Installation instructions for contractors

Wall mounted gas condensing boiler

CGB-2 wall mounted gas condensing boiler
CGB-2K wall mounted gas condensing combi boiler

CGB-2-14
CGB-2(K)-20
CGB-2(K)-24

WOLF GMBH / POSTFACH 1380 / D-84048 MAINBURG / TEL. +49.0.875174-0 / FAX +49.0.875174-1600 / www.WOLF.eu
Art.-Nr.: 3064810_201804 Subject to technical modifications

GB
IE

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1. Information on documentation/ standard delivery

1.1 Other applicable documents

- Operating instructions for the user
- Maintenance instructions
- System and operating log

The instructions for all accessory modules and other accessories also apply where relevant.

1.2 Safekeeping of these documents

The system user or operator should ensure the safekeeping of all instruction manuals and documents.

► Hand over these installation instructions as well as all other applicable manuals to the system user or operator.

1.3 Instructing the system user

- Instruct the system user to take out an inspection and maintenance contract with an approved contractor.
- Inform the system use that the annual inspection and maintenance may only be performed by an approved contractor.
- Inform the system use that repair work may only be performed by an approved contractor.
- Inform the system user that only original spare parts may be used.
- Inform the system user that no technical changes may be made to the boiler or control unit.
- Inform the system user that they are responsible for the safety, environmental compatibility and energy quality of the heating system (German Immission Control Act/ Energy Saving Ordinance) [Germany].
- Inform the system user that these instructions and the other applicable documents must be kept in a safe place.
- Instruct the system user how to operate the heating system.

1.4 Applicability of these instructions

These installation instructions apply to the CGB-2(K) gas condensing boilers.

1.5 Acceptance

Within 4 weeks of commissioning the combustion system, the operator must notify the local flue gas inspector accordingly [check local regulations]. According to Bundes KÜO (German Federal Sweeping and Inspection Act), tests and inspections are only required every 3 years [Germany].

1.6 Recycling and disposal

- Old equipment may only be disconnected from the gas and electricity supply by a qualified contractor.
- Always dispose of materials according to environmental, recycling and waste management standards.
- Old equipment, worn parts, defective components and liquids and oils which are a hazard to the environment must be disposed of or recycled according to the applicable waste disposal regulations in an environmentally compatible manner.
  They must not be disposed of as household waste.
- Dispose of packaging made of cardboard, recyclable plastics and synthetic filler materials in an environmentally compatible manner through appropriate recycling systems or a recycling centre.

1. Information on documentation/ standard delivery

Standard delivery

1 x Gas condensing boiler ready to connect, in casing
1 x Suspension bracket for wall mounting
1 x Installation instructions for contractors
1 x Operating instructions for users
1 x Service instructions
1 x Commissioning checklist
1 x Label "G31/G30" (for conversion to LPG)
2 x Cold water/DHW connection elbow (only for combi boiler)

Accessories

The following accessories are required for installing the gas condensing boiler:

- Air/flue gas accessories (see technical information)
- Control unit for room temperature-dependent or weather-compensated control (AM/BM-2)
- Condensate drain outlet with hose retainer
- Maintenance shut-off valves for heating flow and return
- Gas ball valve with fire protection
- Heating side safety valve
- Safety assembly for DHW
- Locking caps for cylinder connection (only when using appliances without DHW function)

Other accessories as per pricelist

2. Safety instructions

Authorised personnel should read these instructions before any installation, commissioning or service work. Adhere to the specifications in this document. Failure to observe these installation instructions will void any WOLF warranty.

In some countries, the installation of a gas boiler must be notified to and approved by the relevant gas supply company.
Please note that regional permits may be required for the flue system and connecting the condensate drain to the public sewer.
Before installation work begins, the local flue gas inspector and waste water authority must be informed [check local regulations].

The gas condensing boiler must be installed, commissioned and maintained by qualified and trained personnel only. In accordance with VDE 0105 Part 1, work on electrical components (e.g. control unit) must only be carried out by qualified electricians.

VDE/ÖVE regulations and those of your local power supply utility are applicable to electrical installation work [Germany/Austria].

Operate the gas condensing boiler only within its output range, which is stated in the technical documentation supplied by WOLF. Intended use of the boiler includes exclusive use for hot water heating systems in accordance with DIN EN 12828.

Never remove, bypass or otherwise disable any safety or monitoring equipment. Operate the boiler only if it is in perfect technical condition.

Any faults or damage which impact or might impact upon safety must be remedied immediately by a qualified contractor. Replace faulty components and equipment only with original WOLF spare parts.

Symbols

The following warning symbols are used in these instructions. These relate to personal safety and operational reliability.


Instructions that must be followed precisely in order to prevent risk and injury to persons.


Instructions that must be followed precisely in order to prevent risk and injury to persons from live electrical components.

Please note — Indicates technical instructions that must be observed to prevent damage to the boiler and malfunctions.


Danger: if you smell gas

- Close the gas tap.
- Open the windows.
- Do not operate any electrical switches.
- Extinguish naked flames.
- Phone the gas supply utility company and an approved contractor from an external location.


Danger from „live“ electrical components

Never touch electrical components or contacts when the ON/OFF switch is in the ON position. There is a danger of electrocution, resulting in a risk to health or death. The main terminals are ‘live’, even when the ON/OFF switch is in the OFF position.


Danger: if you smell flue gas

- Switch OFF the appliance.
- Open windows and doors
- Notify an approved contractor.


Risk of scalding

Boilers may contain hot water.
Hot water can cause severe scalding.
Before working on parts which are in contact with water, allow the appliance to cool to below 40 °C, shut off all valves and, if necessary, drain the appliance.


Risk of burns

Boiler components may be extremely hot.
Hot components can cause burns.
Before working on the opened up appliance, allow it to cool below 40 °C or wear suitable gloves.

2. Safety instructions

Danger from pressurised water

Boilers are subject to high water pressure. Water pressure can cause severe injuries. Before working on parts which are in contact with water, allow the appliance to cool to below 40 °C, shut off all valves and, if necessary, drain the appliance.

Note:
Sensors can be in contact with water and therefore exposed to pressure.

Working on the system

- Close the gas shut-off valve and secure it against unintentional reopening.
- Isolate the system from the power supply (e.g. by removing the separate mains fuse or by means of a main switch or a heating emergency stop switch) and check to ensure there is no voltage.
- Safeguard the system against reconnection.

Inspection and service

- Ensure the correct operation of the gas boiler by having a contractor carry out inspections at least once a year and maintenance/repair when required.
- (DVGW - TRGI 2008 - G600).

We recommend arranging a suitable maintenance contract.

- The operator is responsible for the safety, environmental compatibility and energy quality of the heating system (German Immission Control Act/Energy Saving Ordinance) [Germany].
- Only use genuine WOLF spare parts.

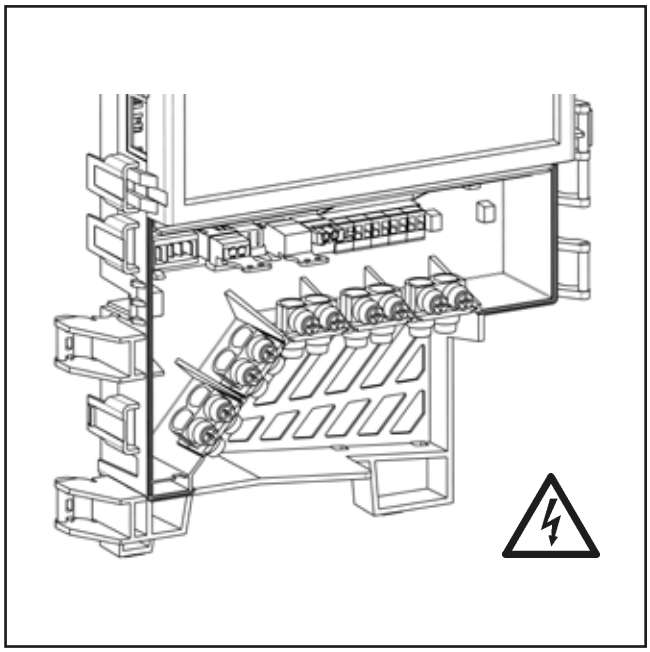


Fig: Terminal box: Danger from electrical voltage

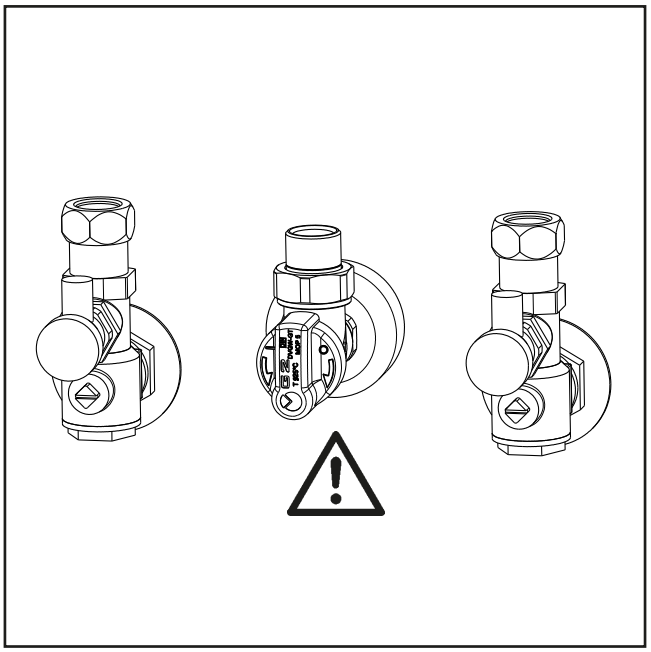


Fig: Gas connection: Risk of poisoning or explosion in the event of gas escaping

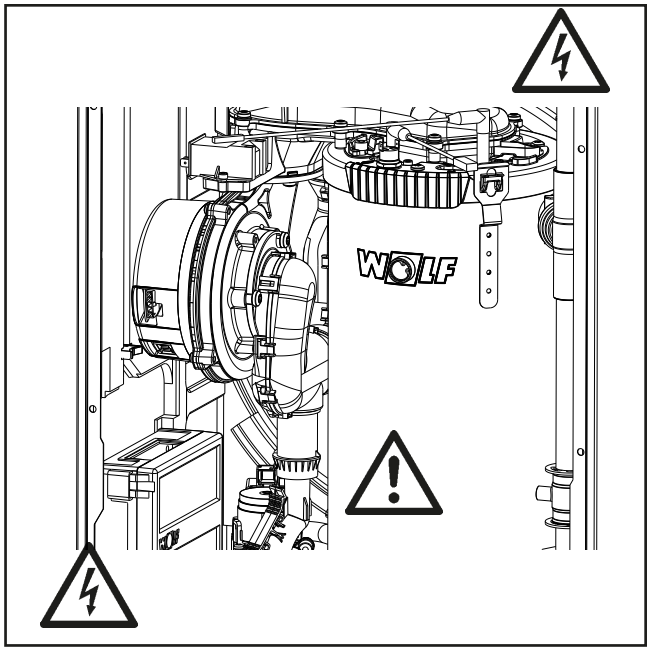


Fig: Ignition transformer, high voltage ignition electrode, combustion chamber
Danger from 'live' electrical components, risk of burning from hot components

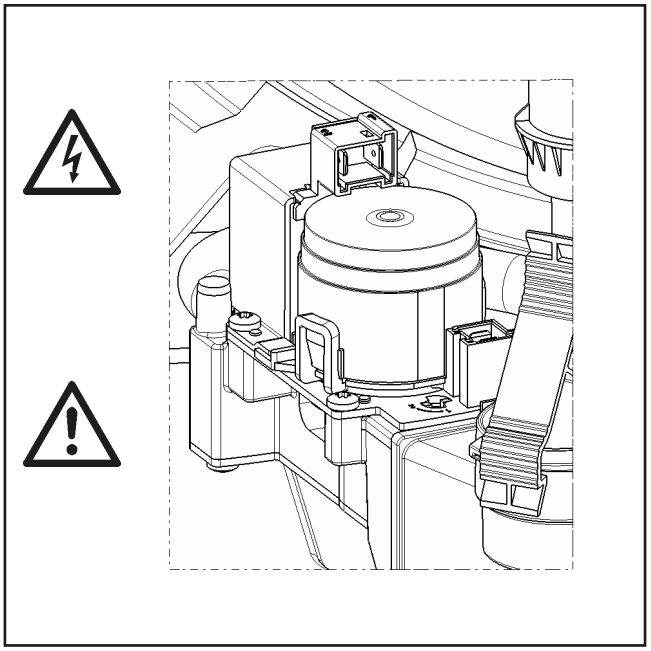
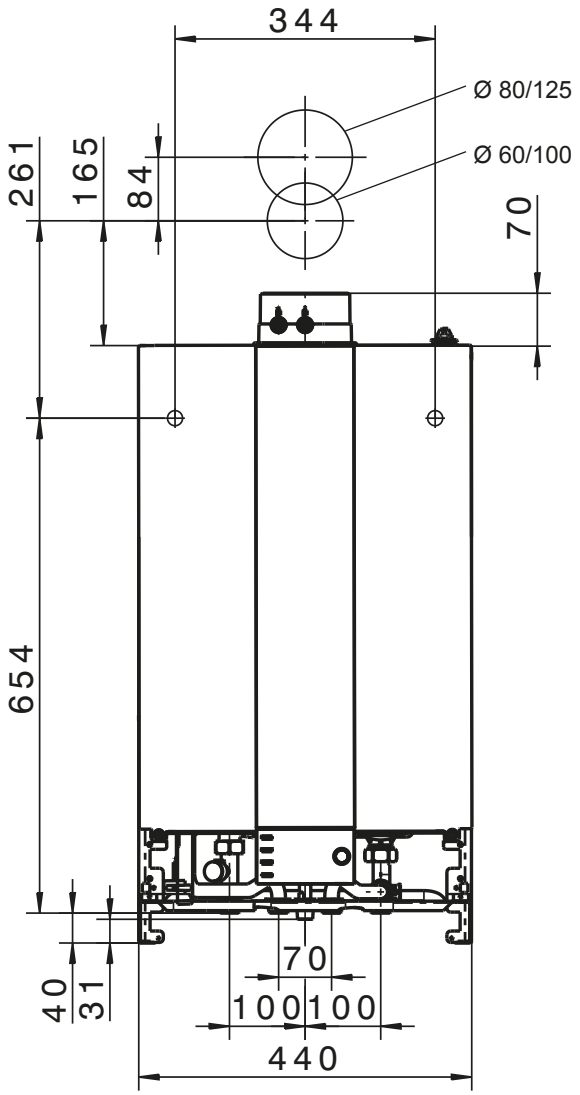
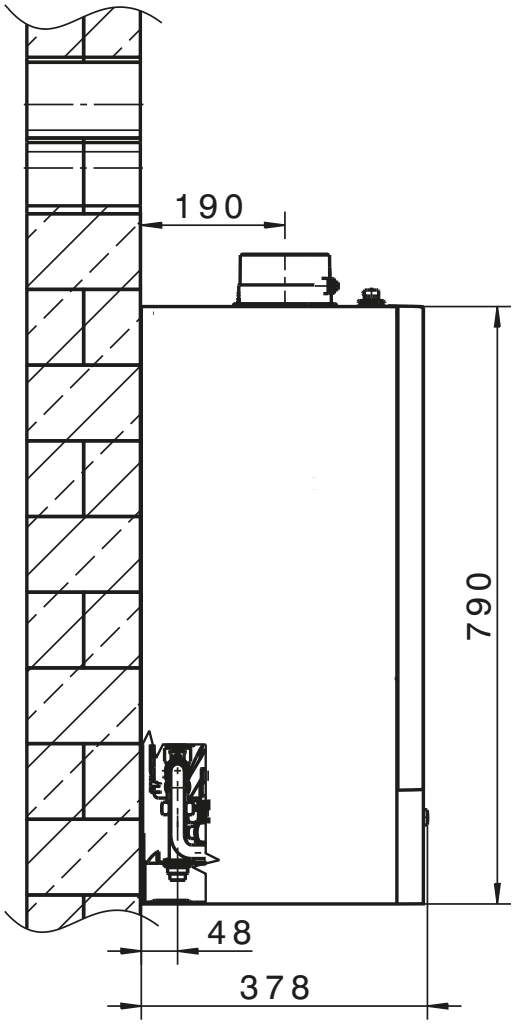


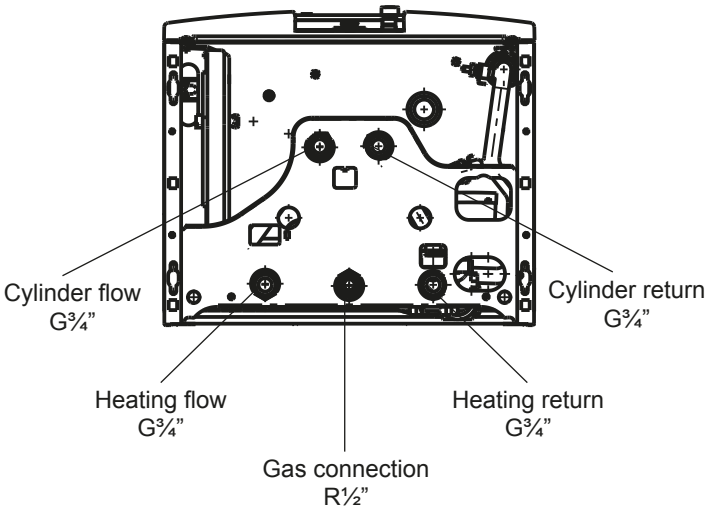
Fig: Gas combination valve
Danger from 'live' electrical components
Risk of poisoning or explosion in the event of gas escaping

3. Dimensions

CGB-2
Wall mounted gas condensing boiler







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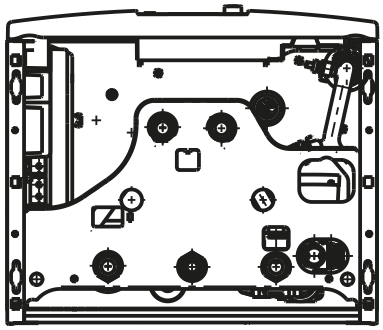
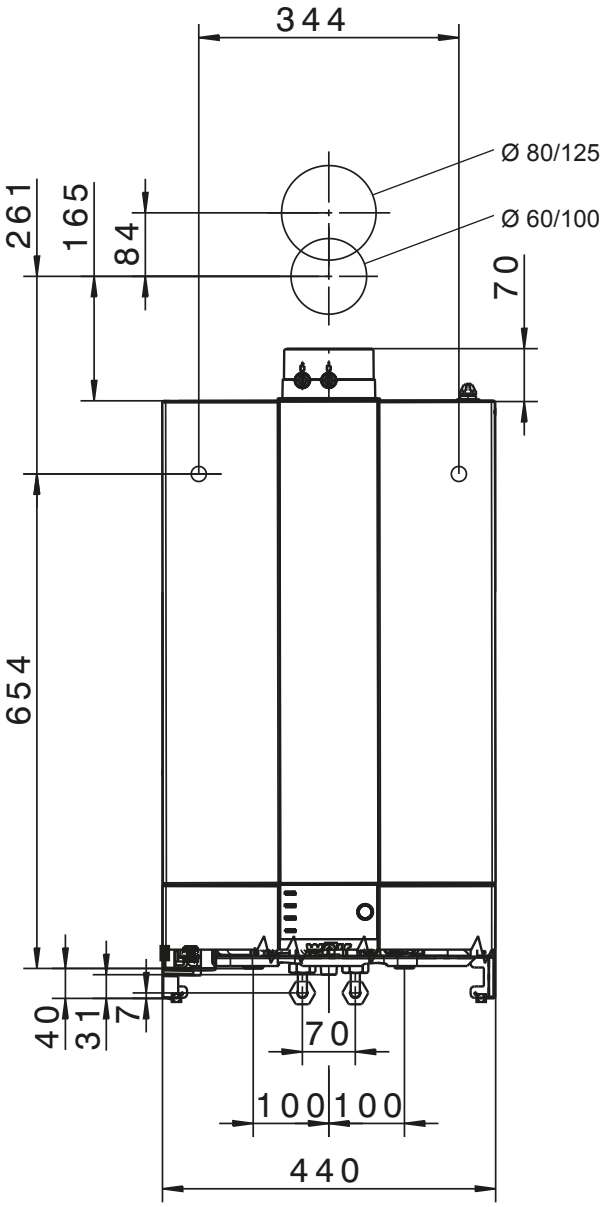
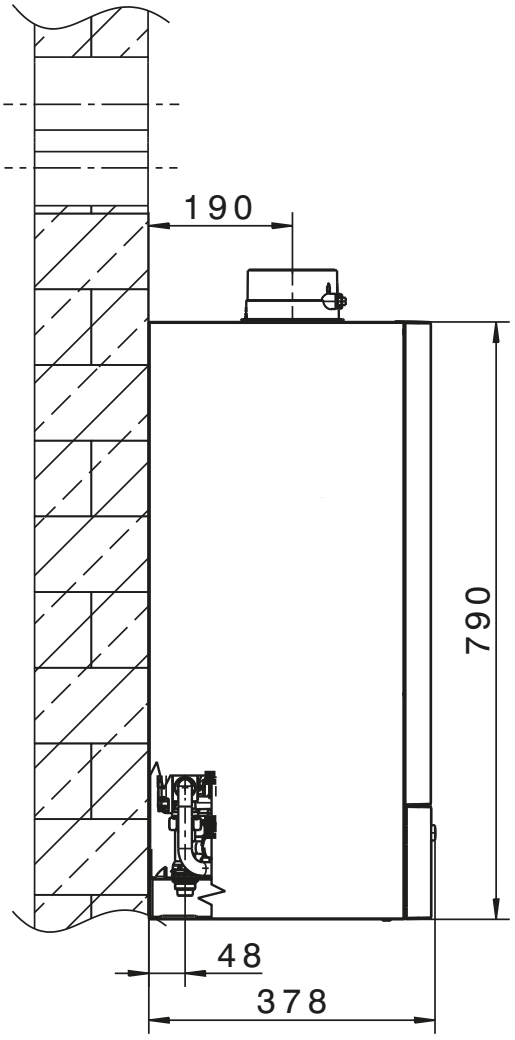
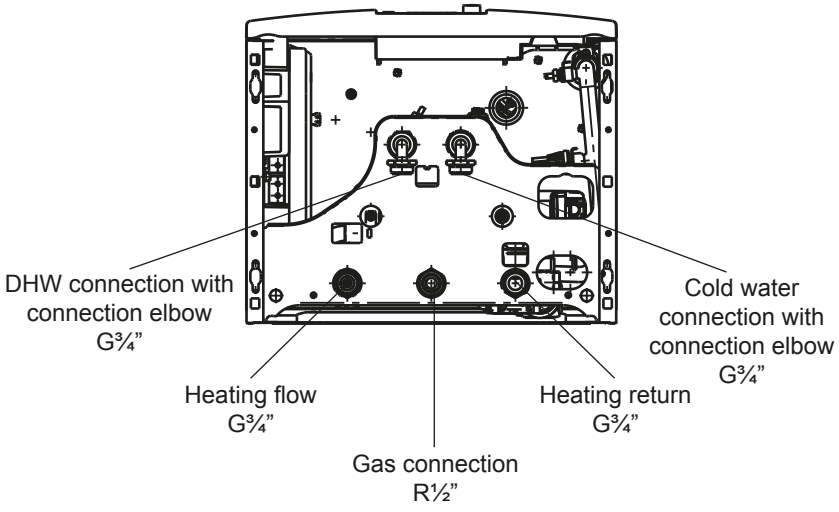


3. Dimensions

CGB-2K
Wall mounted gas condensing combi boiler







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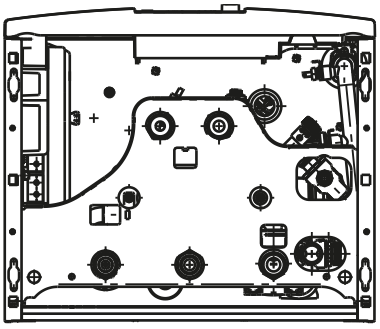


4. Specification

Type		CGB-2	14	20	24	-	-
		CGB-2K	-	-	-	20	24
Rated heating output at 80/60 °C		kW	13.5	18.9/22.2 [1]	23.8/27.1[1] (23.8[3])	18.9/22.2 [1]	23.8/27.1[1] (23.8[3])
Rated heating output at 50/30 °C		kW	15.2	20.4	25.8	20.4	25.8
Rated heat input		kW	14.0	19.6/23.0	24.6/28.0 (24.6 [3])	19.6/23.0	24.6/28.0 (24.6 [3])
Lowest heating output (modulating) at 80/60 °C		kW	1.8/4.6 [2]	3.8/6.8 [2]	4.8/6.8 [2]	3.8/6.8 [2]	4.8/6.8 [2]
Lowest heating output (modulating) at 50/30 °C		kW	2.1/5.4 [2]	4.4/7.4 [2]	5.6/7.4 [2]	4.4/7.4 [2]	5.6/7.4 [2]
Lowest heat input (modulating)		kW	1.9/4.9 [2]	3.9/6.9 [2]	4.9/6.9 [2]	3.9/6.9 [2]	4.9/6.9 [2]
Heating flow connection		G	¾" (DN20)	¾" (DN20)	¾" (DN20)	¾" (DN20)	¾" (DN20)
Heating return connection		G	¾" (DN20)	¾" (DN20)	¾" (DN20)	¾" (DN20)	¾" (DN20)
DHW connection/DHW circulation		G	¾"	¾"	¾"	¾"	¾"
Cold water connection		G	¾"	¾"	¾"	¾"	¾"
Gas connection		R	½"	½"	½"	½"	½"
Balanced flue connection		mm	60/100	60/100	60/100	60/100	60/100
Dimensions	Depth	mm	378	378	378	378	378
	Width	mm	440	440	440	440	440
	Height	mm	790	790	790	790	790
Air/flue gas routing		Type	B23P, B33P, C13(x), C33(x), C43(x), C53(x), C63(x), C83(x), C93(x)				
Gas supply details							
Natural gas E/H (Hi [net cv] = 9.5 kWh/m³ = 34.2 MJ/m³)		m³/h	1.44	2.06/2.42	2.52/2.95	2.06/2.42	2.52/2.95
Natural gas LL (Hi [net cv]=8.6 kWh/m³ = 31.0 MJ/m³)		m³/h	1.59	2.28/2.67	2.79/3.25	2.28/2.67	2.79/3.25
LPG P (H_i [net cv] = 12.8 kWh/m³=46.1 MJ/m³)		kg/h	1.07	1.53/1.80	1.87/2.19	1.53/1.80	1.87/2.19
Natural gas supply pressure (permiss. min./max.)		mbar	20 (17-25)	20 (17-25)	20 (17-25)	20 (17-25)	20 (17-25)
LPG supply pressure (permiss. min./max.)		mbar	50 (42.5-57.5)	50 (42.5-57.5)	50 (42.5-57.5)	50 (42.5-57.5)	50 (42.5-57.5)
Std seasonal efficiency [to DIN] at 40/30 °C (Hi[net cv]/Hs[gross cv])		%	110/99	110/99	110/99	110/99	110/99
Std. seasonal efficiency [to DIN] at 75/60 °C (Hi[net cv]/Hs[gross cv])		%	107/96	107/96	107/96	107/96	107/96
Efficiency at rated load at 80/60 °C (Hi[net cv]/Hs[gross cv])		%	98/88	98/88	98/88	98/88	98/88
Efficiency at 30 % partial load and TR=30 °C (Hi[net cv] /Hs[gross cv])		%	109/98	109/98	109/98	109/98	109/98
Flow temperature, factory setting		°C	75	75	75	75	75
Flow temperature up to approx.		°C	90	90	90	90	90
Max. overall pressure		bar	3.0	3.0	3.0	3.0	3.0
Max. residual head for heating circuit: HE pump (EEI <0.23)							
600 l/h pump rate (14 kW at Δt=20 K)		mbar	550	550	550	550	550
860 l/h pump rate (20 kW at Δt=20 K)		mbar	-	430	430	430	430
1030 l/h pump rate (24 kW at Δt=20 K)		mbar	-	-	280	-	280
DHW flow rate		l/min	-	-	-	2.0-6.5	2.0-8.0
Minimum flow pressure to EN 625		bar	-	-	-	0.4	0.65
Specific water throughput "D" at Δt = 30 K		l/min	-	-	-	10.3	13.0
Max. permissible positive DHW pressure		bar	-	-	-	10	10
DHW temperature range (adjustable)		°C	-	-	-	45-65	45-65
Hot water content of htg. water heat exchanger		l	1.3	1.3	1.3	1.3	1.3
Expansion vessel, total capacity		l	10	10	10	10	10
Expansion vessel, pre-charge pressure		bar	0.75-0.95	0.75-0.95	0.75-0.95	0.75-0.95	0.75-0.95
Flue gas temperature 80/60-50/30 at Qmax		°C	62-45	70-50	76-50	70-50	76-50
Flue gas temperature 80/60-50/30 at Qmin		°C	30-25	30-25	33-27	30-25	33-27
Flue gas mass flow rate at Qmax		g/s	6.2	8.8/10.7 [1]	10.9/13.0 [1]	8.8/10.7 [1]	10.9/13.0 [1]
Flue gas mass flow rate at Qmin		g/s	0.9	1.8	2.3	1.8	2.3
Available gas fan draught at Qmax		Pa	125	135	180	135	180
Available gas fan draught at Qmin		Pa	10	14	17	14	17
Flue gas category			G_{52}	G_{52}	G_{52}	G_{52}	G_{52}
NOx class			6	6	6	6	6
Amount of condensate at 50/30 °C		l/h	approx. 1.4	approx. 2.0	approx. 2.4	approx. 2.0	approx. 2.4
pH value of condensate			approx. 4.0	approx. 4.0	approx. 4.0	approx. 4.0	approx. 4.0
Power consumption in standby		W	3	3	3	3	3
Maximum power consumption		W	17-59/45 [1]	17-51/63 [1]	17-62/88 [1]	17-51/63 [1]	17-62/88 [1]
IP rating		IP	IPX4D	IPX4D	IPX4D	IPX4D	IPX4D
Power supply/fuse/MCB protection			230 V/50 Hz/16 A/B				
Total weight		kg	33	33	33	35	35
CE designation			CE-0085CO0098				
ÖVGW quality symbol [Austria]			G 2.990				
SVGW No. [Switzerland]			14-026-4				

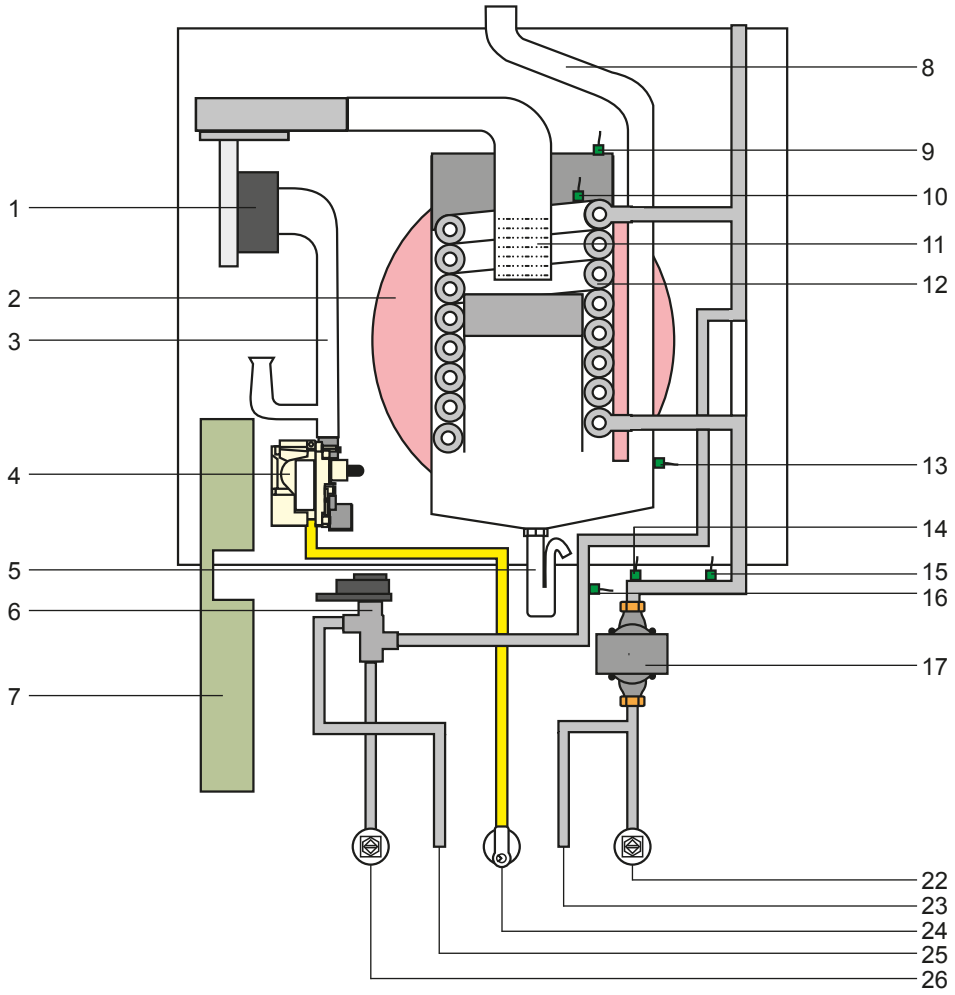
[1] Heating mode/DHW mode

[2] Natural gas/LPG (G31)

[3] Applies only to Switzerland

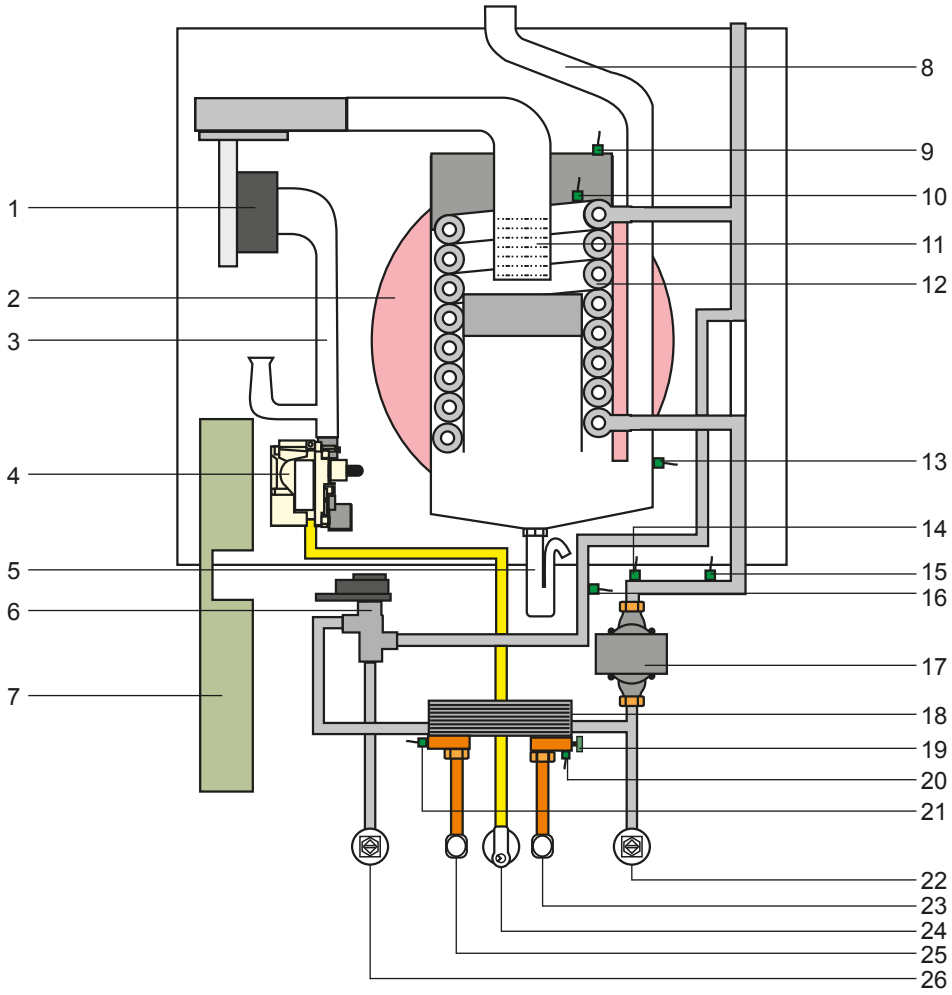
Meets the requirements of proKlima and KfW.

CGB-2
Wall mounted gas condensing boiler



1 Gas fan
2 Expansion vessel
3 Mixing valve
4 Gas valve
5 Trap
6 3-way valve
7 Control unit enclosure
(GBC-e burner control unit, top)
(HCM-2 control unit PCB, bottom)
8 Flue pipe
9 Combustion chamber cover HLSC (thermostat)
10 Combustion chamber temperature sensor
(eHLSC sensor)
11 Burner
12 Heating water heat exchanger
13 Flue gas temperature sensor
14 Pressure sensor
15 Return temperature sensor
16 Boiler water temperature sensor
17 Heating circuit pump with air vent valve
22 Heating return
23 Cylinder return
24 Gas supply pipe
25 Cylinder flow
26 Heating flow

CGB-2K
Wall mounted gas condensing combi boiler



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(GBC-e burner control unit, top)
(HCM-2 control unit PCB, bottom)
8 Flue pipe
9 Combustion chamber cover HLSC (thermostat)
10 Combustion chamber temperature sensor
(eHLSC sensor)
11 Burner
12 Heating water heat exchanger
13 Flue gas temperature sensor
14 Pressure sensor
15 Return temperature sensor
16 Boiler water temperature sensor
17 Heating circuit pump with air vent valve
18 Plate heat exchanger
19 Flow limiter
20 Flow sensor
21 DHW outlet temperature sensor
22 Heating return
23 Cold water connection
24 Gas supply pipe
25 DHW connection
26 Heating flow

Gas-adaptive combustion air control

Principle:
The relationship between the actual ionisation current and excess air is used for combustion control.
The system carries out a continuous set/actual comparison for the ionisation current.
The control unit adjusts the gas throughput via the electronic gas valve to match the actual ionisation current to the set value.
Set values for the ionisation current for every output value are stored in the system.

Calibration:
For all gases, the ionisation current is at its maximum when Lambda **λ** (air ratio) = 1

- The system calibrates automatically by briefly shifting to Lambda 1.
- Briefly increased CO emissions

When does the system calibrate?
1. Each time the mains supply is switched on.
2. Cyclically after a certain number of burner starts and a certain burner runtime.
3. After certain faults such as "Flame failure during operation".

