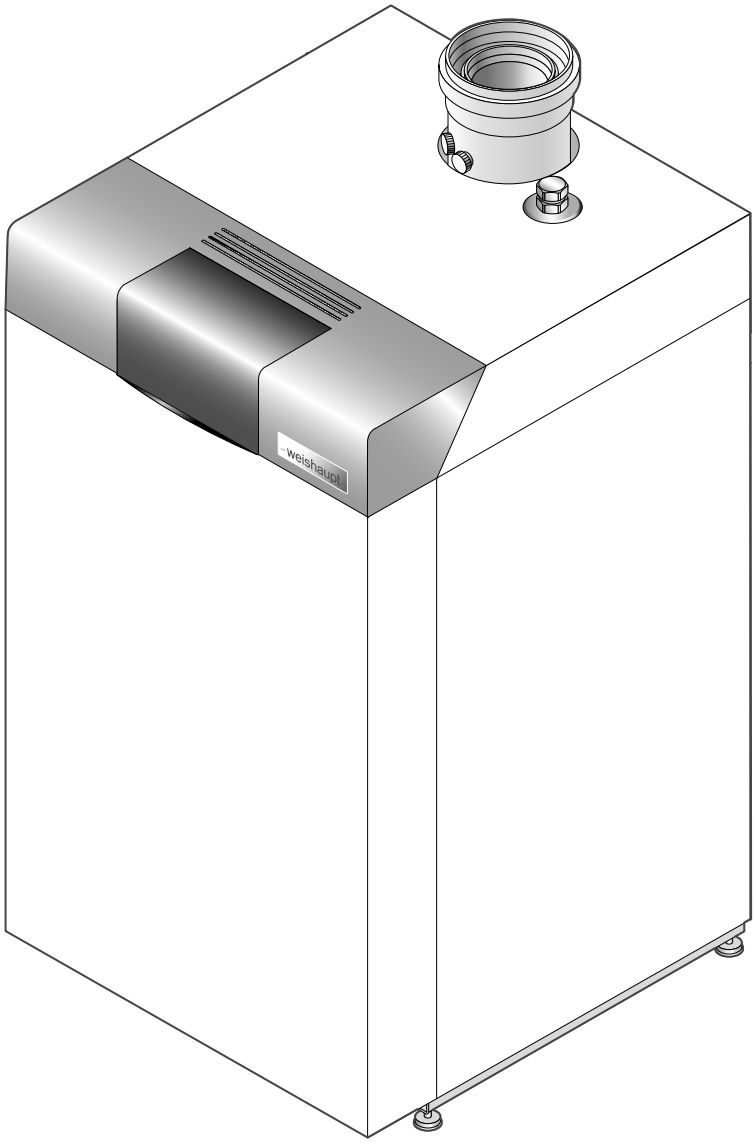
–weishaupt–

manual

Installation and operating instruction



Gas condensing boiler WTC-GB 90-A

83266502 ▪ 1/2010-08

Conformity certification

4820000002

Manufacturer: **Max Weishaupt GmbH**

Address: **Max-Weishaupt-Straße**
D-88475 Schwendi

Product: Gas condensing boiler

WTC-GB 90-A, WTC-GB 120-A,
WTC-GB 170-A, WTC-GB 210-A,
WTC-GB 250-A, WTC-GB 300-A

The product described above conforms with

the regulations of directives:

GAD	2009 / 142 / EC
LVD	2006 / 95 / EC
EMC	2004 / 108 / EC
BED	92 / 42 / EEC

This product is labelled as follows:

CE

CE-0085

Schwendi, 14.07.2010

ppa. Dr. Lück

ppa. Denkinger

1 User instructions

Translation of original operating instructions

These installation and operating instructions form part of the unit and must be kept on site.

1.1 User guide

1.1.1 Symbols

 **DANGER**	Immediate danger with high risk. Non observance can lead to serious injury or death.
 **WARNING**	Danger with medium risk. Non observance can lead to environmental damage, serious injury or death.
 **CAUTION**	Danger with low risk. Non observance can cause damage to the equipment and injury to personnel.
	Important information.
▶	Requires direct action.
✓	Result after an action.
▪	Itemisation.
...	Range.

1.1.2 Target group

These installation and operating instructions are intended for the operator and qualified personnel. They should be observed by all personnel working on the unit.

Work on the unit must only be carried out by personnel who have the relevant training and instruction.

1.2 Guarantee and Liability

Guarantee and liability claims for personal and equipment damage are excluded, if they can be attributed to one or more of the following causes:

- Non approved application of the unit,
- non-observance of the installation and operating instruction,
- operating the unit with faulty safety equipment,
- continual operation despite a fault,
- improper installation, commissioning, operation and service of the unit,
- alterations to the unit,
- the installation of additional components, which have not been tested with the unit,
- the installation of combustion chamber inserts, which impede full flame formation,
- repairs, which have been carried out incorrectly,
- the use of non original Weishaupt parts,
- unsuitable fuels,
- defects in the inlet lines,
- on non diffusion tight heating circuits without system separation,
- acts of God.

2 Safety

2.1 Permissible application

The condensing boiler is suitable for:
- Warm water heating circuits in closed systems according to DIN EN 12828
- Flow rate of maximum 7.8 m³/h.

The combustion air must be free from aggressive compounds (e.g. Halogens). If the combustion air in the boiler room is contaminated, increased cleaning and servicing may be required. In this case the unit should be operated room air independent.

The unit should only be used in enclosed rooms. The installation room must comply with local regulations.

Improper use could:
- endanger the health and safety of the user or third parties,
- cause damage to the unit or other material assets.

2.2 When gas can be smelled

Avoid open flames and spark generation, for example:
- do not operate light switches,
- do not operate electronic equipment,
- do not use mobile telephones.

- ► Open doors and windows.
- ► Close gas isolating valve.
- ► Warn the inhabitants (do not ring door bells).
- ► Leave the building.
- ► Inform the heating company or gas supplier from outside of the building.

2.3 What to do if flue gas can be smelled

- ► Switch off the appliance and turn off the system.
- ► Open doors and windows.
- ► Inform heating company.

2.4 Safety measures

- Rectify safety-relevant defects immediately,
- Replace safety-relevant components according to their specified service life (see Ch. 9.1).

2.4.1 Normal operation

- All labels on the unit must be kept in a legible condition,
- only operate the unit with its cover in the closed position,
- stipulated settings, service and inspection work should be carried out at regular intervals.

