Install the buffer charging pump:

306	3	3-pole power supply 230 V _{AC}	Feeder pump/valve or buffer charging pump
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Sensors



The standard configuration requires 3 sensors (WITHOUT domestic hot water preparation) or 4 sensors (WITH domestic hot water preparation) for the buffer tank.

- Use sensors S1–S3–S5 or S1–S3–S4–S5 depending on the buffer tank diagram.
→ Route the sensor such that you can subsequently change the sensor positions.

Allow for sufficient reserve cable!

330	2	2-pole connection sensor PT1000	Buffer storage tank 1 temperature
331	2	2-pole connection sensor PT1000	Buffer storage tank 2 temperature
332	2	2-pole connection sensor PT1000	Buffer storage tank 3 temperature
333	2	2-pin connection sensor PT1000	Buffer storage tank 4 temperature
334	2	2-pole connection sensor PT1000	Buffer storage tank 5 temperature

7.2.2.2 Heating circuit

Several installation steps are required to activate the heating circuit.

→ Install an outside temperature sensor on the building's northern side.

Conne- tor	Pins	Description	Function
327	2	2-pole connection sensor PT1000	Outside temperature

→ Install a forward flow temperature sensor for each heating circuit at the respective forward flow.

337	2	2-pole connection sensor PT1000	Forward flow temperature heating circuit 1
338	2	2-pole connection sensor PT1000	Forward flow temperature heating circuit 2

→ Install the heating circuit pump including mixer motor:

309	4	4-pole power supply 230 V _{AC}	Heating circuit 1 mixer
310	3	3-pole power supply 230 V _{AC}	Heating circuit 1 pump
307	4	4-pole power supply 230 V _{AC}	Heating circuit 2 mixer
308	3	3-pole power supply 230 V _{AC}	Heating circuit 2 pump

Optional

Carry out the following installation steps only if required.

→ Install the control units in the living quarters:

362	7	7-pin bus connection	Control unit 1
363	7	7-pole bus connection	Control 2 (is delivered bridged)

- Install one release contact or request contact:

322	2	2-pole digital input 24 V _{DC} Is delivered bridged.	Release heating circuit 1
323	2	2-pole digital input 24 V _{DC} Is delivered bridged.	Release heating circuit 2

7.2.2.3 Pumps/mixer (WMM)

Pumps

The respective Comfort 4 connections are suitable for energy-saving pumps ("category A").

Conne- tor	Pins	Description	Function
301	3	3-pole power supply 230 V _{AC}	Pump/valve for secondary heating source
304	3	3-pole power supply 230 V _{AC}	Circulation pump
305	3	3-pole power supply 230 V _{AC}	DHW pump

306	3	3-pole power supply 230 V _{AC}	Feeder pump/valve or buffer charging pump
310	3	3-pole power supply 230 V _{AC}	Heating circuit 1 pump
308	3	3-pole power supply 230 V _{AC}	Heating circuit 2 pump

Mixer

309	4	4-pole power supply 230 V _{AC}	Heating circuit 1 mixer
307	4	4-pole power supply 230 V _{AC}	Heating circuit 2 mixer

7.2.2.4 Fault contact + multi-function outputs

Four (2) multi-function outputs (floating switch contacts) are available for the following functions.

Multi-function output 1 (#125)

The following options are also possible as alternatives!

NO contact (in de-energized state as well as "main switch: Off", contact open) configurable for:

- `Fault`
To display faults (can be configured as "NC" or "NO" contact)
- `Automatic boiler`
As request contact for switching and/or requesting an automatic boiler.
- `Burner operating display`
Output closed if the boiler is in operation
- `Smoke extractor`
As request contact to switch an external smoke extractor or an air inlet flap

125	2	2-pole floating contact, max. 10 A	Multi-function output 1
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Multi-function output 3 (#124):

NC contact (in de-energized state as well as "main switch: Off", contact closed) for:

- `Fault`

124	2	2-pole floating contact, max. 10 A	Multi-function output 3
-----	---	------------------------------------	-------------------------

7.2.2.5 DHWC

Several installation steps are required to activate the DHWC.

→ Install a temperature sensor at the storage tank:

328	2	2-pole connection sensor PT1000	DHWC 1 temperature
-----	---	---------------------------------	--------------------

→ Install a DHW pump:

305	3	3-pole power supply 230 V _{AC}	DHW pump
-----	---	---	----------

7.2.2.6 Circulation

→ Install a circulation pump – If required, a push-button can send the external start signal to the pump:

Conne- tor	Pins	Description	Function
304	3	3-pole power supply 230 V _{AC}	Circulation pump
<p>Option → If required, install a return flow temperature sensor on the metal of the circulation return flow:</p>			
329	2	2-pole connection sensor PT1000	Circulation temperature
320	2	2-pole digital input 24 V _{DC}	Circulation, push button

7.2.2.7 Secondary heating source

Several installation steps are required to activate an additional heating source.

→ Install the pump or the valve for the secondary heating source:

Conne- tor	Pins	Description	Function
301	3	3-pole power supply 230 V _{AC}	Pump/valve for secondary heating source
<p>→ Install a request contact if the secondary heating source is an automatic boiler:</p>			
311	2	2-pin floating contact, max. 10 A	Request heating source 2
<p>Option Optionally, you can also clip the exhaust gas thermostat to plug #230 ("Extern 1") if the secondary heating source is a manually filled boiler:</p>			
230	2	2-pole digital input 24 V _{DC}	Combustion release ("External 1") (Is delivered bridged.)

→ Install a temperature sensor for the secondary heating source:

342	2	2-pole connection sensor PT1000	Secondary heating source temperature
-----	---	---------------------------------	---

If a manually filled secondary heating source charges the buffer tank, you must always use sensor S5 for the differential charge.

7.2.3 KWB Comfort 4 electrical connections

Modular

The KWB Comfort 4 control platform is a modularly designed bus system that is used to operate and regulate the KWB biomass heating systems.

The central element is the bus that connects almost all components with each other: The entire communication is processed via this bus, from the exchange of measuring data to the implementation of user entries.

7.2.3.1 Equipotential bonding



CAUTION

Differences in voltage can damage the electronics and endanger your safety

→ The equipotential bonding is important in order to prevent voltage differences between parts of the system.

→ Connect the system as prescribed by regulations to the equipotential bonding strip via the connected pipe system.

7.2.3.2 Cabling

A network connects the components of the KWB Comfort 4 control system.

Boiler bus

The boiler bus connects ...

- Boiler power module
- Boiler signal module

House bus

The house bus connects ...

- Heat management module (Option)

Control unit bus

The control unit bus connects the WMM with max. 2 control units:

- Basic control unit
- Exclusive control unit

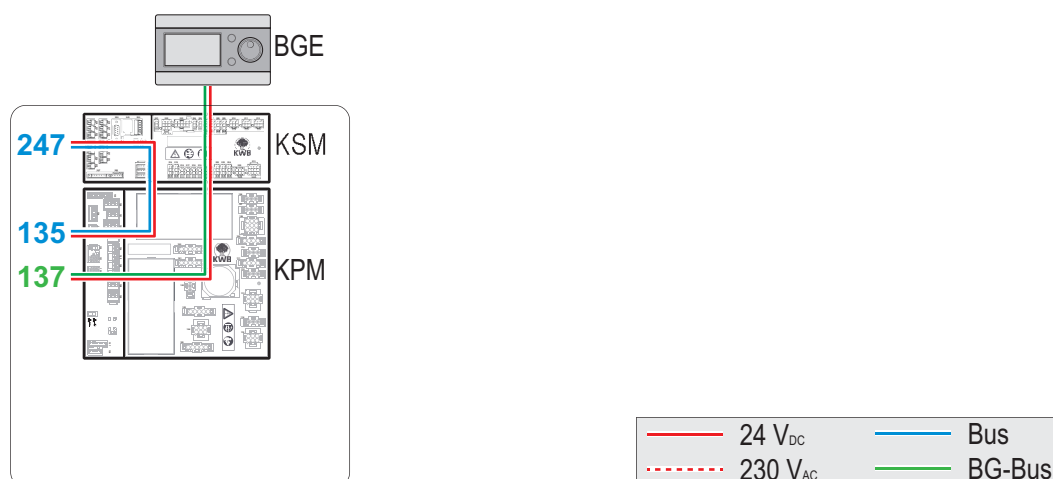
Exception: The control unit at the boiler is connected to the Boiler power module.