Please note **CO emissions may be increased during calibration.**

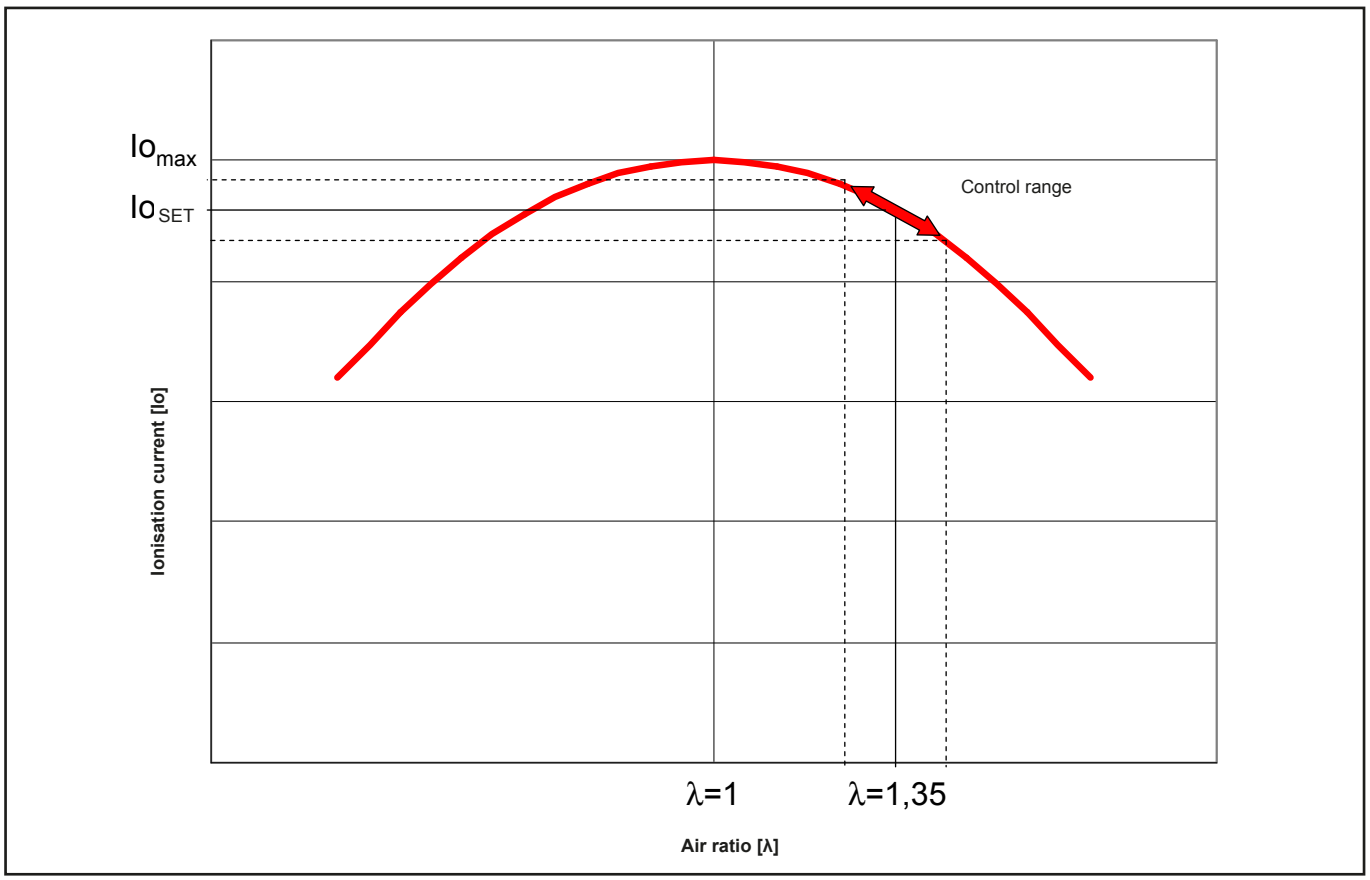


Fig: Ionisation current control diagram

Casing

First, grip the control unit cover on the r.h. side and swivel to the side. Then undo the two screws on the r.h. and l.h. sides of the front casing. The front casing can then be released at the top and removed.

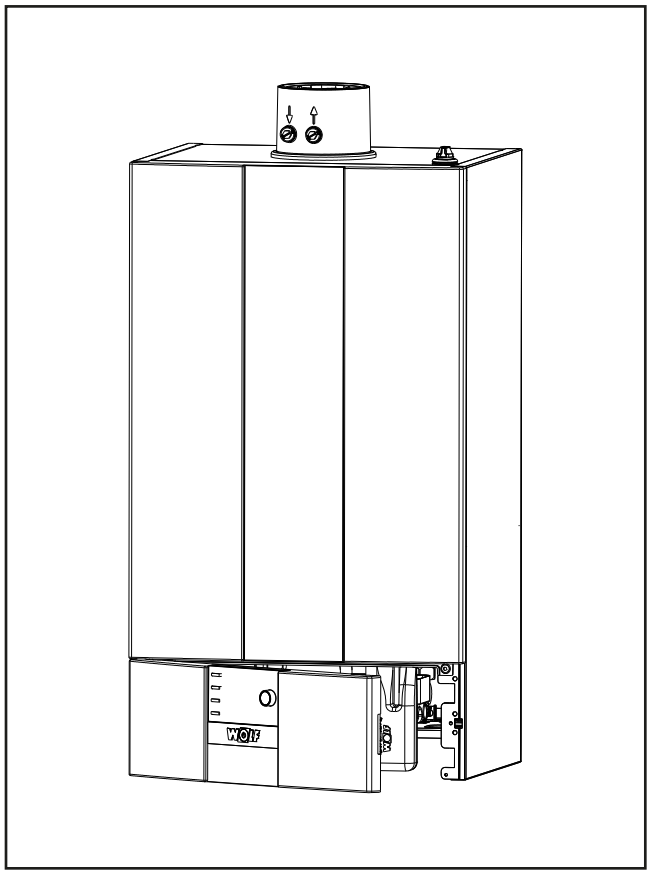


Fig: Front view, control unit cover slightly partially open

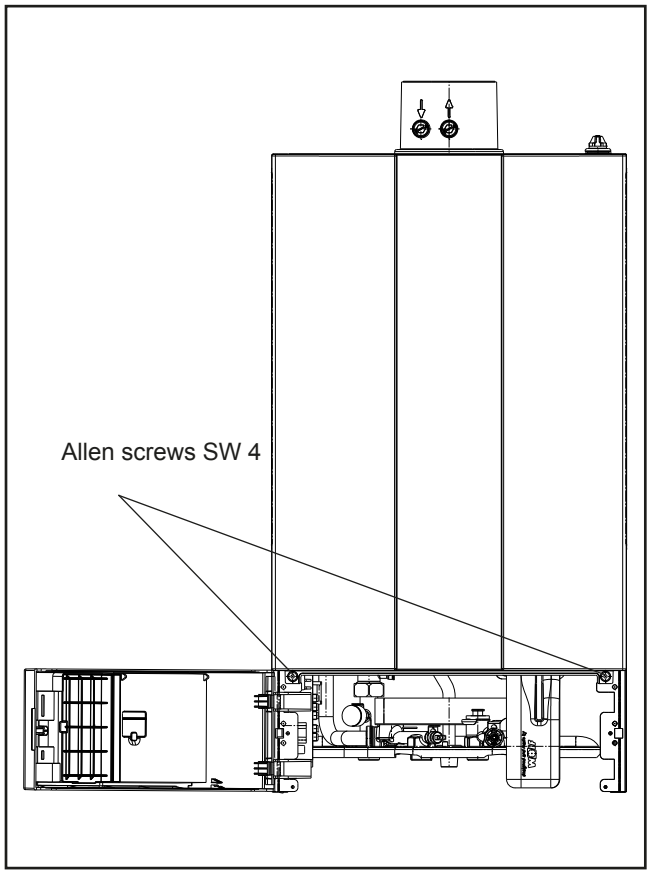


Fig: Front view, control unit cover fully open

8. Standards and regulations

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

Observe the information on the boiler type plate.

The following local regulations must be complied with during installation and operation of the heating system:

- Siting conditions
- Ventilation and exhaust air facilities and connection to a chimney
- Electrical connection to the power supply
- Technical regulations of the gas supply utility company regarding the connection of the gas appliance to the local gas mains
- Regulations and standards regarding the safety equipment of the water heating system
- DHW installation

8. Standards and regulations

The following general regulations, rules and guidelines must be observed for installation in particular:

- (DIN) EN 806 Specifications for installations inside buildings conveying water for human consumption
- (DIN) EN 1717 Protection against pollution of potable water installations
- (DIN) EN 12831 Heating systems in buildings – Method for calculation of the design heat load
- (DIN) EN 12828 Heating systems in buildings – Design of water-based heating systems
- (DIN) EN 13384 Chimneys - Thermal and fluid dynamic calculation methods
- (DIN) EN 50156-1 (VDE 0116 Part 1) Electrical equipment for furnaces
- VDE 0470/(DIN) EN 60529 Degrees of protection provided by enclosures (IP rating)
- VDI 2035 Prevention of damage in hot water heating systems
  - Scale formation (Sheet 1)
  - Corrosion by water (Sheet 2)
  - Corrosion by flue gases (Sheet 3)

CGB -2... wall mounted gas condensing boiler

Gas condensing boiler to EN 437/EN 13203-1/EN 15502-1/EN 15502-2-1/EN 60335-1/EN 60335-2-102/EN 62233/EN 61000-3-2/EN 61000-3-3/EN 55014-1, as well as 92/42/EEC (Efficiency Directive) / 2016/426/EU (Gas Appliances Directive), 2014/30/EU (EMC Directive) / 2014/35//EU (Low Voltage Directive) / 2009/125/EC (ErP Directive) / 2011/65/EU (RoHS Directive) / Commission Delegated Regulation (EU) No 811/2013 / Commission Delegated Regulation (EU) No 813/2013, with electronic ignition and electronic flue gas temperature monitoring, for low temperature heating and DHW heating in heating systems with flow temperatures up to 90 °C and 3 bar permissible operating pressure in accordance with EN 12828.This Wolf gas condensing boiler is also approved for installation in garages.

Fig: Wolf wall-mounted gas condensing boiler

Gas condensing boilers operated with an open flue may be installed only in rooms that comply with the appropriate ventilation requirements. Otherwise there is a risk of asphyxiation or poisoning. Read the installation and maintenance instructions before installing the boiler. Also take into consideration all technical information.

When operating the boiler with LPG use only propane according to DIN 51 622, otherwise faults may arise when starting and operating the gas condensing boiler, which may lead to damage to the appliance and personal injury.
A poorly vented LPG tank can lead to problems with ignition. In such a case, contact the company that fills the LPG tank.

The adjustable cylinder water temperature can exceed 60 °C. Short-term operation at temperatures above 60 °C must be supervised in order to prevent scalding. For permanent operation, appropriate precautions should be taken to prevent draw-off temperatures above 60 °C, e.g. thermostatic valve.

To protect against scaling, the DHW temperature should be set to max. 50 °C when the total water hardness is 15 °dH (2.5 mol/m³) or above.
Under the Drinking Water Ordinance [Germany], this is the lowest permissible value for DHW temperatures, as it practically rules out the risk of legionella proliferation with daily use of the hot water system (when a DHW cylinder ≤ 400 l is installed – water in the cylinder is fully replaced within 3 days through usage.)

With a total hardness of 20 °dH or higher, the use of a water treatment facility in the cold water supply line when heating DHW is essential, in order to extend maintenance intervals.
Even if water hardness is below 20 °dH, a higher risk of scale build-up may occur locally, necessitating suitable softening measures. Failure to take such measures will result in premature scaling of the appliance and a reduction in the convenient availability of domestic hot water. The contractor responsible should always check the local conditions.

9. Positioning

Minimum clearances

We recommend observing minimum clearances to facilitate inspection and maintenance work on the boiler. This ensures that adequate inspection and function tests can be carried out on the appliance.

The boiler may be installed only in rooms that are protected from frost.

The temperature in the installation room must be between 0°C and 40°C.
In addition, all components of the condensing boiler must be freely accessible from the front. It must be possible to carry out flue gas emissions tests. If minimum clearances and accessibility are not observed, Wolf may stipulate accessibility for on-site customer service attendance.

Clearance between the boiler and combustible materials or components is not required, as temperatures will not exceed 85 °C at the rated boiler heating output. However, explosive or readily flammable materials must not be used in the installation room as this would cause a risk of fire or explosion.

The installation room and the combustion air supplied to the appliance must be free from chemicals, e.g. fluorine and chlorine or sulphur. Such materials are contained in sprays, paints, adhesives, solvents and cleaning agents. Under unfavourable conditions, these may lead to corrosion, including in the flue system.

Please note

During boiler installation, ensure that no contaminants (e.g. drilling dust) enter the gas boiler, as this could lead to appliance faults.

Operation in wet rooms

In the delivered condition and for room-sealed operation, the Wolf gas condensing boiler has IP rating IPx4D. When installing it in wet rooms, the following conditions must be met:

- Balanced flue operation
- Compliance with IP rating IP 4D
- All outgoing and incoming cables must be routed through the strain relief cable glands and secured. Tighten the cable glands securely, to ensure that no water can enter the casing.

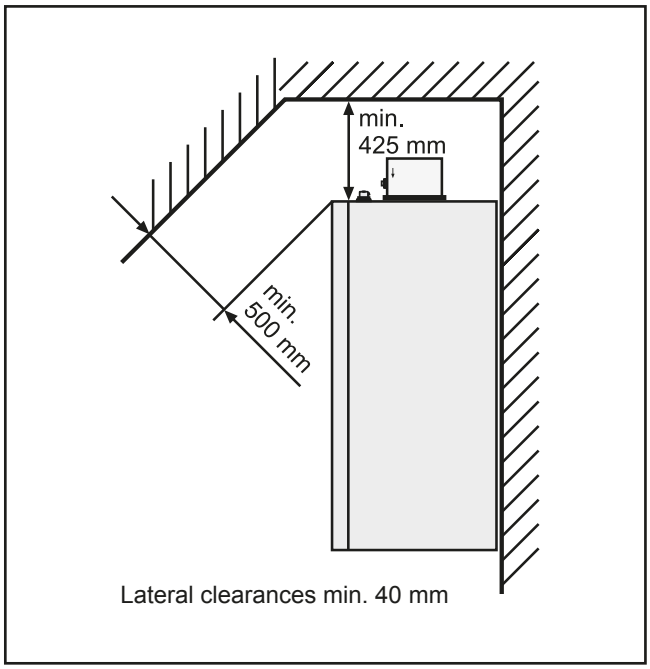
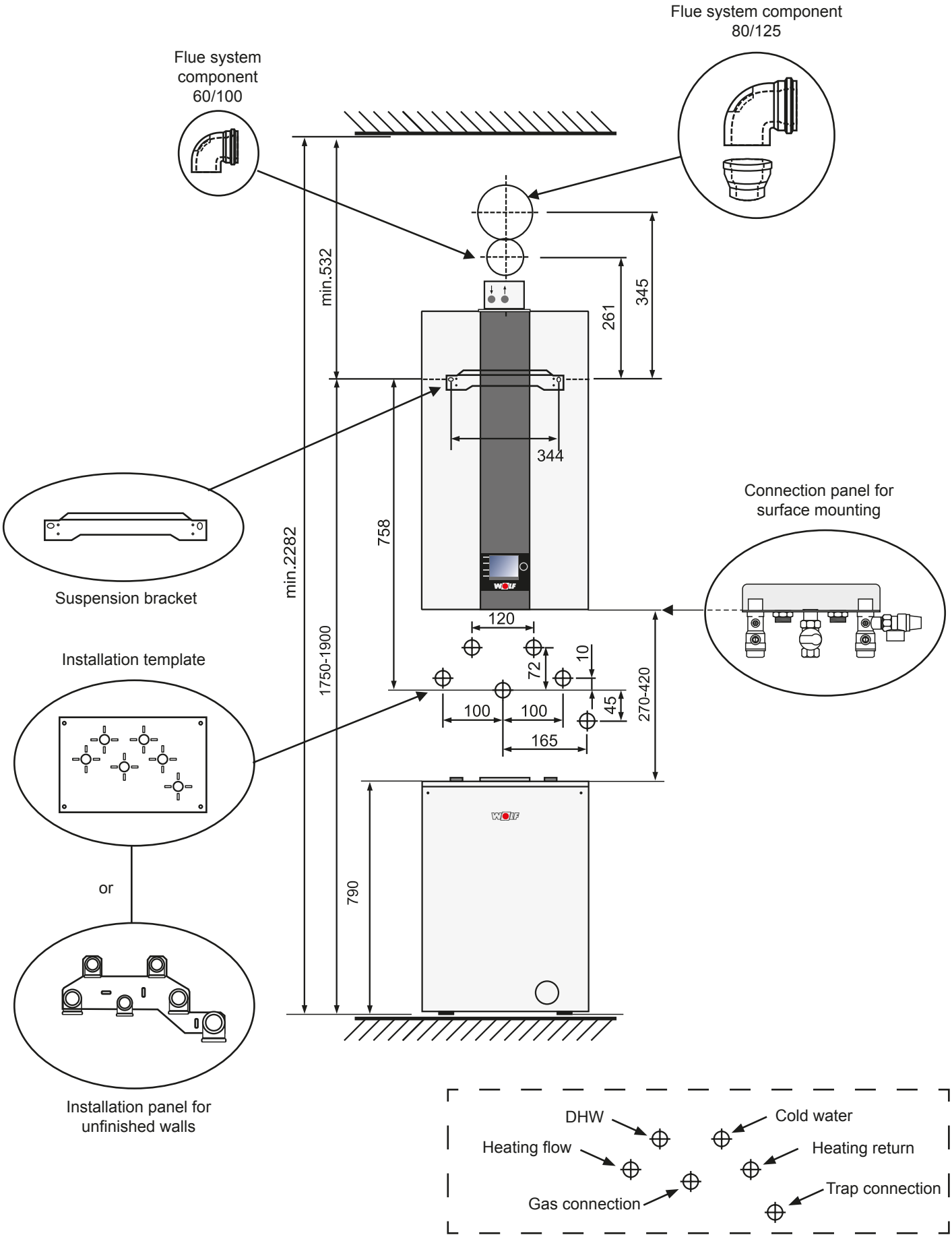


Fig: Minimum clearances

First determine where the appliance is to be installed.
For this, take into account the flue outlet, lateral clearances towards walls and ceiling and any existing connections for gas, central heating, DHW and electrics.

Sound insulation: Under certain critical installation conditions (e.g. installation on a drywall), additional measures may be necessary to soundproof the boiler. In such conditions, use anti-vibration rawl plugs and, if necessary, rubber mounts or insulation strips.


Flue system component 80/125
Flue system component 60/100
min.532
345
261
344
758
min.2282
1750-1900
120
72
10
100
100
45
165
270-420
790
Connection panel for surface mounting
Suspension bracket
Installation template
or
Installation panel for unfinished walls
DHW
Cold water
Heating flow
Heating return
Gas connection
Trap connection

10. Installation dimensions

Securing the appliance with the suspension bracket

When installing the appliance, ensure that the fixings have sufficient load-bearing capacity. Also take into account the condition of the wall,as an escape of gas or water might result in a risk of explosion and flooding.

1. Mark the Ø12 holes to be drilled for the suspension bracket, taking into account the minimum clearances.

2. Insert the rawl plugs and fit the suspension bracket using the screws supplied.

3. Hook the boiler onto the suspension bracket using the mounting stay.

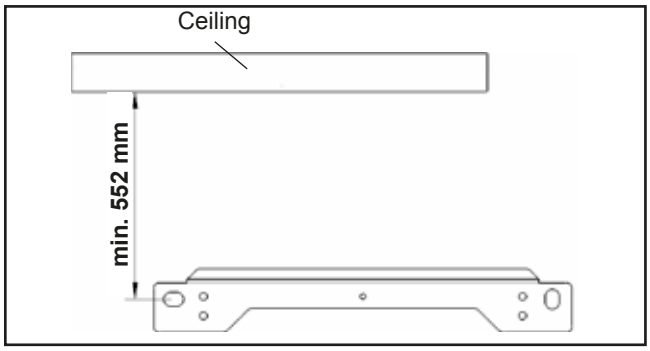


Fig: Drill holes for suspension bracket

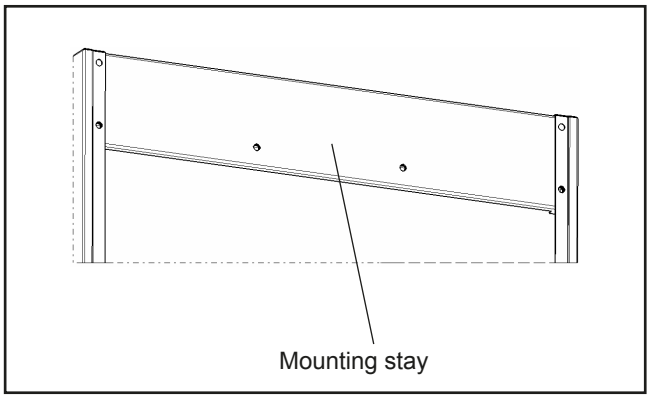


Fig: Mounting stay on the combi boiler

Supply lines on unfinished walls

If supply lines for cold water and DHW, heating, gas and safety valve drain are routed on unfinished walls, the connections can be determined using the installation template for unfinished walls.

Route pipes for gas, heating and DHW on unfinished walls according to the installation template available as an accessory.

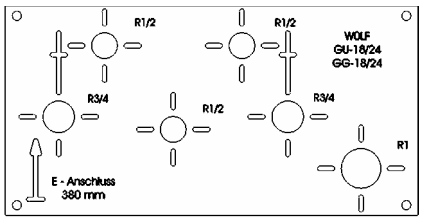


Fig: Installation template for unfinished walls

If supply lines for cold water and DHW, heating, gas and safety valve drain are routed on unfinished walls, the concealed mounting bracket (accessory) can determine the location of connections.

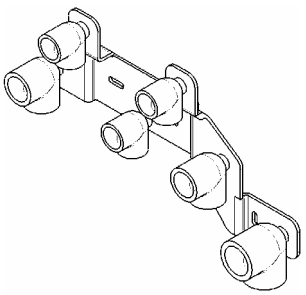


Fig: Bracket for unfinished walls (accessory) for CGB-2K

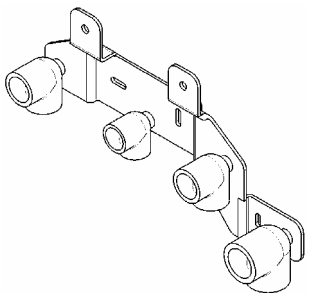


Fig: Bracket for unfinished walls (accessory) for CGB-2

Supply lines for surface mounting on finished walls

If supply lines for cold water and DHW, heating, gas and safety valve drain are routed on finished walls, the surface mounted connection bracket (accessory) can be used to determine the location of connections.

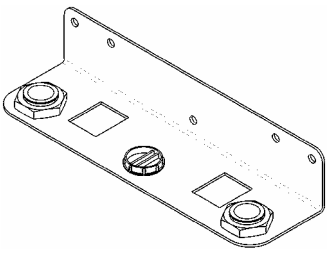


Fig: Connection bracket for surface mounting (accessory) for CGB-2

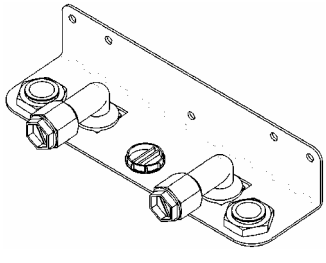


Fig: Connection bracket for surface mounting (accessory) for CGB-2K

Heating circuit

We recommend installing a maintenance valve in both the heating flow and heating return – angled design for concealed installation, straight design for surface mounting.

Please note

The return line to the appliance must have a dirt trap. A sludge separator with magnetite separator should be used to protect the appliance and the high efficiency pump from dirt/sludge and magnetite.

Deposits in the heat exchanger may lead to boiling noise, a drop in performance or faults in the appliance.

Installation on unfinished walls

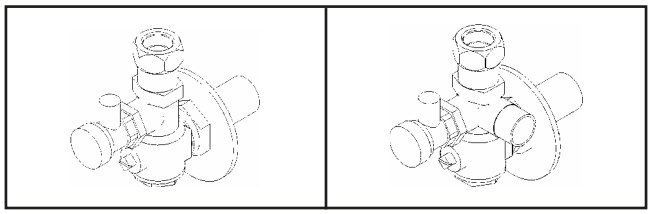


Fig:
Angle maintenance valve, with BDF valve (accessories)

Fig:
Angle maintenance valve with connection for safety valve, with BDF valve (accessories)

Installation on finished walls

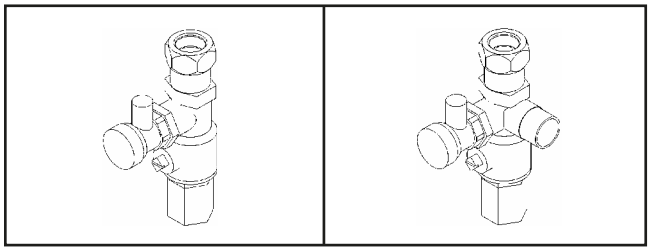


Fig:
Straight-through maintenance valve, with BDF valve (accessories)

Fig:
Straight-through maintenance valve with connection for safety valve, with BDF valve (accessories)

On boilers that are not used for DHW, seal the cylinder flow and return connections tightly with locking cap G¾" (accessories). Install a safety valve with 3 bar opening pressure on site in the heating return (see connection kit accessories). Failure to observe this requirement can result in material losses on building and equipment due to uncontrolled water leakage.

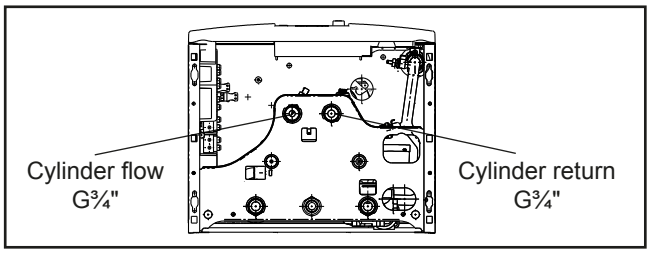


Fig: Cylinder flow/return connections

Heating circuit safety valve

Install the safety valve marked "H", max. 3 bar.

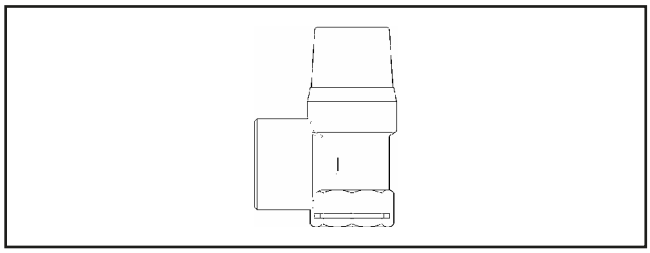


Fig: Heating circuit safety valve (accessory)

Cold water and DHW connection

A maintenance valve must be installed in the cold water supply line.
We recommend installing a maintenance valve into the cold water supply line.
If the cold water supply pressure is above the maximum permissible operating pressure of 10 bar, install a tested and certified pressure reducer in accordance with Wolf accessories.
If mixer taps are used, provide a centralised pressure reducer.
Observe the regulations of DIN 1988 [Germany] as well as those of your local water supply utility when connecting cold water and DHW.
Your warranty is void if the installation does not comply with the illustration shown.

Note: When selecting the installation material for the system, observe engineering standards and take into account possible electrochemical processes. (Mixed installation)

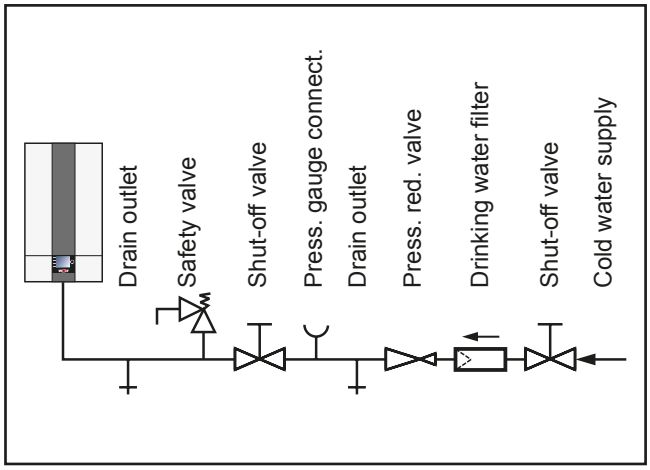


Fig: Cold water connection to DIN 1988

12. Gas connection

Connect the gas supply line at the gas connection or the expansion joint (recommended) using gas connection R½" and an approved sealant. Ensure the supply line is stress-free.

Only a licensed gas fitter may route the gas pipe and make the gas connections.

Remove all residues from the heating pipework and the gas line prior to connecting the condensing boiler, particularly in older systems. Prior to commissioning, test all gas pipes and connections for leaks. Inappropriate installation or the use of unsuitable components or assemblies may lead to gas escaping, resulting in a risk of poisoning and explosion.

Install a gas ball valve with fire protection in the gas supply line upstream of the condensing boiler. Otherwise explosions may occur during a fire. Size the gas supply line in accordance with DVGW-TRGI regulations [Germany].

Mount the gas ball valve in an easily accessible place.

Carry out a tightness test on the gas line without the gas condensing boiler. Never release the test pressure via the gas valve.

Gas fittings on the appliance should be pressure tested to a maximum of 150 mbar. Higher pressure may damage the gas valve, resulting in a risk of explosion, asphyxiation or poisoning. Before pressure testing the gas line, close the gas ball valve on the gas condensing boiler.

When installing the gas connection, ensure all fittings are sufficiently tightened to prevent gas leaks.

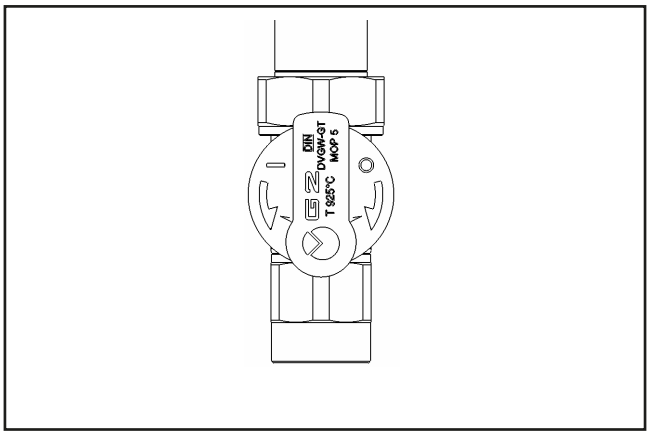


Fig: Gas ball valve, straight (accessories)

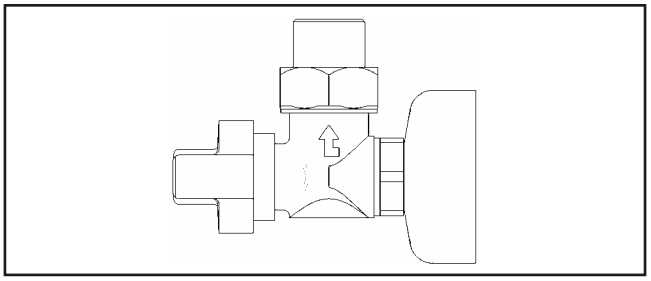


Fig: Gas ball valve, angled (accessories)

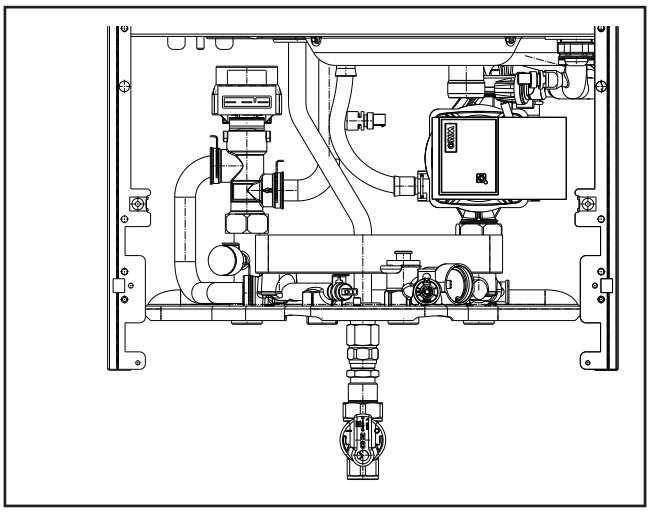


Fig: Gas connection installation

13. Fitting the trap

Condensate connection

First, grip the control unit cover on the r.h. side and swivel to the side. Then undo the two screws on the r.h. and l.h. sides of the front casing. The front casing can then be released upwards.
Fill the supplied trap with water and connect it to the condensate pan connector.
The drain hose must be safely secured above the drain outlet (trap).
If the condensate is directly routed to the drain pipe, ventilation must be provided so that the drain pipe cannot affect the gas condensing boiler.
If installing a neutralising system (accessories), observe the instructions supplied.
According to Code of Practice ATV-DVWK- A251 [Germany], no neutralising system is required for condensing boilers up to 200 kW.
If a neutralising system is used, the national regulations regarding the disposal of residues from such systems apply.

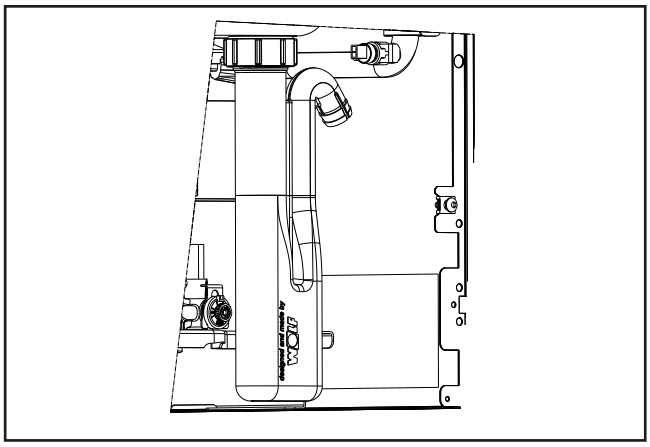


Fig: Trap

The trap must be filled with water prior to commissioning. Operating the appliance with an empty trap presents a risk of poisoning or asphyxiation due to flue gases escaping. Unscrew the trap, remove and fill until water runs out of the drain hole on the side. Refit the trap and ensure the gasket seals tightly.

Before commissioning, carry out a tightness test on all hydraulic pipework:
Test pressure on the DHW side max. 10 bar
Test pressure on the heating water side max. 4.5 bar

Connection to Wolf cylinder

A detailed description is included with the connection set (accessories).

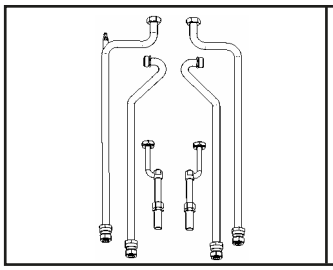


Fig:
Connection set for Wolf cylinder CSW-120
Installation on unfinished walls (accessories)

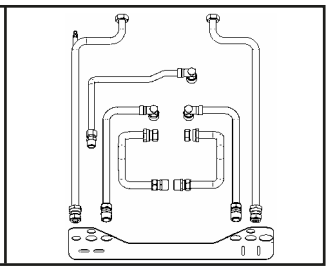


Fig:
Connection set for Wolf cylinder CSW-120
Installation on finished walls (accessories)

Please note

For concentric balanced flue systems, use only original Wolf parts.
Prior to installation, read the technical information regarding air/flue gas routing.

As regulations in the individual Federal States [Germany] differ, we recommend consulting the relevant authorities and local flue gas inspector prior to installation.

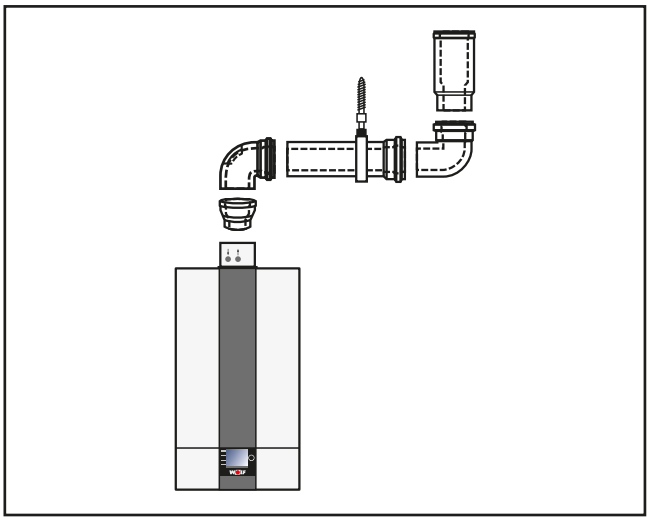


Fig: Example: Air/flue gas routing

Please note

The flue gas test ports must remain accessible for your local flue gas inspector, even after fitting the ceiling bezels.

At low outside temperatures, the water vapour contained in the flue gas may condense and freeze on the flue. Prevent falling ice through on-site measures, e.g. the installation of a suitable snow catcher grille.

Note

Inspection and testing intervals

The gas condensing boiler is equipped with self-calibrating control of the combustion process. Under the Bundes-KÜO (German Federal Sweeping and Inspection Act), inspection and testing of this gas boiler is only required every 3 years [Germany]. This must be done by a flue gas inspector.

15. Electrical connection

General information
Electrical connection

The installation may be carried out only by an approved electrical contractor. Observe VDE regulations [Germany] and all local regulations of your power supply utility.

For installation in Austria: The ÖVE regulations and requirements and those of your local power supply utility must be observed.
An omnipolar isolator with at least 3 mm contact separation must be integrated in the power cable upstream of the appliance. A connection box must also be installed on site.

Never route sensor leads alongside 230 V mains cables.

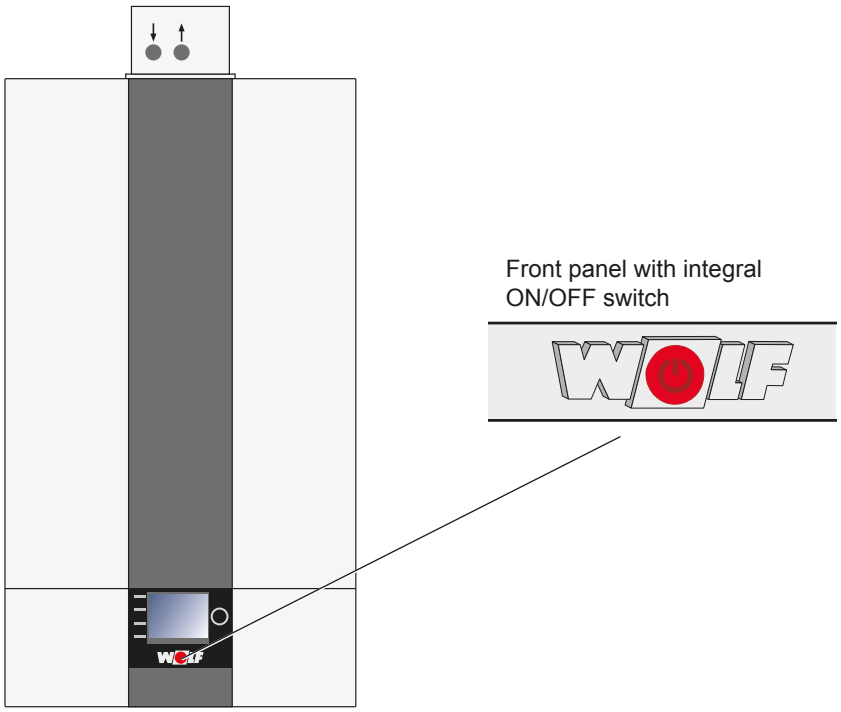
Danger from 'live' electrical components
Please note: Turn off the ON/OFF switch before removing the casing.

Never touch electrical components or contacts when the ON/OFF switch is in the ON position. There is a risk of electrocution that could result in injury or death.

The main terminals are 'live' even when the ON/OFF switch is in the OFF position.