2.4.2 Electrical connection

For all work carried out on live parts:
- Observe the accident prevention instructions BGV A3 and adhere to local directives,
- tools in accordance with EN 60900 should be used.

2.4.3 Gas supply

- Only the gas supplier or an approved agent may carry out installation, alteration and maintenance work on gas appliances in buildings and properties.
- Pipe work must be subject to a pre and main test and a combined load and valve proving test relative to the pressure range intended (e.g. DVGW-TRGI, work sheet G 600).
- Inform the gas supplier about the type and size of plant prior to installation.
- Local regulations and guidelines must be observed during installation (e. g. DVGW-TRGI, work sheet G 600; TRF Band 1 and Band 2)..
- The gas supply pipe work should be suitable for the type and quality of gas and should be designed in such a way that it is not possible for liquids to form (e. g. condensate) Observe the vaporisation pressure and vaporisation temperature of liquid petroleum gas.
- Use only tested and approved sealing materials, whilst observing all process information.
- Re-commission the appliance when changing to a different type of gas.
- Carry out soundness test after each service and fault rectification.

2.5 Disposal

Dispose of all materials used in a safe and environmentally friendly way. Observe local regulations.

3 Product description

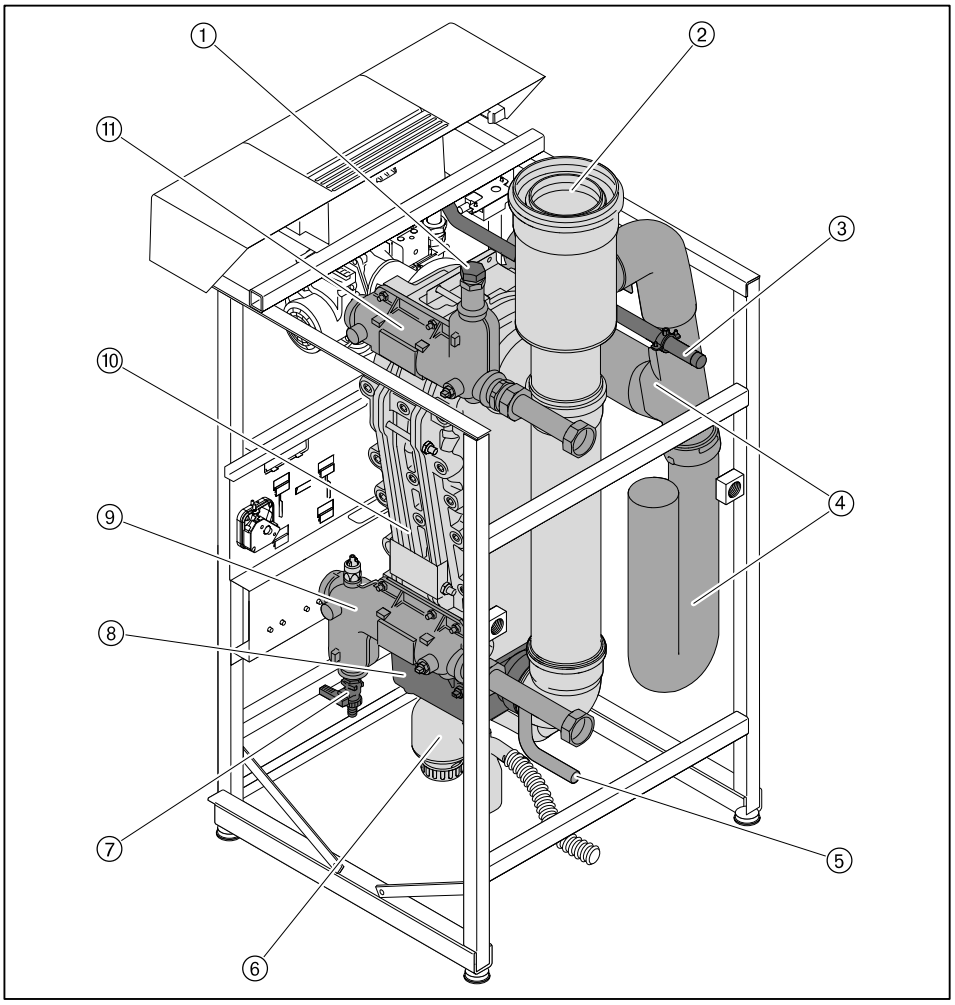
3.1 Type key

WTC-GB 90-A

WTC	Weishaupt Thermo Condens
-G	Fuel: Gas
B	Type of construction: floor standing
90	Ratings size: 90 kW
-A	Construction