7.2.3.2.1 Network examples

WMM	Heat management module	KSM	Boiler signal module
KPM	Boiler power module	BGB	Basic control unit
BGE	Exclusive control unit	BGBS	Mounting base for Basic control unit
BGES	Mounting base for Exclusive control unit	Bus	Boiler bus and/or house bus
BG bus	Control unit bus		

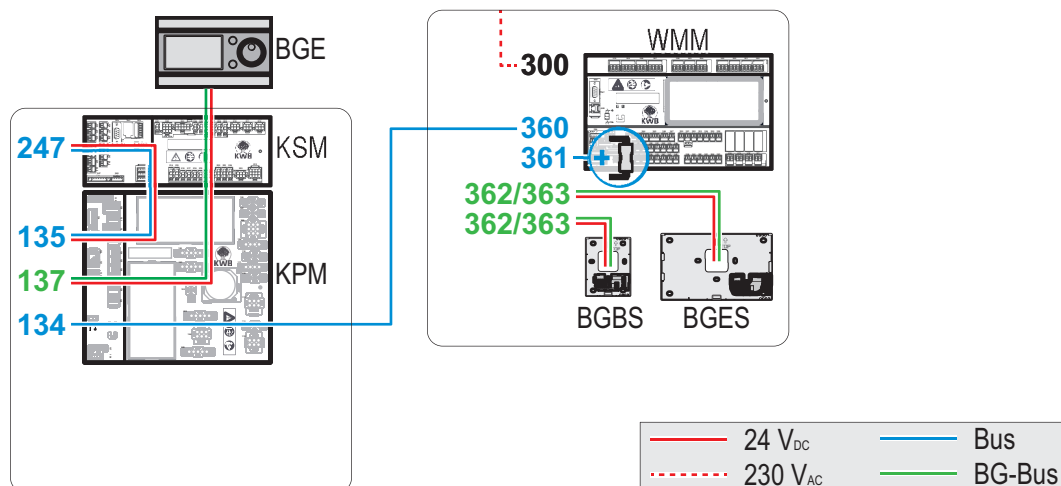
Note: The first operating device (Basic control unit or Exclusive control unit) must always be connected at input 362. The second operating device (is any) at input 363 (see **Control unit cabling** [► 66]).

Simplest network – WITHOUT heat management module

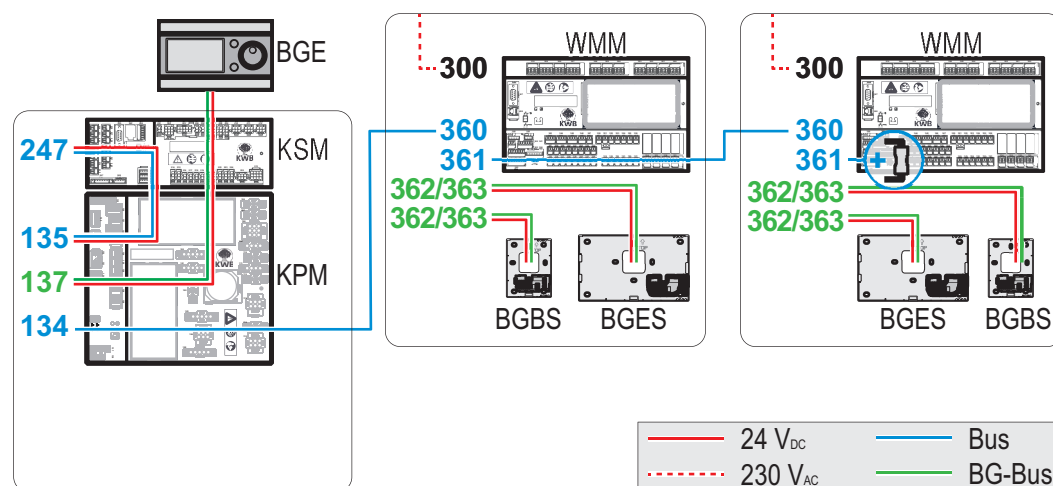


Network with 1x heat management module

WMM external



Network with 2x heat management modules external



Please also see

■ Control unit cabling (► 66)

7.2.3.2.2 Cable assignment

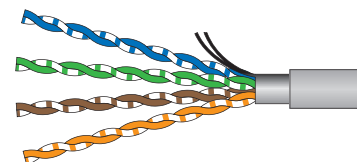
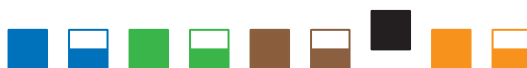
NOTE

The following must be observed with regard to the bus cabling:

- A Cat.5 cable can be used for the bus cabling if the total bus cabling length is less than 100 m.
- If the total length of the bus cabling amounts to more than 100 m, we recommend using a CAN bus cable. For bus lengths **up to 600 m**, we recommend using a CAN bus cable of the type "UNITRONIC BUS DN THIN FD P pair number & AWG size: 1x2xAWG24 + 1x2xAWG22" (Art.No.: 2170345). For bus lengths **above 600 m**, we recommend using a CAN bus cable of the type "UNITRONIC BUS DN THICK FD P pair number & AWG size: 1x2xAWG18 + 1x2xAWG15" (Art.No.: 2170344). (Manufacturer: LappAustria)

Cat.5 cable

- Use a Cat.5 cable (twisted & screened/shielded) for the bus cabling.



blue	[CAN Ground]
Blue-white	Return flow <i>(only for unfavourable cabling)</i>
Green	Data transfer
Green-white	
brown	24 V _{DC} and GND for control unit
Brown-white	
black	Cable screening/shielding
Orange	Return flow <i>(only for unfavourable cabling)</i>
Orange-white	

Maximum length

With proper cabling using a Cat5 cable, the house bus will function up to a length of 100 meters.

- In this case, you will also have to count in the **return wires** used!
- The cable lengths to the **control units are NOT** included in the calculation!

CAN bus cable

→ Using of a CAN bus cable for the bus cabling.



	Colour	Description		Connection on
1	Blue (CAN high)	Data pair – data transmission		Green
2	White (CAN low)			Green-white
3	Silver	Cable screening/shielding		black
4	Red (not used)	Power pair – 24 V _{DC} and GND for control unit		-
5	Black (CAN ground)			blue

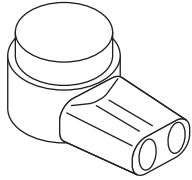
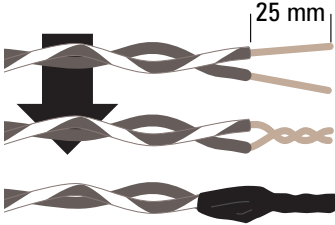
Maximum length

With proper cabling using a CAN bus cable, the house bus will function up to a length of 900 meters.

- In this case, you will also have to count in the **return wires** used!
- The cable lengths to the **control units are NOT** included in the calculation!

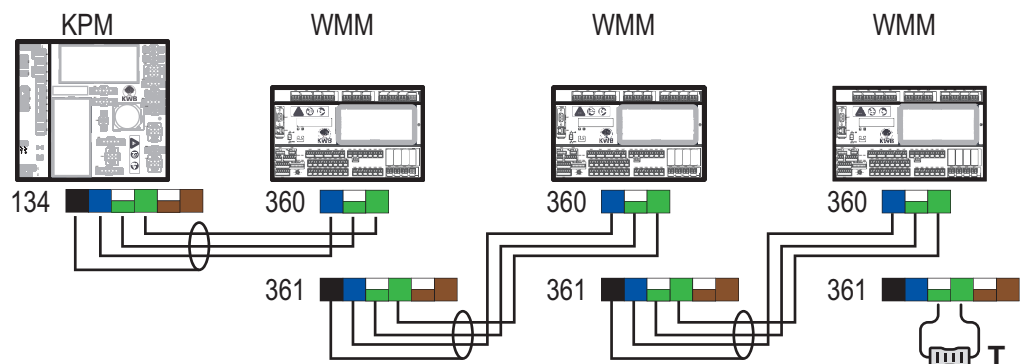
7.2.3.2.3 Connecting the cable

- Ensure optimally established contacts at the cable ends: Badly established contacts may result in unforeseen problems!
- Use individual wire connectors or twist the Litz wires individually with one another.

CORRECT: Individual wire connectors	CORRECT: Twist litz wires	INCORRECT: 230 V connection techniques
		Note that all connection techniques intended for 230 V are NOT allowed. (terminal strips, push terminals, etc.)
(e.g. 3M Scotchlok) Insert Litz wires, crimp - done!	Strip litz wires 25 mm, twist, and insulate with shrink hose	

→ **Tip:** Always ensure that the connection has strain relief.