During servicing and installation work, isolate the entire system from the power supply across all poles, otherwise there will be a risk of electrocution.

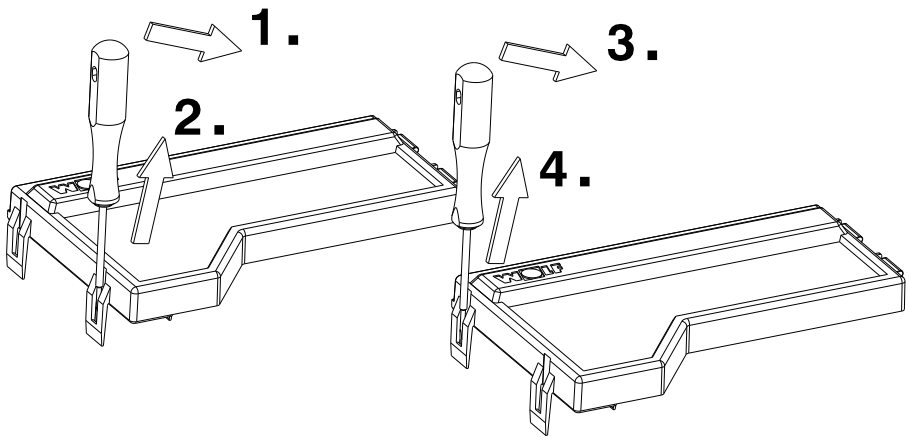
Either an AM display module or a BM-2 programming module can be installed in the front panel for operating the appliance.
The ON/OFF switch (integrated in the Wolf logo) switches the appliance off across all poles.



Removing the front casing

See chapter "Casing".

Removing the HCM-2 casing cover



Control unit component overview

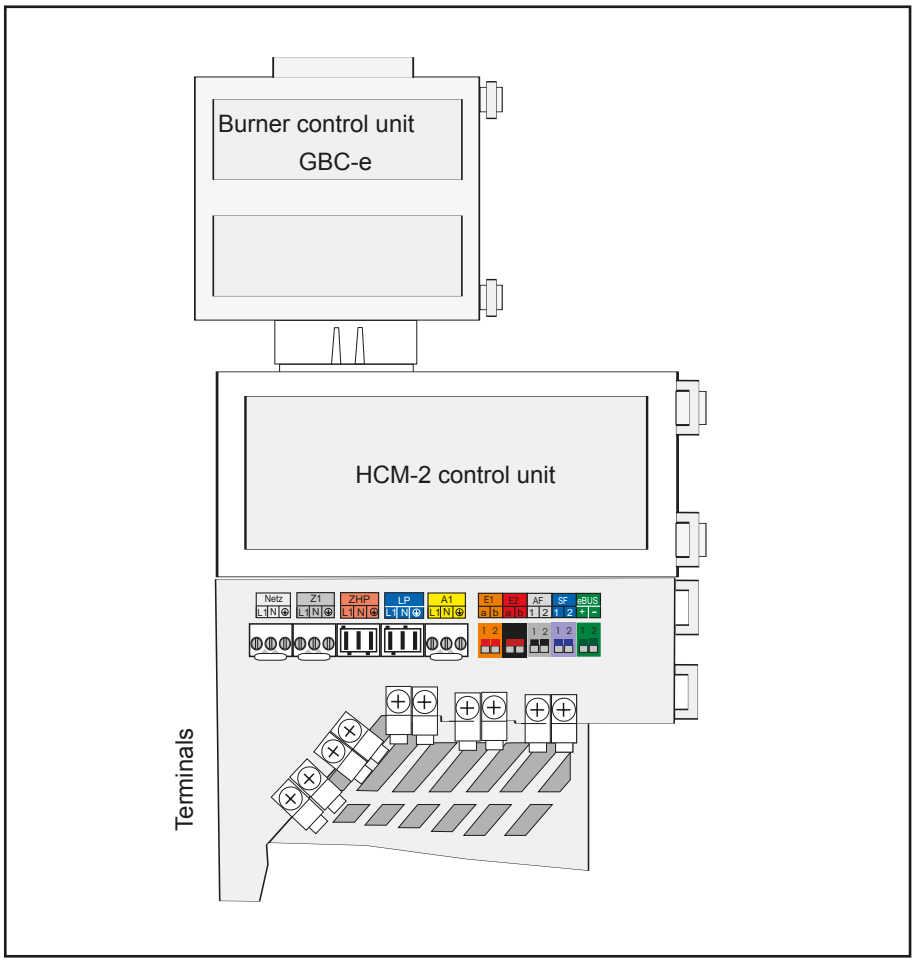
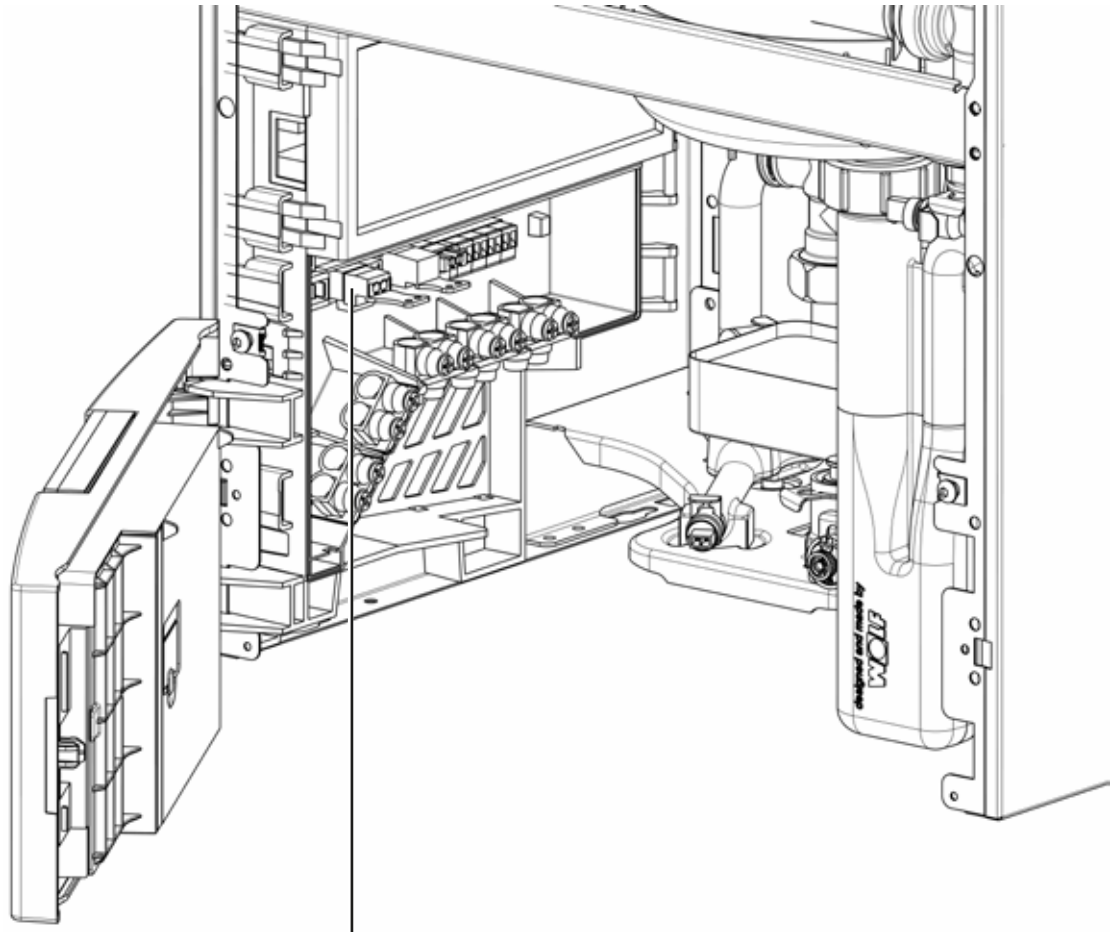
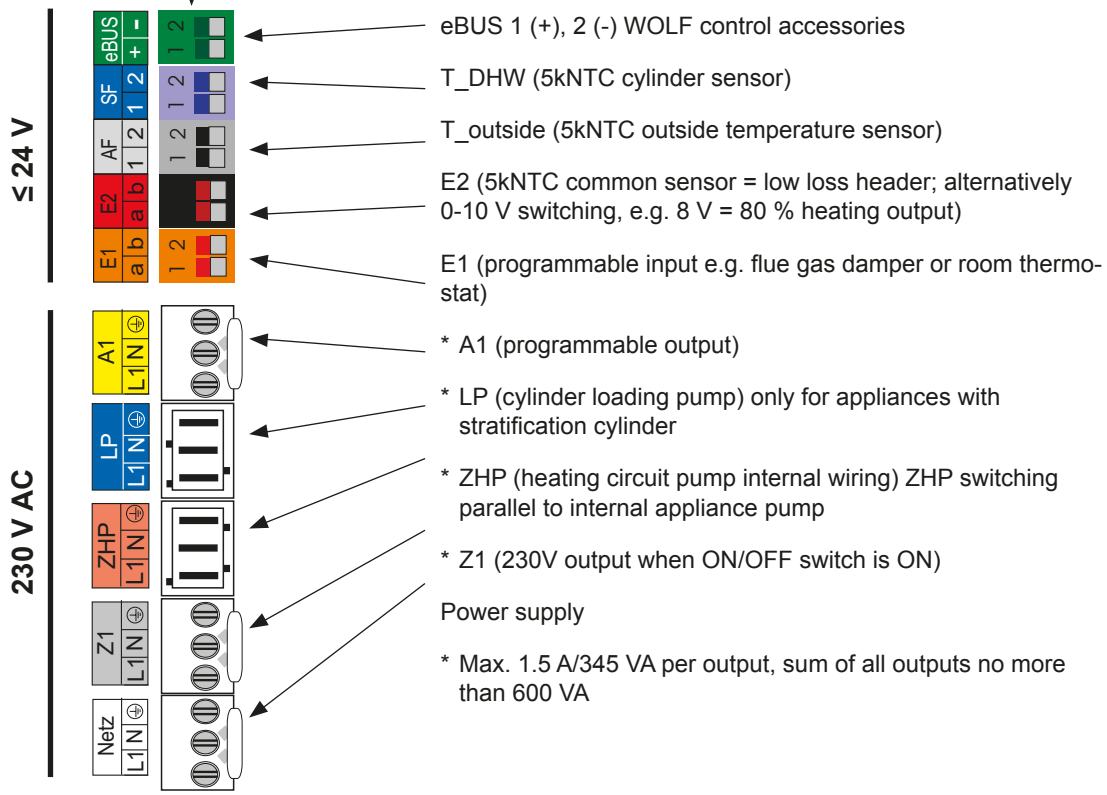


Fig: Control unit component overview

Connections inside the control unit





15. Electrical connection

230 V mains connection

The control and safety equipment is fully wired and tested.
You only need to connect the power supply and the external accessories.
Create a permanent connection for the power supply.

Provide the power supply via a mains isolator (e.g. heating system emergency stop switch) that ensures at least 3 mm contact separation for all poles.

No other consumers may be connected to the power cable. The appliance (IP rating IPX4D) is approved for installation in the immediate vicinity of a bath or shower (protected area 1 according to DIN VDE 0100). Measures must be taken to prevent jets of water.
In rooms with a bathtub or shower, the appliance may be connected only via an RCD.

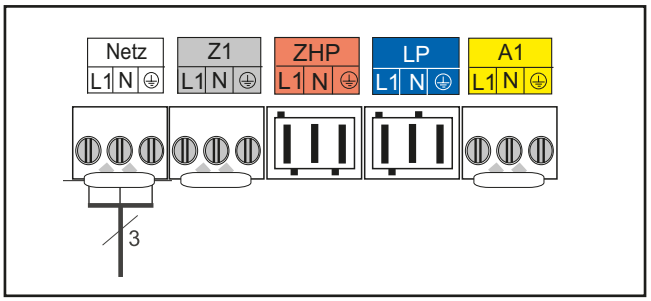


Fig: Mains connection

Installation information, electrical connection

- Isolate the system from the power supply before opening.
- Check that the appliance is isolated from the power supply.
- Swivel the control unit cover to one side.
- Remove the front casing.
- Open the lower casing cover of the HCM-2.
- Flexible power cable, at least 3x1.0 mm² (strip approx. 70 mm of insulation)
- Remove the insert from the HCM-2 casing.
- Push the cable through the strain relief (insert) and secure.
- Pull out the Rast5 plug.
- Terminate the appropriate cores at the Rast5 plug.
- Push the inserts back into the HCM-2 casing.
- Push the Rast5 plugs back into their correct positions.

Connection, Z1 output (230 V AC; max. 1.5 A) *

Insert and secure the power cable through the cable gland. Connect the power cable to terminals L1, N and ⏚.

* Max. 1.5 A/345 VA per output, sum of all outputs no more than 600 VA

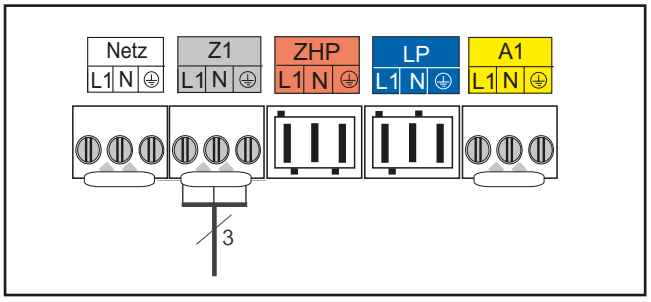


Fig: Connection of Z1 output

Connecting output A1 (230 V AC; max. 1.5 A) *

Insert and secure the power cable through the cable gland.
Connect the power cable to terminals L1, N and ⏚.
The parameters for output A1 are described in the table.

* Max. 1.5 A/345 VA per output, sum of all outputs no more than 600 VA

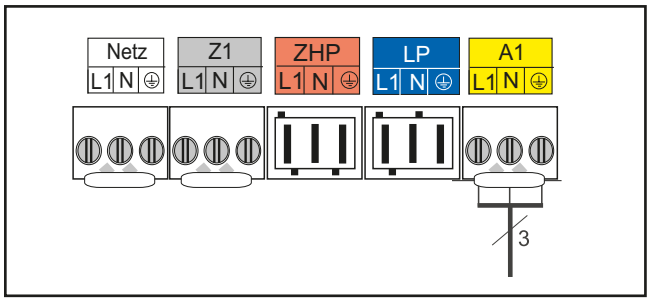


Fig: Connection of A1 output

Changing a fuse

Isolate the combi boiler from the power supply prior to changing a fuse.
The ON/OFF switch on the boiler does not provide isolation from the power supply.
The F1 and F2 fuses are located under the top casing cover of the HCM-2.
F1: Fine wire fuse (5x20 mm) 4 A (medium)
F2: Micro fuse 1.25 A (slow)
Danger from live electrical components Never touch electrical components or contacts if the condensing boiler has not been isolated from the power supply. Danger to life!

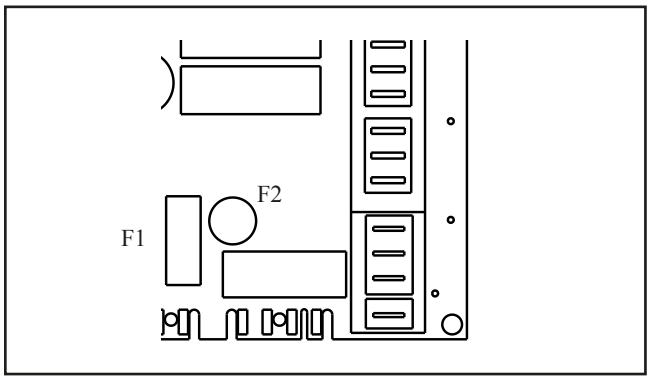


Fig: Changing a fuse

Connecting low voltage devices

Please note

When installing the appliance in places where there is a risk of increased electromagnetic interference, it is advisable to fit screened sensor leads and eBus cables. One end of the cable shield should be connected to the PE potential in the control unit.

Connecting input E1

Insert and secure the power cable through the cable gland.
Connect the connection cable for input E1 to terminals E1 as shown in the wiring diagram.

Please note

No external voltage may be connected to input E1, as this could destroy the component.

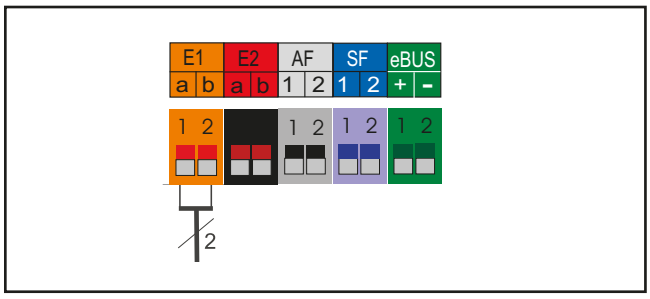


Fig: Connection of E1 output

Connecting input E2

Insert and secure the power cable through the cable gland.
Connect the connection cable for input E2 to terminals E2 as shown in the wiring diagram.

Please note

Only one external voltage of up to 10 V can be connected to input E2, otherwise the PCB will be destroyed.
1(a) = 10 V, 2(b) = GND

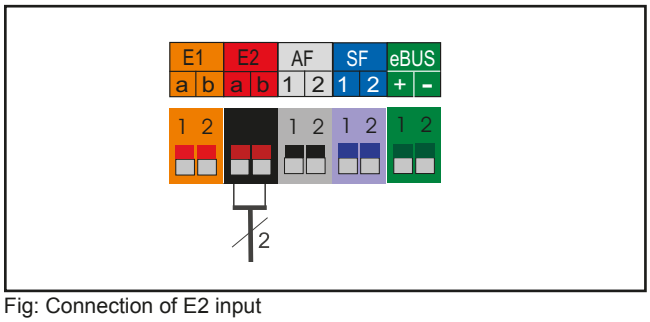


Fig: Connection of E2 input

Connecting outside sensor

The outside sensor can be connected to the terminal strip of the condensing boiler at connection AF, or to the terminal strip of the BM-2 programming unit.

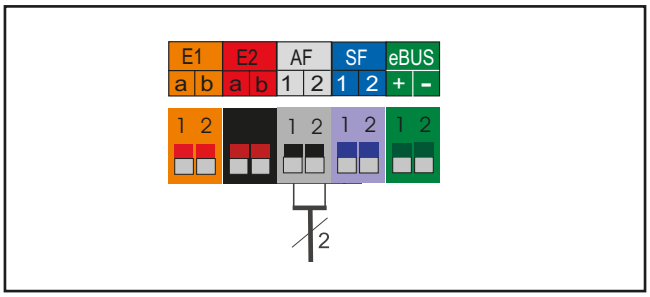


Fig: Connection of outside sensor

Cylinder sensor connection

Insert and secure the connecting cable through the cable gland. Connect the cable for cylinder sensor (SF) to the SF terminals as shown in the wiring diagram.

Please note

Use the cylinder sensor from the WOLF control accessories!

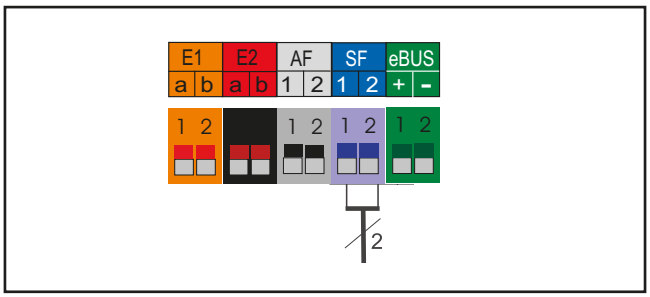


Fig: Cylinder sensor connection

Connecting digital WOLF control accessories (e.g. BM-2, MM-2, KM-2, SM1-2, SM2-2)

Only control units from the Wolf range of accessories may be connected. Each accessory is supplied with its own connection diagram.
Use a two-core cable (cross-section > 0.5 mm²) as the connecting cable between the control unit accessory and the condensing boiler.

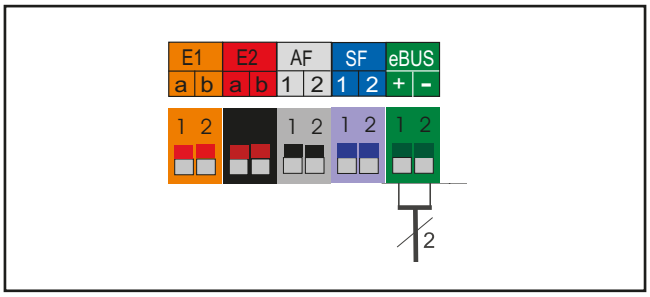


Fig: Connection of digital Wolf control accessories (eBUS interface)

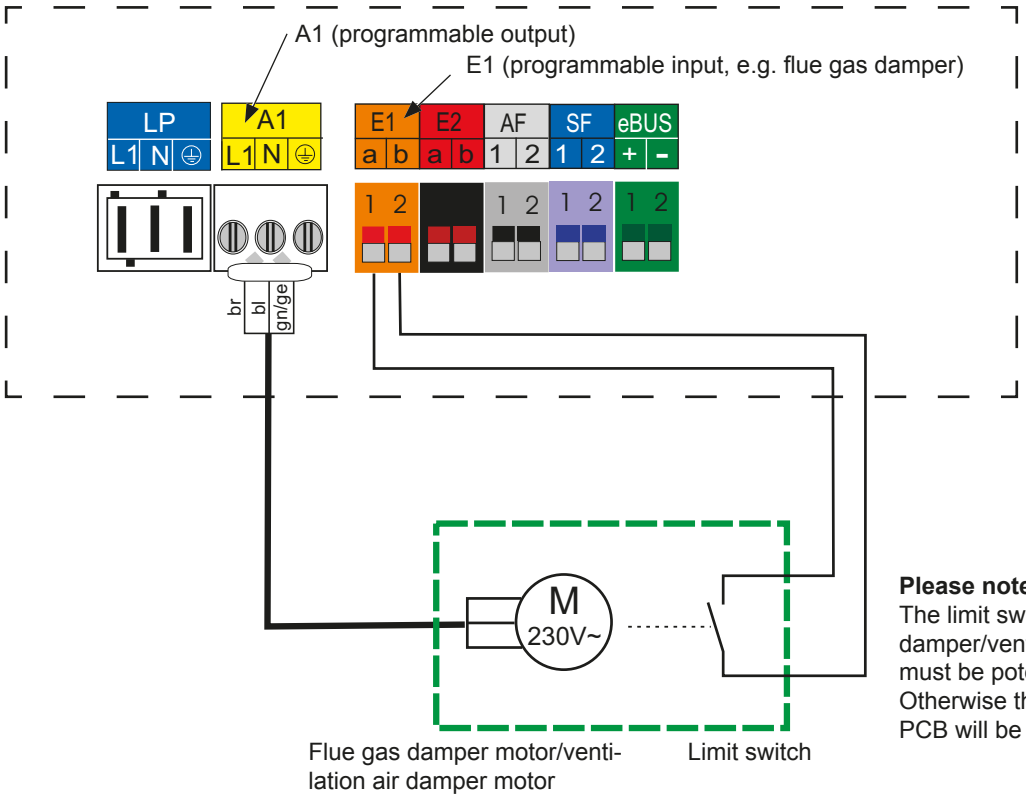
Flue gas damper/ventilation air damper electrical connection

- Isolate the system from the power supply before opening.
- Check that the appliance is isolated from the power supply.
- Swivel the front panel to one side.
- Remove the front casing.
- Open the lower casing cover of the HCM-2.
- Remove the insert from the HCM-2 casing.
- Strip approx. 70 mm of insulation from the connecting cable of the damper motor and signal contact.
- Pull the Rast5 plug out from output A1.
- Push the connecting cable of the flue gas damper/ventilation air damper motor through the strain relief (insert) and secure.
- Terminate the cores at the Rast5 plug A1 and insert the plug.
- Pull the Rast5 plug out from input E1.
- Push the limit switch lead of the flue gas damper/ventilation air damper motor through the strain relief (insert) and secure.
- Terminate the cores at the Rast5 plug E1 and insert the plug.

Note:
The contractor parameter
HG13 (input 1) must be set to
Fl. gas damper
and
HG14 (output 1) must be set to
Fl. gas damper.

When the limit switch is open, the burner is blocked both for DHW and central heating as well as for emissions test and frost protection.

HCM-2 electrical connection



Flue gas damper motor/ventilation air damper motor

Limit switch

Please note:
The limit switch for the flue gas damper/ventilation air damper must be potential-free.
Otherwise the HCM-2 control unit PCB will be destroyed.

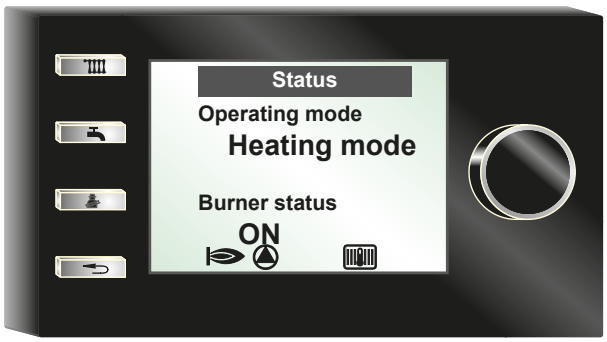
Damper function test

- Start the appliance
- Inspect visually to ensure damper is open
- Unplug E1 for 2 minutes during operation.
  Boiler must lockout with fault code 8, with the fan continuing to run at low speed.
- Reconnect E1
- Acknowledge fault message
- Inspect visually to ensure flue gas damper is closed

17. Display/programming module installation

Either an AM display module or a BM-2 programming module must be installed for operating the gas combi boiler.

AM



The AM functions solely as a display module for the boiler. Boiler-specific parameters and values can be programmed and displayed.

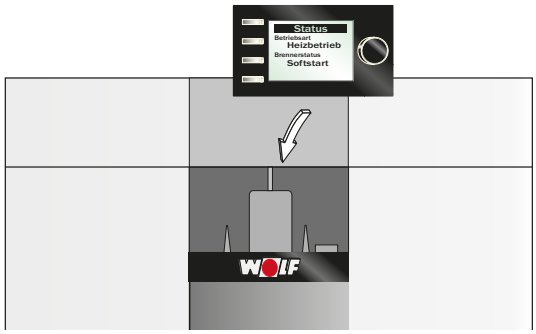
Specification:
- 3" LCD screen
- 4 quick start keys
- 1 rotary selector with pushbutton function

Please note:
- Use when BM-2 is deployed as a remote control or in a cascade circuit
- AM is always in the boiler

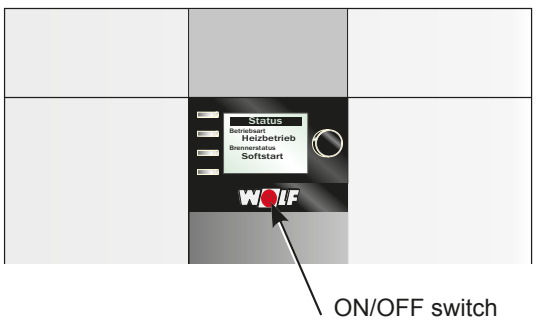
BM-2

The BM-2 (programming module) communicates with the boiler and all connected extension modules via eBUS.

Specification:
- 3.5" colour display, 4 function keys, 1 rotary selector with pushbutton function
- microSD card slot for software update
- Central programming unit with weather-compensated flow temperature control
- Time program for heating, DHW and DHW circulation



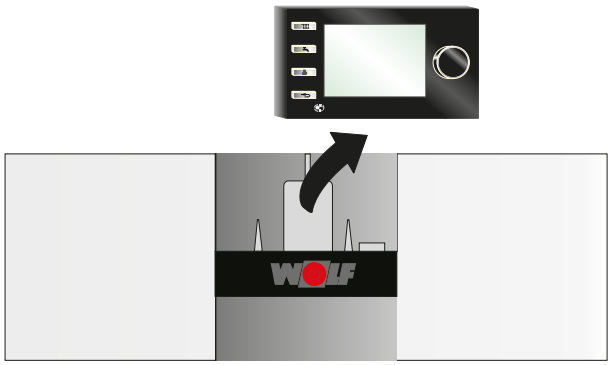
Insert the AM or BM-2 in the slot above the ON/OFF switch (Wolf logo).
Both modules can be plugged into this slot. Further commissioning or address assignment measures specific to the BM-2 can be found in the BM-2 installation instructions.

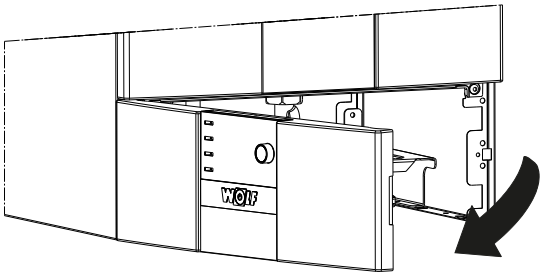


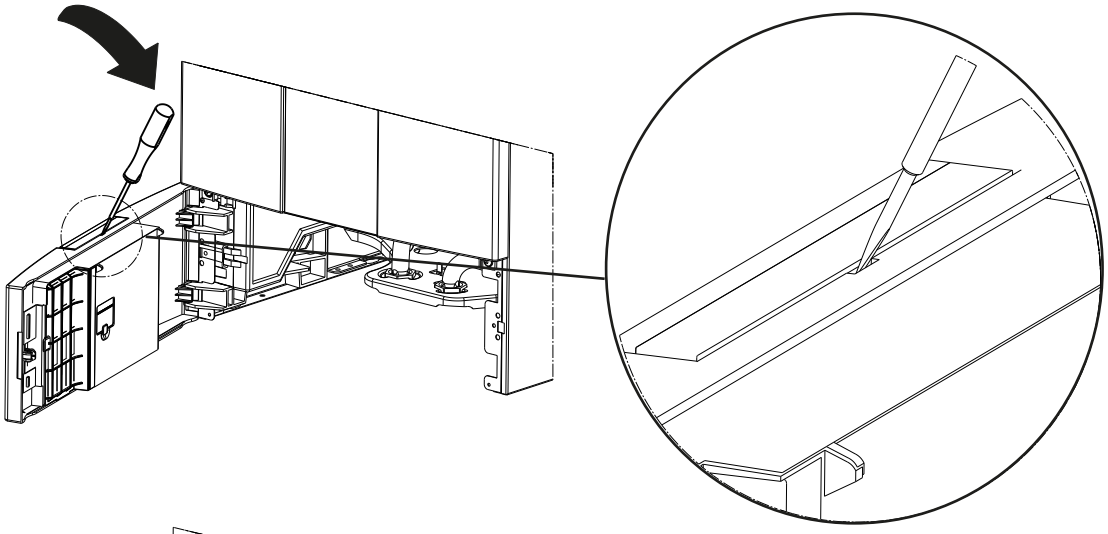
Switch on the power supply/MCB and switch the ON/OFF switch on the appliance to ON.

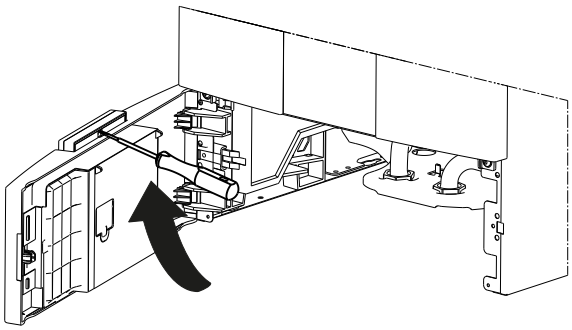
18. Removing the display module/ programming unit

Removing the BM-2 programming unit or AM display module





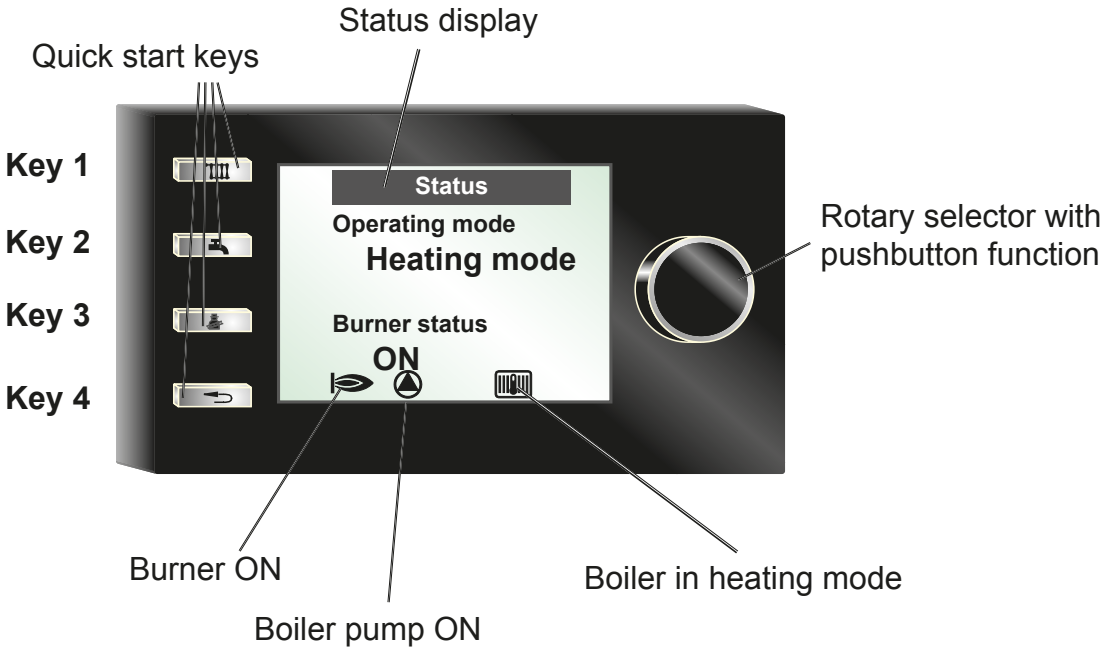


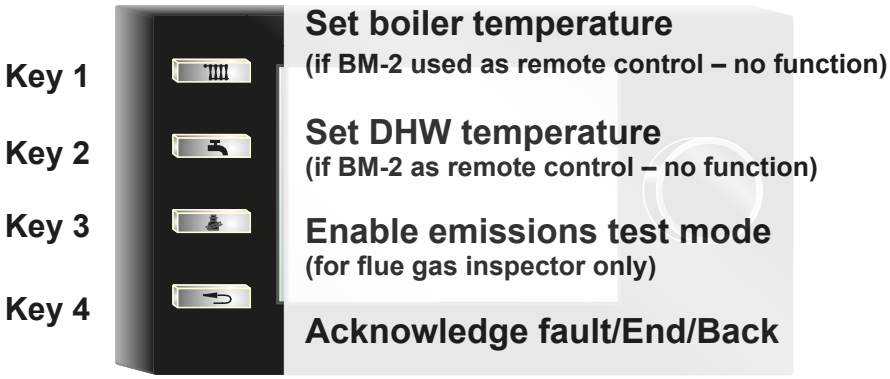


19. AM display module

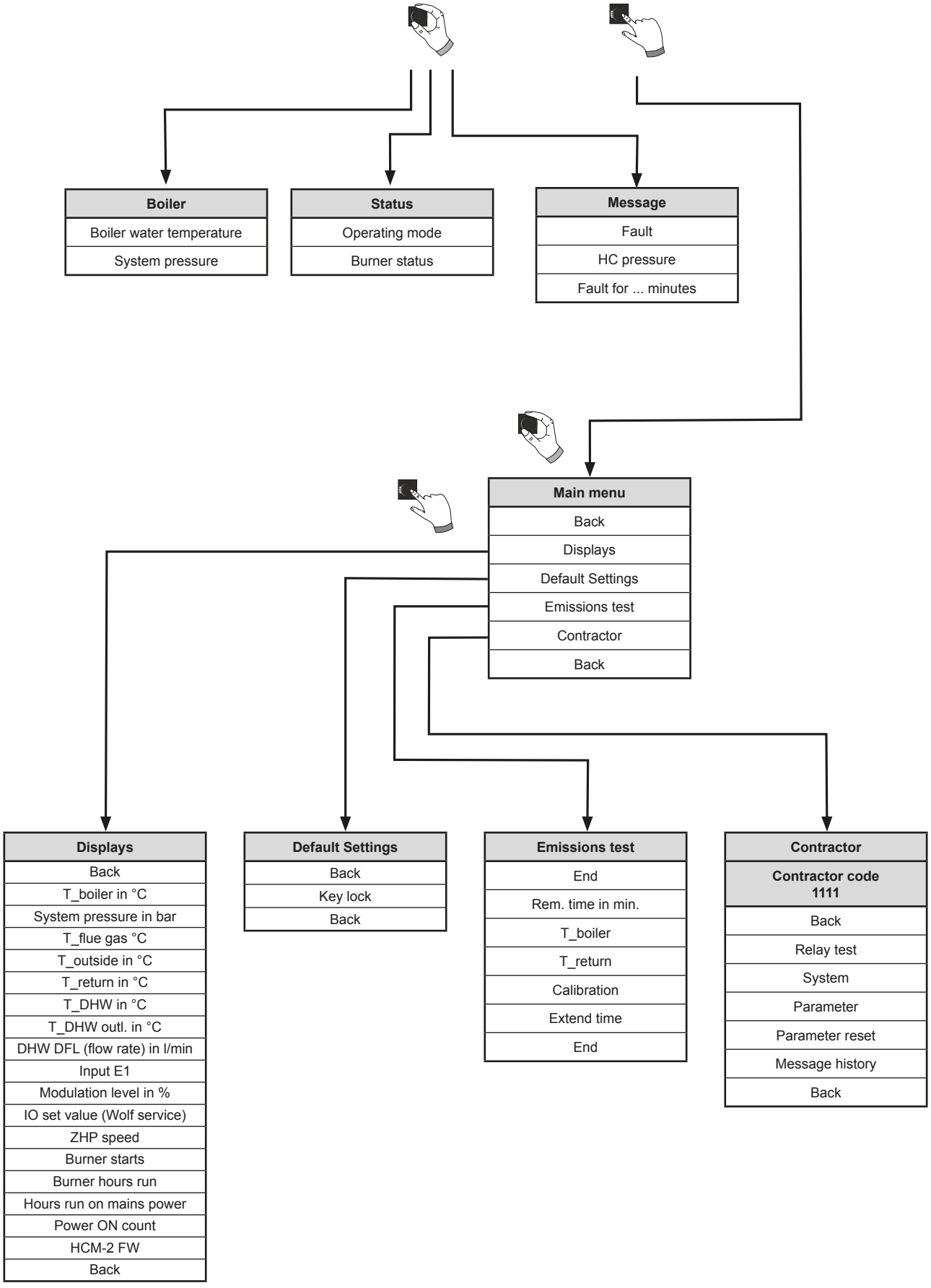
AM overview

Note:
If your Wolf boiler is not equipped with an AM display module, ignore this page.
Further functions and descriptions can be found in the installation instructions for contractors or the user operating instructions for the AM display module.