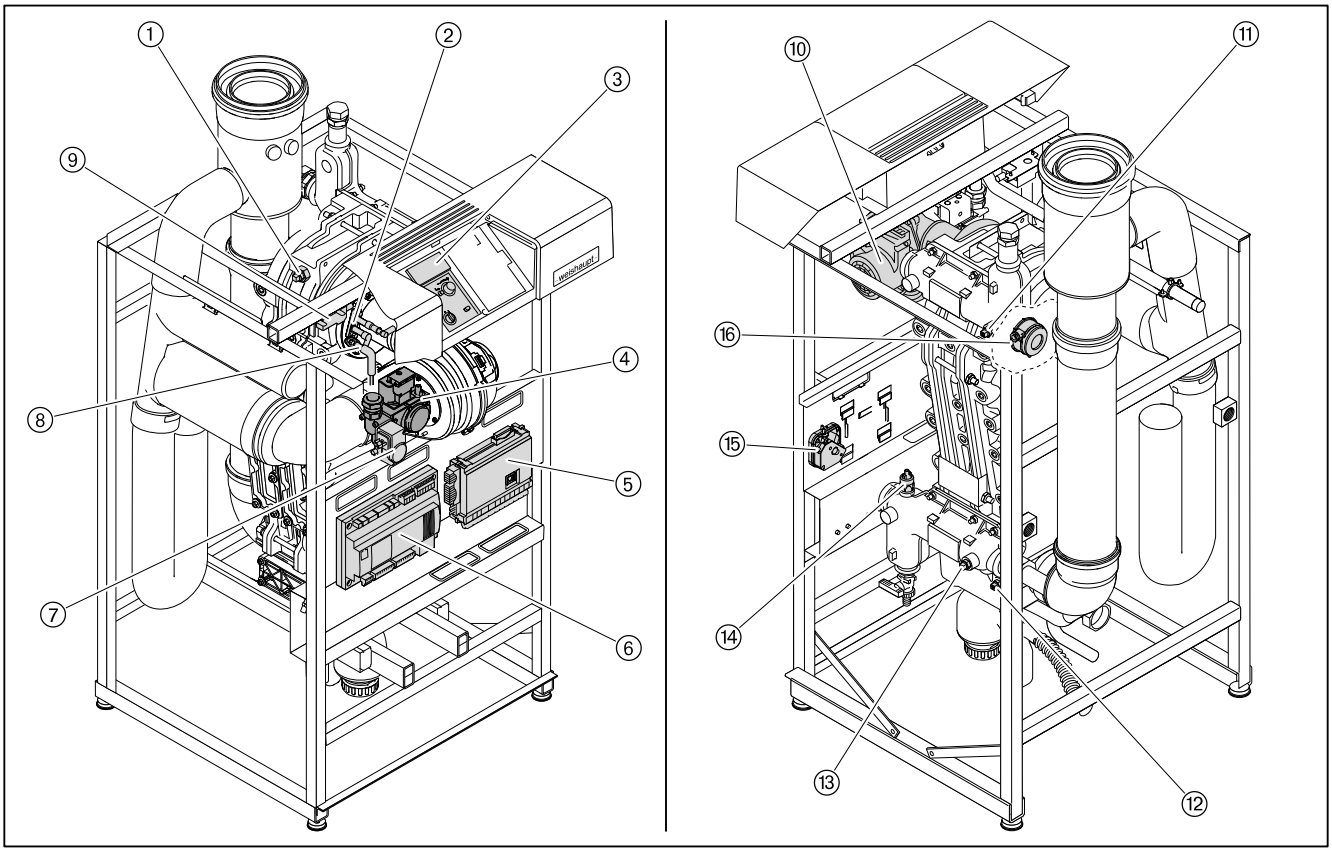
3.2 Function

3.2.1 Components



① Safety valve connection 1"
② Air intake/flue gas connection DN 160/110
③ Gas pipe Ø 22 mm
④ Air intake ducting with sound attenuator
⑤ Connection expansion vessel Ø 22 mm
⑥ Siphon
⑦ Inlet and outlet tap
⑧ Condensate pan
⑨ Return collector with union nut 1½"
⑩ Heat exchanger section
⑪ Supply collector with union nut 1½"

3.2.2 Electrical parts



① Safety temperature limiter (eSTL)
② Ignition electrode
③ Boiler control panel (WCM-CUI)
④ Gas combi valve
⑤ Connection box (W-EAB)
⑥ Boiler electronics (WCM-CPU)
⑦ Gas pressure switch
⑧ Ionisation electrode
⑨ Ignition unit
⑩ Fan
⑪ Supply sensor
⑫ Flue gas sensor
⑬ Return sensor
⑭ Water level interlock
⑮ Air pressure switch
⑯ Flue gas pressure switch

3.2.3 Safety devices

Safety temperature limiter (eSTL)

The fuel supply is shut off and the fan and the pump run-on are activated if the temperature on the eSTL exceeds a value of 95 °C (W12). The boiler restarts automatically, if the temperature drops below the flow setpoint value for 1 minute.

The fuel supply is shut off and the fan and the pump run-on are activated if the temperature on the eSTL exceeds 105 °C. The installation goes to lockout (F11).

Temperature differential supply/return

If the difference between flow and return temperature exceeds the value of parameter A21, the boiler is switched off (W15). The installation goes to lockout after 30 warnings with (F15). When approaching this value, first the pump rating is increased to 100 %, then the burner rating is reduced step by step.

Temperature differential eSTB/supply sensor

If the difference between eSTB and supply temperature exceed the value of parameter A22, the boiler is switched off (W18). The installation goes to lockout after 30 warnings with (F18).

Monitoring supply temperature increase (gradient)

If the temperature at the eSTL increases too rapidly (parameter A23), the boiler is switched off (W14). This function is only activated at a temperature of > 45 °C.

Flue gas sensor

The fuel supply will be switched off if the flue gas temperature exceeds the value defined in parameter 33 (factory setting 120 °C). The fan and pump run-on is activated (W16).

Air pressure switch

The air pressure switch monitors the fan pressure. Before the pre-purge phase is started, the idle position of the switch contact is checked. During the pre-purge phase the fan rotation is checked. The system goes to lockout after 4 failed start attempts (F32, F45).

Flue gas pressure switch

During operation, the pressure in the condensate collector is monitored. This stops the siphon from being squeezed empty if the backpressure is too high. If the pressure switch is activated (>5.5 mbar) the system goes to lockout (F46). If the pressure switch is activated during the idle time of the fan the system also goes to lockout (F38).

Water level interlock

If the system pressure drops below 1 bar, the boiler switches off (F36). If the pressure increases to 1.2 bar again, the boiler automatically restarts.

Gas pressure switch

The gas connection pressure is monitored both before and during operation. If the gas pressure set is not maintained, the boiler switches off (W47).

3.2.4 Program sequence

1. Pre-purge

At heat demand ① the fan starts and dries to pre-purge speed ②.

2. Ignition

The fan drives down to ignition speed ③, ignition ④ switches on, the gas valves ⑤ open. The ignition spark ignites the fuel. A flame appears.

3. Safety time

Following the safety time (3.5 seconds) ⑥ ignition is switched off.

4. Stabilisation of the flame

If a flame signal ⑦ is transmitted, the flame stabilisation time ⑧ will follow.