7.2.3.2.4 House bus cabling

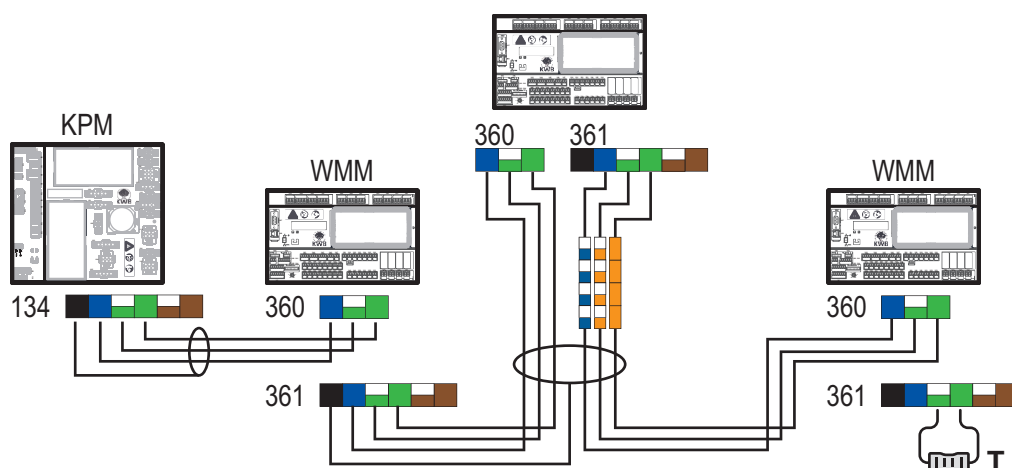


KPM	Boiler power module	T	Terminating resistor
WMM	Heat management module		

Unfavourable cabling

In case of unfavourable cabling, the three unused litz wires of the Cat.5 cable (blue-white, orange-white and orange) can be used as return wires:

Note: This is not possible when using a CAN bus cable!



Bus cabling with return wire (Cat.5 cable – up to a max. of 100 m)

7.2.3.2.5 Cabling lightning protection module (optional)

Surge voltage protection – lightning protection module (optional)

- The optionally lightning protection module for the bus system is to be connected respectively (Art. No.: 13-2000454 – Instructions for the Lightning Protection Module).

7.2.3.2.6 Terminating resistor



To ensure that the data bus signals are not reflected at the end of the cabling (and thus disturb the detection of the next signals!), you must check the terminating resistor at the end of the house bus cabling ("terminate")!

- ✎ The terminating resistor is available on all Heat management module [WMM].
- Remove all terminating resistors between the last Heat management module [WMM] and the Boiler power module [KPM].
- Leave the terminating resistor only at the last Heat management module [WMM].
The terminating resistor connects the contacts green and green-white.

Warning: Do not install a terminating resistor with the control units!

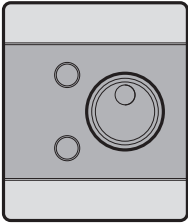
7.2.3.3 Control units

KWB Comfort 4 offers several options to control your heating system:

- The Basic control unit is a cost-effective, easy to use control frequent performed actions.
- The Exclusive control unit provides extensive control over the heating system.

With a maximum of 14 heating management modules and 2 control units per heating management module, the maximum number is 28 control units per bus. In addition, there are the directly connected BGEs in the Exclusive heat management modules.

7.2.3.3.1 Basic control unit [BGB]



You can change the settings for a heating circuit via the buttons and the dial.

- Size: 103×122 mm
- For installation on the wall, the Basic control unit [BGB] is inserted in the supplied unit base [BGBS]. The room temperature sensor is integrated in the base.
- The LEDs light up green or red.
- The setpoint room temperature can be corrected by $\pm 5^{\circ}\text{C}$ via the dial.
- Two buttons permit switching between programs and enable the activation of the DHW quick charge (heating DHW 1x).
- Every Basic control unit [BGB] comes with two designer covers in white and black; these can be installed without tools to replace the silver standard designer cover.

Bus

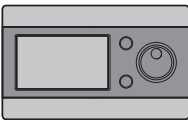
The module is connected to the WMM via the control unit bus.

Voltage

The power supply comes from the Heat management module via the Cat.5 cable (up to max. 100 m total length).

- One Basic control unit [BGB] is possible per heating circuit.

7.2.3.3.2 Exclusive control unit [BGE]



You can change the settings for boilers, heating circuits, buffer storage tanks and DHWC via the buttons and the dial or the 4.3" touch screen ("touch screen") ...

- Size: 200×122 mm
- An Exclusive control unit [BGE] must be available at the boiler.
- To mount the Exclusive control unit [BGE] on a wall, it is inserted into a separately supplied control unit base [BGES]. The room temperature sensor is integrated in the base.
- The number of Exclusive control unit [BGE]s in the network is limited to 30.
- Every Exclusive control unit [BGE] has an SD card slot for software updates at the lower edge.
- Every external Exclusive control unit [BGB] comes with two designer covers in white and black; these can be installed without tools to replace the silver standard designer cover.

Bus

The module is connected to the WMM via the control unit bus.

Voltage

The power supply comes from the Heat management module via the Cat.5 cable (up to max. 100 m total length).

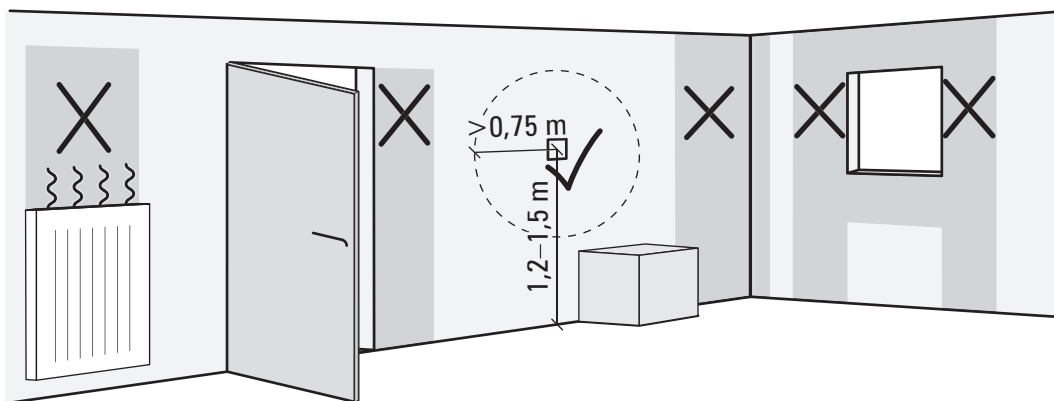
In the room

All parameters are accessible, even if the Exclusive control unit [BGE] is used externally (e.g. in the living room) – Only the actuators cannot be controlled manually!

7.2.3.3.3 Correct positioning

The correct positioning of the control units is important if the temperature probes integrated in the control units are used for heating regulation.

If you use control units without temperature measuring, you can position the control units at any desired place in the living quarters.



Using control units with room temperature measuring

- Use the coolest room that you spend time in during the day.
- Install the control units at a height of 120–150 cm.
- Make sure to leave a distance of 100 cm between the control units and doors and windows.
- Avoid heating sources (heating units, chimneys, heating pipes in the wall, but also electronic devices such as TVs!) and direct sunlight (keep the position of the sun in winter in mind!).
- Avoid positioning the unit in room corners, niches or shelves: There is not enough air circulation available!
- Avoid uninsulated outer walls.
- The control units must not be covered (e.g. by curtains).

Warning: No other sensor must be active in this room that might be able to influence the control: If the radiators contain thermostatic valves, they should always be fully open!

Optimum position

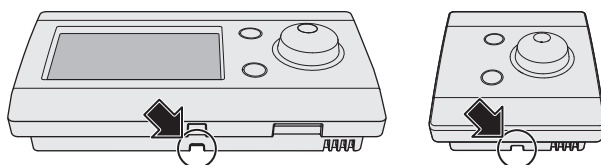
- Install the control units at a free and unobstructed internal wall with 75 cm free space on each side to ensure that the integrated room temperature sensor is able to function properly!

On the wall

The unit base for the control unit must always be mounted **on** the wall: An installation under the plaster would obstruct the function of the temperature sensor!

7.2.3.3.4 Open the control unit

Control units are clamped onto the mounting base without screws.