AM control unit menu structure



21. Operating mode/Boiler burner status

Boiler operating mode

Display shows	Meaning
Start	Appliance starting
Standby	No heating or DHW demand
Combi mode	DHW heating with heat exchanger active, water tap is open
Heating mode	Heating mode, at least one heating circuit demands heat
DHW mode	DHW heating with cylinder, cylinder temperature is below set value
Emissions test	Emissions test mode active, boiler running at maximum output
Frost HC	Boiler frost protection function, boiler water temperature below frost protection limit
Frost DHW	Frost protection function of DHW cylinder enabled;, cylinder temperature below frost protection limit
Frost protection	System frost protection enabled; outside temperature below frost protection limit
Min. combi time	Appliance remains in DHW mode (heat exchanger) for a minimum amount of time
Htg run-on	Heating circuit pump run-on enabled
DHW run-on	Cylinder primary pump run-on enabled
Parallel mode	Heating circuit pump and cylinder primary pump enabled in parallel
Test	Relay test function has been enabled
Cascade	Cascade module in system enabled
BMS	Appliance is controlled by building management system (BMS)
100 % cali	Appliance is calibrating the flue gas system
External disable	External disabling of the heating appliance (input E1 closed; OWHA)

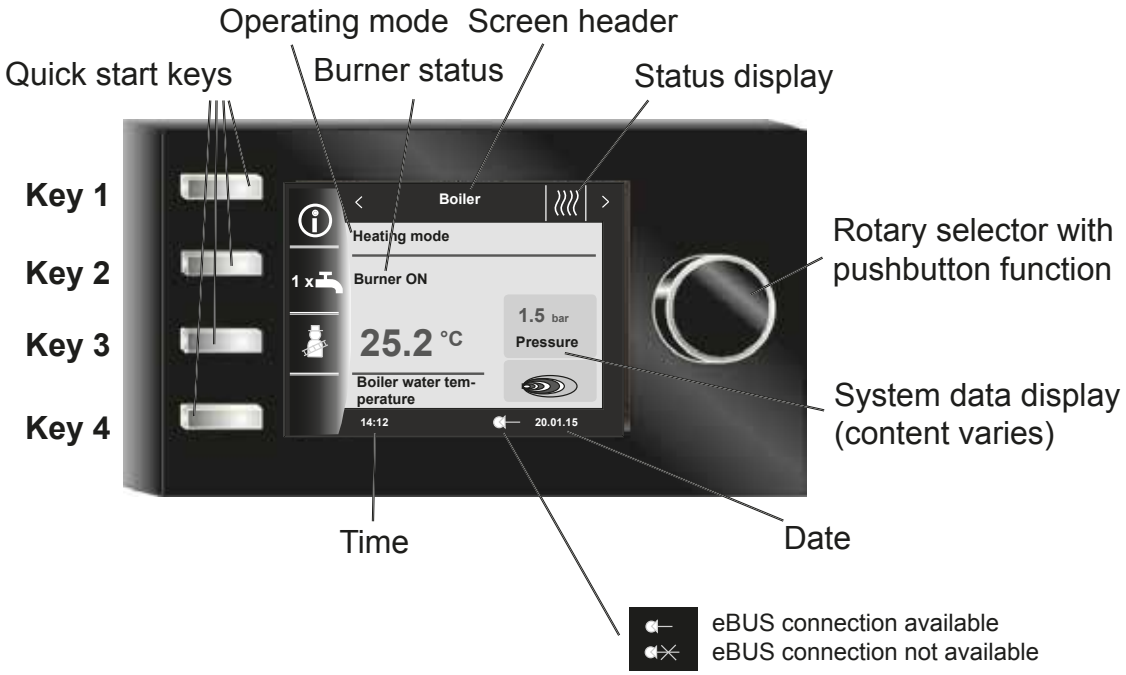
Boiler burner status

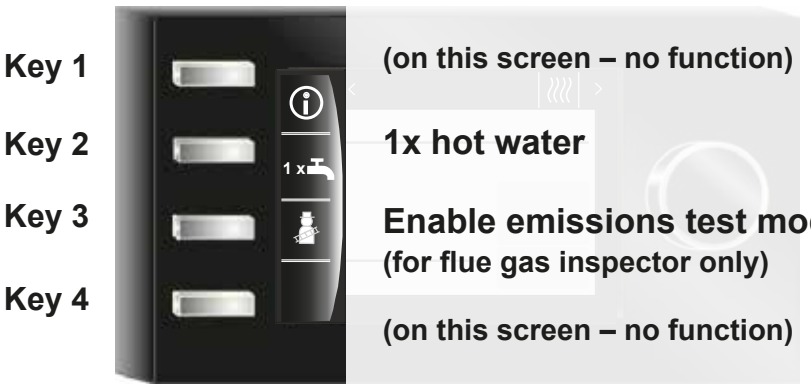
Display shows	Meaning
OFF	No burner demand
Pre-flush	Fan operation before burner start
Ignition	Gas valves and ignition unit are enabled
Stabilisation	Flame stabilisation after safety time
Soft start	After flame stabilisation in heating mode, the burner runs at low burner power for the duration of the soft start to prevent cycling
ON	Burner operational
Cycle block	Burner block after a burner cycle for the duration of the cycle block
Unattended op.	Operation without burner, input E1 closed
Fl. gas damper	Awaiting feedback from flue gas damper (input E1)
Spread too wide	Temperature spread between boiler water temperature sensor and return temperature sensor too wide
Spread KF	Temperature spread between eHLSC1/eHLSC2 and boiler temperature sensor too wide
Valve test	Gas valve test
Ramp control	Boiler water temperature rising too quickly
Fault	Burner not operational due to a fault
Post-flush	Fan operation after burner shutdown

22. BM-2 programming unit

BM-2 overview

Note:
Further functions and descriptions can be found in the installation instructions for contractors or the user operating instructions for the BM-2 programming unit.





23. HG control parameters

Please note **Modifications must only be carried out by a recognised heating contractor or by Wolf customer service. Incorrect operation can lead to system faults.**

Please note **On the AM display module or the BM-2 programming unit, the factory setting for the HG parameters can be reinstated in the contractor menu.**

⚠ **To prevent damage to the heating system, cancel night setback when outside temperatures fall below -12 °C. If this requirement is not observed, ice may form on the flue outlet which may cause injury or material losses.**

The control parameters can only be modified or displayed using the AM display module or BM-2 programming module on the boiler. For procedures, check the operating instructions of the relevant accessories.

No:	Designation:	Unit	Factory setting Condensing boiler			Min:	Max:
			14 kW	20 kW	24 kW		
HG01	Burner switching hysteresis	°C	12	12	12	7	30
HG02	Lower burner output, heat generator in % (fan control)	%	26	24	24	1)	100
HG03	Upper burner output, DHW (fan control) Maximum burner output, DHW in %	%	100	100	100	1)	100
HG04	Upper burner output, heating (fan control) Maximum burner output, heating in %	%	100	88	88	1)	100
HG07	Heating circuit pump run-on time Heating circuit pump run-on time in heating mode	min	1	1	1	0	30
HG08	Max. boiler temperature, heating (applic. to htg. mode) TV-max	°C	75	75	75	40	90
HG09	Burner cycle block, applies to heating mode	min	7	7	7	1	30
HG10	Heat generator eBUS address	-	1	1	1	1	5
HG12	Gas type	-	Nat. gas	Nat. gas	Nat. gas	Nat. gas	LPG
HG13	Function, input E1 Various functions can be assigned to input E1.	-	none	none	none	var.	var.
HG14	Function, output A1 (230 V AC) Various functions can be assigned to output A1.	-	none	none	none	var.	var.
HG15	Cylinder hysteresis, switching differential during cyl. reheating	°C	5	5	5	1	30
HG16	Pump rate HC, minimum	%	45	45	45	15	100
HG17	HC pump rate, maximum	%	70	70	70	15	100
HG19	Run-on time, CLP (cylinder loading pump)	min	3	3	3	1	10
HG20	Max. cylinder heating time	min	120	120	120	30/Off	180
HG21	Minimum boiler temperature TK-min	°C	20	20	20	20	90
HG22	Maximum boiler temperature TK-max	°C	90	90	90	50	90
HG23	Maximum hot water temperature	°C	65	65	65	50	90
HG25	Boiler excess temperature during cylinder heating	°C	15	15	15	1	30
HG33	Burner hysteresis runtime	min	10	10	10	1	30
HG34	eBUS feed	-	Auto	Auto	Auto	OFF	ON
HG37	Pump control type (constant/linear/spread)	-	Lin.	Lin.	Lin.	var.	var.
HG38	Set spread, pump control unit (spread)	°C	15	15	15	0	40
HG39	Soft start time	min	3	3	3	0	10
HG40	System configuration (see chapter "Parameter description")	-	01	01	01	var.	var.
HG41	ZHP speed DHW	%	65	75	85	15	100
HG42	Hysteresis, header	°C	5	5	5	0	20
HG43	IO reductn, default value	-	0	0	0	-5	10
HG44	GPV curve offset	%	29,6 3)	30,9 3)	30,9 3)	15	46.4
HG45	Flue length compensation	%	-	-	-	-	7.5 2)
HG46	Excess boiler temperature, header	°C	6	6	6	0	20
HG60	Minimum burner switching hysteresis	°C	7	7	7	2	30
HG61	DHW control unit (boiler sensor / header sensor)	-	Boiler sensor	Boiler sensor	Boiler sensor	Various	Various

1) Minimum boiler output

2) CGB-2-14 = 2.5 %

3) Value is set automatically with GLV adaptation

Parameter HG01
Burner switching hysteresis

Factory setting: see table
Setting range: 7 to 30 °C

Individual setting:_____

The burner switching hysteresis regulates the boiler water temperature within the set range by switching the burner on and off. The higher the start/stop temperature differential is set, the greater will be the fluctuation in boiler water temperature around the set value with corresponding longer burner runtimes, and vice versa. Longer burner runtimes protect the environment and extend the service life of wearing parts.

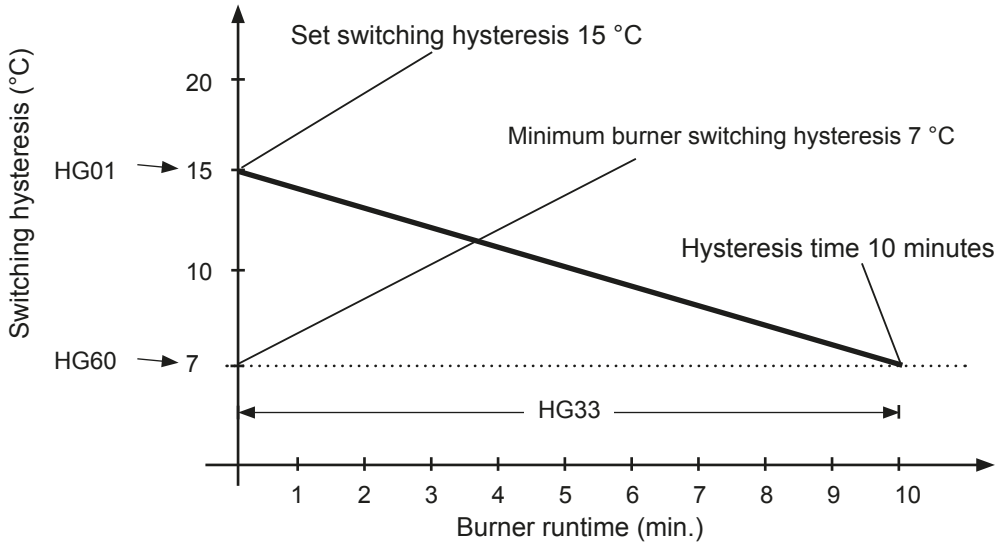


Fig.:
Time curve of the dynamic burner switching hysteresis for a user-defined burner switching hysteresis of 15 °C and a selected hysteresis time (parameter HG33) of 10 minutes. After expiry of the hysteresis time, the burner switches off at the minimum switching hysteresis (parameter HG60).

Parameter HG02
Lower burner output

Factory setting: see table
Setting range: 1 to 100 %

Individual setting:_____

The setting for minimum burner output (minimum appliance load) is applicable to all operating modes. This percentage value corresponds approximately to the real appliance output.
This setting may be modified only by qualified personnel, as faults may otherwise result.

Parameter HG03
Upper burner output DHW

Factory setting: see table
Setting range: 1 to 100 %

Individual setting:_____

The setting for the maximum burner output in DHW mode (maximum appliance load). Applies to buffer cylinder charging and combi mode. This percentage value corresponds approximately to the real appliance output.

Parameter HG04
Upper burner output HZ

Factory setting: see table
Setting range: 1 to 100 %

Individual setting:_____

The setting for the maximum burner output in heating mode (maximum appliance load). Applies to heating mode, cascade, BMS and emissions test. This percentage value corresponds approximately to the real appliance output.

Parameter HG07
Run-on time, heating circuit pump

Factory setting: see table
Setting range: 0 to 30 min

Individual setting:_____

If there is no longer a heat demand from the heating circuit, the internal appliance pump runs on for the set amount of time, to prevent a boiler safety shutdown due to high temperatures.

Parameter HG08
Maximum boiler water temperature HZ TV-max.
Factory setting: see table
Setting range: 40 to 90 °C

Individual setting:_____

This function sets an upper limit on the boiler water temperature in heating mode and the burner shuts down. This parameter has no function during cylinder heating, and the boiler water temperature may also be higher during this time. "Reheating effects" can result in the temperature being slightly exceeded.

Parameter HG09
Burner cycle block

Factory setting: see table
Setting range: 1 to 30 min

Individual setting:_____

Each time the burner is shut down in heating mode, it will be disabled for the duration of the burner cycle block. The burner cycle block is reset by switching the ON/OFF switch OFF and ON or by briefly pressing the reset button.

Parameter HG10
eBUS address of the heat generator

Factory setting: see table
Setting range: 1 to 5

Individual setting:_____

If multiple heat generators are controlled in one heating system with a cascade module, addresses must be assigned to each heat generator. Each heat generator requires its own eBUS address in order to communicate with the cascade module. The activation sequence of the heat generators can be set in the cascade module.
Please note: Duplicated addresses lead to malfunctions of the heating system.

Parameter HG12
Gas type of the heat generator

Factory setting: see table
Setting range: Nat. or LPG

Individual setting:_____

In this parameter, the gas type used for the gas condensing boiler can be set to Nat. Gas (natural gas) or LPG (liquid propane gas).
The gas valve must be adjusted at the same time (1 = natural gas, 2 = LPG).

24. Parameter description

Parameter HG13
Function input E1

The functions of input E1 can only be checked and set directly on the boiler under parameter HG13 using the AM display module or BM-2 programming module.

Display	Designation:
none	**no function (factory setting)** Input E1 is ignored by the control unit.
RT	**Room thermostat** With input E1 open, heating mode will be disabled (summer mode), regardless of any digital Wolf control accessories*.
DHW	**DHW disabled/enabled** With input E1 open, DHW heating will be disabled, regardless of any digital Wolf control accessories.
RT/DHW	**Heating and DHW disabled/enabled** With input E1 open, heating mode and DHW heating will be disabled, regardless of any digital Wolf control accessories*.
Zirkomat	**Zirkomat (DHW circulation remote control)** When input E1 is configured as the DHW circulation remote control, output A1 is automatically set to "DHW circulation pump" and is blocked for further settings. When input E1 is closed, output A1 is activated for 5 minutes. When input E1 has switched off and 30 minutes have elapsed, the remote control function is re-enabled for the next operation.
BOB	**Operation without burner (burner disabled)** When contact E1 is closed, the burner is disabled. Heating circuit pump, 3-way valve and cylinder primary pump continue running in standard mode. The burner is enabled in emissions test mode and in frost protection mode. Opening contact E1 enables the burner again.
Flue gas damper	**Flue gas/ventilation air damper** Function monitoring of the flue gas/ventilation air damper with floating contact Closed contact is a prerequisite for enabling burner in heating, DHW and emissions test mode. If input E1 is configured as a flue gas damper, output A1 is automatically programmed as a flue gas damper and disabled for other settings.
OWHA	**Operation without heating appliance (external disable)** When contact E1 is closed, the heating appliance is disabled. Burner, heating circuit pump, feed pump, 3-way valve and cylinder primary pump are disabled. The heating appliance is enabled in emissions test mode and in frost protection mode. Opening contact E1 enables the heating appliance again.
Ext. fault	**External fault (e.g. fault contact of condensate pumping station)** When contact E1 is open, fault message 116 is generated and heating & DHW heating are disabled. Closing contact E1 enables heating and DHW heating again. Fault message 116 is cancelled.

* When heating is disabled, frost protection mode and emissions test mode will remain enabled.

Parameter HG14
Function output A1

The functions of output A1 can only be checked and set directly on the boiler under parameter HG14 using the AM display module or BM-2 programming module.

Display	Designation:
none	**none (factory setting)** Output A1 is ignored by the control unit.
Circ 100	**DHW circulation pump 100 %** Output A1 is switched by the time program in the control accessory if DHW circulation has been enabled. Output A1 is constantly switched if no accessory controller is installed.
Circ 50	**DHW circulation pump 50 %** Output A1 is switched cyclically by the time program in the control accessory if DHW circulation has been enabled. 5 minutes ON, 5 minutes OFF Output A1 is switched cyclically if no accessory controller is installed.
Circ 20	**DHW circulation pump 20 %** Output A1 is switched cyclically by the time program in the control accessory if DHW circulation has been enabled. 2 minutes ON, 8 minutes OFF Output A1 is switched cyclically if no accessory controller is installed.
Flame	**Flame detector** Output A1 is activated after a flame has been recognised.
Zirkomat	**Zirkomat (DHW circulation remote control)** Output A1 is activated for 5 minutes when input E1 closes. If output A1 Zirkomat is configured, input E1 is automatically set to 'DHW circulation remote control' and is blocked for further settings. When input E1 has switched off and 30 minutes have elapsed, the remote control function is re-enabled for the next operation.
Flue gas damper	**Flue gas/ventilation air damper** Output A1 is activated first before each burner start. The burner will, however, only be enabled after input E1 has been closed. Closed contact E1 is a pre-requisite for enabling burner in central heating, DHW and emissions test mode. If output A1 is activated and does not close input E1 within 2 minutes, a fault is generated (FC 8). If output A1 is deactivated and does not open input E1 within 2 minutes, a fault is generated (FC 8). If output A1 is configured for a flue gas damper, input E1 is automatically programmed for a flue gas damper and blocked for other settings.
Alarm	**Alarm output** When a fault has occurred and 4 minutes have passed, the alarm output is activated. There is no notification of warnings.
Ext vent.	**External ventilation** Output A1 is activated inversely to the flame signal. Switching OFF external ventilation (e.g. extractor fan) during burner operation is required only if the boiler is operated in open flue mode.
Fuel valve	**External fuel valve** [1)] Activates an additional fuel valve during burner operation. Output A1 is activated from pre-flushing of the device until burner shutdown.
HCP	**Heating circuit pump (can only be enabled via HG40 System configuration 12)** If parameter HG40 System configuration is set to 12, output A1 is automatically enabled as the output for a heating circuit pump (direct heating circuit). This function cannot be selected separately via HG14.

[1)] According to DVFG-TRF 2012 chapter 9.2, an additional on-site LPG valve is not required if it has been ensured that no potentially hazardous quantity of gas can escape from the appliance. The CGB-2(K)-14/20/24 gas boilers meet these requirements.

Parameter HG15
Cylinder hysteresis

Factory setting: see table
Setting range: 1 to 30 K

Individual setting:_____

The cylinder hysteresis regulates the start point for cylinder heating. The higher the setting, the lower the start point for cylinder heating.

Example: Set cylinder temperature 60 °C
Cylinder hysteresis 5 K
Cylinder heating commences at 55 °C and ends at 60 °C.

Parameter HG16
Pump rate HC, minimum

Factory setting: see table
Setting range: 15 to 100 %

Individual setting:_____

In heating mode, the internal appliance pump does not regulate below this set value. Independent of pump control type set in HG37.

Parameter HG17
HC pump rate, maximum

Factory setting: see table
Setting range: 15 to 100 %

Individual setting:_____

In heating mode, the internal appliance pump does not regulate above this set value. Independent of pump control type set in HG37. If the pump control type is "Constant", HG17 is used as the setting for the pump speed in heating mode.

Parameter HG19
Run-on time, CLP
(cylinder loading pump)

Factory setting: see table
Setting range: 1 to 10 min

Individual setting:_____

After completing cylinder heating in summer mode (the cylinder has reached the set temperature), the cylinder primary pump will run on up to the maximum set run-on time.
The cylinder primary pump will switch OFF prematurely if, during the run-on time, the boiler water temperature cools down to a differential between boiler and set cylinder temperature of 5 K.
In winter mode, the cylinder primary pump runs on for a fixed time of 30 seconds after successful cylinder heating (regardless of parameter HG19).

Parameter HG20
Max. cylinder heating time

Factory setting: see table
Setting range: OFF/30 to 180 min

Individual setting:_____

Cylinder heating commences as soon as the cylinder temperature sensor demands heat. The heating circuit pumps would be constantly switched off if the appliance were undersized, the cylinder were scaled up or if DHW were constantly drawn off during DHW priority mode. The accommodation would then cool down significantly. To limit this effect, it is possible to specify a maximum cylinder heating time.
If the set maximum cylinder heating time has expired, fault message 52 appears on the programming or display module.
The control unit reverts to heating mode and cycles in the selected rhythm (HG20) between heating and cylinder heating mode, irrespective of whether the cylinder has reached its set temperature or not.
The "Max. cyl. heat time" function remains active even if parallel pump operation is enabled. If HG20 is set to OFF, the "Max. cyl. heat time" function is disabled. Set this parameter to OFF in heating systems with high DHW consumption, e.g. hotels, sports facilities, etc.

Parameter HG21
Minimum boiler temperature TK-min

Factory setting: see table
Setting range: 20 to 90 °C

Individual setting:_____

The control unit is equipped with an electronic boiler thermostat which has an adjustable minimum start temperature. The burner is switched on subject to the cycle block if this temperature is not achieved when heat is demanded. If there is no heat demand, the minimum boiler water temperature TK-min. may be undershot.

Parameter HG22
Maximum boiler temperature TK-max

Factory setting: see table
Setting range: 50 to 90 °C

Individual setting:_____

The control unit is equipped with an electronic boiler thermostat which has an adjustable maximum shutdown temperature (maximum boiler water temperature). The burner is switched off if this temperature is exceeded. The burner will restart when the boiler water temperature has fallen by as much as the burner switching differential.

Parameter HG23
Maximum DHW temperature

Factory setting: see table
Setting range: 50 to 90 °C

Individual setting:_____

The DHW temperature is factory-set to 65 °C. If, for commercial reasons, a higher DHW temperature is required, a maximum of up to 90 °C can be enabled. If pasteurisation has been enabled, the DHW cylinder will be heated to 65 °C during the first cylinder heating of the day, subject to parameter HG23 being set to this temperature or higher.

Please note:
Take adequate measures to prevent scalding.

Parameter HG25
Excess boiler temp.
for cylinder heating

Factory setting: see table
Setting range: 1 to 30 °C

Individual setting:_____

The excess temperature differential between the cylinder temperature and the boiler water temperature during cylinder heating is selected with parameter HG25.
The boiler water temperature continues to be limited by the maximum boiler water temperature (parameter HG22). This ensures that, even in spring and autumn, the boiler water temperature is higher than the cylinder temperature, thereby ensuring short heating times.

Parameter HG33
Burner hysteresis runtime

Factory setting: see table
Setting range: 1 to 30 min

Individual setting:_____

When the burner starts or when the boiler switches to heating mode, the burner hysteresis is set to the parameter "Burner switching differential" HG01. Based on this set value, the burner hysteresis within the set "Runtime burner hysteresis" HG60 is reduced to the minimum burner hysteresis of 7 K. This is designed to prevent short burner runtimes.

Parameter HG34
eBUS feed

Factory setting: see table
Setting range: OFF to ON

Individual setting:_____

In the "Auto" setting, the power supply to the eBUS system is switched ON or OFF automatically by the control unit, depending on the number of available eBUS subscribers.

OFF = BUS feed is always switched OFF.
ON = BUS feed is always switched ON.
Auto = The control unit switches the BUS feed ON or OFF automatically.

Parameter HG37
Type of pump control

Factory setting: see table

Individual setting:_____

For setting the type of pump speed control in heating mode, cascade operation and with BMS.

Constant = Fixed pump speed (HG17)
Linear = Linear pump speed between HG16 and HG17 corresponding to the current burner output
Spread = Speed control between HG16 and HG17 to achieve the set flow/return temperature spread (HG38)

Parameter HG38
Set spread, pump control

Factory setting: see table
Setting range: 0 to 40 °C

Individual setting:_____

The set spread specified in HG38 applies if dT pump control unit is enabled in parameter HG37. The change to the pump speed means the spread is regulated between flow and return within the speed limits in HG16 and HG17.

Parameter HG39
Soft start time

Factory setting: see table
Setting range: 0 to 10 min

Individual setting:_____

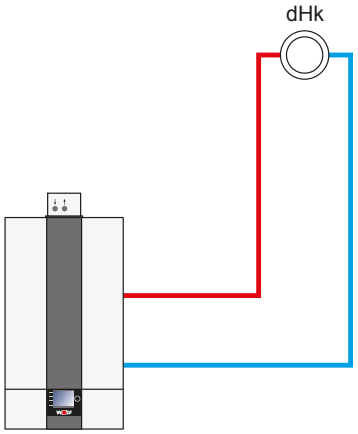
In heating mode, the burner is run at a lower output for the set time after burner start.

Parameter HG40
System configuration

The condensing boiler is fine-tuned to the heating system by selecting from 7 programmed system configurations that can only be checked and set directly on the boiler under parameter HG40 using the AM display module or BM-2 programming unit. This parameter affects the function of the internal appliance pump, input E2 and output A1.

System configuration 01

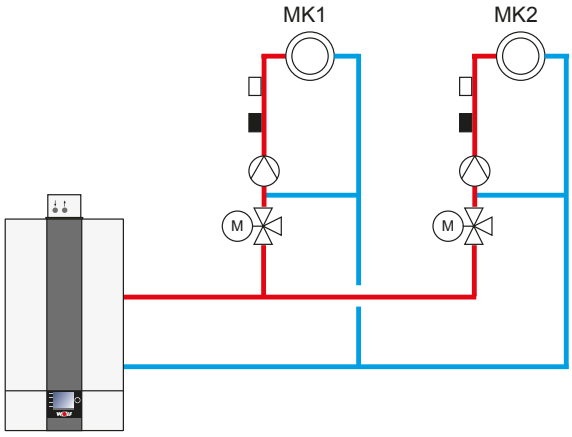
Direct heating circuit on the condensing boiler + optional additional mixer circuits via mixer modules (factory setting)



- Burner is enabled subject to demand from the direct heating circuit or optionally connected mixer circuits
- Internal appliance pump is enabled as a heating circuit pump
- Thermostatic boiler control
  Set value is specified by the heating circuit or mixer circuits
- Input E2: not assigned

System configuration 02

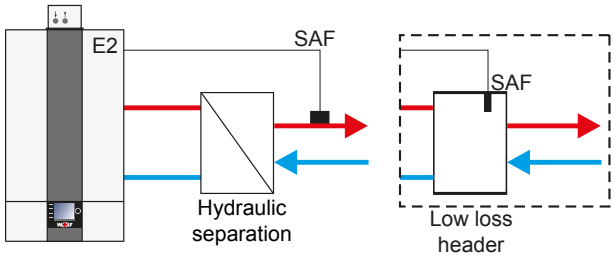
One or more mixer circuits via mixer modules (no direct heating circuit on the condensing boiler)



- Burner starts subject to demand from the connected circuits with mixer
- Internal appliance pump is enabled as a feed pump
- Thermostatic boiler control set value is specified by mixer circuits
- Input E2: not assigned

System configuration 11

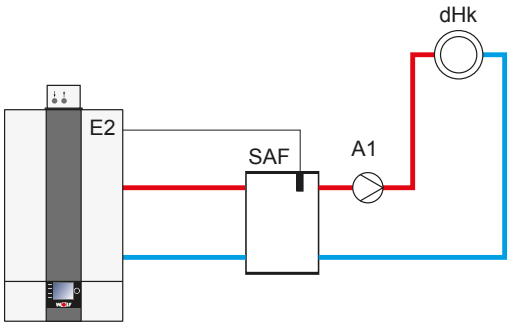
Plate heat exchanger for system separation



- Burner is enabled subject to demand from the header temperature control
- Feed/heating circuit pump (ZHP) enabled as a feed pump for header demand
- Header temperature control
- Input E2: Header sensor
- Parameter HG08 (TVmax): 90 °C
- DHW cylinder connection see parameter HG61

System configuration 11

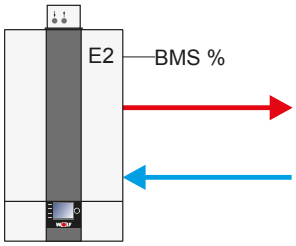
Low loss header with header sensor



- Burner is enabled subject to demand from the header temperature control
- Internal appliance pump is enabled as a feed pump
- Header temperature control
- Input E2: Header sensor
- Parameter HG08 (TVmax): 90 °C
- Parameter HG14 (Output A1): HKP
- DHW cylinder connection see parameter HG61

System configuration 51

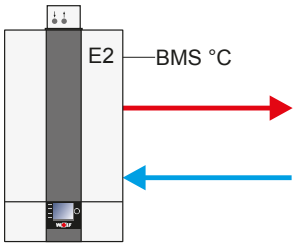
BMS burner output



- Burner is enabled subject to demand from the external controller
- Internal appliance pump is enabled as a feed pump from 2 V
- No temperature control
- Input E2:
  0-10 V control from the external controller
  0-2 V burner OFF
  2-10 V burner output min. to max. within the programmed limits (HG02 and HG04)
- Automatic output reduction when approaching TK_{max} (HG22) is enabled. Shutdown when TK_{max} is reached

System configuration 52

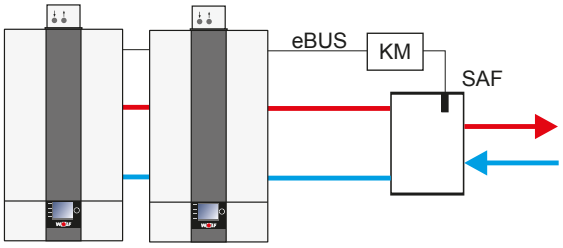
BMS set boiler temperature



- Burner is enabled subject to demand from the boiler thermostat
- Internal appliance pump is enabled as a feed pump from 2 V
- Thermostatic boiler control
- Input E2:
  0-10 V control from the external controller
  0-2 V burner OFF
  2-10 V set boiler water temperature TK_{min} (HG21) - TK_{max} (HG22)

System configuration 60

Cascade (automatic setting, if cascade module is connected)



- Burner starts following a demand from the cascade module via eBUS (0-100 % burner output; min. to max. within the programmed limits HG02 and HG04)
- Internal appliance pump is enabled as a feed pump
- Header temperature control via cascade module
- Input E2: not assigned
- Automatic output reduction when approaching TK_{max} (HG22) is enabled. Shutdown when TK_{max} is reached
- A low loss header or plate heat exchanger can be used to provide system separation

Important information:
In these schematic diagrams, shut-off valves, air vent valves and safety equipment are not fully represented. These should be provided for each system individually, in line with the applicable standards and regulations.
Hydraulic and electrical data can be found in the hydraulic system solutions technical guide.

Parameter HG41
ZHP speed DHW

Factory setting: see table
Setting range: 15 to 100 %

Individual setting:_____

In DHW mode, the pump runs at this set value. Independent of pump control type set in HG37.

Parameter HG42
Hysteresis, header

Factory setting: see table
Setting range: 0 to 20 °C

Individual setting:_____

The header hysteresis regulates the header temperature within the set range by switching the heat generator ON and OFF. The higher the ON/OFF temperature differential, the higher the header temperature fluctuation around the set value, resulting in longer heat generator runtimes, and vice-versa.

Parameter HG43
IO reductn, default value

Factory setting: see table
Setting range: -5 to 10

Individual setting:_____

Parameter HG43 has two functions:
1. Triggering of a 100 % calibration (burner or IO electrode replacement)
2. Permanent raising or lowering of the IO default value after a 100 % calibration has been completed.

Calling up HG43 results in an automatic 100 % calibration, which involves a burner restart. When a 100 % calibration is requested, "**100 % calibration Cali comp. OFF and Cali. active ON**" is displayed.
The 100 % calibration is complete as soon as "**100 % calibration Cali comp. ON and Cali. active ON**" appears in HG parameter 43 on the display.
The IO default value is an operand for the electronic gas/air mixture and determines the CO_2 level. By reducing the IO default value, (HG43) the CO_2 value can be lowered over the entire output range.
The default value should not be increased/reduced on newly installed appliances or in the event of a burner or IO electrode replacement. In the first hours of operation, the components are subject to ageing, which can temporarily affect the CO_2 level. If the CO_2 value of the condensing boiler is outside the CO_2 set range after approx. 1000 hours run, we recommend raising/lowering the default value via the HG 43 parameter.

(CO_2 reduction = set positive numerical value under HG43; CO_2 increase = set negative numerical value under HG43)

Parameter HG44
GPV curves offset
(gas valve zero point)

Factory setting: see table
Setting range: 15 to 46.4 %

Individual setting:_____

In standard control mode, the zero point specific to the gas valve is automatically determined at minimum output and stored in the control unit. After a gas valve replacement, set HG44 to the standard value.

Standard values: 14 kW = 25 %
20/24 kW = 29.3 %

Parameter HG45
Flue length compensation

Factory setting: see table
Setting range: 0 to 7.5 %

Individual setting:_____

The setting range of the flue length compensation is from 0 to 7.5 % and can be enabled in increments of 2.5 %. Flue length compensation compensates for the pressure drop which increases with the length of the balanced flue system, thus ensuring optimum operation.

There is a separate setting table for each model of the CGB-2:

CGB-2-14

	HG45	
Flue system/DN	0 %	2.5 % [1]
C33x / DN 60/100	0 m - 4 m	4.25 m - 16 m
C33x / DN 80/125	0 m - 4.25 m	4.25 m - 17 m
C33x / DN 110/160	0 m - 4.5 m	4.5 m - 18 m
Other balanced flue systems, diameter Max. balanced flue, see: Balanced flue for wall mounted gas condensing boilers up to 24 kW	0 m - 0.25 x BF_{max}	0.25 x BF_{max} - BF_{max}

1) When setting the tube trimming (HG45) to 2.5 %, adjust HG43 (IO reduction, default value) to -5 to achieve the set Lambda.

CGB-2-20

	HG45			
Flue system / DN	0 %	2.5 %	5 %	7.5 %
C33x / DN 60/100	0 m - 3.5 m	3.5 m - 7 m	7 m - 10.5 m	10.5 m - 14 m
C33x / DN 80/125	0 m - 5.5 m	5.5 m - 11 m	11 m - 16.5 m	16.5 m - 22 m
C33x / DN 110/160	0 m - 6.25 m	6.25 m - 12.5 m	12.5 m - 18.75 m	18.75 m - 25 m
Other balanced flue systems, diameter Max. balanced flue, see: Balanced flue for wall mounted gas condensing boilers up to 24 kW	0 m - 0.25 x BF_{max}	0.25 x BF_{max} - 0.5 x BF_{max}	0.5 x BF_{max} - 0.75 x BF_{max}	0.75 x BF_{max} - BF_{max}

CGB-2-24

	HG45		
Flue system / DN	0 %	2.5 %	5 %
C33x / DN 60/100	0 m - 3 m	3 m - 6 m	6 m - 12 m
C33x / DN 80/125	0 m - 6.5 m	6.5 m - 13 m	13 m - 26 m
C33x / DN 110/160	0 m - 7.5 m	7.5 m - 15 m	15 m - 30 m
Other balanced flue systems, diameter Max. balanced flue, see: Balanced flue for wall mounted gas condensing boilers up to 24 kW	0 m - 0.25 x BF_{max}	0.25 x BF_{max} - 0.5 x BF_{max}	0.5 x BF_{max} - BF_{max}

Parameter HG46
Excess boiler temperature, header

Factory setting: see table
Setting range: 0 to 20 °C

Individual setting:_____

The excess temperature differential between the header temperature and the boiler water temperature during header heating is selected with parameter HG46. The boiler water temperature continues to be limited by the maximum boiler water temperature (parameter HG22).

Parameter HG60
Minimum burner switching hysteresis

Factory setting: see table
Setting range: 2 to 30 °C

Individual setting:_____

Based on the maximum burner hysteresis HG 01, there is a linear reduction of the burner shutdown point after the burner start. After expiry of the hysteresis time (HG 33), the burner switches off when the minimum switching hysteresis is reached (HG60).
Also see parameter HG01 diagram.

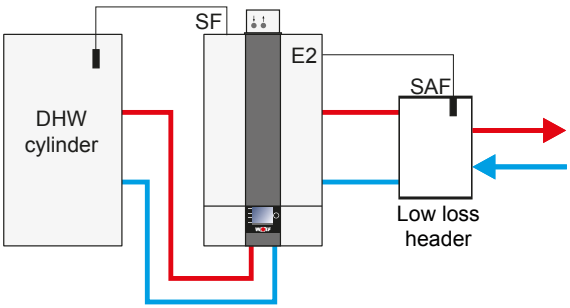
Parameter HG61
DHW control unit
(DHW control)

Factory setting: see table

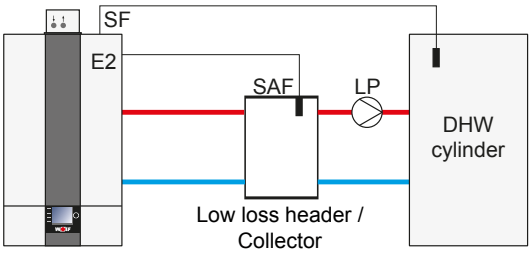
Individual setting:____

If a header sensor is connected to the appliance
(system configuration HG40 = 11 or 12) and an external DHW cylinder is installed, a hydraulic connection can be made between the DHW cylinder directly to the heating appliance (before the buffer/header) or after the buffer/header.

Boiler sensor:
Cylinder loading pump upstream of low loss header. Control on boiler sensor; feed pump off during cylinder heating.



Header sensor:
Cylinder feed pump downstream of low loss header. Control on header sensor; feed pump on during cylinder heating.



25. Filling the heating system/trap

Hydraulics

Please note

Before commissioning, carry out a leak test on all hydraulic pipework

If the appliance is not watertight, there is a risk of leaks and resulting material damage.

Test pressure on the heating water side max. 4 bar

Prior to testing, close the shut-off valves in the heating circuit for the appliance, as otherwise, the safety valve (accessory) opens at 3 bar. The appliance has already been leak tested at the factory at 4.5 bar.

Treatment of heating water in accordance with VDI 2035:

Filling

Potable water may be used as filling and top-up water if the limits in table 1 are not exceeded. Otherwise, the water must be treated using a desalinisation process.
If the water quality does not meet the required values, the warranty for components on the water side becomes void.

Please note

The only permissible water treatment process is desalinisation!

Thoroughly flush the system prior to commissioning. In order to keep oxygenation as low as possible, it is recommended to flush the system using tap water and then to use this water for the water treatment (position the dirt filter upstream of the ion exchanger).

Please note

Heating water additives such as antifreeze or inhibitors are not permitted, as they can damage the heating water heat exchanger. Alkalising additives may be used by a water treatment specialist to stabilise the pH value.

Filling

In order to prevent corrosion damage to the aluminium heating water heat exchanger, the pH value of the heating water must be between 6.5 and 9.0.

Please note

In mixed installations, a pH value of 8.2 to 9.0 must be maintained in accordance with VDI 2035.