5. Delayed heating operation

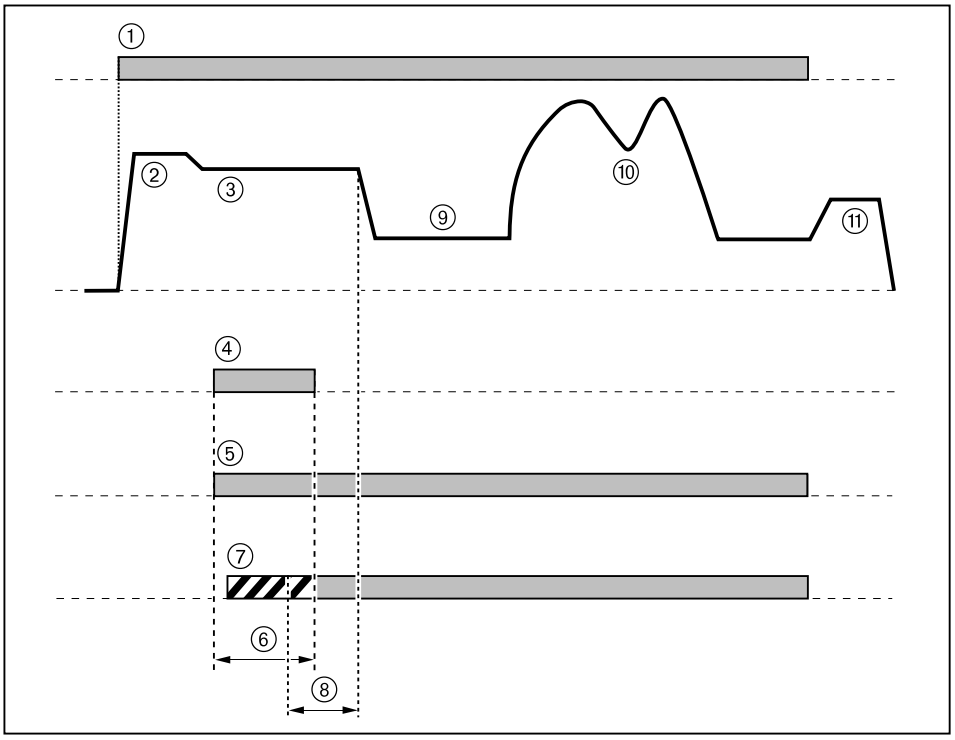
In the heating operation mode the delayed heating operation ⑨ is carried out first. The heating capacity is restricted for the duration of the delayed time (the delayed heating operation is omitted during DHW operation)

6. Modulating operation

The internal unit temperature regulator sets the speed setpoint for the fan ⑩ within the programmed load limits.

7. Post-purge

Following every normal shut down, after faults and after the return of the power supply, the fan is operated at the post-purge speed ⑪.



3.3 Technical data

3.3.1 Approval data

Gas Appliance Category (DE, AT, CH)	II_{2ELL3P}, II_{2H3P}
Type of installation	B_{23}, B_{23P}(1, B_{33}, $C_{13(x)}$, $C_{33(x)}$, $C_{43(x)}$, $C_{53(x)}$, $C_{63(x)}$, $C_{83(x)}$, $C_{93(x)}$
CE-PIN	CE-0063 BS 3948
SVGW	07-050-4

(1 only in conjunction with a flue gas system in pressure class P1 or H1 to EN 14471.

Basic standards	DIN EN 60335-2-102:2006 DIN EN 61000-3-2:2006 DIN EN 61000-3-3:1995 DIN EN 55014-1:2000, DIN EN 55014-2:1997 DIN EN 656:1999-10 DIN EN 15417:2006-07

3.3.2 Electrical data

Supply voltage / frequency	230 V/50 Hz
Power consumption operation	149 W
Power consumption standby	7 W
Internal unit fuse (WCM-CPU)	6.3 AT
External pre-fuse	16 A
Type of protection	IP 20
Ignition electrode distance	4.0 mm

3.3.3 Ambient conditions

Temperature in operation	+3 … +30 °C
Temperature during transport / storage	-10 … +60 °C
relative humidity	max 80 %, no dew point

3.3.4 Permissible fuels

- Natural Gas,
- Liquid Petroleum Gas Propane

3.3.5 Emissions

The condensing boiler complies with EN 297 Emission Class 5.

Standard emission factor to DIN 4702 T8 (40/30 °C)

Nitrogen Oxide NO_x	57 mg/kWh
Carbon Monoxide CO	18 mg/kWh

O_2content at minimum and maximum rating

Rating	min	max
Natural Gas	4.6 %	4.3 %
Liquid Petroleum Gas	5.3 %	4.8 %

3.3.6 Rating

Combustion heat rating Q_C	17.0 … 86.5 kW
Boiler capacity at 80/60 °C	16.5 … 84.3 kW
Boiler capacity at 50/30 °C	18.2 … 90.0 kW
Fan speed Natural Gas	1620 … 6900 rpm
Fan speed Liquid Petroleum Gas	1620 … 6600 rpm
Condensate quantity at 50/30 °C	2.2 … 6.4 L/h
Standard efficiency at 40/30 °C	110.1 % H_i (99.2 % H_s)

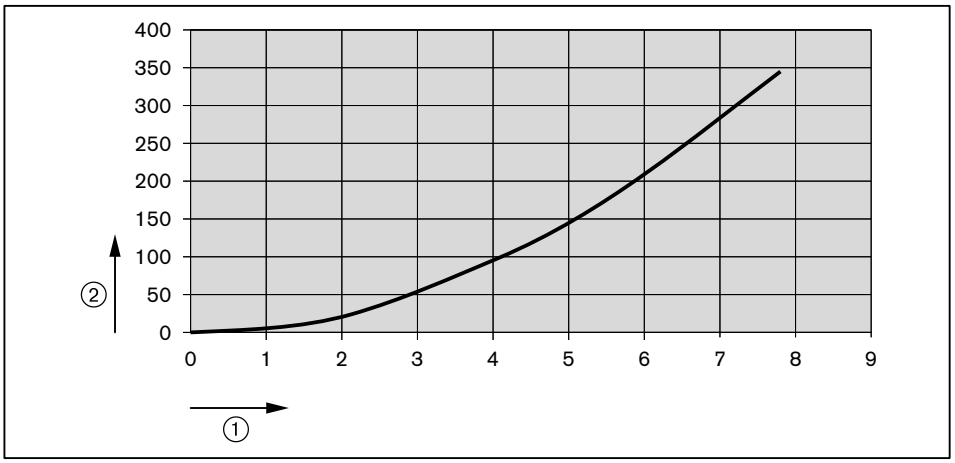
3.3.7 Heat exchanger

Water content	7.5 litre
Boiler temperature	max 85 °C
Operating pressure	max 6 bar
Throughput limit	max 7.8 m^3/h

Pressure loss

Observe the pressure loss of the condensing boiler and the maximum throughput limit when determining the hydraulic sizing of the heating system.

► Determine pressure loss using the diagram.