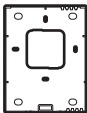
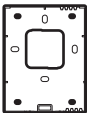
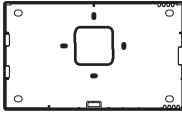
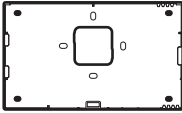


- Use a pen to push into the recess on the lower side of the control unit to release the lock as illustrated in the picture.
- **NOTE! Please note when using the control unit that a short cable links the control unit to the mounting base!**

7.2.3.3.5 Mount and connect

Base

- Secure the mounting base with the 4 supplied screws.

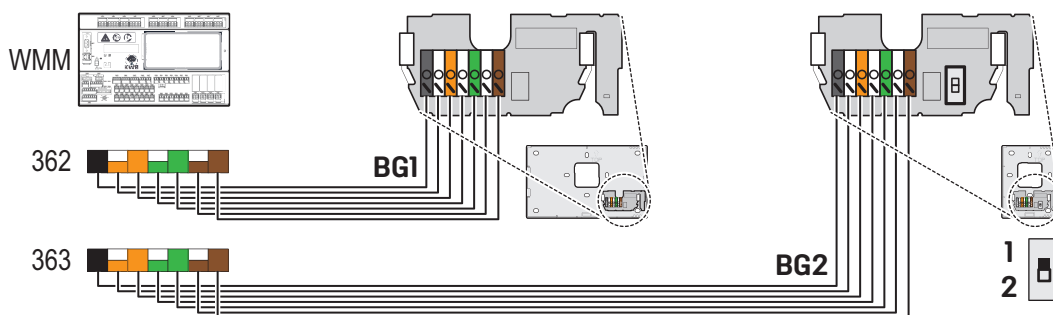
On a socket installed under the plaster	With wall anchors
	
	
<p>→ Secure the mounting base exactly aligned with the socket under the plaster.</p>	<p>→ Insert the wall anchors at the desired position of the control unit.</p> <p>→ Screw the mounting base to the wall anchors.</p>

Cable

- Pull the Cat.5 cable (up to a max. length of 100 m) from the rear through the large opening in the mounting base.
- Ensure that you have enough reserve cable before you fasten the Cat.5 cable with a cable binder at the mounting base.
- Always seal the cable duct against draughts!
Only then you can be sure that the measured temperature will be accurate!

Control unit

- Connect the control unit with the mounting base.
- Place the control unit – true to side – inclined from below at the two upper corners of the mounting base. Then, push the control unit's lower edge onto the mounting base: The control unit will make an audible noise when it snaps into place!
- The control unit packaging contains the upper and lower lids in 2 additional covers. Insert the lids in the desired colours.
- Only for Basic control unit:
In the control unit packaging you will find a removable card containing an explanation of symbols in several languages. Remove your desired language and place the strip in the lower lid.

7.2.3.3.6 Control unit cabling

WMM	Heat management module		
BG1	1. Control unit, e.g one Exclusive control unit	BG2	2. Control unit, e.g one Basic control unit

Terminating resistor

When cabling the control units, NO termination is required!

- Use plug 362 for the first control unit that you connect to the Heat management module [WMM]!

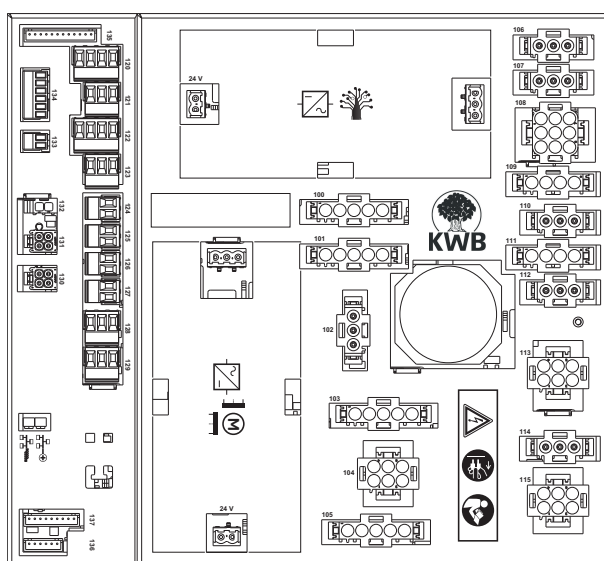
→ If you use plug 363 for an additional control unit, you will first have to remove the existing bridges!

Only for Basic control unit [BGB]:

- The base for the Basic control unit [BGBS] contains a DIP switch which specifies the address for the Basic control unit [BGB].
- When you connect two BGBs with a Heat management module [WMM], you must specify a unique address for every BGB (control unit Basic).

7.2.3.4 Boiler power module [KPM]

The boiler-dependent Boiler power module contains all required power connections for motors and actuators that use mains voltage (230/400 V_{AC}) as well as the safety switches.



The illustration shows a fully equipped circuit board. Individual connections might be missing depending on the usage. As a replacement part, the circuit board always comes fully equipped and the software detects the specific use and releases the required parts/interfaces.

Bus

The module is connected to other bus devices via the control unit bus.

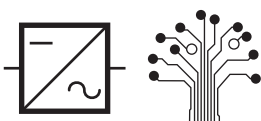

LED displays

The circuit board contains 2 LEDs that show the house bus status.

LED behaviour		
Flashing red	Adjusting the data rate	—
Flashes red 1x	CAN error	—
Red light (not flashing)	No bus, bus reset	CAN error
Flashing green	Waiting for the BGE connection	OK (CAN activity)
Green light	OK	No activity

Power supply units

The Boiler power module contains slots for two pluggable power supply units.

1. Power supply unit	2. Power supply unit
	
Always required.	Only required for the power supply of the KWB Multifire and KWB Pelletfire Plus multi-phase motors.

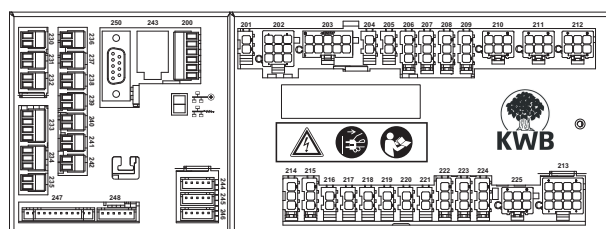
7.2.3.4.1 Plug at the KPM

Connector	Pins	Description	Function
100	5	3-pole power supply 230 V _{AC}	Boiler power supply (L1 to L3 bridged)
101	5	5-pin power supply 230 V _{AC}	Outgoing power supply for supplementary circuit board
111	2	2-pin digital input 230 V _{AC}	Safety temperature limiter (STL) or additional supply tapping KWB dust filter
113	6	6-pin power supply 230 V _{AC}	Induced draught (4-5-6)
120	4	4-pole power supply 230 V _{AC}	Mixer for return flow boost
121	3	3-pole supply 230 V _{AC} , max. 200 W	Boiler circuit pump
122	4	4-pin power supply 230 V _{AC}	Quick charging valve
123	3	3-pole supply 230 V _{AC}	Feeder pump/valve or buffer charging pump 0
124	2	2-pole floating contact, max. 10 A	Multi-function output 3
125	2	2-pole floating contact, max. 10 A	Multi-function output 1
128	3	3-pole digital input 230 V _{DC} Is delivered bridged.	Reserve safety input, e.g. for the low water pressure switch
129	3	3-pole digital input 230 V _{DC}	Emergency stop ("emergency escape switch") (Must remain bridged for pure log wood operation!)
130	4	4-pin digital input 24 V _{DC}	Ash container switch removed (1-3) (bridged in the KWB Classicfire / KWB Classicfire type CF1)
131	4	4-pin digital input 24 V _{DC}	Sensor for overflow protection cover at the conveyor channel (must remain bridged in Easyfire, Combifire and Classicfire!)
132	2	2-pin digital input 24 V _{DC}	Temperature monitor fuel storage (TMFS) (must either remain bridged or must be used!)

133	2	2-pin digital input 24 V _{DC}	Reserve safety input [MF2, CF2, CF1] or limit switch ash tray
134	6	6-pole bus clamp	House bus [OUT]
135	12	12-pin bus flat connector	Boiler bus [IN]
136	6	6-pole bus flat connector	Outgoing bus connection for supplementary circuit board
137	9	Bus flat connector (3 + 4 = unused. 9 = screen/shield.)	House bus [IN] + 24 V _{DC} control unit and boiler bus [IN] + 24 V _{DC} control unit Only to be used for the boiler control unit!