The pH value should be checked again 8-12 weeks after commissioning, as under certain circumstances, chemical reactions may cause it to change. If it does not fall within this range after 8-12 weeks, remedial measures must be taken.

Electrical conductivity and water hardness

Heating water quality requirement relating to the entire heating system

Limits in relation to specific system volume VA
(VA = system volume / max. rated heating output[1])
Total hardness conversion: 1 mol/m³ = 5.6 °dH = 10°fH

	Total heating output	V_A ≤ 20 l/kW			V_A > 20 l/kW and < 50 l/kW			V_A ≥ 50 l/kW		
		Total hardness / total alkaline earths		Conductivity[2] at 25°C	Total hardness / total alkaline earths		Conductivity[2] at 25°C	Total hardness / total alkaline earths		Conductivity[2] at 25°C
	[kW]	[°dH]	[mol/m³]	C [µS/cm]	[°dH]	[mol/m³]	C [µS/cm]	[°dH]	[mol/m³]	C [µS/cm]
1	≤ 50	≤ 16.8	≤ 3.0	< 800	≤ 11.2	≤ 2	< 800	≤ 0.11[3]	≤ 0.02	< 800
2	50-200	≤ 11.2	≤ 2	< 100	≤ 8.4	≤ 1.5	< 100	≤ 0.11[3]	≤ 0.02	< 100
3	200-600	≤ 8.4	≤ 1.5		≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02	
4	≤ 600	≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02	

The total amount of fill and top-up water over the life cycle of the boiler must not exceed three times the nominal volume of the heating system.

[1] According to VDI 2035, in systems with multiple boilers, use the maximum rated heating output of the smallest heat source
[2] High salinity < 800 µS/cm
Low salinity < 100 µS/cm
[3] < 0,11°dH recommended standard; permissible up to limit of < 1°dH

Table 1

25. Filling the heating system/trap

Commissioning

Vent the system completely at the maximum system temperature.

The commissioning parameters must be recorded in the system log. This system log must be handed to the system operator following commissioning of the system. From that point onward, the operator is responsible for maintaining and keeping the system log. The system log is provided with the accompanying documents.

The water values, in particular the pH value, electrical conductivity and hardness, must be measured **annually** and documented in the system log.

Top-up water

The total amount of fill water used over the life cycle of the boiler must not exceed three times the system volume (oxygenation!). Where a system requires large volumes of top-up water (e.g. more than 10 % of the system volume per year), the cause must be sought immediately and the fault remedied.

Example:

Limits in relation to specific system volume VA
(VA = system volume / max. rated heating output[1])
Total hardness conversion: 1 mol/m³ = 5.6 °dH = 10°fH

	Total heating output	V_A ≤ 20 l/kW			V_A > 20 l/kW and < 50 l/kW			V_A ≥ 50 l/kW		
		Total hardness / total alkaline earths		Conductivity[2] at 25°C	Total hardness / total alkaline earths		Conductivity[2] at 25°C	Total hardness / total alkaline earths		Conductivity[2] at 25°C
	[kW]	[°dH]	[mol/m³]	C [µS/cm]	[°dH]	[mol/m³]	C [µS/cm]	[°dH]	[mol/m³]	C [µS/cm]
1	≤ 50	≤ 16.8	≤ 3.0	< 800	≤ 11.2	≤ 2	< 800	≤ 0.11[3]	≤ 0.02	< 800
2	50-200	≤ 11.2	≤ 2	< 100	≤ 8.4	≤ 1.5	< 100	≤ 0.11[3]	≤ 0.02	< 100
3	200-600	≤ 8.4	≤ 1.5		≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02	
4	≤ 600	≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02		≤ 0.11[3]	≤ 0.02	

The total amount of fill and top-up water over the life cycle of the boiler must not exceed three times the nominal volume of the heating system.

[1] According to VDI 2035, in systems with multiple boilers, use the maximum rated heating output of the smallest heat source
[2] High salinity < 800 µS/cm
Low salinity < 100 µS/cm
[3] < 0.11°dH recommended standard; permissible up to limit of < 1°dH

System with a CGB-2-20 system volume = 800 l
Total hardness of untreated potable water = 18°dH

V_A = 800 l / 20 kW = 40 l / kW

Because the specific system volume V_A is between 20 and 50 l/kW with a total output of < 50 kW, the fill and top-up water must be in the range of 2 to 11.2°dH If the total hardness of the untreated potable water is too high, some of the filling and top-up water must be desalinated.

A% desalinated water must be added.

$A = 100\% - [(C_{max} - 0.1°dH) / C_{potable\ water} - 0.1°dH)] \times 100\%$

C_{max} : Maximum permissible total hardness in °dH
$C_{potable\ water}$: Total hardness of untreated potable water in °dH

$A = 100\% - [(11.2°dH - 0.1°dH) / (18°dH - 0.1°dH)] \times 100\% = 38\%$

38% of the filling and top-up water must be desalinated.
$V_{treatment}$ = 38% x 800 l = 304 l
At least 304 L of desalinated water must be added when filling the system.
The system can then be topped up with potable water.

25. Filling the heating system/trap

Filling the heating system

To ensure correct function of the condensing boiler, fill the system as instructed, vent it completely and fill the trap.

We recommend using a sludge separator with integral magnetite separator in the boiler inlet to protect the high efficiency pump and the boiler. This is particularly relevant for old systems and mixed installations.

Please note

Before connecting it, flush the entire system to remove residues such as weld beads, hemp, putty, etc. from the pipework. Check the dirt filter.

- The gas condensing boiler must be switched OFF. Close the gas ball valve.
- Open the cap of the automatic air vent valve on the high efficiency pump by one revolution.
- Open all radiator valves.
  Open the flow and return valves on the boiler.
- Slowly fill the entire heating system and appliance in a cold condition to approx. 2 bar via the return.

Please note

Never use inhibitors or antifreeze.

- Bleed all radiators with a bleed key and if the system pressure drops significantly, top up with water to 2 bar.
- Check the entire system and all component unions for water leaks.

If leak-tightness cannot be ensured, there is a risk of water damage.

- Switch ON the condensing boiler at the red ON/OFF switch in the WOLF logo (pump will run).
- Briefly open the manual air vent valve until all air has escaped and then close it again.

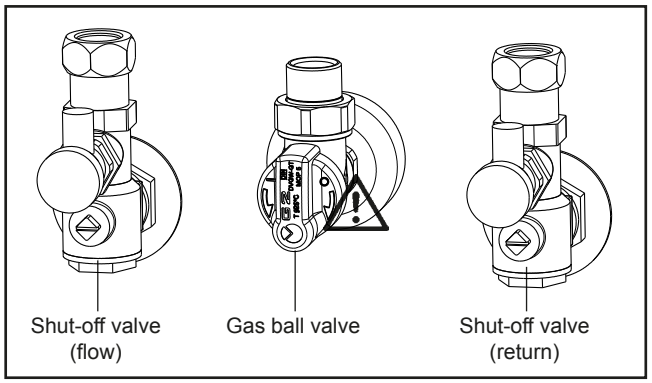


Fig: Gas connection: Risk of poisoning or explosion in the event of gas escaping

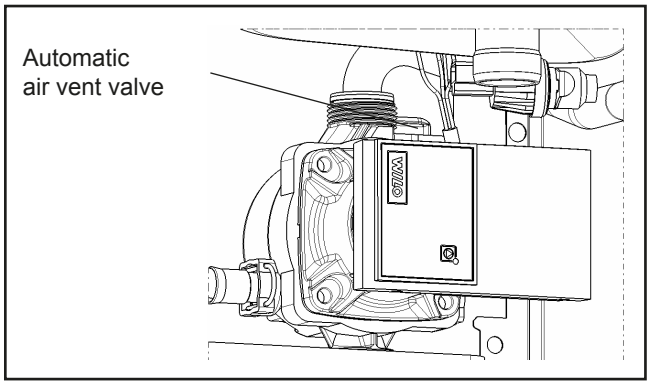


Fig: Automatic air vent valve on the heating circuit pump

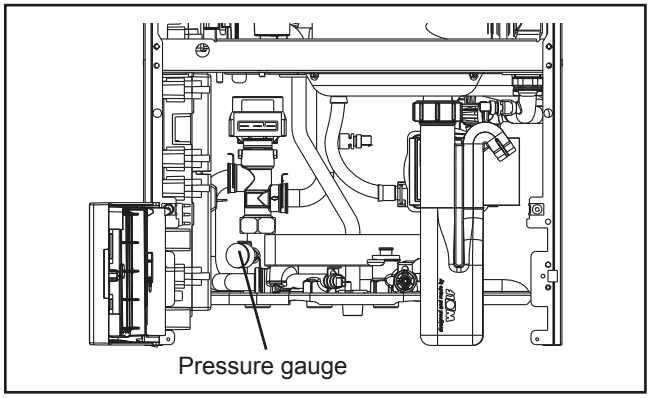


Fig: Pressure gauge

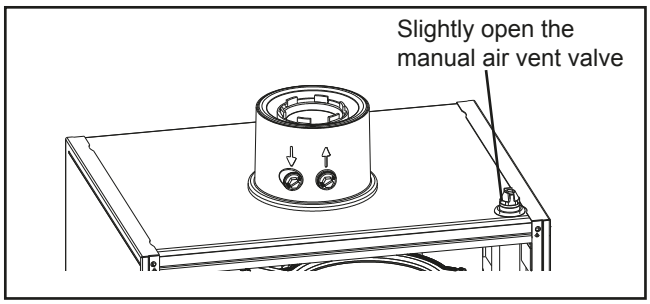


Fig: Manual air vent valve

25. Filling the heating system/trap

Please note

When installing an automatic vent, lock the lower threaded connection of the rotary joint underneath the combustion chamber floor.

- Check the system pressure again and top up with water if required.

Note:
During continuous operation, the heating circuit is automatically vented via the high efficiency pump.

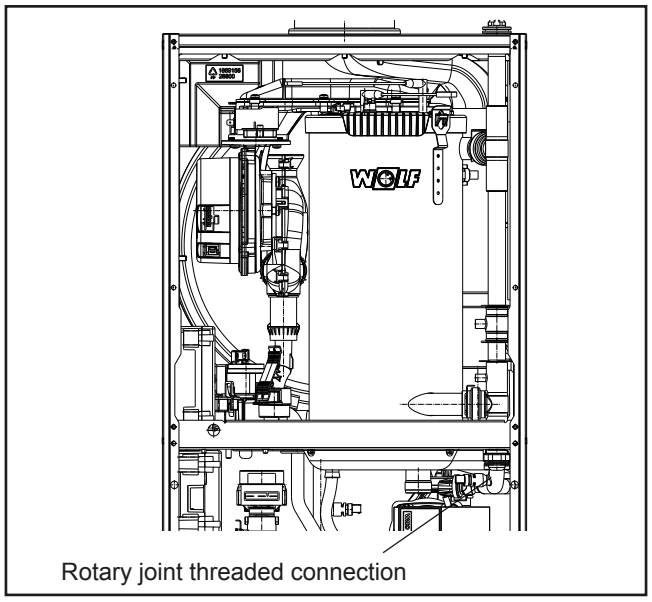


Fig: Threaded connection of rotary joint

Filling the trap

Prior to opening the gas ball valve and acknowledging the fault:
- Remove the trap.
- Fill the trap with water up to the mark.
- Refit the trap.
- Open the gas ball valve and acknowledge the fault.
- Switch ON the condensing boiler at the red ON/OFF switch in the WOLF logo.

Note:
The condensate hose attached to the trap must not form a loop or roll up, as this could lead to impaired operation.

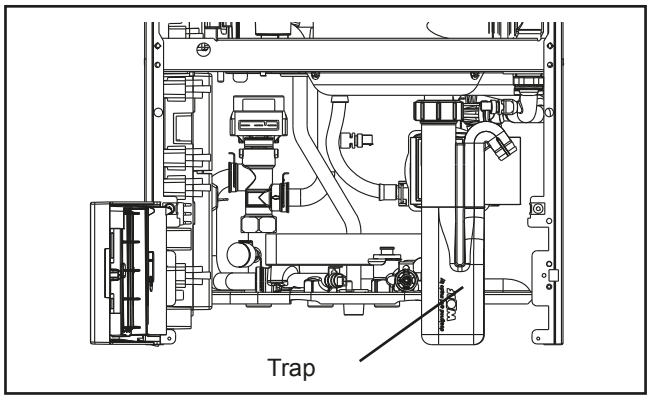


Fig: Trap

26. Filling of optional appliance versions

Optional boiler versions (subject to country-specific versions):

Two versions are available equipped with heating system filling facility.

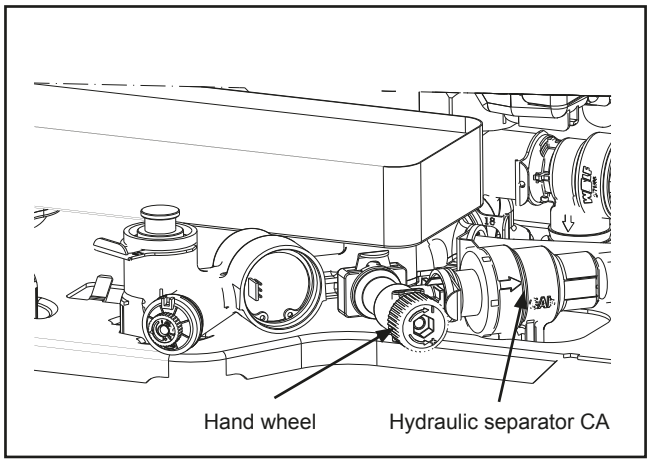


Fig: Filling facility integrated in the appliance on delivery

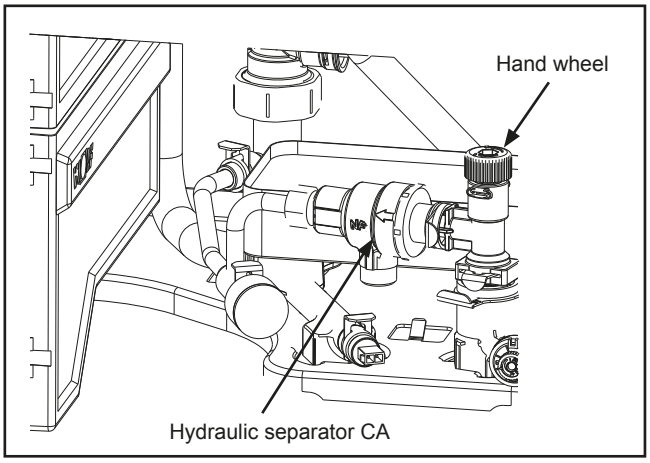


Fig: Filling facility that can be integrated into the appliance as a retrofit kit

Applicable standards for the filling facility:

(DIN) EN 1717 Protection against pollution of potable water installations
(DIN) EN 14367 Non controllable backflow preventer - Family C, type A
DIN 1988-100 (for Germany) Codes of practice for drinking water installations
Also observe the country-specific standards and guidelines on installation and operation.

Installation and operating information:

The filling facility contains a hydraulic separator CA (class b) to DIN EN 14367.
According to DIN EN 1717, hydraulic separators of type CA are approved for liquids up to and including hazard category 3 (e.g. heating water without inhibitors).

For Germany and Austria, only drinking water may be used for the (initial) filling of the heating system using the filling facility. An (initial) filling with treated water (deionised water, etc.) corresponds to a higher hazard category, for which the CA hydraulic separator may not be used.
To ensure long-term and fault-free operation of the filling facility, we recommend using a dirt trap (fine filter) in the DHW installation.

Operation:

For the filling procedure, open the hand wheel and fill to about 2 bar system pressure (observe pressure indication on pressure gauge or display module). After filling, close the hand wheel.

Maintenance:

The filling facility with CA hydraulic separator does not require any maintenance.
If there is water leaking from the CA hydraulic separator outlet, correct function can no longer be guaranteed and the CA hydraulic separator should be replaced.

27. Draining the heating system

Draining the heating system:

- Switch OFF the condensing boiler at the red ON/OFF switch in the WOLF logo.
- Close the gas ball valve.
- Allow the temperature in the heating circuit to cool to at least 40 °C.
  (Risk of scalding)
- Safeguard the heating system against accidental reconnection to the power supply.
- Open the drain valve (boiler drain & fill valve, on site).
- Open the air vent valves on the radiators.
- Drain the heating water.

28. Determining/changing the gas type

Determining the gas type

The condensing boiler is equipped with electronic combustion control which regulates the gas-air-ratio in accordance with the prevailing gas quality and so provides optimum combustion.

1 Request information regarding the gas type and Wobbe index from your local gas supply utility or LPG supplier.

2. Change the gas type for operation with LPG (see "Changing the gas type").

3. Enter the gas type in the commissioning report.

4. Open the gas ball valve.

Natural gas E/H 15.0:
W_S= 11.4 - 15.2 kWh/m³ = 40.9 - 54.7 MJ/m³

Natural gas LL 12.4:[1)]
W_S= 9.5 - 12.1 kWh/m³ = 34.1 - 43.6 MJ/m³

LPG B/P
W_S= 20.2 - 24.3 kWh/m³ = 72.9 - 87.3 MJ/m³

[1)] not applicable to Austria/Switzerland

Table: Wobbe index in relation to gas type

Gas categories and supply pressures

Country	Appliance category		Supply pressure in mbar					
	Natural gas	LPG	Natural gas			LPG		
			Nom.	Min.	Max.	Nom.	Min.	Max.
DE	II2N3P		20	18	25	50	42.5	57.5
AT	II2H3P		20	18	25	50	42.5	57.5
BE	I2N	I3B/P	20/25	18	30	30	25	35
ES, IE	II2N3+		20	18	25	28-30	25	35
						37	25	45
FR	II2N3B/P		20/25	18	30	30	25	35
FR	II2N3B/P		20/25	18	30	50	42.5	57.5
BA, BY	II2N3P		20	18	25	37	25	45
DK, EE, FI, GB, GR, HR, IT, LT, NO, PT, RO, RU, SE, SI, TR	II2N3B/P		20	18	25	30	25	35
BG, CZ, IS, ME, RS, SK, UA	II2N3B/P		20	18	25	37	25	45
CH	II2N3B/P		20	18	25	50	42.5	57.5
CY		I3B/P				30	25	35
CY		I3B/P				50	42.5	57.5
HU, NL	II2H3B/P		25	18	30	30	25	35
NL	II2N3B/P, II2EK3B/P		25	18	30	30	25	35
LU, LV, MT	I2N		20	18	25			
PL	II2E Lw3B/P, II2N3B/P		20	18	25	30	25	35

If the supply pressure is outside the specified range, adjustments must not be carried out and the boiler must not be started.
Gas categories of group "N" indicate a self-calibrating system (automatic matching to all gases of family 2; this includes natural gas E, H, L, LL) to DIN EN 437.

Changing the gas type (only for operation with LPG)

Change the gas type for operation with LPG

1. The gas boiler must be switched OFF.
   Close the gas ball valve.

Please note

The boiler starts automatically when there is a heat demand, even if the gas type has not yet been correctly set.

2. Set adjusting screw (A) on the gas valve to "2".
3. Press the red ON/OFF switch to switch ON the boiler.
4. Set the gas type at the contractor level.
   - Press the operating button Þ Main menu.
   - Select the contractor level by rotating and pressing the operating button.
   - Enter code "1111" and confirm.
   - Select HG parameter HG12 and set to LPG.
   - Exit the contractor level.
   - Update the type plate.
     Affix the label "Conversion to LPG" (included with the documentation) next to the type plate.

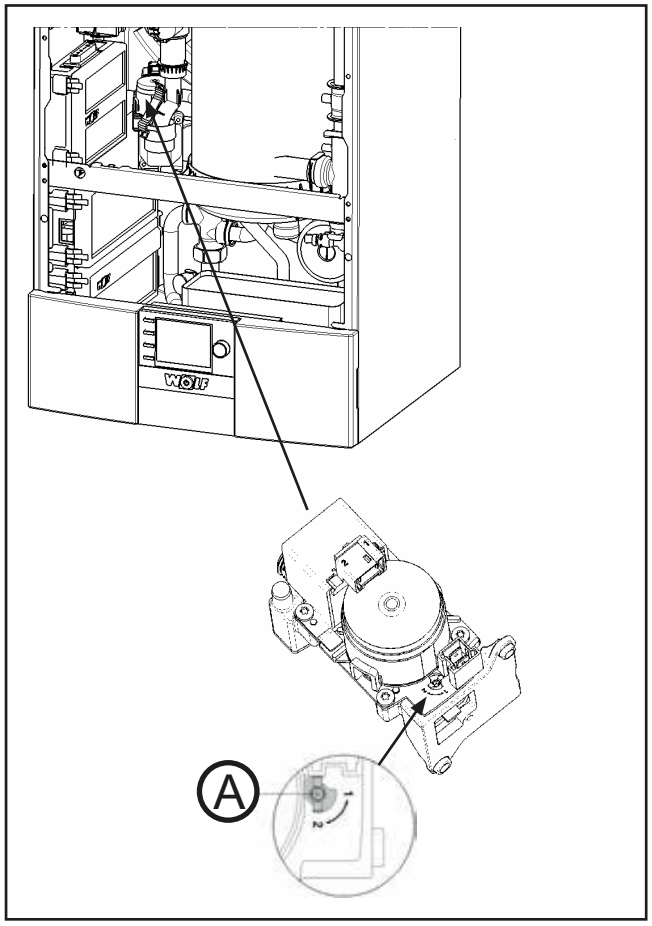


Fig: Changing the gas type

29. Checking the gas supply pressure

Checking the gas supply pressure

For permissible values, see table "Gas categories and supply pressures".
Work on gas components must only be performed by a licensed gas fitter. Work that is carried out incorrectly may lead to gas escaping, resulting in a risk of explosion, suffocation or poisoning.

1. The gas boiler must be switched OFF.
   Close the gas ball valve.
2. Loosen screw (B) on the gas test connector of the gas combination valve with a screwdriver. Do not remove the screw.
3. Connect the pressure gauge.
4. Open the gas ball valve.
5. Switch the gas condensing boiler ON.
6. After the boiler has started, read the supply pressure on the pressure gauge and enter it in the commissioning report.
7. Turn OFF the boiler, close the gas ball valve, remove the pressure gauge and tighten the screw in the pressure test nipple.
8. Open the gas ball valve.
9. Check the gas test connector on the gas combination valve for tightness.
10. Complete the enclosed notice and affix it to the inside of the casing.
11. Close the boiler.

If any screws are not fully tightened, gas may escape, leading to a risk of explosion, suffocation or poisoning.

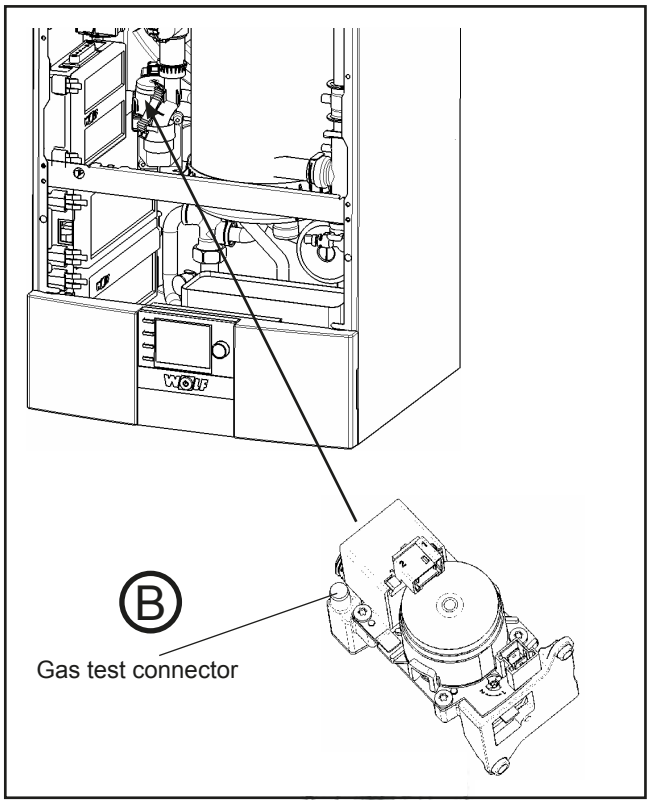


Fig: Changing the gas type

30. Adjusting the maximum heating output

Output setting (parameter HG04)

The output setting can be modified with Wolf control accessories with eBUS capability.
The heating output is determined by the gas fan speed. By reducing the gas fan speed in accordance with the table, the maximum heating output at 80/60 °C is matched.

14 kW appliance

Display value (%)	19	30	40	50	60	70	80	90	100
Heating output (kW)	1.9	3.5	5.1	6.7	8.2	9.8	11.3	12.9	13.5

20 kW appliance

Display value (%)	23	30	40	50	60	70	80	90	100
Heating output (kW)	3.8	5.5	7.9	10.3	12.6	15.0	17.4	19.8	22.2

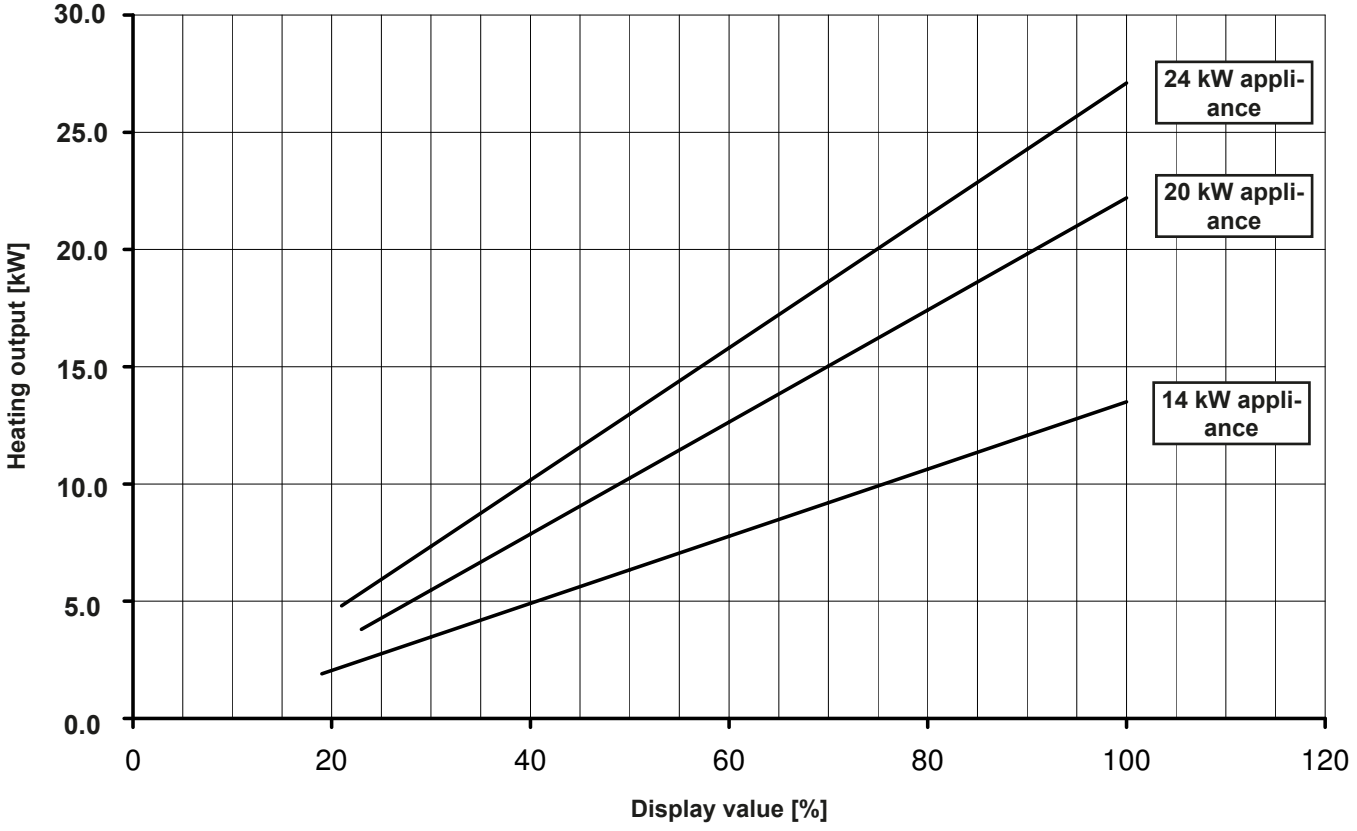
24 kW appliance

Display value (%)	21	30	40	50	60	70	80	90	100
Heating output (kW)	4.8	7.3	10.2	13.0	15.8	18.6	21.5	24.3	27.1

Table: Output settings

[1] minimum appliance output

Limiting the maximum heating output relative to a flow/return temperature of 80/60 °C



31. Checking the combustion parameters

The condensing boiler is equipped with electronic combustion control which ensures optimum combustion quality.
During commissioning and maintenance, only a check of CO, CO_2 or O_2 is required.
Test the combustion parameters with the boiler closed.

Please note

A flue gas emissions test by a contractor is necessary after every modification of the GBC-e PCB, mixing device, burner and gas valve.

Note: The combustion control carries out an automatic calibration after every boiler start. This can lead to briefly increased CO emissions.
Therefore, test the emissions no sooner than 60 seconds after the burner has started.

Checking the intake air

1. Remove screw (A) from the left hand test port.
2. Open the gas ball valve.
3. Insert the test probe.
4. Switch ON the boiler and select Emissions test via the function keys.
5. Check the temperature and CO_2.
6. In the case of a balanced flue, the flue is not gas-tight if the CO_2 content is > 0.3 %. The leak must be rectified.
7. After the test has been completed, switch the boiler OFF, remove the test probe and close the test port. Ensure the screws are tightly secured.

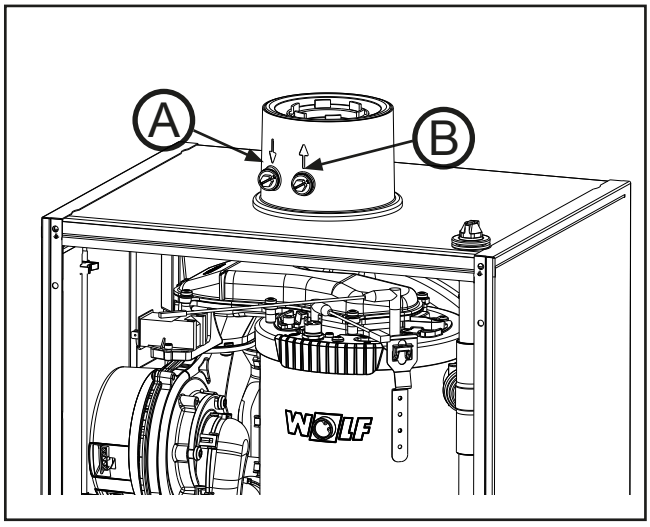


Fig.: Testing intake air and flue gas parameters

Checking the flue gas parameters

Please note

When the test port is open, flue gas can escape into the installation room. There is a risk of asphyxiation.

1. Remove screw (B) from the right hand test port.
2. Open the gas ball valve.
3. Insert the test probe.
4. Switch ON the boiler and select Emissions test via the function keys.
5. Carry out the checks after a minimum of 60 seconds of operation, measuring first at maximum load and then at minimum load.
6. Flue gas values (for permissible values, see table).

	14/20/24kW-appliance		
Gas type	CO_2 in %	O_2 in %	Lambda
Natural gas E/H/LL	7.8 - 9.8[1)]	3.5 - 7.0	1.35 +/- 0.15
LPG (G31)	9.1 - 11.4[2)]		
[1)] Max. base CO_2 value = 11.7 % (G20)			
[2)] Max. base CO_2 value = 13.7 % (G31)			

7. After the test has been completed, switch the boiler OFF, remove the test probe and close the test port. Ensure the screws and gasket are tight and firmly seated.

If the actual CO_2 or O_2 values lie outside their respective ranges, proceed as follows:

1. Check the ionisation electrode and supply line.

2. Check the electrode gaps.

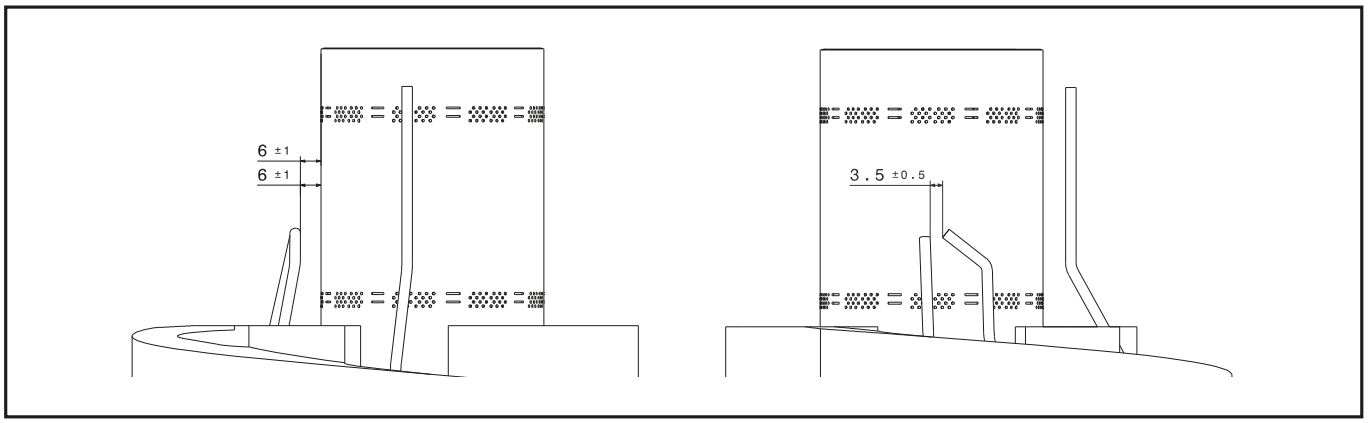


Bild: Abstand Zündelektrode

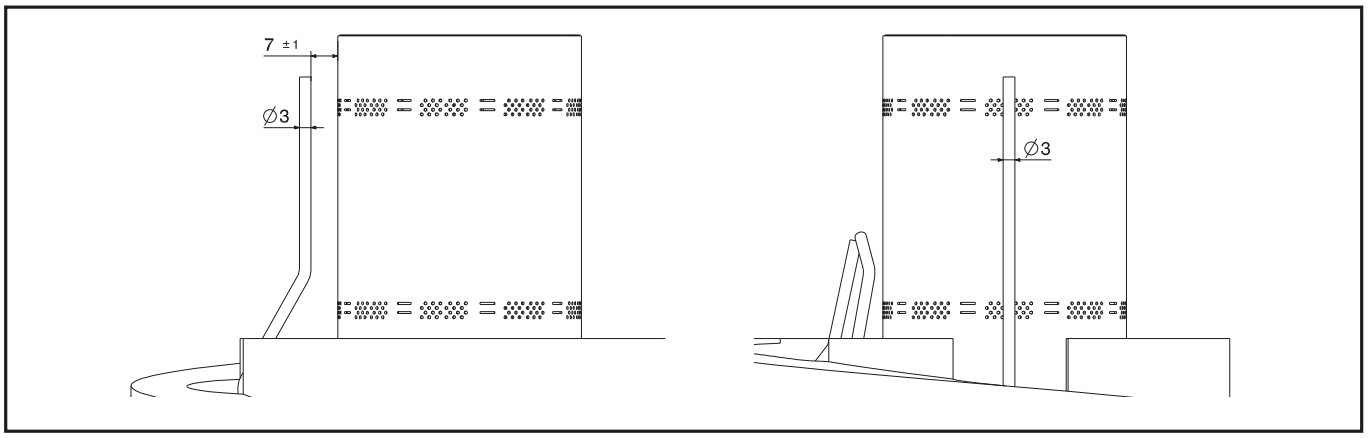


Bild: Abstand Ionisationselektrode

Check the electrodes for wear and contamination.

Clean the electrodes with a small brush (not with a wire brush) or sandpaper.

Check the electrode gaps. If the gaps do not correspond to the drawing or the electrodes are damaged, replace the electrodes and gaskets and align them.
Tighten the electrode fixing screws with a torque of 2.3 ±0.2 Nm.

3. Carry out a 100 % calibration after working on the ionisation electrode.

   → see description HG43 in chapter “Parameter description”

4. If the CO_2 or O_2 value remains outside the respective range, the flue gas values can be adjusted via parameter HG43.

32. Converting from combi boiler to boiler with cylinder

The conversion must only be carried out by authorised contractors.

Combi boilers can be converted to boilers with cylinder and vice versa (does not apply to CGB-2-14). This requires the appropriate conversion kit from the Wolf accessories range.

Carry out the following steps:

1. Combi boiler to boiler with cylinder

- Disconnect the system from the power supply.
- The gas condensing boiler must be switched OFF. Close the gas ball valve.
- Shut off/drain the heating water, DHW and cold water lines.
- Disconnect the electrical connections on the flow sensor and the DHW outlet sensor.
- At the panel for the combi boiler, disconnect the cold water supply and the DHW outlet.
- Remove the trap.
- Remove the plate heat exchanger via the 2 knurled nuts underneath the panel (Allen screw).
- Remove the two circlips that secure the DHW flow block and the DHW return block to the panel.
  Þ Push against the circlip with a screwdriver and release it slightly using a second screwdriver.
  Þ Pull off the circlips using needle-nosed pliers.
- Undo the plug-in connection to the 3-way valve and on the DHW return block.
- Remove the disconnected assemblies.
- Install the cylinder heating inlet pipes and cylinder heating outlet pipes. Secure pipes with the plug-in connection at the 3-way valve and the heating water return block. Then secure the connections to the panel using the two circlips.
- Attach them to the free connections on the panel.
- Connect the cylinder sensor to the terminal strip on the control unit.
- Refit the filled trap.
- Open/fill the heating water, DHW and cold water lines.

2. Boiler with cylinder to combi boiler

- Disconnect the system from the power supply.
- The gas condensing boiler must be switched OFF. Close the gas ball valve.
- Shut off/drain the heating water, DHW and cold water lines.
- Remove the cylinder heating inlet pipes and cylinder heating outlet pipes.
- Terminate the cylinder sensor.
- Install the DHW flow block and DHW return block.
- Install the plate heat exchanger.
- Connect the electrical connections on the flow sensor and the DHW outlet.
- Open/fill the heating water, DHW and cold water lines.

After conversion, carry out a master reset with the power supply connected. Otherwise no heat demand will be detected. This resets all parameters to their factory settings.
If changes have previously been made to control parameters to adjust the system, make sure to record these first and then set them again after the master reset.