① Flow rate in m^3/h
② Pressure loss in mbar

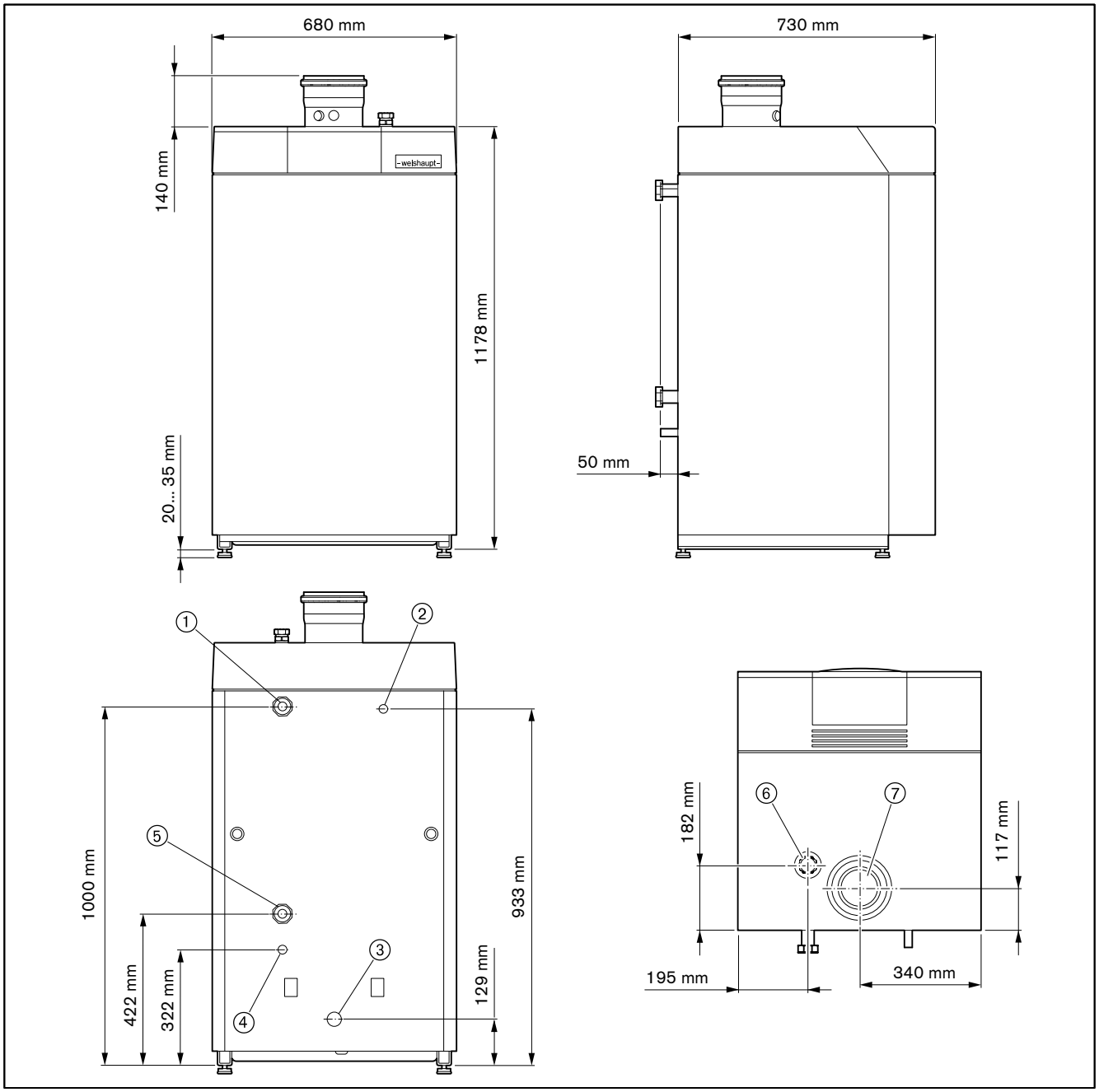
3.3.8 Flue gas system data

Residual supply pressure at flue gas outlet	7 … 157 Pa
Flue gas mass flow rate	7.6 … 38.2 g/s
Flue gas temperature at 80/60 °C	58 … 68 °C
Flue gas temperature at 50/30 °C	31 … 48 °C
Flue gas connection	DN 160/110

3.3.9 EnEV Product Characteristics

Boiler efficiency factor at 100 % rating and at medium boiler temperature 70 °C	97.5 % H_i (87.8 % H_s)
Boiler efficiency factor at 30 % rating and at return temperature 30 °C	107.7 % H_i (97.0 % H_s)
Standby loss at 50 K above room temperature	0.33 % / 271 W

3.3.10 Dimensions



① Supply 1½" (union nut)
② Gas pipe Ø 22 mm
③ Condensate connection DN 25
④ Connection expansion vessel Ø 22 mm
⑤ Return 1½" (union nut)
⑥ Safety valve connection G1"
⑦ Air intake/flue gas connection DN 160/110

3.3.11 Weight

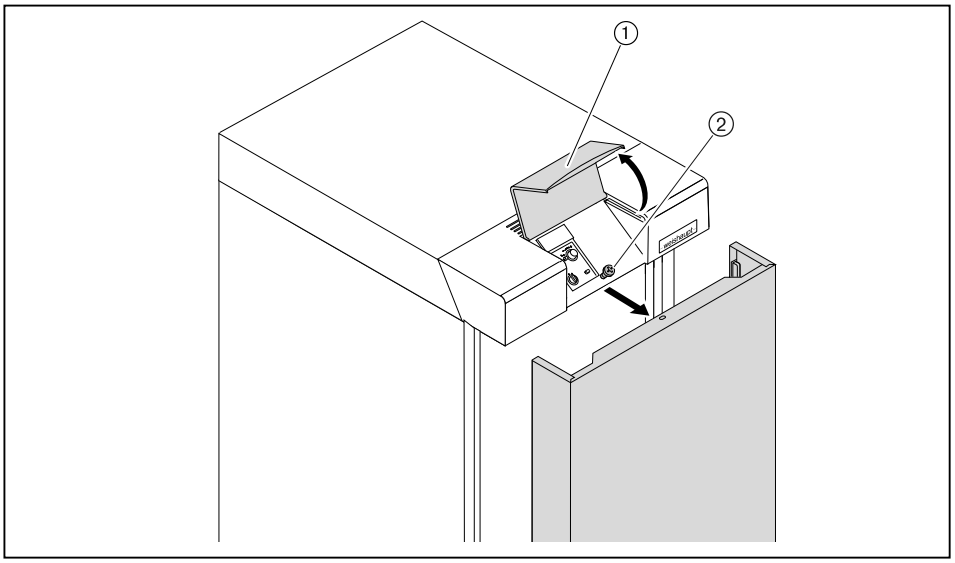
Weight empty: ca. 117 kg

4 Installation

Only valid in Switzerland
When installing and operating in Switzerland the regulations of SVGW, VKF, and local and Cantonal regulations, as well as the EKAS guideline (Liquid Petroleum Gas Guideline, Part 2) must be observed.