7.2.3.5 Boiler signal module [KSM]

The boiler-dependent Boiler signal module [KSM] contains the connections for all sensors (boiler, outside temperature, buffer storage tank, external) and offers a serial interface.



The illustration shows a fully equipped circuit board. Individual connections might be missing depending on the usage. As a replacement part, the circuit board always comes fully equipped and the software detects the specific use and releases the required parts/interfaces.

Voltage

The module receives its voltage (24 V_{DC}) from the Boiler power module [KPM].

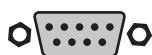
Bus

The module is connected to the Boiler power module [KPM] via the boiler bus.

LED displays

The circuit board contains 2 LEDs that show the house bus status.

LED behaviour		
Flashing red	Adjusting the data rate	—
Flashes red 1x	CAN error	—
Red light (not flashing)	No bus, bus reset	CAN error
Flashing green	Waiting for the BGE connection	OK (CAN activity)
Green light	OK	No activity



Serial interface

The serial interface (RS232) is the basis for future expansions and various connections (e.g. GSM module). NO power supply has been integrated for connected components!



RJ12 socket

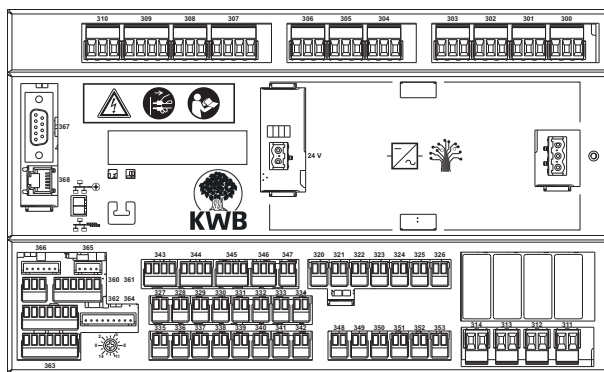
The 6-pole RJ12 sockets integrates an GSM module and supplies it with power.

7.2.3.5.1 Plug at the KSM

Conne- ctor	Pins	Description	Function
200	6	6-pole connection sensor	Lambda probe
205	2	2-pin connection sensor	Door contact
211	6	6-pin connection sensor	Induced draught, fan speed (4-5-6)
213	12	10-pin connection sensor & actuator	Air shutter: OPEN/CLOSED (2-6-10) and position (4-8-12).
217	2	2-pole connection sensor PT1000	Return flow temperature
218	2	2-pole connection sensor PT1000	Boiler forward flow temperature
220	2	2-pin connection sensor type K	Exhaust gas temperature
230	2	2-pole digital input 24 V _{DC}	Combustion release ("External 1") (Is delivered bridged.)
235	2	2-pin connection, actuator	Boiler circuit pump PWM1
237	2	2-pole connection sensor PT1000	Outside temperature
238	2	2-pole connection sensor PT1000	Buffer storage tank temperature 1
239	2	2-pole connection sensor PT1000	Buffer storage tank temperature 2
240	2	2-pole connection sensor PT1000	Buffer storage tank temperature 3
241	2	2-pole connection sensor PT1000	Buffer storage tank temperature 4
242	2	2-pole connection sensor PT1000	Buffer storage tank temperature 5
243	6	RJ12 plug	Power supply 24 V _{DC} for GSM module
247	12	12-pole bus flat connector	Boiler bus [IN] from KPM (#135)
248	6	6-pole bus flat connector	Boiler bus [OUT]
250	9	D-SUB 9M plug	RS232 interface, e.g. for GSM module

7.2.3.6 Heat management module [WMM]

Comprises all heat management connections.



The illustration shows a fully equipped circuit board. Individual connections might be missing depending on the usage. As a replacement part, the circuit board always comes fully equipped and the software detects the specific use and releases the required parts/interfaces.

Voltage

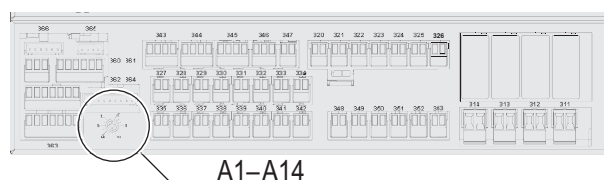
Board in the control box	Board in the multi-function enclosure
24 V _{DC} power supply by the Boiler power module:	Voltage supply 230 V _{AC} In this case, a Heat management module is required

Bus

The module is connected to other bus devices via the control unit bus.

Board in the control box	Board in the multi-function enclosure
Bus connection through ribbon cable	Bus connection with Cat.5 cable (up to max. 100 m total length) or CAN bus cable (up to max. 900 m total length)

Node number



→ Use a unique node number for every module: Use the small screw driver to set the selector switch to a free node number.

- The number range for the Heat management module is A1 to A14.
- Maximally 14 heat management modules [WMM] maybe addressed per bus.

Versions

- Version with 1 heating circuit
Enables control of 1 heating circuit with mixer control and pump activation, 1 buffer storage tank incl. activation of 1 buffer charging pump or activation of 1 feeder pump (network pump), 1 DHWC, 1 circulation pump.
- Version with 2 heating circuits
As described above, but for 2 heating circuits and the option to activate a second boiler.
- 1 sensor for forward flow temperature
- 1 sensor for DHWC temperature
- 1 sensor for temperature in the circulation line
- 3 sensors for temperature in the buffer storage tank (4th and 5th sensor optionally possible)

The version with 2 heating circuits also contains ...



- 1 sensor for forward flow temperature

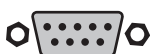
Scope of delivery

- 1 sensor for temperature in the second boiler

LED displays

The circuit board contains 2 LEDs that show the house bus status.

LED behaviour		
Flashing red	Adjusting the data rate	—
Flashes red 1x	CAN error	—
Red light (not flashing)	No bus, bus reset	CAN error
Flashing green	Waiting for the BGE connection	OK (CAN activity)
Green light	OK	No activity



Serial interface

The serial interface (RS232) is the basis for future expansions and various connections (e.g. GSM module). NO power supply has been integrated for connected components!



RJ12 socket

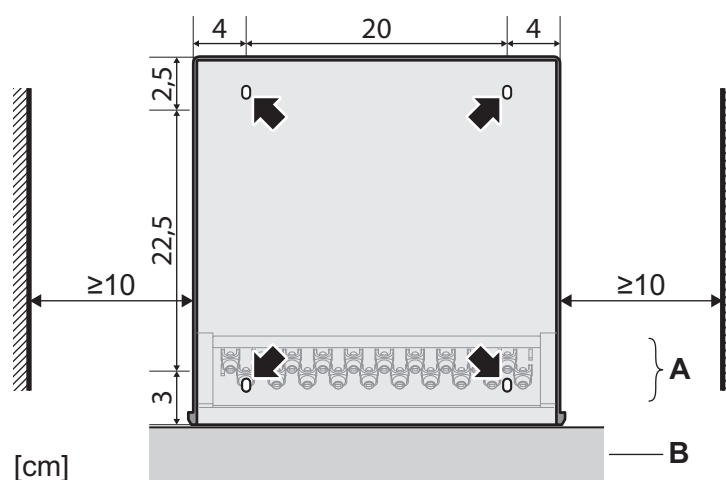
The 6-pole RJ12 sockets integrates an GSM module and supplies it with power.

7.2.3.6.1 Wall installation

Positioning the multi-function enclosure

Position the multi-function enclosure at a location where the connected sensors and actuators (pumps, mixers ...) will also be close by, e.g. at the heat distributor station of the respective building.

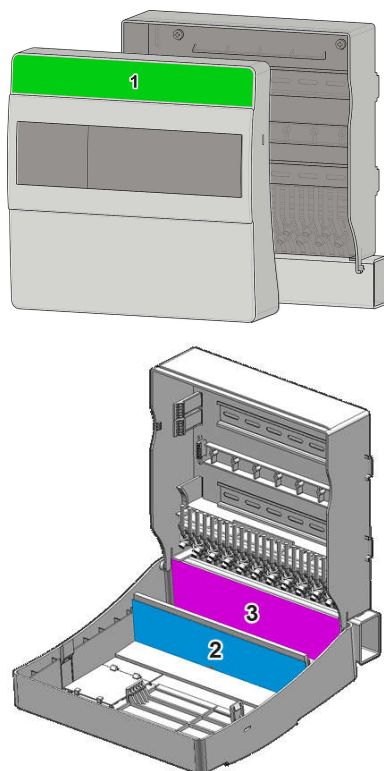
Mounting on the wall



A	Cable clamps	B	Cable duct (max. 40 mm deep)
---	--------------	---	------------------------------

- Leave a clearance of approximately 10 cm on both sides so that you can later loosen the side fastening of the cover with an appropriately short tool.
- Ideally, you should run the cables in the cable duct (e.g. 60x40 mm). Up to a depth of 40 mm, the cable duct can be installed directly at the multi-function enclosure without obstructing its operation.