To carry out a parameter reset:

- Push the rotary selector on the display module.
- Select contractor level and confirm.
- Enter the contractor level password by rotating and pressing: 1111

- Rotate to Parameter reset Þ Factory setting YES

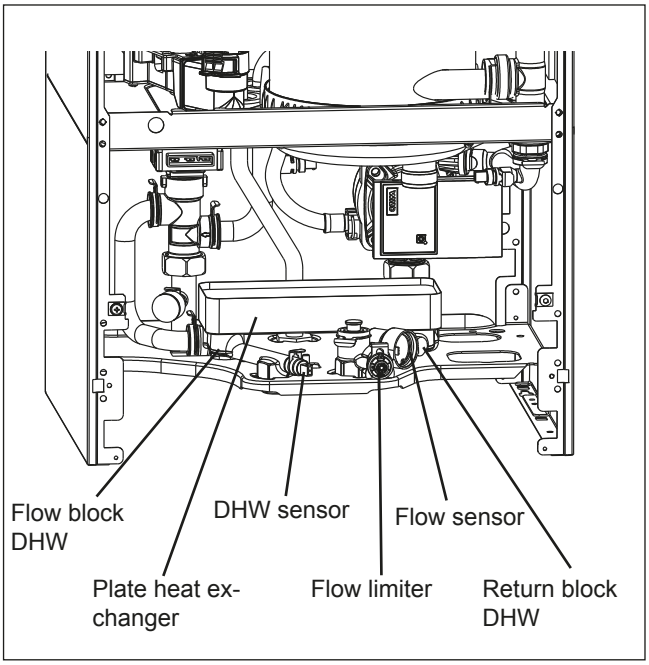


Fig: Combi boiler pipework

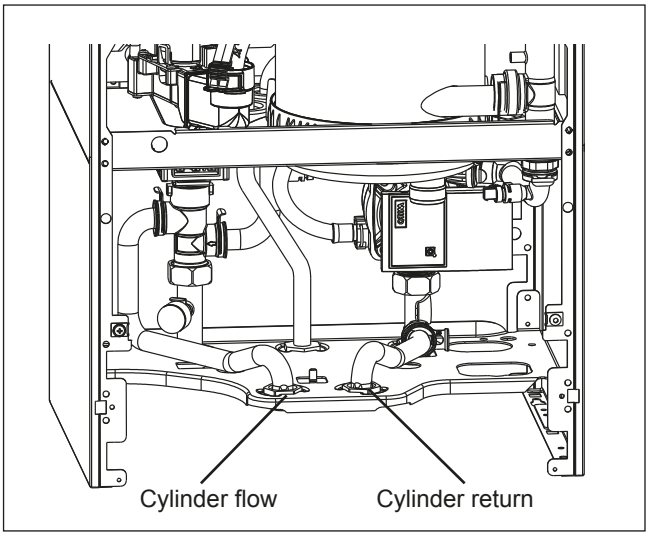


Fig: Connection block removed

33. Setting the flow limiter

The combi boiler is fitted with an adjustable flow limiter (DHW draw-off rate).

The flow limiter is shipped with a flow rate set at the factory to 8 l/min.

The flow rate can be changed via the green rotary selector on the flow limiter.

The flow limiter can be adjusted between 5 and 13 l/min.

Procedure:

- Manually pull out the green rotary selector forwards.
- Increase flow rate Þ
  rotate counter clockwise in **+** direction.
- Reduce flow rate Þ
  rotate clockwise in **-** direction.

  Check the selected flow rate on the display of the AM display module or the BM-2 programming unit.
- Manually push in the green rotary selector to lock it.

Recommended draw-off rate

Appliance type	ΔT=40 K	ΔT=50 K
CGB-2K-20	8.6 l/min	6.8 l/min
CGB-2K-24	10 l/min	8 l/min

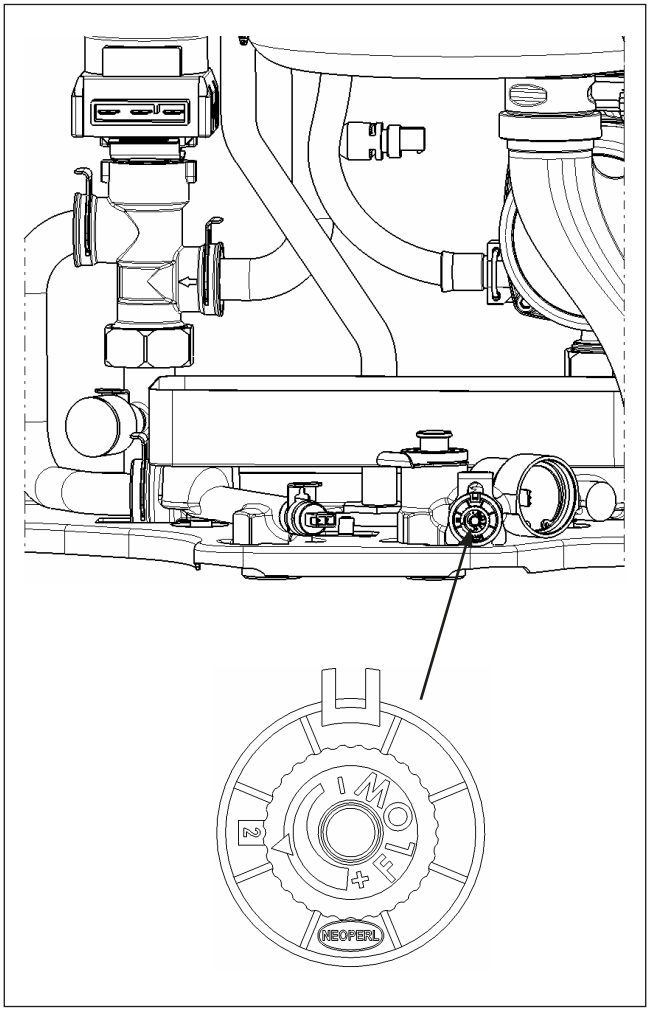
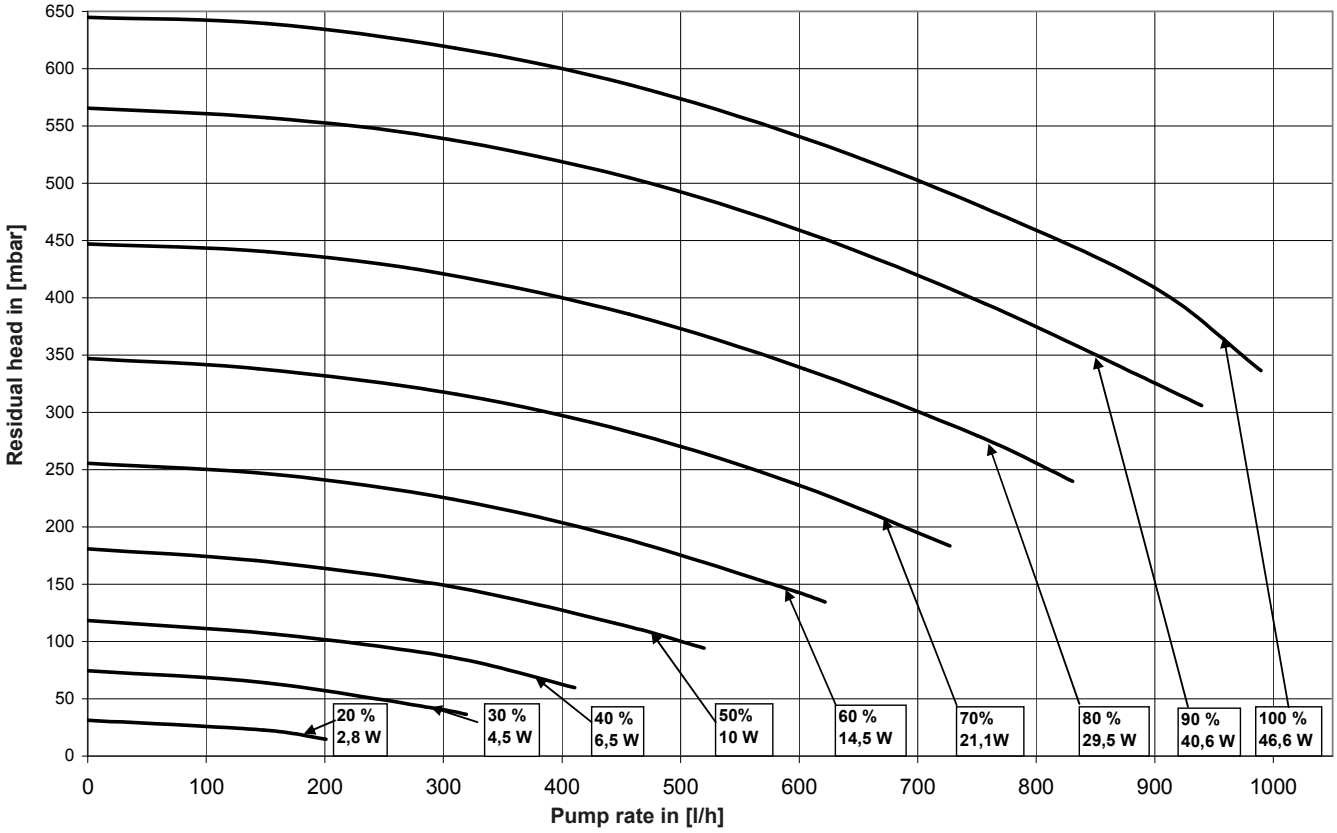


Fig: Flow rate limiter

34. High efficiency pump function description

Residual head of the high efficiency pump (EEI ≤ 0.23)



High efficiency pump function description (EEI ≤ 0.23)	Heating mode	3 operating modes are possible with the modulating heating circuit pump: **1. Pump speed linear to burner output (Linear)** The heating circuit pump modulates in proportion to the burner output, i.e. for max. burner load the pump will run at the maximum set pump speed for "heating mode"; for minimum burner output at the minimum set pump speed for "heating mode". In other words, the burner and pump output are regulated subject to the required heat load. Modulating the pump reduces power consumption. **2. Spread control (dT)** This type of control aims to utilise the condensing effect as fully as possible while minimising the electrical energy required by the pump. This is achieved by constantly maintaining a prescribed spread. **3. Fixed speed setting (constant)** The heating circuit pump runs at the fixed set speed, both for minimum and maximum burner output. The pump rate is not controlled in relation to the required heating load and power consumption is not reduced.
	DHW mode	The heating circuit pump does not modulate, it continuously operates at the selected "DHW" pump speed. (See table "Factory settings for pump speed".)
	Standby mode	The pump does not run when the boiler is in standby mode.
Operating setting	The pump control can be set with parameter HG37.	

34. High efficiency pump function description

Factory settings for pump speeds

Appliance output	Heating mode		DHW	Standby heating mode
	maximum	minimum		
14 kW	70 %	45 %	55 %	30 %
20 kW	70 %	45 %	75 %	30 %
24 kW	70 %	45 %	85 %	30 %

Troubleshooting

Problem	Remedy
Individual radiators do not warm up properly.	Carry out hydraulic balancing, i.e. reduce the flow rate of hotter radiators. Increase the pump speed (HG16).
In the spring and autumn, the required room temperature is not achieved.	Increase the set room temperature at the controller, e.g. with set value setting ± 4.
The required room temperature is not achieved when outside temperatures are very low.	Select a steeper heating curve at the controller, e.g. increase the flow temperature at standard outside temperatures.

35. Commissioning report

Commissioning steps	Test values or confirmation
1.) Serial number on the type plate	_____
2.) Electrical wiring/connection/fuse protection checked in accordance with technical data from installation instructions and VDE regulations?	□
2.) System flushed?	□
3.) System filled and water treatment carried out in line with "Technical information, water treatment"? pH value set Total hardness set	□ _____ pH value _____ °dH
4.) Appliance and system vented?	□
5.) System pressure 2.0 - 2.5 bar?	□
6.) Water connections checked for tightness?	□
7.) Trap filled?	□
8.) Gas valve set to gas type?	Natural gas □ LPG □ Wobbe index _____ kWh/m³ Calorific value, heating _____ kWh/m³
9.) Gas supply pressure checked?	□
10.) Gas tightness test carried out?	□
11.) Switch boiler ON, set control unit to OFF/Standby.	□

35. Commissioning report

Commissioning steps	Test values or confirmation
12.) Standard setting set on control unit?	□
13.) Required heating output set in contractor parameter HG04?	□
14.) Gas type set in contractor parameter HG12?	Natural gas □ LPG □
15.) Check system configuration and modify if required Contractor parameter HG40	□
16.) Flue length compensation set according to "Flue length compensation table" in contractor parameter HG45?	□
17.) Gas type and heating output entered on label?	□
18.) Balanced flue system checked?	□
19.) Flue gas emissions test (emissions test mode): Gross flue gas temperature Intake air temperature Net flue gas temperature Carbon dioxide content (CO_2) or oxygen content (O_2) Carbon monoxide content (CO)	 _____ t_A [°C] _____ t_A [°C] _____ (t_A - t_L) [°C] _____ % _____ ppm
20.) Casing fitted?	□
21.) Function test carried out?	□
22.) System user instructed, documentation handed over?	□
23.) Commissioning confirmed?	_____ □

Temperature monitoring

Combustion chamber temperature sensor (eHLSC)

The combustion chamber temperature sensor is a contact sensor on the indirect coil. It consists of 2 sensor beads which together act as a high limit safety cut-out (eHLSC). At the same time, the combustion chamber temperature sensor acts as a temperature monitor (TM).

The TM shutdown temperature is > 102 °C. When this temperature is reached, the burner shuts down without locking out the boiler. Fault Þ Fault code 06. Once the temperature falls below the shutdown point, the boiler automatically restarts.

The temperature limiter shutdown temperature is ≥ 108 °C. When this temperature is reached, the burner is shut down, resulting in a lockout fault Þ Fault code 02. When the temperature drops below the shutdown point, the boiler will restart once the fault has been acknowledged.

Boiler water temperature sensor (control sensor)

The boiler water temperature sensor in the flow pipe, upstream of the 3-way valve is used as the control sensor. The appliance is controlled via the temperature determined here.
The maximum possible boiler water temperature 85 °C (factory setting). Exceeding this temperature causes the boiler to shut down and results in a burner cycle block (factory setting 7 min.).

Flue gas temperature sensor

The flue gas temperature sensor shuts down the boiler when the flue gas temperature exceeds 110 °C. This results in a lockout fault Þ Fault code 07.

The flue gas temperature is determined by a sensor in the condensate pan.

Combustion chamber cover HLSC (thermostat)

The high limit safety cut-out shuts down the boiler if the temperature exceeds 185 °C. This results in a lockout fault → Fault code 01.

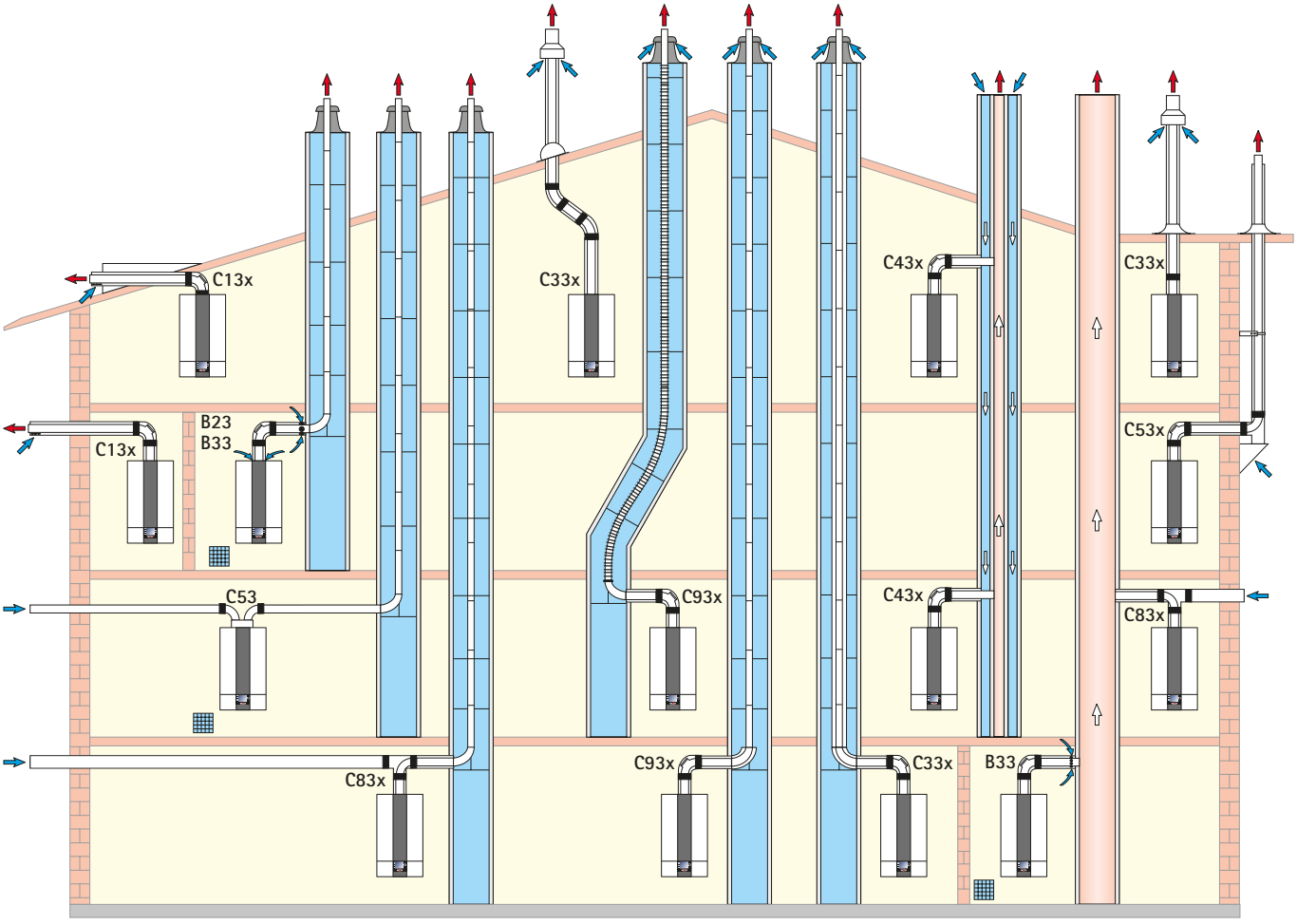
System pressure monitoring

Dry fire protection

The appliance is equipped with a pressure sensor that monitors the operating pressure in the heating circuit. If the system pressure drops below 0.8 bar, a warning appears on the display. If the system pressure drops below 0.5 bar, the burner is shut down without locking out the boiler. Once the pressure exceeds the shut-down threshold again, the appliance restarts automatically.

The appliance also monitors the water pressure increase in the system every time the power supply is switched ON. If the pressure does not increase by at least 150 mbar when the pump starts, the appliance will not start. This results in a lockout fault Þ Fault code 107, i.e. boiler dry.

Balanced flue system



Provide ventilation for B23, B33, C53

Information about multiple connections:

Point	Safe differential pressure in accordance with DIN EN 15502-2-1	CGB-2-14	CGB-2-20	CGB-2-24
a	The maximum safe differential pressure at the lowest thermal load (Δpmax, saf(max))	25		
b	The maximum safe differential pressure at the highest thermal load (Δpmax, saf(min))	87	78	78
c	The maximum safe differential pressure at start (Δpmax, saf(start))	25		
d	The maximum functional differential pressure at the highest thermal load (Δpmax, func(max))	25		
e	The minimum safe differential pressure (Δpmin, saf)	-200		

37. Technical information, air/flue gas routing

Air/flue gas routing

Flue gas routing options			Maximum length[1] [m]		
			up to 14 kW	up to 20 kW	up to 24 kW
B23	Flue inside a duct and combustion air directly through the boiler (open flue)	DN60 DN80	45 -	25 50	21 50
B33	Flue in a duct with horizontal, concentric connection line (open flue)	DN60 DN80	43 50	23 50	19 50
B33	Connection to a moisture-resistant chimney with horizontal concentric connection pipe (open flue)		Calculation to EN 13384 (room sealed balanced flue manufacturer)		
C13x	Horizontal roof outlet through a pitched roof, (room sealed - on-site dormer)	DN60/100 DN80/125	10 10	10 10	10 10
C33x	Vertical concentric roof outlet through a pitched or flat roof Vertical concentric balanced flue for installation in a duct (room sealed)	DN60/100 DN80/125 DN110/160	16 17 18	14 22 25	12 26 30
C43x	Connection to a moisture-resistant balanced flue chimney (room sealed balanced flue) Maximum pipe length from the centre of the boiler bend to the connector 2 m (room sealed)		Calculation to EN 13384 (room sealed balanced flue manufacturer)		
C53	Connection to flue in the duct and ventilation air supply through exterior wall (room sealed), incl. 3 m ventilation air duct	DN80/125	50	50	50
C53x	Connection to a flue on an external wall (room sealed) Combustion air intake via external wall	DN80/125	50	50	50
C83x	Connection to flue in a duct and ventilation air through external wall (room sealed)	DN80/125	50	50	50
C83x	Concentric connection to a moisture-resistant chimney and combustion air through an external wall (room sealed)		Calculation to EN 13384 (room sealed balanced flue manufacturer)		
C93x	Flue for installation in a duct Connecting pipe DN60/100, vertical DN60	rigid flexible	17 13	17 13	17 13
C93x	Flue for installation in a duct Connecting pipe DN60/100 or DN80/125, vertical DN80	rigid flexible	18 14	21 17	26 22

[1] **The maximum length corresponds to the total length from the appliance to the flue terminal.**

For available lifting pressures of gas fans, see specification.

Note: Systems C33x and C83x are also suitable for installation in garages.
Where necessary, adapt the installation examples to the relevant building regulations and requirements in your country/region. Any questions relating to the installation, particularly regarding the provision of inspection components and ventilation apertures (ventilation generally required above 50 kW output) should be raised with your local flue gas inspector prior to installation.

The specified lengths refer to concentric balanced flues and standard flues, and apply to original Wolf components only.

Balanced flue systems DN60/100 and DN80/125 are certified as single units together with Wolf gas condensing boilers.

The following balanced flues or standard flues with CE-0036-CPD-9169003 certification may be used:
- Flue pipe DN80
- Concentric balanced flue DN60/100 and DN80/125
- Flue pipe DN110
- Concentric balanced flue (on external walls) DN80/125
- Flexible flue pipe DN83

Wolf accessories are supplied with the relevant necessary identification labels.
Please also observe the installation information supplied with the accessories.

37. Technical information, air/flue gas routing

General information

For reasons of operational safety, use only original Wolf components for concentric balanced flues and standard flues.

Where necessary, adapt the installation examples to the relevant building regulations and requirements in your country/region. Any questions relating to the installation, particularly regarding the inspection components and ventilation apertures, should be raised with your local flue gas inspector prior to installation.

With low outside temperatures, the water vapour contained in the flue gas may condense and freeze on the flue. **This ice may fall from the roof causing injuries or material losses.** Prevent ice from falling by taking on-site measures, e.g. installing a snow guard.

If the balanced flue passes through different floors of the building, route the pipes outside the boiler room inside a duct with at least 90 min fire resistance. In low-rise residential buildings (building category 1 to 2) a minimum of 30 min fire resistance is required. Fire may spread if these instructions are not observed.

Gas condensing boilers with a balanced flue with roof outlet may be installed only in attics or in rooms whose ceiling also forms the roof or where only the roof construction is located above the ceiling.

The following applies to gas boilers with a balanced flue routed above the roof, where only the roof structure lies above the ceiling:

If fire resistance **is** required for the ceiling, the pipes for combustion air supply and flue gas must be equipped with a casing in the area between the top edge of the ceiling and the roof skin. The casing must provide the same fire resistance as the ceiling and must be made from non-combustible materials. There is a risk of fire spreading if these requirements are not observed.

If fire resistance is **not** required for the ceiling, route the lines for the combustion air supply and the flue gas from the top edge of the ceiling to the roof skin in a duct made from non-combustible, rigid materials or in a protective metal pipe (mechanical protection). There is a risk of fire spreading if these requirements are not observed.

No clearance is required between the concentric balanced flue and combustible materials or components, as at the rated output temperatures higher than 85 °C will not arise.
If only a standard flue is installed, maintain the clearances specified by DVGW/TRGI 2008 [or local regulations].

Air/flue systems without a duct must not be routed through other installation rooms, as there is a risk of fire spreading and mechanical protection is not ensured.

Please note

Combustion air must not be drawn from chimneys previously used to carry flue gases from oil or solid fuel boilers.

Outside the duct, secure the balanced flue or standard flue with spacer clips. These must be provided at a minimum 50 cm from the appliance connection and upstream/downstream of diversions, to prevent the pipe joints being pulled apart. Flue gas may escape if these instructions are not observed. Furthermore, damage to the appliance may result.

Flue gas temperature limiter

The electronic flue gas temperature limiter switches the oil condensing boiler off when the flue gas temperature exceeds 110 °C.

Please note

The appliance will go back into operation when the reset button is pressed. It is important to find out why the appliance deactivated before resetting the boiler. Resetting the boiler when the flue gas temperature is too high can destroy the flue gas system.

37. Technical information, air/flue gas routing

If the gas condensing boiler is installed with a balanced flue routed over an external wall (type C13x), the rated boiler output in heating mode must be reduced to below 11 kW (for appropriate measures, see chapter "Limiting the maximum output").

Connection to the balanced flue

It must be possible to inspect the entire cross-section of the flues. Therefore, install an appropriate cleaning and/or inspection aperture inside the boiler room; agree suitable arrangements with your local flue gas inspector.

Flue connections are created using couplings and gaskets. Always arrange couplings against the direction of the condensate flow. **Install the balanced flue with a slope of at least 3° towards the gas condensing boiler. Install spacer clamps to secure the positioning (see installation examples).**

Calculating the balanced flue length

The calculated length of the balanced flue system or the flue is derived from the straight pipe length and the length of any pipe bends.

Example for a 60/100 system[1]):

Straight balanced flue pipe, length 1.5 m	L = straight length + bend length
1 x 87° bend ≙ 1.5 m	L = 1.5 m + 1 x 1.5 m + 2 x 1.3 m
2 x 45° bends ≙ 2 x 1.3 m	L = 5.6 m

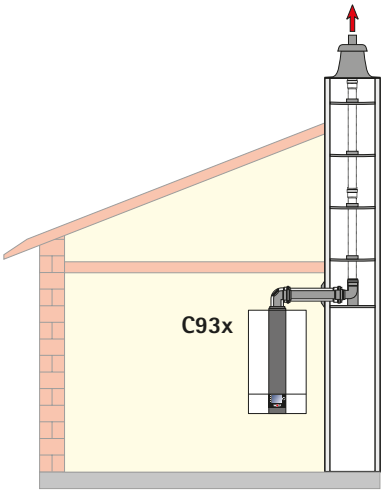
Note: To avoid reciprocal interference between air and flue gas pipes routed above the roof, we recommend maintaining a minimum clearance of 2.5 m between the pipes.

[1]) Equivalent length of the system:

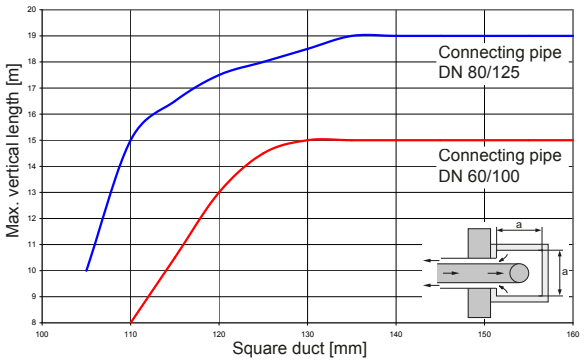
	60/100	80/125
87° bend	1.5 m	3 m
45° bend	1.3 m	1.5 m

Minimum duct size for room sealed operation C93x

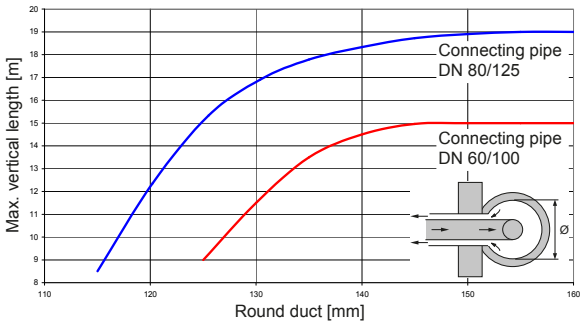
Assuming: In the installation room:
2x inspection bends, 1x 87° bend and
1.5 m horizontal with 87° support bend



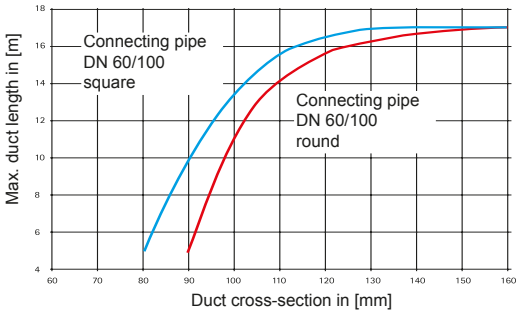
Flue pipe DN 80



Flue pipe DN 80



Flue pipe DN 60



Connection to a moisture-resistant room sealed balanced flue, flue chimney or flue system type C 43x

Horizontal balanced flues must **not be more than 2 m long** when connecting the system to a balanced flue chimney.
The room sealed balanced flue chimney must be certified by DIBT - Deutsches Institut für Bautechnik [Germany] or CE-designated and must be approved for condensing operation with positive/negative pressure.
For sizing, use calculations to EN 13384.

Connection to a moisture-resistant flue gas chimney or a flue system type B33 for open flue operation

Horizontal balanced flues must be **no longer than 2 m** when connecting the system to a chimney. In addition to the boiler connection bend, no more than **two** 90° diverters may be installed.
The flue gas chimney must be certified by DIBT [Germany] or CE-designated, and must be approved for condensing operation.
If necessary, obtain the connection piece from the chimney manufacturer.
The air apertures to the boiler room must be completely free from obstruction.

Connection to a moisture-resistant flue type B23 for open flue operation

For this option, observe the regulations concerning ventilation for boiler rooms acc. to DVGW-TRGI.

Connection to a moisture-resistant flue, type C53, C83x, for room sealed operation

For horizontal air ducts, a maximum length of 2 m is recommended. Observe the special requirements for flues that are not surrounded by combustion air acc. to DVGW-TRGI 2008 and all locally applicable combustion regulations.

Connection to a combustion air and flue gas system type C63x that is not tested together with the gas combustion equipment

Original Wolf components are designed for long-term use, are designated with the DVGW quality seal and are designed for use with Wolf gas condensing boilers. When using third party equipment that is only DIBT certified or CE-designated, the installer himself is responsible for the correct sizing and trouble-free function of the system. Faults, material losses and injuries resulting from incorrect pipe lengths, excessive pressure drop, premature wear with escaping flue gas and condensate or incorrect function, e.g. through components working themselves loose, are excluded from our warranty if third party equipment bearing only DIBT certification is used.

If the combustion air is drawn from the duct, the duct must be free from contamination.

Multiple connections/cascade

These boilers are suitable for multiple connections to a shared chimney in accordance with DVGW Code of Practice G 635. An internal flue gas return preventer is used to prevent a return flow of flue gas. The installed flue gas system must be certified for multiple connection to a common chimney. Evidence of suitability must be provided by relevant calculations in accordance with fire protection regulations.

The maximum overpressure in the flue system may not exceed 200 Pa.

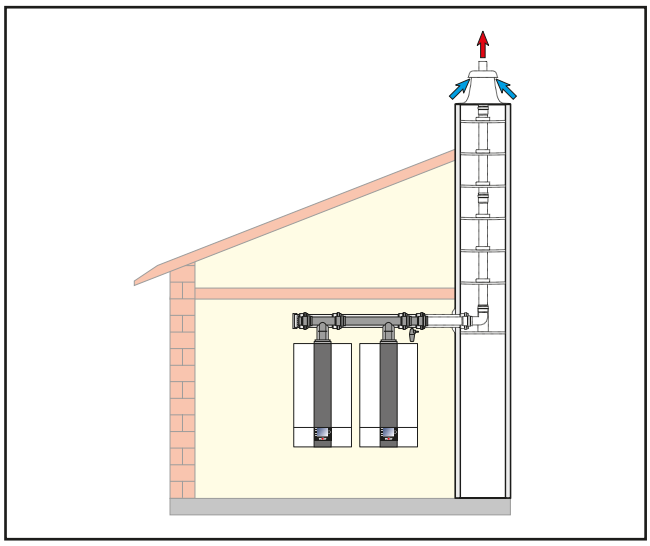


Fig: Cascade

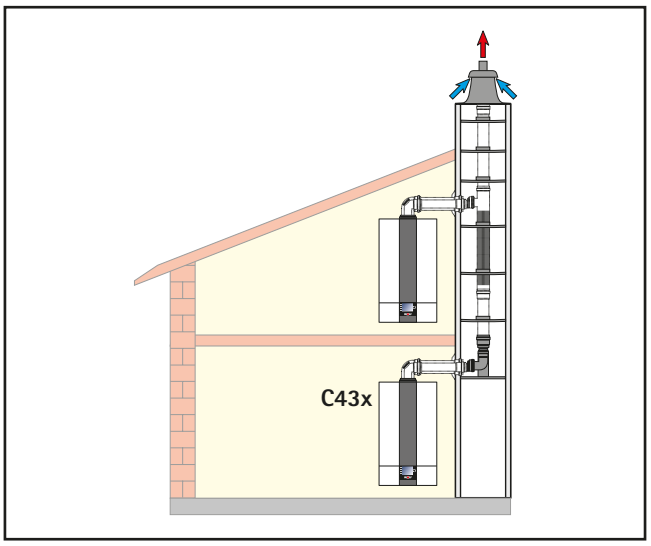


Fig: Multiple connection

37. Technical information, air/flue gas routing

Tightness test on connections to adjacent appliances

As part of the annual boiler test, the cascade damper on overpressure boiler systems must be tested for tightness, to ensure no CO_2 can escape into the boiler room (risk of poisoning or asphyxiation).
The check must be carried out with the appliance closed.

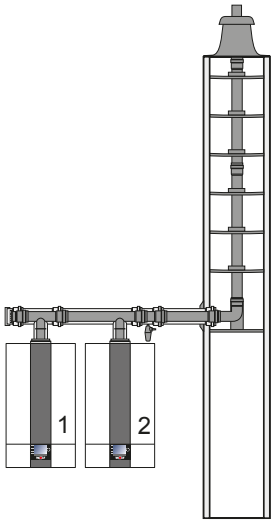
We recommend proceeding as follows:

Tightness test on connections to adjacent appliances

- Select the mixer circuit via the right hand rotary selector. Press function key 3 and use the rotary selector to select "Standby", then press to confirm. Repeat process for "DHW".
- Then, on the first CGB-2, under status display "Heating appliance", press quick start key 3 to activate the "Emissions test" ➔ CGB-2 starts.
- Operate the first CGB-2 for at least 5 minutes.
- Check the CO_2 content in the air connectors on all other appliances.
- If the CO_2 value exceeds 0.2 % within 15 minutes, the leak must be found and remedied.
- Subsequently close all test ports again. When doing so, ensure the caps are seated firmly.

Testing the first CGB-2 for tightness

- Shut down the first CGB-2 via function key 4 ➔ Emissions test is disabled.
- On the second CGB-2, press quick start key 3 under status display "Heating appliance" to enable the emissions test ➔ CGB-2 starts.
- Operate the second CGB-2 for at least 5 minutes.
- Check the CO_2 content in the air connector on the first CGB-2.
- If the CO_2 value exceeds 0.2 % within 15 minutes, the leak must be found and remedied.
- Subsequently close all test ports again. When doing so, ensure the caps are seated firmly.