Remove front panel

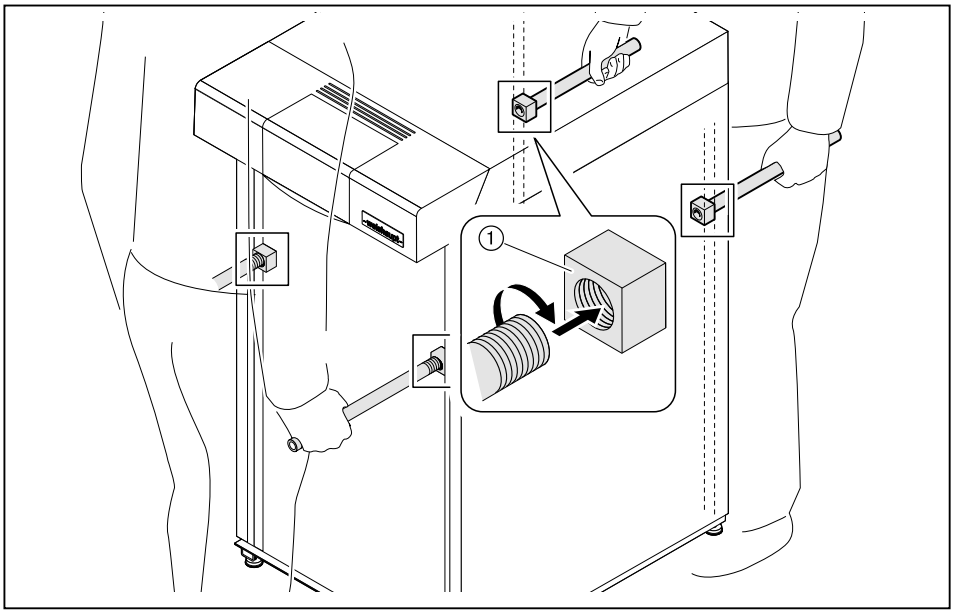
- ► Open flap ① on boiler control panel.
- ► Undo screw ② and remove front panel.



Transport

For transportation, ¾" pipes can be screwed in at 4 points.

- ► Screw ¾" pipes to the transport points ①.



4 Installation

Installation location

The installation room must comply with local regulations. For room air dependant operation it must be fitted with an opening leading to atmosphere with a minimum cross section (see DVGW-TRGI, work sheet G 600).

The cross section may be split between a maximum of two openings.

Minimum cross section for room air independent operation: 230 cm^2.

Dimensions

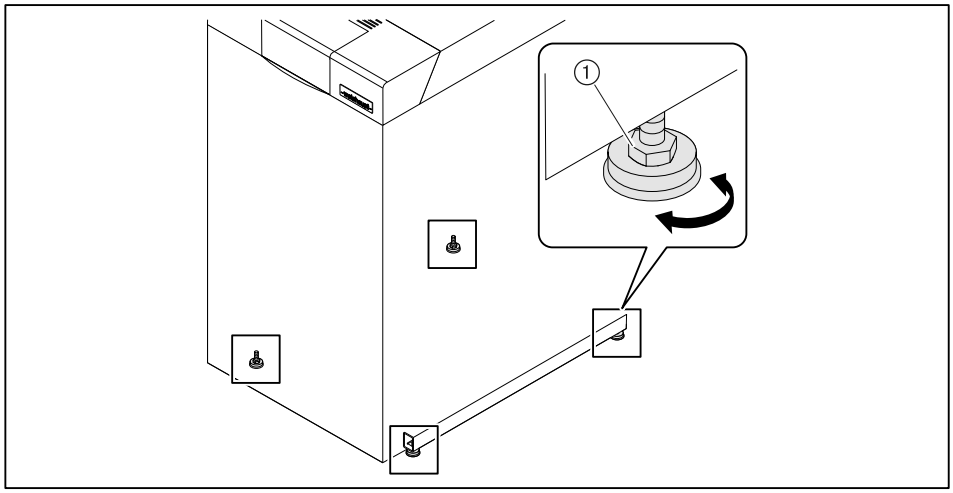
Observe the dimensions during the installation of the system (see Ch. 3.3.10).

Minimum clearances

Maintain a distance of minimum 50 cm to the walls on all sides of the boiler for installation and service work.

Adjust boiler position

► Level the boiler horizontally using the 4 screw feet ①.



5 Installation

5.1 Requirements for the heating water

In support of guideline VDI 2035 the following requirements are applicable for heating water.

- Untreated fill and top-up water must be of domestic water quality (colourless, clear and without any sedimentation),
- the fill and top-up water must be pre-filtered (mesh width max 25 µm),
- the pH value must be 8.5 ± 0.5,
- there must be no oxygen enrichment of the heating water (max 0.05 mg/l),
- in the case of diffusion resistant system components, the unit must be disconnected from the heating circuit by means of a separator.

5.1.1 Permissible water hardness

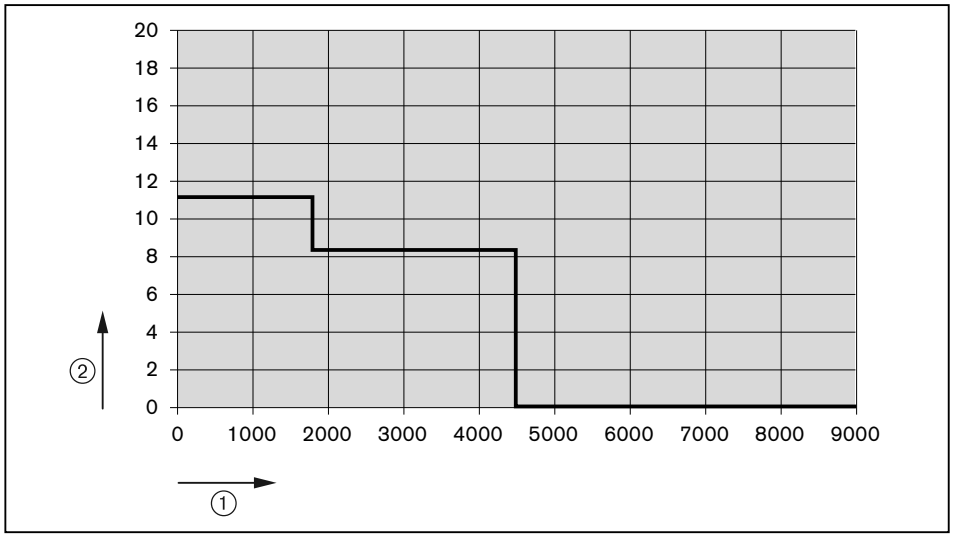
The permissible water hardness is determined in proportion to the fill and top up water quantity.