- The lower cup has 4 slotted holes.
- Open the enclosure and remove the cover.
- Position the lower tray at the intended wall position and mark the hole positions (see arrows in the illustration) with a pencil on the wall.
- Fasten the lower tray in the desired position with the 4 included screws.
- Attach three labels (stickers) to the Heat management module [WMM] as follows:



1	Cover, outer side – front top	Sticker with symbols
2	Cover, inside – in the middle	Sticker "Outputs 230 V _{AC} ≤ 200 W"
3	Cover inside – bottom	Sticker "Inputs PT1000 temperature sensors"

- Replace the cover.

7.2.3.6.2 Connecting dimensions

Max. permitted values: Total loads for all connections

Switching voltage	≤ 440 V _{AC} or 125 V _{DC}
Switching current	≤ 10 A
Switching power	≤ 2500 VA
Pumps	≤ 200 W (Category A)

7.2.3.6.3 Pulling in the cable

The multi-function enclosure offers 20 cable feedthroughs at its underside.

- Thread the cables into the enclosure from below and fasten each cable at one cable clamp (1), respectively.
- Ensure short cable paths, so select the cable feedthrough closest to the connector.



- Keep the terminal compartment clear and avoid crossing wires and cables.
- Always route signal and power supply cables separately.
- Use the power cable in accordance with DIN VDE 0281-5 or local regulations.
- Check the polarity of the connections.

Sensors

- When connecting the sensors, there is no specified polarity; simply observe the correct connection in pairs.

Strain relief

- To relieve the strain use a cable clamp for every cable.

7.2.3.6.4 Plug at the WMM

Conne- tor	Pins	Description	Function
300	3	3-pole supply 230 V _{AC} (fuse rating 13A type B)	supply voltage
301	3	3-pole power supply 230 V _{AC}	Pump/valve for secondary heating source
304	3	3-pole power supply 230 V _{AC}	Circulation pump
305	3	3-pole power supply 230 V _{AC}	DHW pump
306	3	3-pole power supply 230 V _{AC}	Feeder pump/valve or buffer charging pump
307	4	4-pole power supply 230 V _{AC}	Heating circuit 2 mixer
308	3	3-pole power supply 230 V _{AC}	Heating circuit 2 pump
309	4	4-pole power supply 230 V _{AC}	Heating circuit 1 mixer
310	3	3-pole power supply 230 V _{AC}	Heating circuit 1 pump
311	2	2-pin floating contact, max. 10 A	Request heating source 2
320	2	2-pole digital input 24 V _{DC}	Circulation, push button
322	2	2-pole digital input 24 V _{DC} Is delivered bridged.	Release heating circuit 1
323	2	2-pole digital input 24 V _{DC} Is delivered bridged.	Release heating circuit 2
327	2	2-pole connection sensor PT1000	Outside temperature
328	2	2-pole connection sensor PT1000	DHWC 1 temperature
329	2	2-pole connection sensor PT1000	Circulation temperature
330	2	2-pole connection sensor PT1000	Buffer storage tank 1 temperature
331	2	2-pole connection sensor PT1000	Buffer storage tank 2 temperature

332	2	2-pole connection sensor PT1000	Buffer storage tank 3 temperature
333	2	2-pin connection sensor PT1000	Buffer storage tank 4 temperature
334	2	2-pole connection sensor PT1000	Buffer storage tank 5 temperature
335	2	2-pole connection sensor PT1000	Room temperature heating circuit 1 analog
336	2	2-pole connection sensor PT1000	Room temperature heating circuit 2 analog
337	2	2-pole connection sensor PT1000	Forward flow temperature heating circuit 1
338	2	2-pole connection sensor PT1000	Forward flow temperature heating circuit 2
342	2	2-pole connection sensor PT1000	Secondary heating source temperature
360	3	3-pole bus connection	House bus [IN] (remains open if installed in the boiler)
361	6	6-pole bus connection	House bus [OUT] Delivered terminated (120 Ω) Must be removed in case of bus extensions!
362	7	7-pin bus connection	Control unit 1
363	7	7-pole bus connection	Control 2 (is delivered bridged)
364	9	9-pole flat connector	Control unit 3 – Only for the control unit directly in the multi-function enclosure!
365	4	4-pole flat connector	Connection to the LED row
366	6	6-pole flat connector	Input bus connection from the Boiler power module (#136)
367	9	D-SUB 9M plug	RS232 interface, e.g. for SMS module
368	6	RJ12 plug	Power supply 24 V_{DC} for SMS module

7.2.3.7 Final steps

- Leave the construction site in a clean condition.
- Close the control box at the boiler.
- Install the front casing and connect the Exclusive control unit [BGE].
- Install the Exclusive control unit [BGE] on the front casing: First, hook the control unit in at the upper edges and then push the lower edge down.
- Ensure strain relief for the cable to the Exclusive control unit [BGE].
- Use the two screws to fasten the front casing to the boiler housing.

7.3 Chimney

7.3.1 Chimney requirements

Moisture-resistant according to DIN 18160

Due to the high boiler efficiency, the chimney design should be resistant to moisture. According to DIN 18160, these are chimney designs which prevent moisture penetration or damage to the brickwork, even though the temperature level in the exhaust path remains permanently below the exhaust gas dewpoint! Exceptions are only possible if the exhaust gas temperature is increased due to interventions in the device. However, boiler efficiency will be reduced by such a measure.

Chimney diameter

The approximate values for the chimney diameter are specified in the technical data table. They are valid for the applicable system size, given average structural conditions. This means: Effective chimney height 8–10 m, 1.5 m exhaust pipe length, maximum 2 segment bends at 90° each, 1 contraction, 1 T-connection at 90°.

The cross-section diagrams provided by the chimney manufacturer can serve as a quick reference aid, if the site conditions are not less favourable than the conditions specified in the cross-section diagrams. If conditions differ or are less favourable, it is necessary to carry out a chimney calculation according to EN 13384-1. The boiler parameters required for the calculation are specified in the technical data table.

KWB provides an electronic data entry sheet for this purpose. Upon request, KWB will provide the chimney calculation based on the information provided on the form. This is a chargeable service.

The local expert for these issues is your responsible chimney sweep. It is advisable to involve the chimney sweep during the planning phase as he is the one who will have to issue the acceptance certificate for the exhaust gas system.

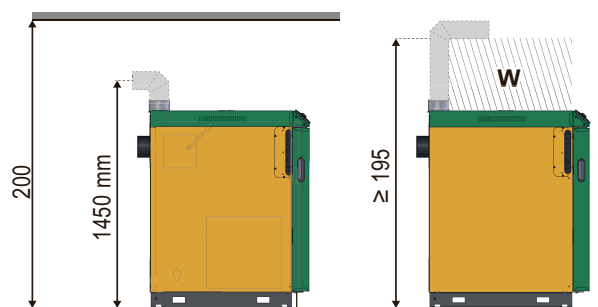
7.3.2 Connecting the exhaust pipe

The KWB system is equipped with an induced draught fan as standard equipment.

NOTE

Keep the maintenance area free!

- The distance from the upper edge of the boiler to the exhaust pipe depends on whether the exhaust pipe is installed above the heat exchanger or not.
- If the exhaust pipe to the chimney is installed above the heat exchanger, it is essential that you adhere to the specified clearance!
- ↳ Only if this is the case, the cleaning springs can be dismantled during maintenance, if required.



W Keep the maintenance area free!

Chimney connection

The diameter of the chimney connection should be 20 mm larger than the exhaust gas pipe diameter at the boiler. This way, it is possible to integrate an acoustic transmission decoupler between the exhaust gas pipe and the chimney.

The exhaust gas pipe connection between boiler and chimney should be identical to the connection on the boiler.

→ Install a **draught limiter** and an **explosion damper** at the exhaust pipe or the chimney side wall.

↳ We recommend installing a draught limiter in the chimney under the exhaust pipe inlet as constant negative pressure is ensured at this spot.