Vertical balanced flue routing (examples) system DN 60/100

1 Gas condensing boiler

2 Balanced flue pipe with inspection port
(250 mm long)

3 Separator DN60/100
(slide coupling)
if required

4 Balanced flue pipe DN60/100
500 mm
1000 mm
2000 mm

5 Balanced flue, vertical DN60/100
(roof outlet for flat or pitched roofs)
L = 1200 mm
L = 1200 mm ... 1700 mm

6 Universal tile for pitched roof 25/45°

7 Flat roof collar

8 Bend 45° DN60/100

9 Inspection bend DN60/100

10 Bend 87° DN60/100

11 Pipe collar

12 Support rail

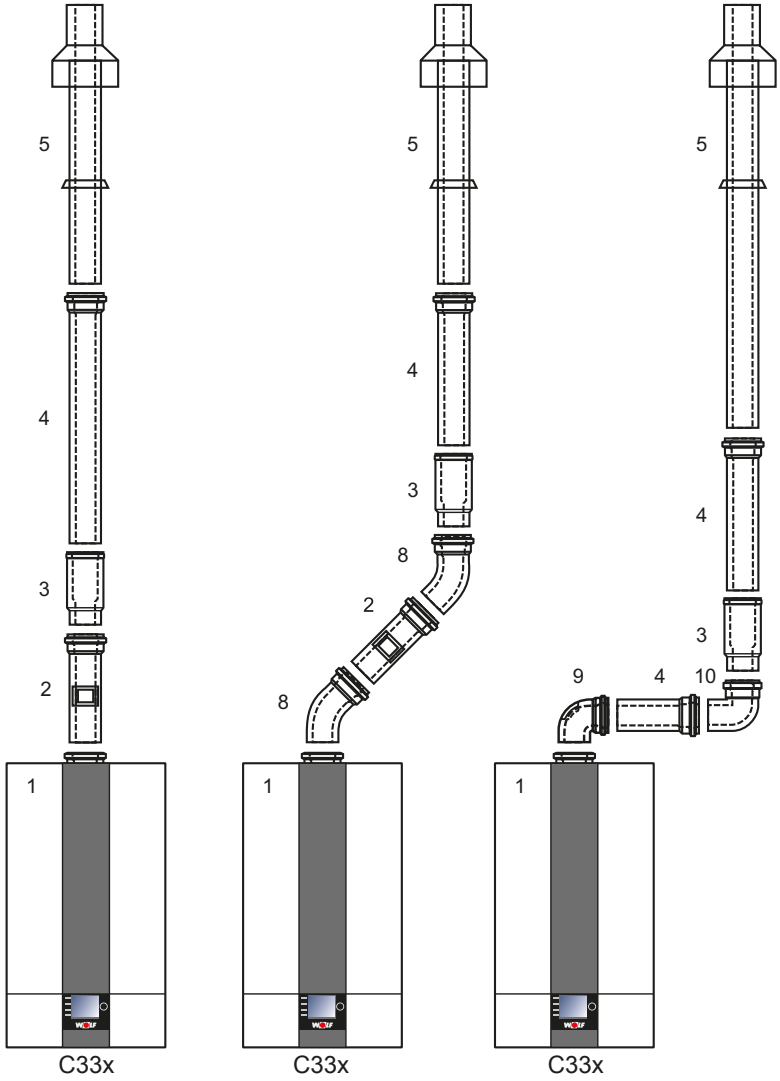
13 Support bend 87° DN60 to DN80

14 Spacer

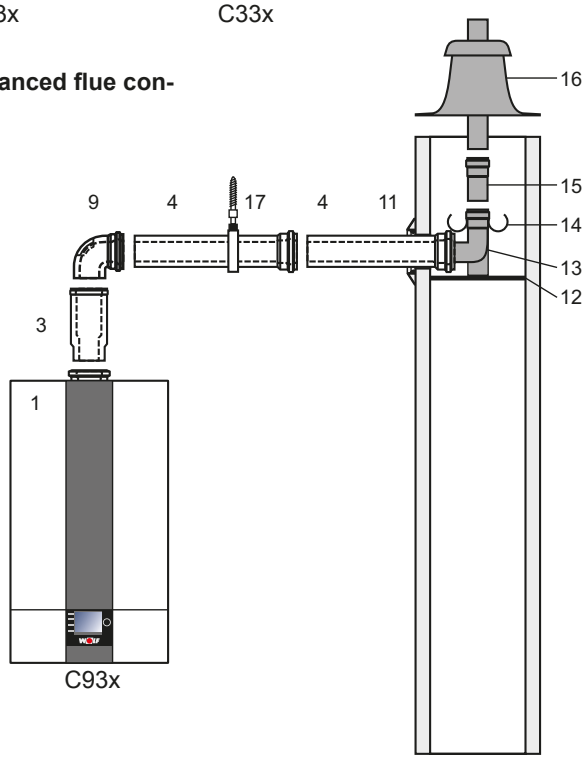
15 Flue pipe DN80
500 mm
1000 mm
2000 mm

16 Duct cover with
UV resistant terminal

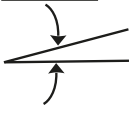
17 Spacer bracket



Installation examples for balanced flue connections (vertical)



Please note



Install horizontal pipe with > 3° slop=e towards boiler

Flue gas < 120 °C

Horizontal balanced flue/connection to balanced flue chimney (examples) system DN60/100

1 Gas condensing boiler

2 Balanced flue pipe with inspection port
(250 mm long)

4 Balanced flue DN60/100
500 mm
1000 mm
2000 mm

9 Inspection bend

10 Bend 87° DN60/100

11 Pipe collar

12 Support rail

13 Support bend 87° DN60 to DN80

14 Spacer

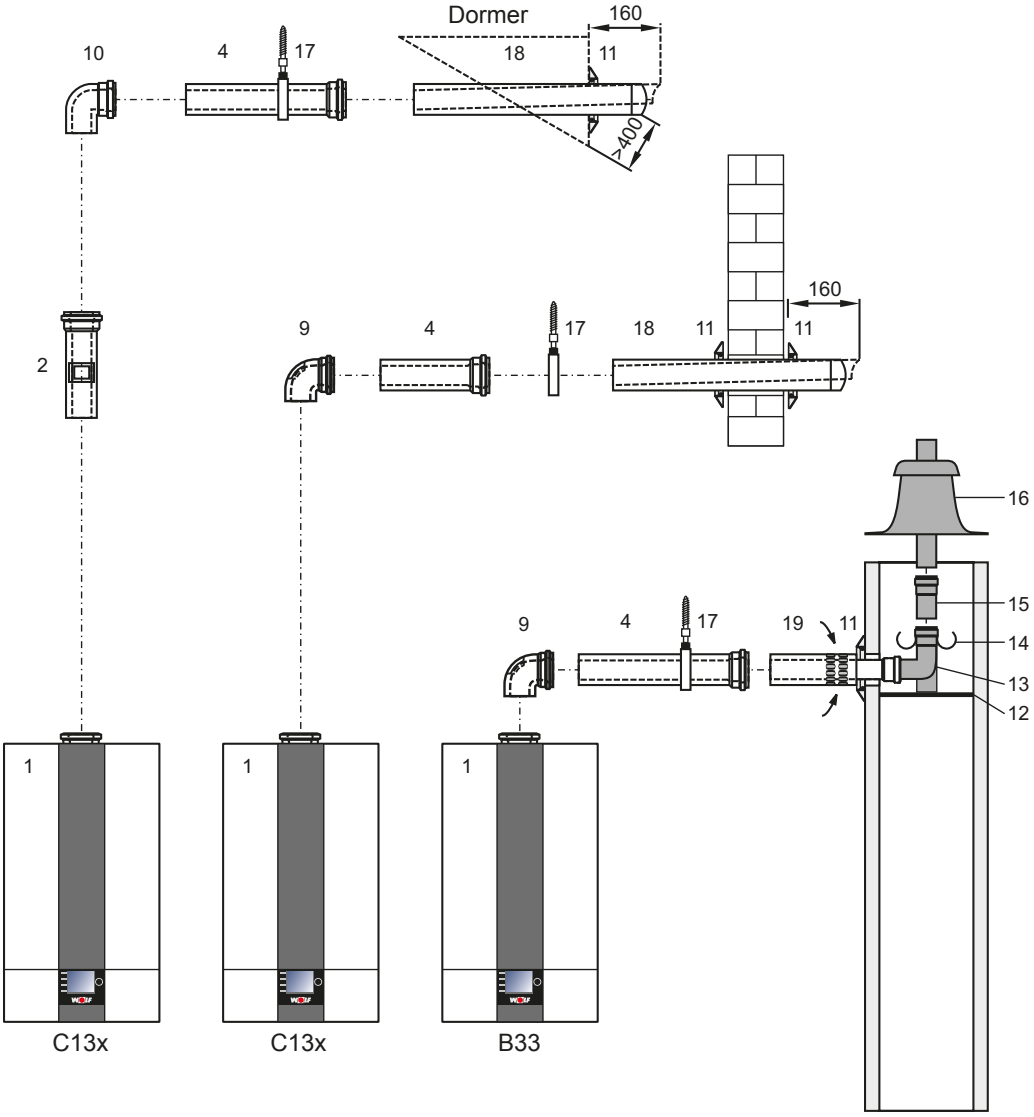
15 PP flue pipe DN80
500 mm
1000 mm
2000 mm

16 Duct cover
with UV resistant terminal

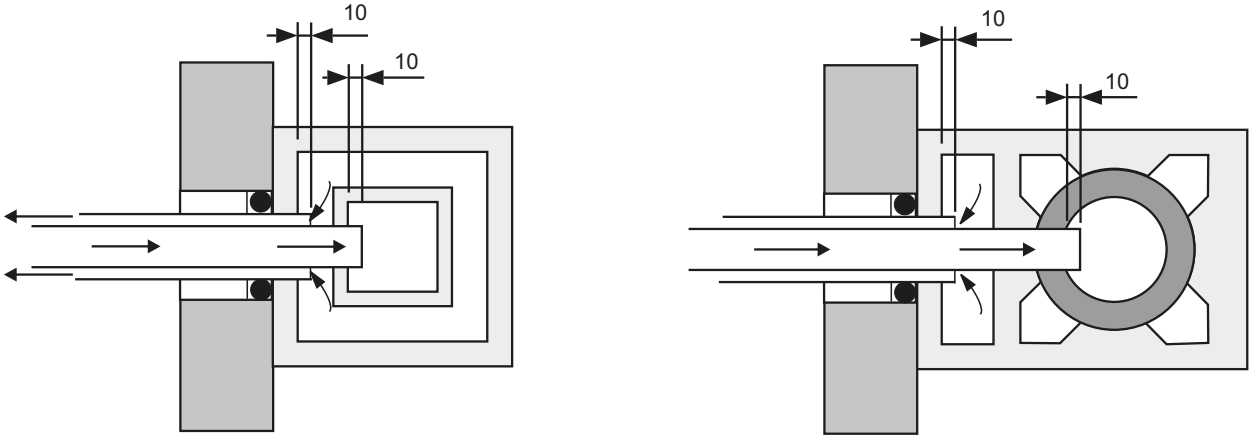
17 Spacer bracket

18 Balanced flue
horizontal, with wind protector

19 Connection to flue gas chimney B33
Length 250 mm with air apertures



Connection to a moisture-resistant flue system and balanced flue chimney



Plewa System
C43x

Schiedel System
C43x

Balanced flue inside a duct with horizontal connecting pipe DN60/100

1 Gas condensing boiler

3 Separator
(slide coupling)
if required

4 Balanced flue DN60/100
500 mm
1000 mm
2000 mm

9 Inspection bend

11 Pipe collar

12 Support rail

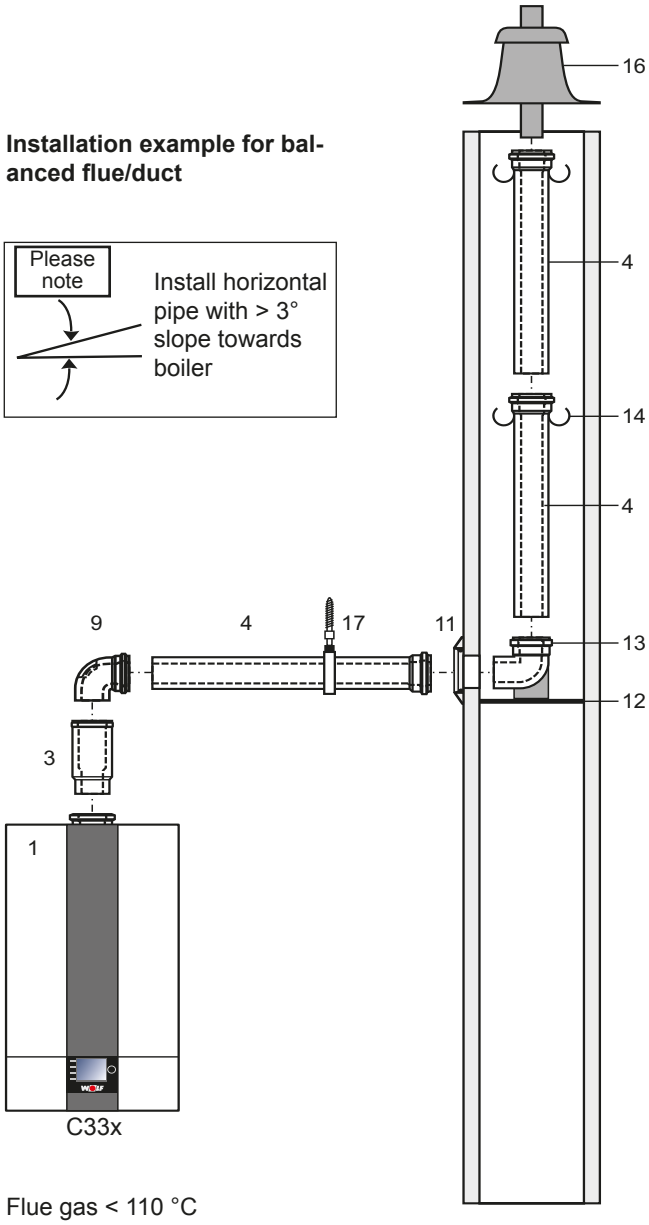
13 Support bend 87° DN60/100

14 Spacer

16 Duct cover with
UV resistant terminal

17 Spacer bracket

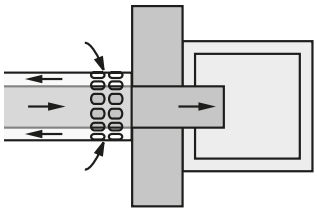
Installation example for balanced flue/duct



Flue gas < 110 °C

Connection to a flue gas chimney (examples) DN60/100

Connection to a moisture-resistant flue gas chimney B33

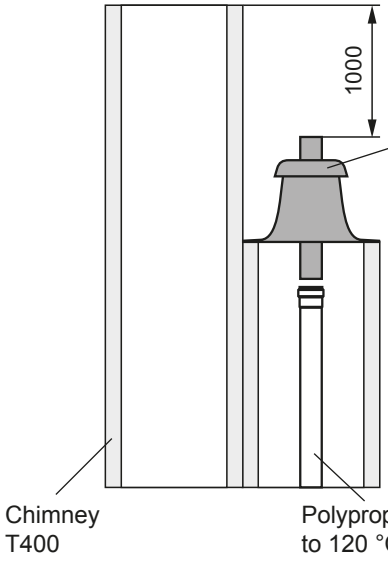


Install flue gas chimney connections with air apertures right beside the flue gas chimney as shown in the diagram, so that all components of the flue gas path are surrounded by combustion air.

The air apertures must be completely free from obstruction.

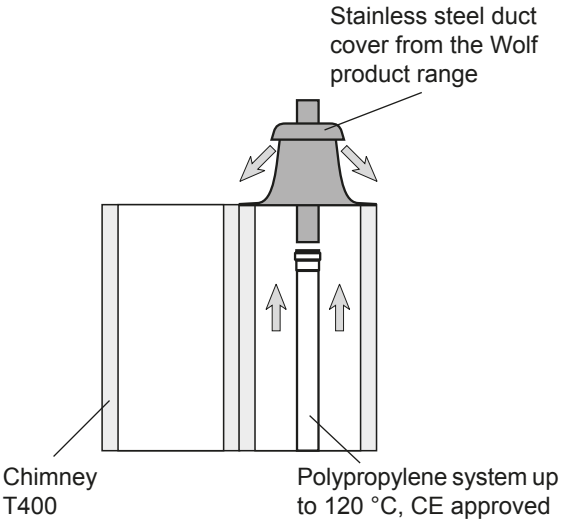
The flue gas chimney must be tested for suitability. Apply 0 Pa draught when calculating the chimney draught. Obtain the connection piece from the chimney manufacturer if required, to safeguard the connection conditions.

Connection to a moisture-resistant flue with two or multiple draught chimneys (duct)



Open flue and room-sealed operation

The requirements of DIN 18160-1 supplementary sheet 3 apply.
Notify your local flue gas inspector prior to installation.



Open flue operation only

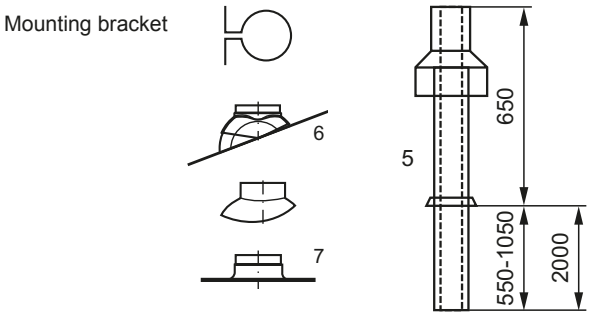
Supplementary installation instructions for balanced flue DN60/100

Flat roof: Affix ceiling outlet (7), approx. Ø 130 mm, to the roof cover.

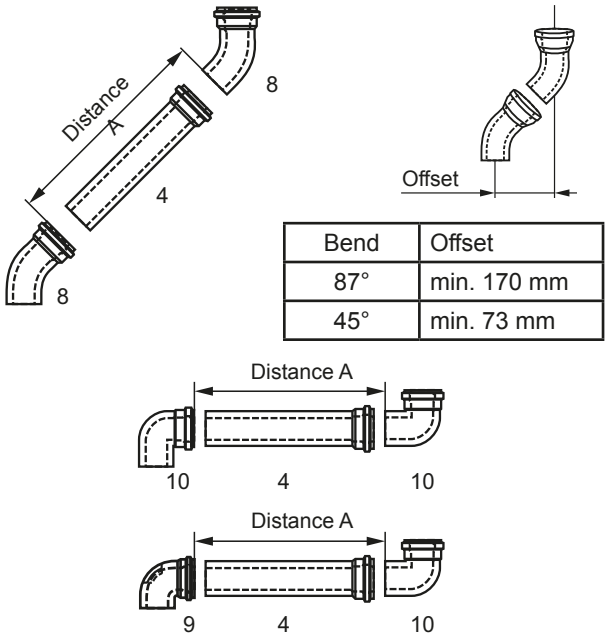
Pitched roof: For (6), observe the installation instructions on the cowl regarding roof pitches.

Insert roof outlet (5) into the roof from above and secure vertically with the mounting bracket to a rafter or brickwork.

Install the roof outlet only in its original condition. Modifications are not permissible.



If an inspection aperture is required for the balanced flue, insert a balanced flue pipe with inspection aperture (2) (200 mm length).



Bend	Offset
87°	min. 170 mm
45°	min. 73 mm

Determine distance A. Length of balanced flue pipe (4) must always be approx. 100 mm longer than distance A. Always trim the flue pipe on the smooth side, **never** on the female connection side.
Chamfer the flue pipe with a file after trimming.

37. Technical information, air/flue gas routing

Vertical concentric balanced flue C33x (examples) system DN80/125

1 Gas condensing boiler

2 Adaptor DN60/100 to DN80/125

3 Balanced flue with inspection port
(250 mm long)

4 Balanced flue DN80/125
500 mm
1000 mm
2000 mm

5 Spacer bracket

6 Mounting bracket DN125
for roof outlet

7 Balanced flue, vertical DN80/125
(roof outlet for flat or pitched roofs)
L = 1200 mm
L = 1800 mm

8 Separator
(slide coupling) if required

9 Bend 45° DN 80/125

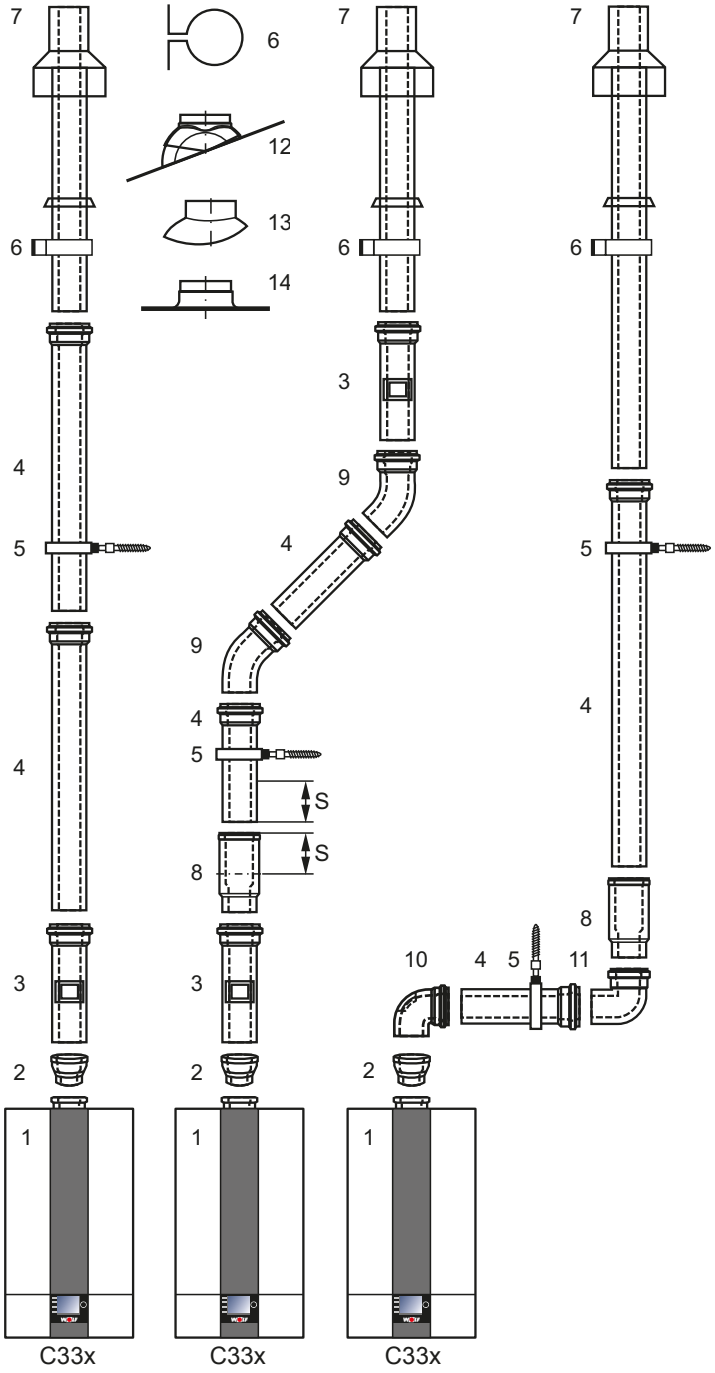
10 Inspection bend 87° DN 80/125

11 Bend 87° DN 80/125

12 Universal tile for pitched roof 25/45°

13 "Klöber" adaptor 20-50°

14 Flat roof collar



Type C33x: Gas condensing boiler with combustion air and flue gas routed vertically to above the roof.

Notes: When installing, slide the separator (8) fully into the female connection. Push the next balanced flue pipe (4) 50 mm (dim. "S") into the female connection of the separator and ensure it is fully secured in this position, e.g. with pipe clips DN125 (5) or with a locking screw on the air side.
Lubricate the pipe ends and gaskets for easier installation (use silicone-free grease only).

Please note: Prior to installation, liaise with your local flue gas inspector regarding the required inspection piece (3) (10). Adapter (2) is always required.

Concentric balanced flue, horizontal C13x, C83x and B33 and flue on an external wall C53x (examples) DN80/125

1 Gas condensing boiler

2 Adaptor DN60/100 to DN80/125

3 Balanced flue pipe with inspection port DN80/125 (250 mm long)

4 Balanced flue pipe DN80/125
500 mm
1000 mm
2000 mm

5 Spacer bracket

10 Inspection bend 87° DN 80/125

11 Bend 87° DN 80/125

15 Balanced flue pipe horizontal, with wind protector

16 Pipe collar

17 External wall panel 87° DN80/125 with smooth air pipe end

18 Balanced flue pipe, external walls DN80/125

19 Air inlet, external wall DN80/125

20 Conc. outlet terminal with clamp fitting

21 Connection to a flue gas chimney B33 Length 250 mm with air aperture

22 Support rail

23 Support bend 87° DN80

24 Spacer

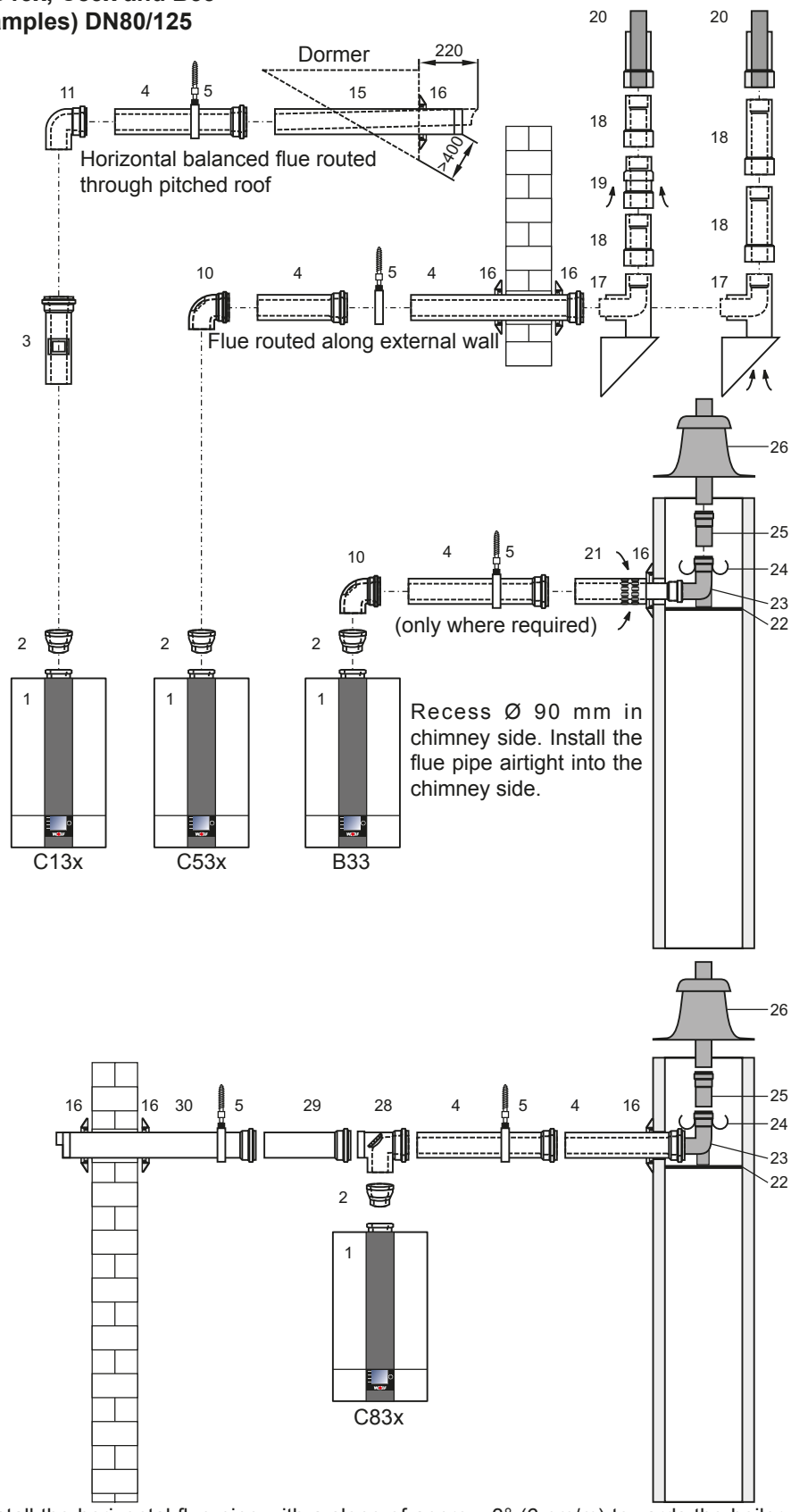
25 PP flue pipe DN80

26 Duct cover with UV resistant terminal

28 Inspection tee

29 Air pipe Ø 125 mm

30 Air inlet pipe Ø 125 mm



Install the horizontal flue pipe with a slope of approx. 3° (6 cm/m) towards the boiler. Route the horizontal air supply with a 3° slope towards the outside – fit the air inlet with a wind protector; permissible wind pressure at the air inlet 90 Pa. The burner will not start if the wind pressure is higher. Downstream of support bend (23), the flue can be routed in DN80 inside the duct. A flexible flue pipe DN83 can be connected downstream of support bend (23).

Connection to a concentric balanced flue inside a duct (examples) DN80/125, C33x
Connection to a flue inside a duct, C93x

1 Gas condensing boiler

2 Adaptor DN60/100 to DN80/125

4 Balanced flue pipe DN80/125
500 mm
1000 mm
2000 mm

5 Spacer bracket

8 Separator
(slide coupling) if required

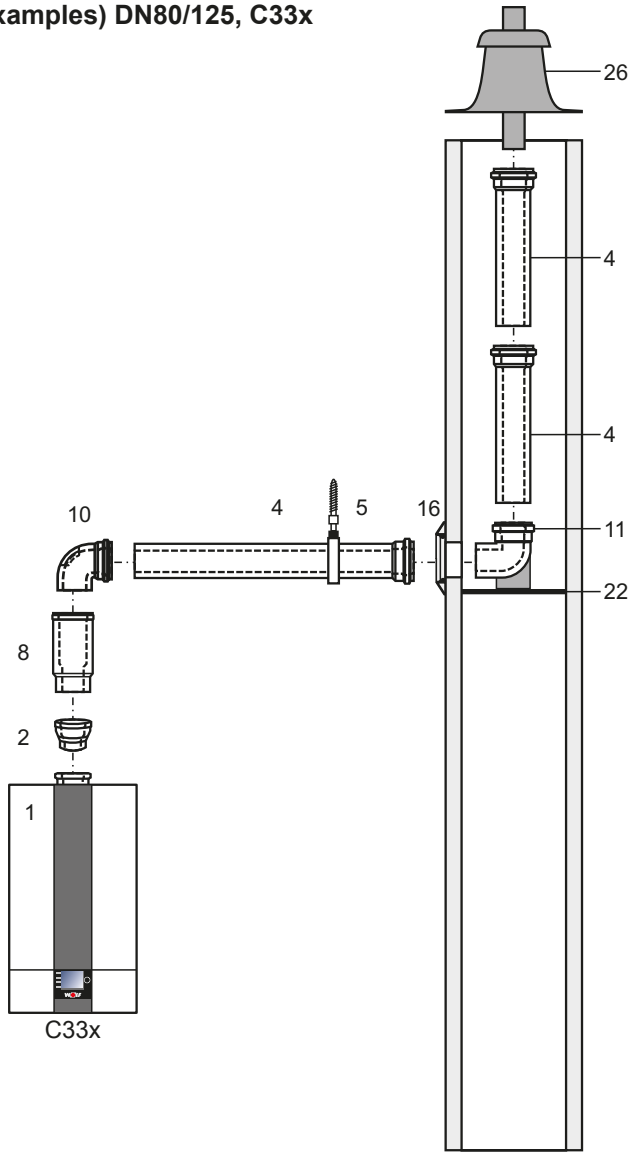
10 Inspection bend 87° DN 80/125

11 Support bend 87° DN80/125

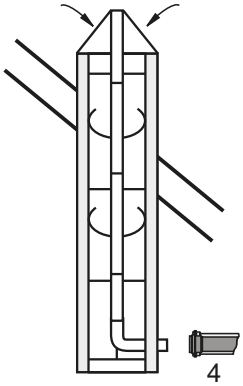
16 Pipe collar

22 Support rail

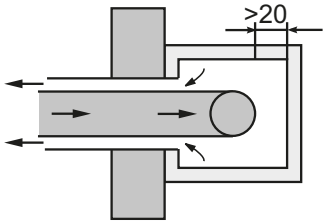
26 Duct cover with
UV resistant terminal



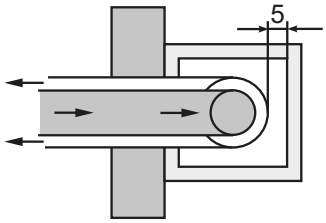
Notify your local flue gas inspector prior to installation.



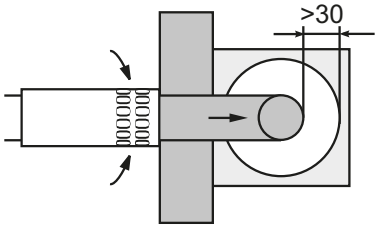
C93x balanced flue system
DN80/185 horizontal and DN80 vertical



C93x balanced flue
in a duct DN80



C33x balanced flue
in a duct DN80/125



B33 open flue
in a duct DN80

37. Technical information, air/flue gas routing

Eccentric balanced flue

Install eccentric balanced flue distributor 80/80 mm (31) for separate air supply/flue gas routing downstream of connection adaptor DN80/125 (2) with a test connector.
When connecting a balanced flue certified acc. to Building Regulations, observe the permit of the relevant body.
Install the horizontal flue pipe with a slope of approx. 3° (6 cm/m) towards the boiler. Route the horizontal air supply with a 3° slope towards the outside – fit the air inlet with a wind protector; permissible wind pressure at the air inlet 90 Pa. The burner will not start if the wind pressure is higher.

1 Gas condensing boiler

2 Adaptor DN60/100 to DN80/125

16 Pipe collar

22 Support rail

23 Support bend 87° DN80

24 Spacer

25 PP flue pipe DN80

26 Duct cover with UV resistant terminal

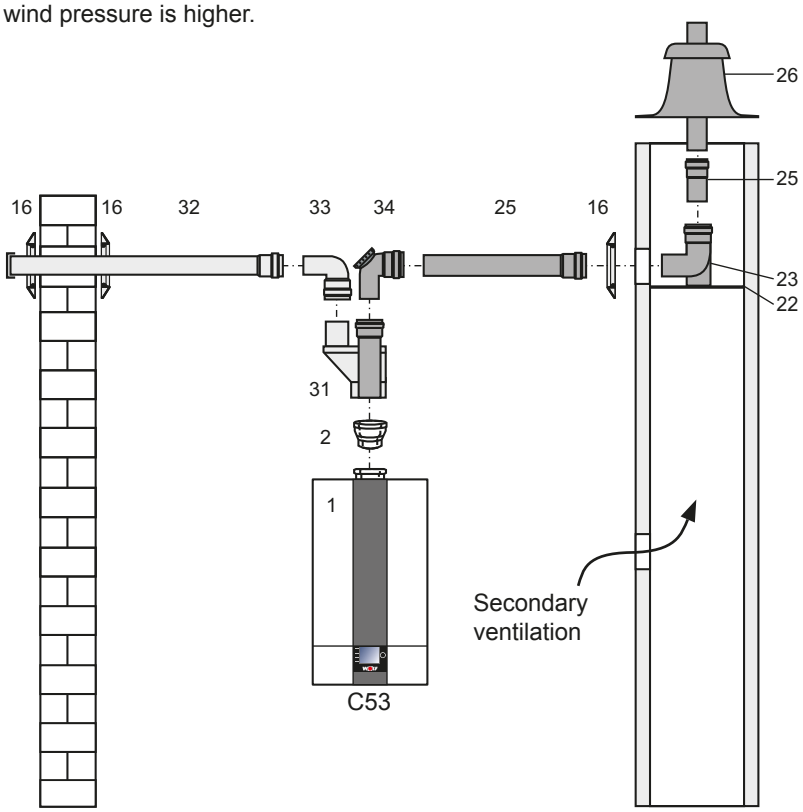
31 Balanced flue distributor 80/80 mm

32 Air inlet pipe Ø 125 mm

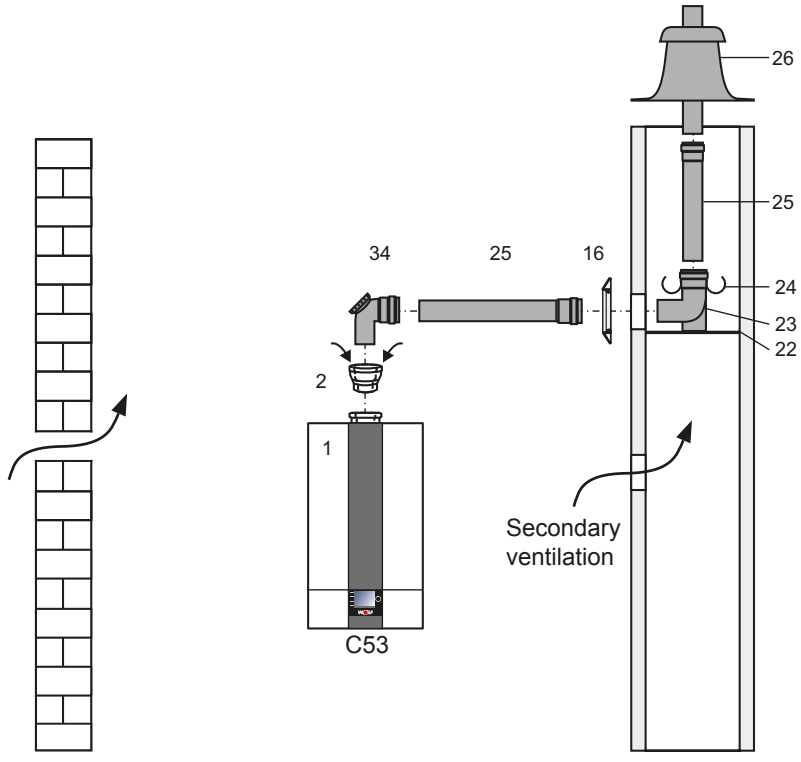
33 Bend 90° DN80

34 87° tee with inspection port DN80

35 Flue pipe DN80
500 mm
1000 mm
2000 mm



Maintain the following clearance between the internal duct wall and the flue: for round ducts: 3 cm
for square ducts: 2 cm

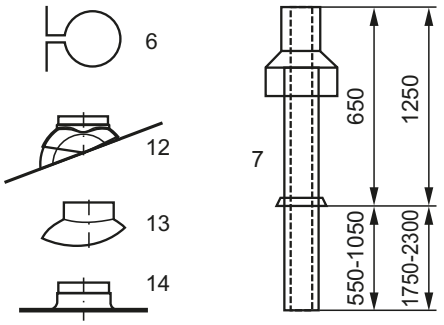


Supplementary installation instructions for balanced flue DN80/125

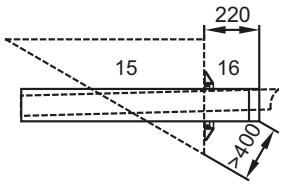
Flat roof: Affix ceiling outlet (14), approx. Ø 130 mm, to the roof cover.
Pitched roof: For (12), observe the installation instructions on the cowl regarding roof pitches.

Insert roof outlet (7) into the roof from above and secure vertically with (6) to a rafter or brickwork.

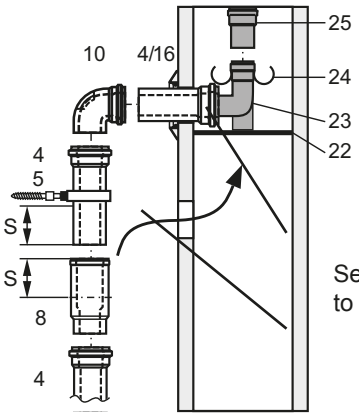
Install the roof outlet only in its original condition. Modifications are not permissible.



If an inspection aperture is required for the balanced flue, insert a balanced flue with inspection aperture (3) (200 mm length).



When installing, slide the separator (8) fully into the female connection. Push the next balanced flue pipe (4) 50 mm (dim. "S") into the female connection of the separator and ensure it is fully secured in this position, e.g. with pipe clips DN125 (5) or with a locking screw on the air side.



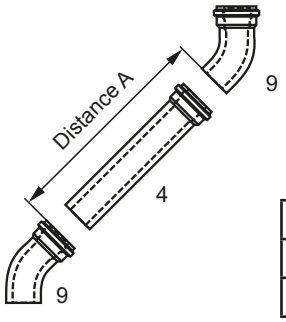
Secure support bend (23) to support rail (22)

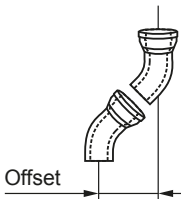
* Observe the installation instructions for polypropylene (PP) flue systems.

As a rule, install the adaptor from balanced flue gas routing DN60/100 to DN80/125 (2) **vertically and always on the flue outlet of the gas condensing boiler.**

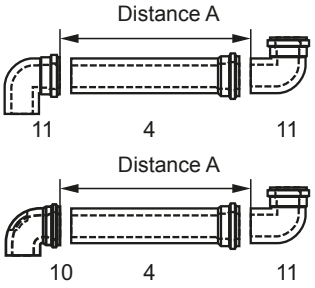
Adaptor from balanced flue DN60/100 to DN80/125

Inspection piece (3)





Bend	Offset
87°	min. 205 mm
45°	min. 93 mm



Determine distance A. Length of balanced flue (4) must always be approx. 100 mm longer than distance A. Always trim the flue pipe on the smooth side, **never** on the female connection side.
Chamfer the flue with a file after trimming.

38. Technical information, underfloor heating/DHW circulation

Underfloor heating system

When using pipes impermeable to oxygen, an underfloor heating system can be connected directly to a heat source with up to 10 kW heating output, subject to system pressure drop. Always install a temperature limiter for the underfloor heating system to protect the pipes from overheating.

The output of the integrated pump should be increased if underfloor heating is connected (parameters HG16 and HG17). Recommendation HG16 → 75% and HG17 → 100%

When connecting an underfloor heating system with an output demand in excess of approx. 10 kW, a 3-way mixer (accessories MM) and an additional pump are required.

Install a regulating valve in the return; this can be used to reduce the excessive head of the additional pump if required.

Please note

Ensure the system user cannot adjust any regulating valves.
When using pipes that are permeable to oxygen, it is necessary to provide system separation by means of a heat exchanger. Inhibitors are not permissible.

If an additional heating circuit is operated in parallel to the underfloor heating system, it must be hydraulically matched to the underfloor heating system.

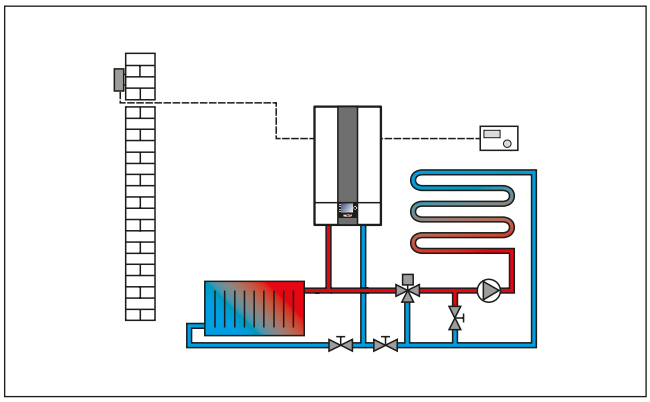


Fig.: Underfloor heating system (example)

Please note

When operating the condensing boiler in conjunction with an underfloor heating system, we recommend sizing the usable volume of a diaphragm expansion vessel 20 % larger than recommended by DIN 4807-2. An diaphragm expansion vessel of insufficient size results in oxygen ingress into the heating system, causing corrosion damage.