► Determine from the diagram below whether water treatment measures are necessary.

If the fill and top up water lies in the upper range of the limit curve:
► treat the fill and top-up water.

If the fill and top up water lies in the lower range of the limit curve, treatment is not necessary.

► Record the fill and top-up water quantities in a system logbook.



① Fill and top up water quantity in litres
② Total hardness in °dH

5.1.2 Fill water quantity

If information about the fill water quantity is not available, the following table can be used to estimate the quantity. On calorifier systems the calorifier content must be taken into consideration.

Heating system	Estimated fill water quantity(1	
	55/45 °C	70/55 °C
Pipe and steel radiators	37 l/kW	23 l/kW
Cast iron radiators	28 l/kW	18 l/kW
Panel radiators	15 l/kW	10 l/kW
Air conditioning	12 l/kW	8 l/kW
Convectors	10 l/kW	6 l/kW
Underfloor heating	25 l/kW	25 l/kW

(1 based on the heating requirements of the building

5.1.3 Treatment of fill and top-up water

De-ionisation (recommended by Weishaupt)

- ► De-ionise the fill and top-up water completely.
  (recommendation: mixed bed procedure)

When the heating water has been entirely de-ionised, additional top-up water up to 10% of the system contents may be untreated. Higher quantities of top-up water must be de-ionised.

- ► Check the ph value (8.5 ∓ 0.5) of the de-ionised water:
  - after the commissioning,
  - after 4 weeks of operation,
  - during the annual servicing.
- ► If necessary, adjust the pH value of the heating water by the addition of Trisodium Phosphate.

Softening (cation exchanger)

CAUTION

Damage to the unit due to raised pH value
Corrosion could damage the unit.
- ► Following the softening of the water by means of cation exchange, the pH value must be stabilised due to the self alkalisation of the heating water.

- ► Soften the fill and top-up water.
- ► Stabilise the pH value.
- ► Check the pH value (8.5 ± 0.5) during the annual servicing.

Stabilisation of hardness

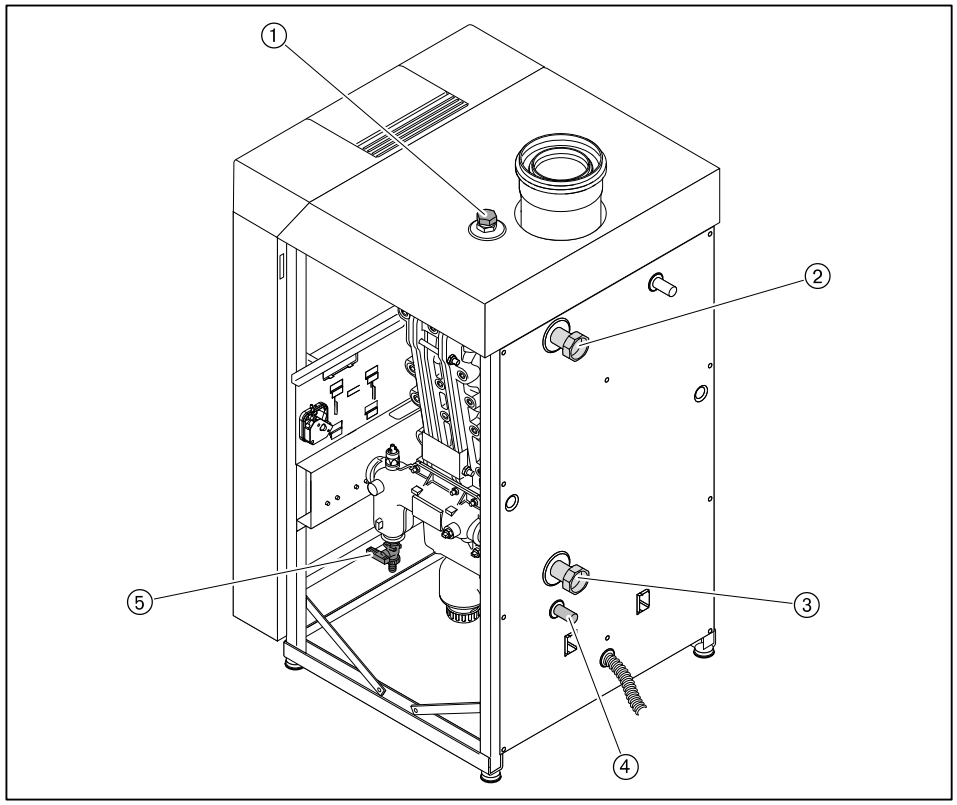
CAUTION

Damage to the unit due to inappropriate inhibitors
Corrosion and scale could damage the system.
- ► Only use inhibitors when the manufacturer can guarantee the following:
  - the requirements relating to the heating water are fulfilled,
  - the heat exchanger will not be attacked by corrosion,
  - there will be no formation of sludge within the heating system.

- ► Treat the fill and top-up water with inhibitors.
- ► Check the pH value (8.5 ± 0.5) according to the instructions of the inhibitors.

5.2 Hydraulic connection

- ► Flush the heating system with at least twice the total system content.
- ✓ Contaminants are removed.
- ► Connect the supply and the return (Recommendation: Use shut off valves).
- ► Fit safety valves.
- ► Fit expansion vessel.
- ► If necessary, install a sludge trap in the return line.



① Safety valve connection G1"
② Supply 1½" (union nut)
③ Return 1½" (union nut)
④ Connection expansion vessel Ø 22 mm
⑤ fill and return tap

Filling the water

CAUTION

Damage to the condensing boiler due to unsuitable fill water
Corrosion and scale could damage the system.
- ► Adhere to the requirements for the heating water and the local directives (see Ch. 5.1).