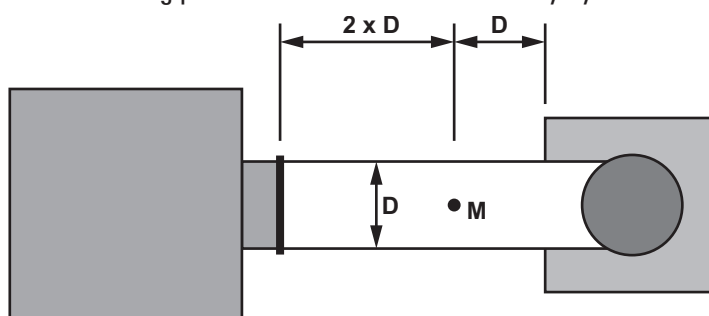
→ Position both safety elements such that there is no chance of a risk to persons!

Exhaust pipe requirements:

- Pipe length as short as possible
- With a slight upward slope to the chimney connection ($\geq 3^\circ$, ideally $30-45^\circ$, max. 45°)
- Sealed and thermally insulated
- Equipped with easily accessible openings for cleaning

Measuring opening

- To measure the emissions of the system, a suitable measuring opening must be installed in the connecting piece between boiler and chimney system.



- There should be a straight inlet path before the measuring opening (M) at a distance of about twice the diameter (D) of the connecting piece. After the measuring opening, there should be a straight outlet path at a distance of about once time the diameter of the connecting piece.
- The measuring opening must always be kept closed while the system is in operation.
- It must be kept in mind for the measuring opening that the outer diameter of the sampling probes may be up to 13 mm. To prevent incorrect false air intake, the diameter of the measuring opening must not exceed 21 mm.



8 Commissioning

8.1 Before commissioning / configuring the boiler

The boiler must be configured to the heating system before commissioning!



WARNING

Unforeseeable consequences (personal injury and property damage) due to incorrect commissioning

- ↳ The initial commissioning requires comprehensive specialised knowledge: Only qualified and certified technicians are permitted commission the system!
- Read the respective documentation before commissioning!
- Adhere to the sequence specified in it and to the specifications in the working steps.

NOTE

Proper configuration by specialists

Only if the system is configured by qualified and certified specialists and the standard factory settings are complied with, it is possible to guarantee an optimal efficiency and an efficient and low-emission operation!

NOTE

Damage to the heating system due to foreign objects

- ↳ Foreign objects in the heating system impair the system's operational safety and may result in material damage.
- Before commissioning purge the entire system in accordance with EN 14336.
- Recommendation: The pipe diameters of the purging nozzles in the forward and return flow should have the same dimension as the pipe diameters in the heating system as specified in ÖNORM H 5195, but no more than DN 50.

- Switch on main switch
- Check the system pressure of the heating system
- Check whether the heating system has been fully bled
- Check whether all water-related connections are closed tightly
 - ↳ Particularly pay attention to those connection where plugs were removed during installation
- Check whether safety devices are available and ensure their proper functioning
- Check whether a sufficient ventilation of the boiler room is ensured
- Check that the boiler is sealed tightly
 - ↳ All doors and revision opening must close tightly!
- Check drives and servomotors for proper functioning and direction of rotation
- Check door contact switch for proper functioning

8.2 Commissioning

8.2.1 Intended fuels



DANGER

Life-threatening danger due to toxic combustion gases

- When burning rubbish, toxic gases are emitted that may destroy the boiler: these include chipboards and other glued laminated wood products, plastic materials, rubber, PVC, varnish, etc.
- Only burn fuels intended for this system!



CAUTION

Explosions through ignition aids

- NEVER ignite and heat the boiler with liquid fuels, such as gasoline!

Reliable fuels

The following fuels, which have to meet the respective standards, are exclusively permitted for system operation:

- **Log wood**

Log wood pursuant to EN ISO 17225 – part 5: log wood class A2 / D15 L50 (in Germany additionally fuel class 4 (§3 of the 1st BImSchV, as amended))

- Length: max. 55 cm (M25)
- Moisture content (w): between 15% and 25% (corresponds to wood moisture (u) of between 17% and 33%)

Note: If the moisture content falls below 15%, it is recommended to adjust the combustion control to the fuel. Contact your heating system company or the KWB customer service!

See also section Increased exhaust gas duct cleaning efforts in the operating instructions

These must not contain any foreign objects (stones, plastic materials)!

Tips on how to store wood



- Split larger log wood pieces before you store them.
- Store the wood in a sunny and dry and well-ventilated spot (e.g. storage at the edge of the forest instead of inside the forest) and keep it protected against weather influences.
- When storing at a building wall, it is preferable to use the side facing the sun and to keep a distance of 5-10 cm to the building wall.
- Create a dry surfaces on which to place the wood, ventilated, if possible, by placing round pieces of timber, palettes, etc.
- Store the daily fuel amount used in heated rooms, if possible (e.g. in the room where the boiler is located).

Relationship of moisture content to storage period

Newly harvested timber has a moisture content of approximately 50 to 60%. During storage, the moisture content of the log wood decreases depending on how dry the storage location is and what the ambient temperature is.

Storage	Wood type	Moisture content	
		15 – 25%	below 15%
Storage in heated and ventilated rooms (approx. 20°C)	Softwood (e.g. spruce)	approx. 6 months	after 1 year
	Hardwood (e.g. beech)	1 – 1.5 years	after 2 years

Storage	Wood type	Moisture content	
		15 – 25%	below 15%
Stored outside (protected against weather influences, exposed to wind)	Softwood (e.g. spruce)	2 summers	after 2 years
	Hardwood (e.g. beech)	3 summers	after 3 years

Partially admissible fuels

- **Wood briquettes**

Partially admissible wood briquettes for non-industrial use according to EN ISO 17225 – part 3: wood briquettes class B / D100 L500 form 1 - 3 (in Germany additional fuel class 5a (§3 of the 1st BImSchV, as amended))

- Diameter: 5-10 cm
- Length: 5-50 cm

Instructions for use

- The ignition of wood briquettes must be carried out using log wood pursuant to EN 17225-5 (at least two log wood layers underneath the wood briquettes).
- The fill room must be filled to max. 3/4 as the wood briquettes expand during combustion.
- When burning wood briquettes, issues may occur during combustion. In this case, adjustments must be made by qualified personnel.
Contact your heating system company or the KWB customer service!

Inadmissible fuels

The use of fuels which are not defined in the section “Intended fuels”, particularly the burning of waste is not permitted.



CAUTION

Boiler damage due to the use of inadmissible fuels

- The combustion of inadmissible fuels leads to increased cleaning expenditures and damage to the boiler due to the build-up of aggressive deposits and condensation; this invalidates the warranty! Moreover, the use of non-standard fuels may strongly impair the combustion!
- Only use admissible fuels!

8.2.2 First heat-up



CAUTION

The boiler may be damaged if it is heated up too quickly during commissioning

- When heating up with too much output, the combustion chamber can develop cracks if it dries out too quickly!
- The commissioning of the log wood boilers should be carried out with a small amount of fuel

Note: Escape of condensation during the first heat-up phase does not indicate a malfunction. Have some cleaning rags ready, if necessary!

- Open the casing door and the fill room door
- Fill the fill room for commissioning and heat up

Note: For detailed information see KWB Classicfire type CF1 operating instructions.



Tip: Cover the first 20 cm of the fill room with small-sized split logs (edge length < 10 cm). This helps reduce the time until an ember bed forms.



Tip: The smaller the split logs, the quicker an ember bed will be able to form.



9 Appendix

Please also see

- 📄 Technische_Datentabelle_TDT_CF1_Stückholz DE (► 84)
- 📄 Declaration of conformity CF1_15-20_DE (► 86)

9.1 Dismantling and disposal

9.1.1 Dismantling

- ✎ Dismantle the boiler in reverse order of the assembly sequence. Consult KWB customer service for advice! Comply with local regulations!
- Shut down the heating system and disconnect the boiler from the mains after the system has cooled down.
- Empty the boiler.



WARNING

Fatal crushing (pulled muscles) caused by heavy components! Inappropriate lifting/transporting can lead to fatal injury and serious damage to the equipment.

- ✎ **Only trained staff** may lift/transport heavy components!
- ✎ **Keep the component weight in mind – handle accordingly:**
 - Verify transport securing devices BEFORE lifting / transporting!
 - Keep the centre of gravity in mind - always secure components to prevent slipping and tilting!
 - Select stable bases, suitable tools and assistance from staff!
 - Lift with your back straight, NOT too heavy.
 - Use your personal protection equipment[PSA].
 - In difficult areas ensure that people and system are safe!