For heating systems with plastic pipes, we recommend the use of impermeable pipes to prevent the diffusion of oxygen through the pipe walls. In heating systems

DHW circulation

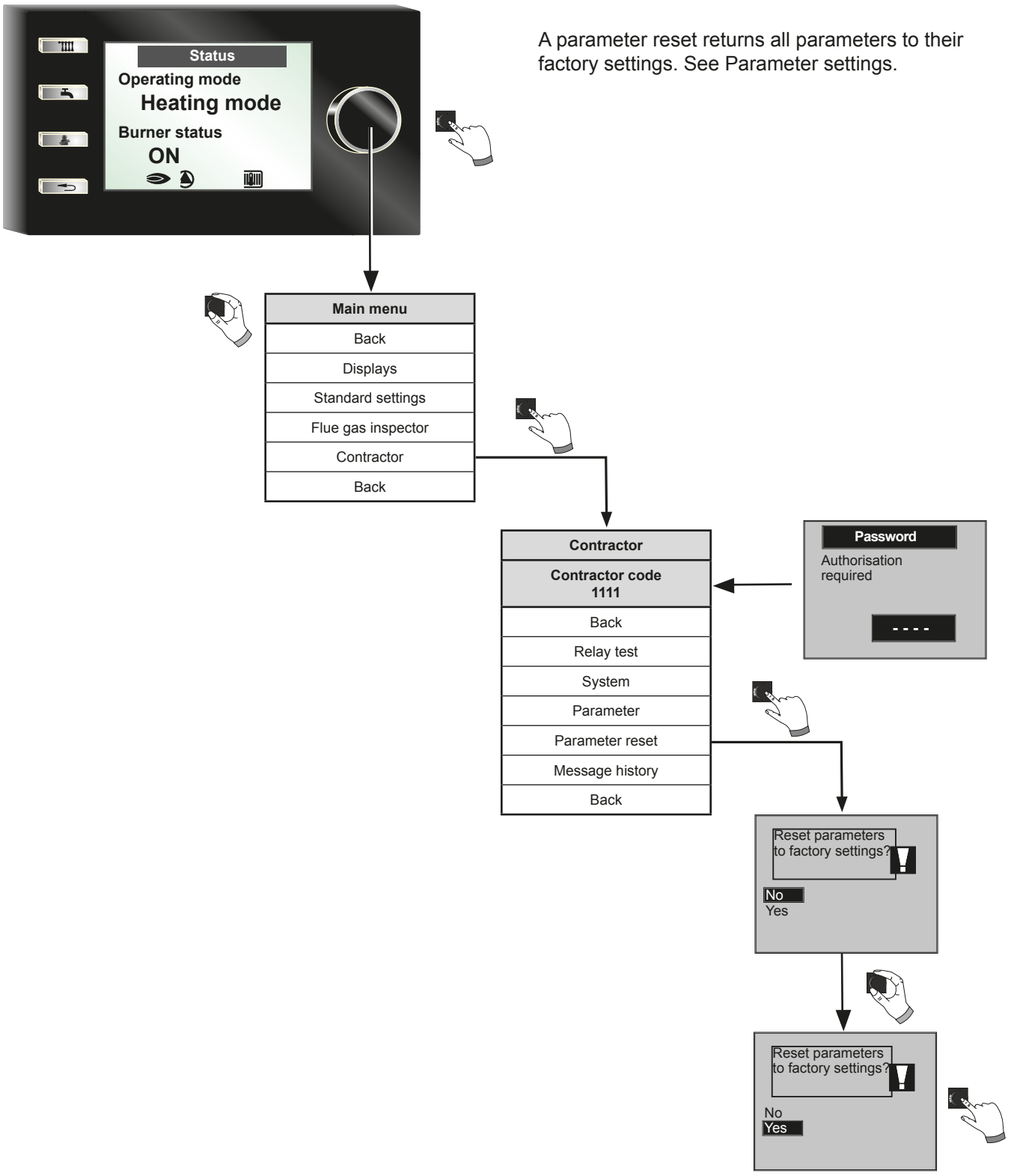
Insulate DHW circulation lines according to the statutory regulations. Connect the DHW circulation pump to the appliance control unit at output A1 as 3 different DHW circulation programs can be set with parameter HG14.

39. Reset

Reset

Parameter Reset

A parameter reset returns all parameters to their factory settings. See Parameter settings.



40. Technical maintenance and design data

NTC
Sensor resistances

Boiler water temperature sensor, cylinder temperature sensor, DHW outlet temperature sensor, outside temperature sensor, return temperature sensor, eHLSC sensor, flue gas temperature sensor, header temperature sensor.

Temp. °C	Resist. Ω	Temp. °C	Resist. Ω	Temp. °C	Resist. Ω	Temp. °C	Resist. Ω
-17	40,810	17	7162	51	1733	85	535
-16	38,560	18	6841	52	1669	86	519
-15	36,447	19	6536	53	1608	87	503
-14	34,463	20	6247	54	1549	88	487
-13	32,599	21	5972	55	1493	89	472
-12	30,846	22	5710	56	1438	90	458
-11	29,198	23	5461	57	1387	91	444
-10	27,648	24	5225	58	1337	92	431
-9	26,189	25	5000	59	1289	93	418
-8	24,816	26	4786	60	1244	94	406
-7	23,523	27	4582	61	1200	95	393
-6	22,305	28	4388	62	1158	96	382
-5	21,157	29	4204	63	1117	97	371
-4	20,075	30	4028	64	1078	98	360
-3	19,054	31	3860	65	1041	99	349
-2	18,091	32	3701	66	1005	100	339
-1	17,183	33	3549	67	971	101	330
0	16,325	34	3403	68	938	102	320
1	15,515	35	3265	69	906	103	311
2	14,750	36	3133	70	876	104	302
3	14,027	37	3007	71	846	105	294
4	13,344	38	2887	72	818	106	285
5	12,697	39	2772	73	791	107	277
6	12,086	40	2662	74	765	108	270
7	11,508	41	2558	75	740	109	262
8	10,961	42	2458	76	716	110	255
9	10,442	43	2362	77	693	111	248
10	9952	44	2271	78	670	112	241
11	9487	45	2183	79	649	113	235
12	9046	46	2100	80	628	114	228
13	8629	47	2020	81	608	115	222
14	8233	48	1944	82	589	116	216
15	7857	49	1870	83	570	117	211
16	7501	50	1800	84	552	118	205

Connection types

Type [1]	Operating mode		Can be connected to				
	Open flue	Room-sealed	Chimney, moisture resistant	Air/flue gas chimney	Balanced flue	Certified rm. sealed balanced flue	Moisture-resistant flue
B23, B33, C13x, C33x, C43x, C53, C53x, C83x, C93x	X	X	B33, C53, C83x	C43x	C13x[2], C33x, C53x	C63x	B23, C53x, C83x, C93x

[1] Marking "x" indicates that all components of the flue gas route are surrounded by combustion air.
[2] In Switzerland, observe the G1 gas guidelines.

41. Troubleshooting

General information

Never remove, bypass or otherwise disable any safety or monitoring equipment. Operate the gas condensing boiler only when it is in perfect technical condition. Any faults or damage which impact or might impact upon safety must be remedied immediately by a qualified contractor. Replace faulty components and equipment only with original Wolf spare parts.
Faults and warnings are shown in plain text on the display of the control accessories – AM display module or BM-2 programming module – and correspond to the messages listed in the following tables.
A warning/fault symbol on the display (symbol: triangle with exclamation mark) indicates an active warning or fault message. A lock symbol (symbol: padlock) indicates that the current fault message has caused a lockout of the appliance. The duration of the current message is also shown.

Please note

Warning messages do not need to be acknowledged and do not lead directly to the appliance being switched off. However, the causes of the warnings can lead to malfunctions of the appliance/system or to faults and should therefore be rectified by a qualified contractor.

Please note

Faults must only be rectified by qualified personnel. Component or system damage can result if a lockout fault message is acknowledged several times without the cause of the problem having been rectified.

The control unit automatically acknowledges faults such as faulty temperature sensors or other sensors if the part concerned has been replaced and plausible test values have been supplied.

Procedure in the case of faults:

- Read fault message
- Determine cause of fault using the table below and remedy it
- Acknowledge fault
  If the fault message cannot be acknowledged, high temperatures at the heat exchanger might be preventing a reset
- Check that the system is functioning correctly

Please note:
To acknowledge the following fault messages, first enter contractor code "1111":
FC 20, 30, 32, 35, 36, 37, 38, 39, 99

Procedure in the case of warnings:

- Read warning message
- Determine cause of warning using the table below and remedy it
- With warnings, there is no need for fault acknowledgement
- Check that the system is functioning correctly

Message history:

A message history can be requested in the ‘Contractor’ menu of the AM display module or BM-2 programming unit, displaying the last 20 fault messages.

41. Troubleshooting

Fault code	Fault	Possible causes	Remedy
01	HLSC excess temp.	High limit safety cut-out (thermostat) has responded Temperature at the heat exchanger cover has exceeded 185 °C Combustion chamber contaminated	High limit safety cut-out: - Check cables and plugs - If electrical connection OK and no function: Replace HLSC Combustion chamber: - If combustion chamber is contaminated, clean or replace combustion chamber Check heating circuit pump Vent the system Press reset button
02	TL excess temp.	One of the temperature sensors eHLSC1 or eHLSC2 on the combustion chamber has exceeded the high limit safety cut-out limit (108 °C) System pressure Air in heating circuit Pump	Check system pressure. Vent heating circuit. Temperature limiter (eHLSC): - Check cables and plugs. - If OK and no function, replace the eHLSC. Pump: - Check if pump is running. - If not, check cables and plugs. - If electrical connection OK and no function: Replace the pump. Press reset button.
03	dt flow drift	Temperature differential between temperature sensors eHLSC1 and eHLSC2 > 6 °C at the combustion chamber	eHLSC: - Faulty, replace eHLSC Press reset button.
04	No flame established	When the burner starts, no flame forms by the end of safety time Monitoring electrode faulty Ignition electrode faulty, ignition transformer faulty Gas supply HG44 curves offset Gas valve Gas valve has been replaced Gas condensing boiler contaminated	Gas supply: - Check the gas train (gas valve open?). Ionisation electrode: - Check the position and condition of the electrode, adjust or replace if necessary. Ignition electrode: - Check the position of the ignition electrode and adjust if necessary. Check the ignition transformer and wiring. HG44 curves offset: - Set HG44 to standard value Gas valve: - Check that the gas valve opens; if not, check cables and plugs and repeat test. - If faulty, replace the gas valve. Press reset button. - Set HG44 to standard value after replacing the gas valve.

Fault code	Fault	Possible causes	Remedy
05	Flame failure	Flame failure during flame stabilisation after flame detection Monitoring electrode faulty Flue path blocked Condensate drain blocked Gas type setting Gas pressure Flue gas recirculation (flue gas in ventilation air) Gas condensing boiler contaminated	Gas type setting: - Check gas type setting on the gas valve and the AM/BM. Gas pressure: - Check the gas supply pressure (flow pressure). Ionisation electrode: - Check the condition of the electrode, clean or replace if necessary. - Set gap and position or replace if necessary. Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). Press reset button.
06	TL excess temp.	One of the temperature sensors eHLSC1 or eHLSC2 has exceeded the limit of the temperature limiter (102 °C) System pressure Air in heating circuit Temperature limiter in the flow Pump	Check system pressure. Vent heating circuit. Temperature limiter in the flow: - Check leads and plug-in connections. - If electrical connection OK and no function, replace temperature limiter. Pump: - Check if pump is running. - If not, check cables and plugs. - If electrical connection OK and no function: Replace pump Press reset button.
07	Flue gas TL, excess temperature	The flue gas temperature has exceeded the flue gas temperature limiter's shutdown temperature of 110 °C Combustion chamber module Combustion chamber Flue gas temperature limiter	Combustion chamber module: - Check installation position. Combustion chamber: - If the combustion chamber is heavily contaminated, carry out maintenance or replace. Flue gas temperature limiter: - Check leads and plug-in connections. - If electrical connection OK and no function: Replace temperature limiter.
08	Flue gas damper does not switch	Flue gas damper contact (E1) closes or does not open on demand; output A1 does not switch flue gas damper; flue gas damper blocked	Flue gas damper: - Check cables, plug-in connections and power supply. - Check the flue gas damper function. - Check flue gas damper feedback. - Check settings HG13 and HG14. Press reset button.
255	Fault code unknown	This fault is not known in this software	Check software version of the PCBs. Call a contractor
10	eHLSC sensor faulty	Temperature sensor eHLSC1, eHLSC2 on the combustion chamber or sensor lead has short circuit or break	eHLSC on the combustion chamber: - Check leads and plug-in connections. - If electrical connection OK and no function, replace eHLSC.
11	Flame pretence	Flame signal is detected when burner is off	Check monitoring electrode. Press reset button.

41. Troubleshooting

Fault code	Fault	Possible causes	Remedy
12	Boiler sensor faulty	Excess temperature in the flow Boiler sensor > 100 °C Boiler sensor or sensor lead has short circuit or break	Pump: - Check if pump is running. If not, check cables and plugs. If electrical connection OK and no function, replace pump. Excess flow temperature: - Increase the minimum pump speed. Boiler sensor: - Check leads and plug-in connections. - If OK and no function, replace the boiler sensor. Press reset button.
13	Flue gas sensor faulty	Flue gas sensor or sensor lead has short circuit or break	Flue gas temperature sensor: - Check leads and plug-in connections. - If electrical connection OK and no function: Replace the sensor. Press reset button.
14	DHW sensor faulty	DHW sensor (cylinder sensor) or sensor lead has short circuit or break DHW-sensor > 99 °C	DHW temperature sensor: - Check leads and plug-in connections. - If OK, replace sensor. Press reset button.
15	Outside sensor faulty	Outside sensor or sensor lead has short circuit or break eBus - Outside temperature sensor Funk - Outside temperature sensor	eBus - Outside temperature sensor: - See instructions for eBUS outside sensor. Wireless outside sensor - See instructions for wireless outside sensor. Press reset button.
16	Return sensor faulty	Return sensor or sensor lead has short circuit or break Return sensor > 100 °C	Return sensor: - Check leads and plug-in connections. - If OK and no function, replace the return sensor. Press reset button.
20	GCV relay test	Valve test failed Gas valve faulty	Replace gas valve. Press reset button.
24	Fan speed <	Set fan speed is not achieved Control unit casing not engaged Fan faulty F2 fuse defective on HCM-2	Fan: - Check cables, plug-in connections, power supply and switching. - If OK and no function: Replace the fan. Control unit casing not engaged - Check that control unit top and bottom casings are engaged. Check F2 fuse on HCM-2 control PCB Press reset button.
26	Fan speed >	The fan does not stop	Fan: - Check cables, plug-in connections, power supply and switching. - If the fault occurs repeatedly, replace fan. Press reset button.
27	DHW outlet sensor faulty Stratification sensor faulty	DHW outlet sensor faulty / stratification sensor or sensor lead has a short circuit or lead break	DHW outlet sensor / stratification sensor: - Check cables and plug-in connections. - If OK and no function, replace the sensor.

Fault code	Fault	Possible causes	Remedy
30	CRC burner control unit	The EEPROM record is invalid	EEProm record invalid: - Switch power supply OFF/ON. - If fault persists, call out a contractor
32	23 V AC supply	23 V AC supply outside the permissible range (e.g. short circuit)	Power supply unit: - Switch power supply OFF/ON. - Press reset button. - If the fault cannot be acknowledged, replace HCM-2.
35	BCC missing	Boiler coding card has been removed or incorrectly inserted Burner control unit was replaced and no boiler coding card inserted	Boiler coding card has been removed or incorrectly inserted. Insert boiler coding card according to appliance type.
36	BCC faulty	CRC fault, BCC Faulty boiler coding card	CRC fault, BCC: - Replace boiler coding card. Press reset button.
37	Incorrect BCC	The boiler coding card is incompatible with the GCB-e PCB Incorrect BCC code	Use ON/OFF switch. Boiler coding card incompatible. Enter BCC code from the type plate correctly. Insert the correct boiler coding card. Press reset button and enter contractor code 1111.
38	BCC update required	Boiler coding card fault; PCB requires a new boiler coding card (replacement)	Reinsert boiler coding card. Replace boiler coding card. Press reset button.
39	BCC system error	Faulty boiler coding card BCC copy process not started	Use ON/OFF switch. Replace boiler coding card. Press reset button and enter contractor code 1111.
40	Flow monitoring (pressure increase check)	System pressure < 150 mbar Air in heating circuit Pressure sensor faulty Faulty pump	Check system pressure. Vent heating circuit. Pressure sensor: - Check leads and plug-in connections. - If OK, replace pressure sensor. Pump: - Check if pump is running. - If not, check cables and plugs. - If electrical connection OK and no function: Replace pump. Press reset button.
41	Flow monitoring (check sensor)	Return temperature > eHLSC temperature + 12 K, return temperature > boiler sensor + 12 K System pressure too low Air in heating circuit Pump faulty/low output	Check system pressure. Vent the system. Flow monitoring: - Increase minimum pump speed Pump: - Check if pump is running. - If not, check cables and plugs. - If electrical connection OK and no function: Replace pump.

Fault code	Fault	Possible causes	Remedy
52	Max. cylinder heating time	Cylinder heating takes longer than permitted.	Check DHW sensor (cylinder sensor) and sensor lead. Check cylinder increase HG25 parameter. Press reset button. Check primary pump.
53	IO control deviation	Gas valve faulty Gas supply pressure outside set range Ionisation electrode corroded/bent Current controller on GBC-e faulty Gas valve power supply faulty Burner earthing faulty	Gas valve: - Check cables, plugs, power supply and switching. Gas pressure: - Check gas supply pressure (flow pressure), if OK. Ionisation electrode: - Check the condition of the electrode, clean or replace if necessary. - Adjust gap and position or replace if necessary. Press reset button. Set HG43 IO default value and HG44 KL offset to factory setting (must be done by contractor).
54	GLV actuators	Flue gas recirculation Incorrect gas type setting Incorrect gas restrictor Gas valve faulty Fan faulty	Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). - Check wind effect. Gas type setting - Check gas type setting on the gas valve and the AM/BM-2. Gas restrictor: - Remove the gas valve retainer. - Check that the correct gas restrictor is fitted. CGB-2-20/24: blue CGB-2-14: black Gas valve: - Check cables, plugs, power supply and switching; if valves faulty, replace as necessary. Fan: - Check for bearing damage. - Check cables, plug-in connections, power supply and switching. - If fan faulty, replace it.
55	GLV system error	Internal plausibility check of GBC-e failed	System error: - Check for a strong electromagnetic field nearby. - Switch power ON/OFF, reset if necessary. Press reset button.

Fault code	Fault	Possible causes	Remedy
56	Calibration factory limit	Calibration factory limit (minimum) not reached Flue gas recirculation Ionisation electrode corroded/bent Wiring error on HCM-2 (low voltage side)	Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). Have customer service set IO default value to factory setting. Ionisation electrode: - Electrical wiring and connections. - Check the condition of the electrode, clean or replace if necessary. - Adjust gap and position or replace if necessary. Check burner earthing. Press reset button. Check the electrical connection of the HCM-2 low voltage side
57	Calibration discrepancy	Ionisation electrode corroded/bent Soot or dirt particles in the intake air Flue gas recirculation Wiring error on HCM-2 (low voltage side)	Intake air: - Soot or dirt particles in the intake air cause a calibration discrepancy (be aware of this in cases of room-sealed operation). Ionisation electrode: - Check electrical wiring and connections. - Check the condition of the electrode, clean or replace if necessary. - Adjust gap and position or replace if necessary. - Carry out 100 % calibration. Replace boiler coding card Check the electrical connection of the HCM-2 low voltage side
58	Timeout calibration	The heating appliance cannot carry out calibration Flue gas recirculation Fan faulty Inadequate heat transfer Wiring error on HCM-2 (low voltage side)	Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). Fan: Check that the fan and its wiring are intact. Inadequate heat transfer: - Ensure adequate heat transfer, Open heating circuits. Check IO electrode. Press reset button. Check the electrical connection of the HCM-2 low voltage side
59	Calibration factory limit	Calibration factory limit (maximum) exceeded Soot or dirt particles in the intake air Flue gas recirculation Wiring error on HCM-2 (low voltage side)	Intake air: Soot particles or other dirt particles in the intake air (be aware of this in cases of room-sealed operation). Tightness test Have customer service set IO default value to factory setting. Check the electrical connection of the HCM-2 low voltage side

41. Troubleshooting

Fault code	Fault	Possible causes	Remedy
78	Header sensor faulty	Sammlerfühler oder Fühlerleitung hat Kurzschluss oder Unterbruch	Header sensor: - Check leads and plug-in connections. - If OK and no function, replace the sensor. - Press reset button
90	BCU communication	Communication between control unit PCB and burner control unit disrupted	Press reset button. Connection between GBC-e and HCM-2: - Check engagement of the two PCB enclosures. - If OK and fault persists. Check PCB plug on HCM-2. If fault persists, call out a contractor.
95	Program mode	Burner control unit is controlled by PC (only for service)	No action.
96	Reset	Reset button pressed too many times	Switch power supply OFF/ON. If fault persists, call out a contractor.
98	Flame amplifier	Fault in flame amplifier circuit Monitoring electrode short circuit or contamination Wiring error on HCM-2 (low voltage side)	- Press reset button. Ionisation electrode: - Check electrical connections. - Check the condition of the electrode; clean or replace if necessary. - Adjust gap and position or replace if necessary. Check the electrical connection of the HCM-2 low voltage side
99	Burner control unit system fault	Loose contact PWM connector or fan power connection Internal burner control unit fault GBC-e PCB faulty Unknown GBC-e PCB	Check plug/lead for PWM signal fan for any loose contact. Internal burner control unit fault: - Reset only possible after power supply OFF/ON. GBC-e PCB: - Check plug-in connection or power supply of GBC. - If OK, request a service Press reset button.
107	HC pressure	System pressure too low Supply line pressure sensor faulty Pressure sensor faulty	Check system pressure. Check if supply line is faulty. Pressure sensor: - Check leads and plug-in connections. - If OK and no function, replace the pressure sensor. Press reset button.
116	External fault at programmable Input E1	External fault reported at programmable input E1 (fault message contact at E1 has opened)	Rectify external fault; check lead Acknowledge fault message

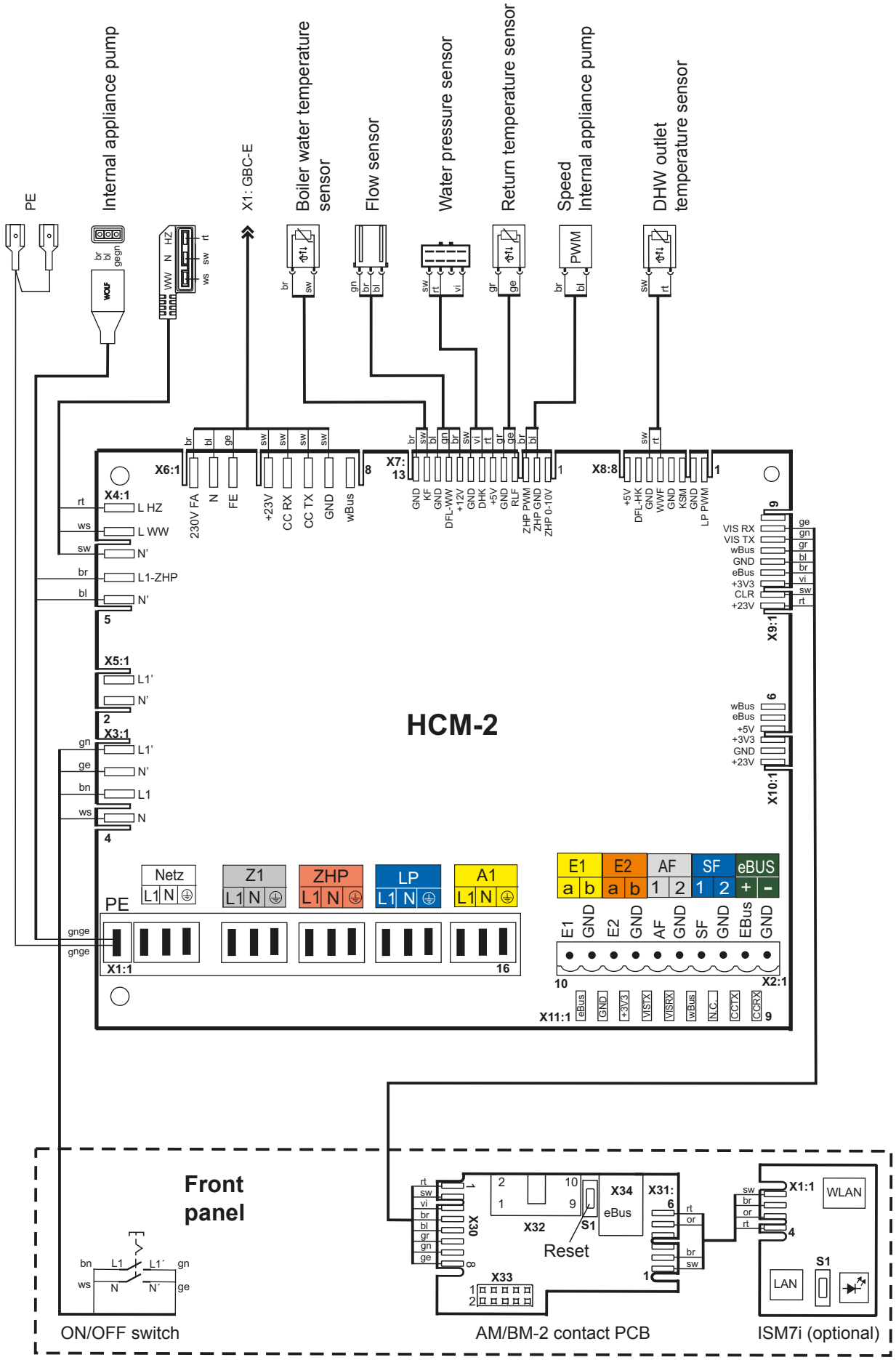
Key:

BCC = Boiler coding card
BCU = Burner control unit
GCV = Gas combination valve
TM = Temperature monitor
TL = Temperature limiter
HLSC = High limit safety cut-out
eHLSC = Electronic high limit safety cut-out
GAM = Gas/air mixture
dT = Temperature differential

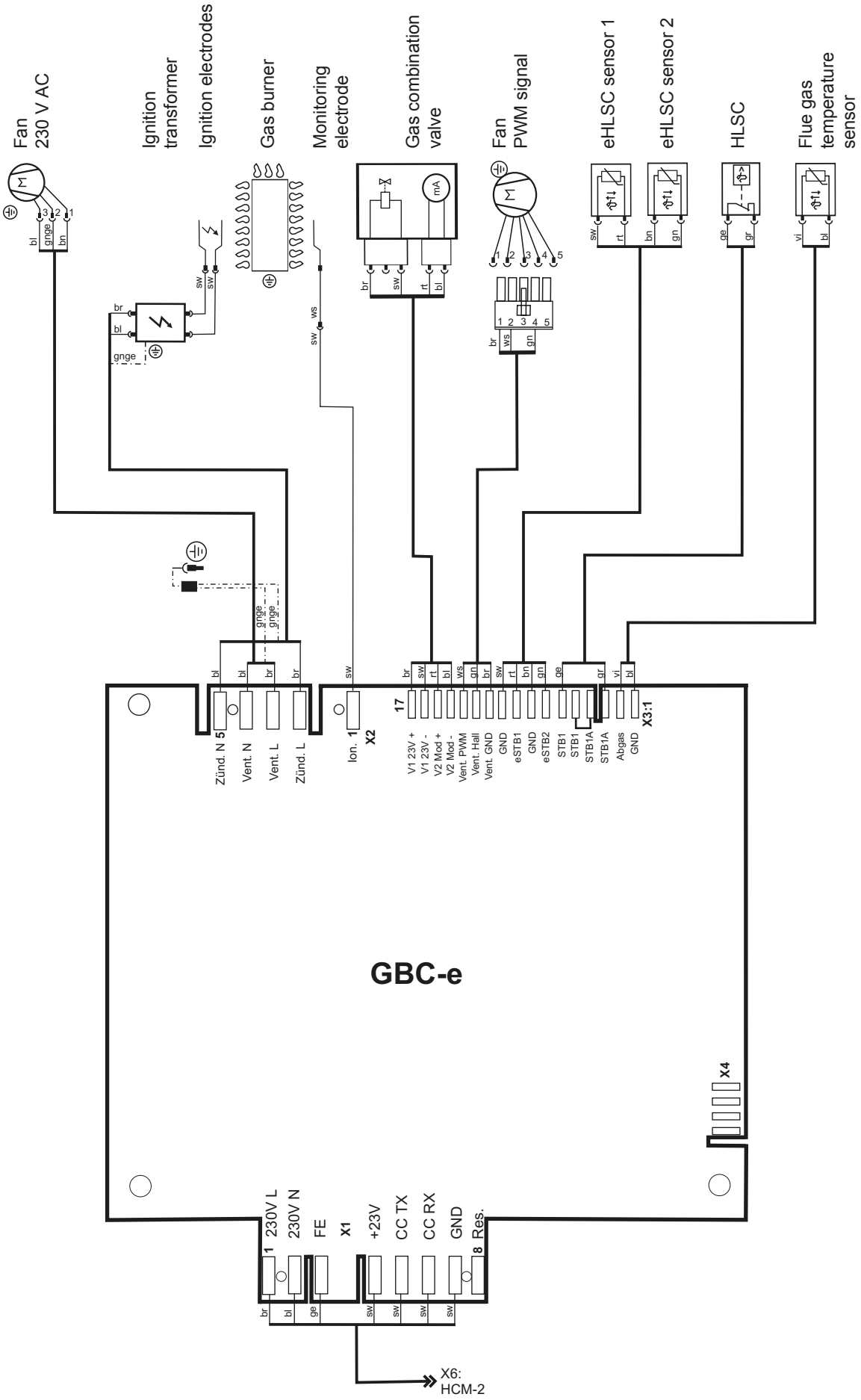
Fault code	Warning	Possible causes	Remedy
1	Burner control unit replaced	The PCB has detected that the burner control unit has been replaced	Ensure that the correct boiler coding card has been inserted. Check appliance parameter settings.
2	Heating circuit pressure	Water pressure has fallen below warning limit	Check the system pressure, test sensors
3	Parameter changed	Another boiler coding card has been inserted. All parameters have been reset to the factory setting; PCB HCM-2 or GBCe has been replaced	Ensure that the correct boiler coding card is inserted. Check appliance parameter settings.
4	No flame established	No flame was detected at the last start attempt of the burner.	Wait for more start attempts. Check the ignition electrode and ignition transformer. Check the monitoring electrode. Check the gas supply pressure.
5	Flame failure during stabilisation time Flame failure after safety time	Flame failure during operation	Check/replace monitoring electrode, flue gas path blocked, Condensate drain blocked, Check the gas supply pressure.
24	Speed below or above limit	Fan speed does not reach set speed or standstill	Check flue system, PWM and power cable to fan Check connection between CGBe and HCM-2
43	Many burner starts	Excessive number of burner starts	Inadequate heat transfer: Ensure adequate heat transfer. (Open radiators). Increase burner cycle block HG09
53	IO control deviation	Gas valve faulty Gas supply pressure outside set range Ionisation electrode corroded/bent Current controller on GBC-e faulty Gas valve power supply faulty Burner earthing faulty	Gas valve: - Check cables, plugs, power supply and switching. Gas pressure: - Check gas supply pressure (flow pressure); if OK, Ionisation electrode: - Check the condition of the electrode, clean or replace if necessary. - Adjust gap and position or replace if necessary. Replace GBC-e PCB, as current controller possibly faulty. Press reset button.

Fault code	Warning	Possible causes	Remedy
54	GLV actuators	Flue gas recirculation Incorrect gas type setting Incorrect gas restrictor Gas valve faulty Fan faulty	Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). - Check wind effect. Gas type setting - Check gas type setting on the gas valve and the AM/BM. Gas restrictor: - Remove the gas valve retainer. - Check that the correct gas restrictor is fitted. CGB-2-20/24: blue CGB-2-14: black Gas valve: - Check cables, plugs, power supply and switching; if valves faulty, replace as necessary. Fan: - Check for bearing damage. - Check cables, plug-in connections, power supply and switching. - If fan faulty, replace it.
55	GLV system error	Internal plausibility check of GBC-e failed.	System error: - Check for a strong electromagnetic field nearby. - Switch power ON/OFF, reset if necessary. Press reset button.
58	Timeout calibration	The heating appliance cannot carry out calibration Flue gas recirculation Fan faulty Inadequate heat transfer	Flue gas recirculation: - Check the flue path inside and outside the appliance (leaking, blocked). Fan: - Check that the fan and its wiring are intact. Inadequate heat transfer: - Ensure adequate heat transfer. Check IO electrode Press reset button.
68	GPV offset	Inadmissible GPV curves (offset) Corrupt/incorrect EEProm value Gas valve faulty	Corrupt EEProm value: - Replace boiler coding card. - Check leads and plug-in connections. - If OK and no function, replace the gas valve.
69	Adaptation not possible	Fan faulty (no stable state at minimum output) Strong wind effect	Wind: - Warning can occur due to strong wind. Fan: - If warning occurs frequently, check fan.

43. HCM-2 wiring diagram



43. GBC-e wiring diagram



Product fiche according to Regulation (EU) no. 811/2013

Product group: CGB-2

Supplier's name or trade mark			Wolf GmbH	Wolf GmbH	Wolf GmbH
Supplier's model identifier			CGB-2-14	CGB-2-20	CGB-2-24
Seasonal space heating energy efficiency class			A	A	A
Rated heat output	P_{rated}	kW	14	19	24
Seasonal space heating energy efficiency	η_s	%	93	93	93
Annual energy consumption for space heating	Q_{HE}	kWh	7570	10581	13290
Sound power level, indoors	L_{WA}	dB	47	47	48
Any specific precautions that shall be taken when the space heater is assembled, installed or maintained			See installation instruction	See installation instruction	See installation instruction

Product fiche according to Regulation (EU) no. 811/2013

Product group: CGB-2K

Supplier's name or trade mark			Wolf GmbH	Wolf GmbH
Supplier's model identifier			CGB-2K-20	CGB-2K-24
Load profile			XL	XL
Seasonal space heating energy efficiency class			A	A
Water heating energy efficiency class			A	A
Rated heat output	P_{rated}	kW	19	24
Annual energy consumption for space heating	Q_{HE}	kWh	10568	13308
Annual fuel consumption for water heating	AFC	GJ	17	17
Seasonal space heating energy efficiency	η_s	%	93	93
Seasonal water heating energy efficiency	η_{wh}	%	85	85
Sound power level, indoors	L_{WA}	dB	47	48
Any specific precautions that shall be taken when the space heater is assembled, installed or maintained			See installation instruction	See installation instruction

45. Technical parameters according to EU regulation no. 813/2013

Type			CGB-2-14	CGB-2-20	CGB-2K-20	CGB-2-24	CGB-2K-24
Condensing boiler	[yes/no]		yes	yes	yes	yes	yes
Low temperature boiler (**)	[yes/no]		no	no	no	no	no
B11 boiler	[yes/no]		no	no	no	no	no
Cogeneration space heater	[yes/no]		no	no	no	no	no
If yes, equipped with a supplementary heater	[yes/no]		-	-	-	-	-
Combination heater	[yes/no]		no	no	yes	no	yes
Item	Symbol	Unit					
Rated heat output	P_{rated}	kW	14	19	19	24	24
Useful heat output at rated heat output and high-temperature regime (*)	P_4	kW	13.5	18.9	18.9	23.8	23.8
Useful heat output at 30 % of rated heat output and low-temperature regime (**)	P_1	kW	4.1	5.7	5.7	7.1	7.1
Auxiliary electricity consumption at full load	elmax	kW	0.025	0.028	0.028	0.029	0.029
Auxiliary electricity consumption at part load	elmin	kW	0.010	0.012	0.012	0.012	0.012
Auxiliary electricity consumption in standby mode	P_{SB}	kW	0.003	0.003	0.003	0.003	0.003
Seasonal space heating energy efficiency	n_s	%	93	93	93	93	93
Useful efficiency at rated heat output and high-temperature regime (*)	n_4	%	88.1	87.8	87.8	87.8	87.8
Useful efficiency at 30 % of rated heat output and low-temperature regime (**)	n_1	%	98.0	97.7	97.7	97.7	97.7
Standby heat loss	P_{stby}	kW	0.033	0.033	0.033	0.032	0.032
Ignition burner power consumption	P_{ing}	kW	0.000	0.000	0.000	0.000	0.000
Emissions of nitrogen oxides	NO_x	mg/kWh	18	17	17	18	18
Declared load profile	(M, L, XL, XXL)	-	-	-	XL	-	XL
Daily electricity consumption	Qelec	kWh	-	-	0.157	-	0.170
Water heating energy efficiency	nwh	%	-	-	85	-	85
Daily fuel consumption	Qfuel	kWh	-	-	22,878	-	23,006
Contact details			Wolf GmbH, Industriestraße 1, D-84048 Mainburg				

(*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.
(**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

46. Notes

46. Notes

46. Notes

EU DECLARATION OF CONFORMITY

(to ISO/IEC 17050-1)

Number:	3063421
Issued by:	**Wolf GmbH**
Address:	Industriestrasse 1, D-84048 Mainburg
Product:	Gas condensing boiler CGB-2-14 CGB-2(K)-20 CGB-2(K)-24

The product described above conforms to the requirements specified in the following documents:

§6, 1. BImSchV, 26.01.2010
DIN EN 437 : 2009 EN 437 : 2003 + A1 : 2009)
DIN EN 13203-1 : 2015 (EN 13203-1 : 2015)
DIN EN 15502-2-1 : 2013 (EN 15502-2-1 : 2012)
DIN EN 15502-1 : 2015 (EN 15502-1 + A1 : 2015)
DIN EN 60335-1 : 2012 / AC 2014 (EN 60335-1 : 2012 / AC 2014)
DIN EN 60335-2-102 : 2010 (EN 60335-1 : 2006 + A1 : 2010)
DIN EN 62233 : 2009 (EN 62233 : 2008)
DIN EN 61000-3-2 : 2010 (EN 61000-3-2 : 2006 + A1 : 2009 + A2 : 2009)
DIN EN 61000-3-3 : 2010 (EN 61000-3-3 : 2008)
DIN EN 55014-1 : 2012 (EN 55014-1 : 2006 + A1 : 2009 + A2 : 2011)

In accordance with the following Directives

92/42/EEC (Efficiency Directive)
2016/426/EU (Gas Appliances Directive)
2014/30/EU (EMC Directive)
2014/35/EU (Low Voltage Directive)
2009/125/EC (ErP Directive)
2011/65/EU (RoHS Directive)
EU Regulation 811/2013
EU Regulation 813/2013

this product is identified as follows:

CE
0085

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Mainburg, 01.08.2017

Gerdewan Jacobs
Engineering Director

Jörn Friedrichs
Head of Development

WOLF GMBH

POSTFACH 1380 / D-84048 MAINBURG / TEL. +49.0. 87 51 74- 0 / FAX +49.0.87 51 74- 16 00

www.WOLF.eu

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