- Remove the ash from the boiler.
- Remove the casing cover parts and the cabling.
- Disconnect the boiler from the hydraulic system and the chimney connection.

9.1.2 Disposal

- Comply with local waste disposal regulations! Ensure environmentally sound disposal pursuant to AWG (Austria) or country-specific provisions.
- Recyclable materials can be taken separately and in clean condition to the specified recycling points.

In principle, you can dispose of the heating system as residual or bulky waste – but we recommend separating its components for recycling purposes (in a recycling centre) in order to handle resources in a more sustainable manner.

Plastic materials

The control unit housings, cable bushings and seals are made of plastic or rubber.

Construction waste

This includes the insulation (mineral wool) and the refractory bricks from the combustion chamber.

Metal

Our main material is metal which can be recycled efficiently: boiler bodies, cables ...

Circuit boards

- Dispose of these responsibly!
- Comply with all local waste disposal regulations!



CAUTION

Hazardous waste – dispose of properly!

The metals on and in the circuit boards do NOT belong in the household waste.

- ↳ All circuit boards used by KWB comply with the "Directive 2002/95/EC for the restriction of certain hazardous substances in electrical and electronics equipment".
- Take the circuit boards to a proper disposal facility – this helps protect the environment!
- Dispose of the circuit boards at collection points for electronic waste only.

Battery



CAUTION

Environmental contamination by batteries

- ↳ There is a lithium battery inside the boiler control unit.
- Dispose of the battery separately. When doing so, you must comply with all local regulations!



The following characters below the garbage bin symbol stand for:

- Pb: Battery contains lead
- Cd: Battery contains cadmium
- Hg: Battery contains mercury

Old batteries may not be disposed of in the household waste: EU Directive 2006/66/EC obligates consumers to dispose of batteries/rechargeable batteries at a collection point (more information can be found at <http://www.epbaeurope.net/>). Returning batteries to communal collection points is free of charge for private households.

Alternatively, you can send used batteries from the KWB control unit back to us. When sending batteries/rechargeable batteries, you must meet a few special conditions: Please inquire ahead of time (hazardous materials) and be sure to provide sufficient postage.

CF1 23.08.2018	Unit	CF1 15	CF1 20
		Log wood	Log wood
Rated power	kW	15,0	20,0
Boiler efficiency at rated power	%	92,5	92,0
Full load burning period: Beech Spruce	h	4,9 - 7,0 3,0 - 4,2	3,5 - 5,0 2,1 - 3,0
Boiler class according to EN 303-5:2012	-	5	5 4 ¹
EU Energylabel ²	-	A+	A+
Water side			
Water content	l	90	90
Water connection, forward/return flow (internal thread)	inch mm	1 25,4	1 25,4
Water connection for filling and/or emptying (internal thread)	inch mm	1/2 12,7	1/2 12,7
Thermal safety valve: pressure	bar	2-6	2-6
Water connection for thermal safety valve (internal thread)	inch mm	1/2 12,7	1/2 12,7
Water-side resistance at 20 K **	mbar	0,5	1,5
Boiler-entry temperature	°C	60	60
Working temperature/operating temperature	°C	90	90
Maximum operating pressure	bar	3	3
Buffer tank required	-	✓	✓
Minimum usable buffer tank volume	l	1000	1500
Recommended usable buffer tank volume	l	1500	1500
Exhaust-gas side (data for chimney design)			
Required draft at rated power/partial load	Pa	8,0	8,0
Required draft at rated power/partial load	mbar	0,08	0,08
Induced draught required	-	✓	✓
Exhaust-gas temperature at rated power	°C	150	170
Exhaust-gas mass flow at rated power	kg/h	36,0	46,8
Exhaust-gas mass flow at rated power	kg/s	0,010	0,013
Chimney connection height	mm	1.395	1.395
Exhaust pipe diameter (outer)	mm	129	129
Chimney diameter (minimum)	mm	150	150
Chimney design: moisture-resistant	-	✓	✓
Fuel			
Permitted fuels: log wood A2 / D15 L50 acc. to EN ISO 17225-5	-	✓	✓
Maximum length log-wood	cm	55	55
Maximum water content (fresh weight)	kg/kg	≤ 25	≤ 25
Fill area			
Fill area volume	l	80	80
Width of fill doors	mm	350	350
Height of fill doors	mm	360	360
Electrical system			
Connection	-	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A
Unit switch and main switch: present	-	✓	✓
Elektrisk effekt ved nominal last	W	37	42
Energy requirement standby	W	9	9
Weights			
Total weight	kg	455	465
Setup			
Minimum distance from wall - to the rear	mm	400	400
Minimum distance from wall - to the front	mm	800	800
Minimum distance from wall - on each side	mm	200 (500) ⁴	200 (500) ⁴
Minimum distance from wall - on each side	mm	200 (500) ⁴	200 (500) ⁴

CF1 21.08.2018	Unit	CF1 15	CF1 20
Emissions according to test report		TÜV Austria	TÜV Austria
Test report no.	–	18-U-268/SD	18-U-269/SD
O ₂ content rated power	Vol.-%	6,9	7,0
CO ₂ content rated power	Vol.-%	13,3	13,3
Noise emissions (EN 15036-1)			
Normal operating noise at rated power	dB(A)	< 70	< 70
Ref. 10 % O₂ dry (EN303-5)			
CO at rated power	mg/Nm ³	140	104
NO _x at rated power	mg/Nm ³	163	178
OGC at rated power	mg/Nm ³	6	7
Dust at rated power	mg/Nm ³	15	21
Ref. 11 % O₂ dry			
CO at rated power	mg/Nm ³	128	94
NO _x at rated power	mg/Nm ³	148	162
OGC at rated power	mg/Nm ³	6	6
Dust at rated power	mg/Nm ³	14	19
Ref. 13 % O₂ dry (FJ-BLT)			
CO at rated power	mg/Nm ³	102	75
NO _x at rated power	mg/Nm ³	118	129
OGC at rated power	mg/Nm ³	5	5
Dust at rated power	mg/Nm ³	11	15
In accordance with § 15a-BVG Austria			
CO at rated power	mg/MJ	69	51
NO _x at rated power	mg/MJ	80	88
OGC at rated power	mg/MJ	3	3
Dust at rated power	mg/MJ	8	10

1) with partial load test

2) energy efficiency index of the integrated unit comprising solid fuel boiler and temperature control

3) according to BAFA (55 litres/kW)

4) The boiler should be placed on one side (B or D) at a distance of at least 500 mm to the wall, to ensure easy access to the device connection and for maintenance work (e.g. induced draught).

Declaration of Conformity

As specified by the EC Machinery Directive 2006/42/EC, Annex II 1 A

We hereby declare that the specified system in the series version complies with all applicable provisions of the Machine Directive.

Boilers of the model range

KWB Classicfire 15–20 kW
comprising the models: CF1 15 / 20

Furthermore, the system conforms to the following directives/applicable regulations:

EMC Directive 2014/30/EU; Directive 2014/35/EU; RoHS Directive 2011/65/EU

Applied European harmonised standards:

EN 303-5:2012, EN 60335-1:2014-04, EN 60335-2-102:2016-11, ÖNORM EN ISO 12100:2013-10-15

KWB – Kraft und Wärme aus
Biomasse GmbH

St. Margarethen an der Raab
14. 08. 2018



Authorised representative for
the compilation of the technical
documents

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Date

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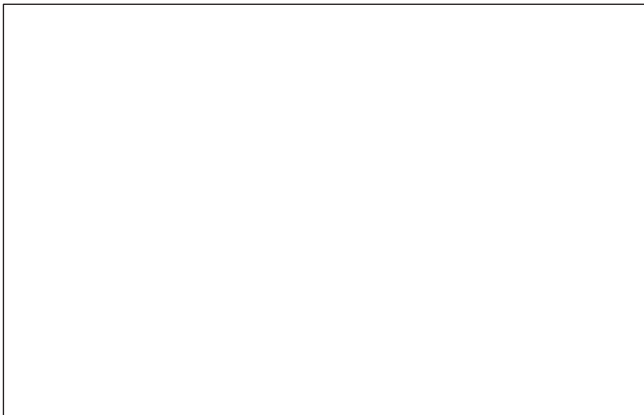
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