- ► Open the shut off valves.
- ► Gradually fill the heating system through the inlet tap (system pressure minimum 1.3 bar).
- ► Vent the system.
- ► Check the system for leakage and check the filling pressure.

5.3 Condensate connection

DANGER

Danger of poisoning by escaping flue gas
Inhalation leads to dizziness, nausea and eventually death.
► Check the fill level of the siphon at regular intervals and replenish, if necessary, in particular when the system has been shut down for longer periods or has been operated at high return temperatures (> 55 °C).

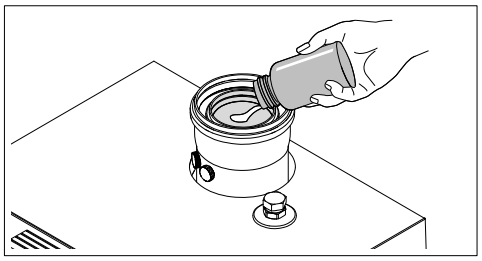
The condensate generated during the heating operation is discharged to the house waste water drainage system via an integrated siphon.

Observe work sheet ATV-DVWK-A 251 and install a neutralisation system if required.

If the discharge point of the waste water system is located above the condensate drain:
► Installing condensate lift pump.

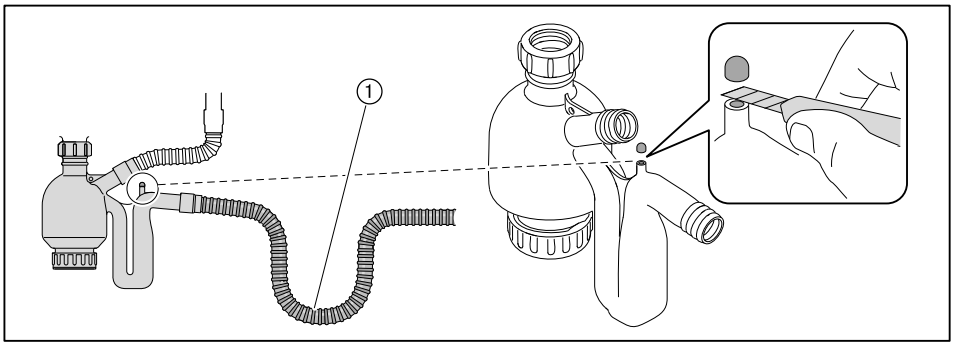
Filling the siphon

► Run condensate hose on siphon to condensate outlet pipe.
► Fill siphon with water via the flue gas outlet of the boiler, until water flows from the condensate hose.



If an external siphon ① is present external to the boiler (e. g. due to the condensate hose):
► Cut of cap from ventilation opening.

If there is no external siphon present, the cap must not be removed.



5.4 Gas supply

The gas side connection must only be carried out by an approved gas installer. All country specific guidelines and local regulations imposed by the gas supply company must be observed.

The gas characteristics must match the data given on the name plate of the boiler.

The condensing boiler is factory preset to Natural Gas E (G20).

Conversion from Natural Gas to Liquid Petroleum Gas (see Ch. 7.3).

Gas connection pressure

The gas connection pressure must be within the following ranges:

Natural Gas E/H	17.0 … **20** … 25.0 mbar
Natural Gas LL	20.0 … **25** … 30.0 mbar
Liquid Petroleum Gas P (*P*n 37)	25.0 … **37** … 45.0 mbar
Liquid Petroleum Gas P (*P*n 50)	42.5 … **50** … 57.5 mbar

Commissioning outside of the pressure ranges to DIN EN 437 is not permitted.

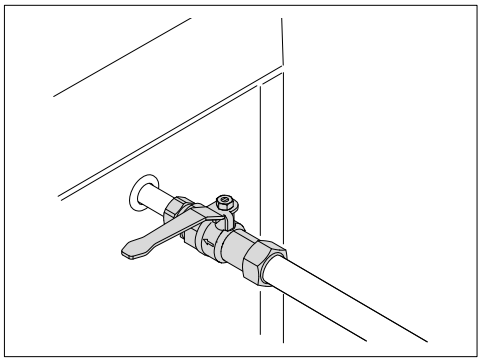
Installing the gas supply

DANGER

Risk of explosion due to leaking gas
Gas leaks can lead to a build-up of explosive gas/air mixture. With an ignition source present this can result in an explosion.
- ► The gas supply should be installed with care and all safety instructions should be observed.

- ► Close all shut off devices prior to commencing work and protect from accidental re-opening.
- ► Install gas supply pipes tension free.

If a thermal shut off device (TAE) is required:
- ► Install a thermal shut off device in front of the gas isolating valve, or install a gas isolating valve with TAE.
- ► Install gas isolating valve.
- ► Connect gas supply to gas inlet.



Carry out soundness test of gas supply line and vent

Only the gas supply company or a contract installation company may carry out a soundness test and vent the gas line.

5.5 Routing of air/ flue gas circulation

Air supply ducting

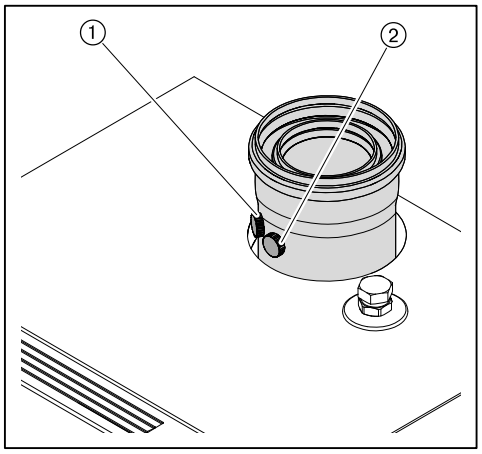
The combustion air can be supplied:
- from the installation room (room air dependent operation),
- through concentric piping systems (room air independent operation),
- through separate air duct in the room (ducted air intake).

Flue gas system

Local and building regulations must be observed when designing the flue gas ducting.

Only approved flue gas systems may be used.
If the condensing boiler is connected to a chimney, this must be damp proof.

► Install the flue gas system at the flue gas connection.



① Measuring point in supply air annular gap
② Flue gas test point

The flue gas system must be sound.

► Carry out a soundness test of the flue gas system.

5.6 Electrical installation

DANGER

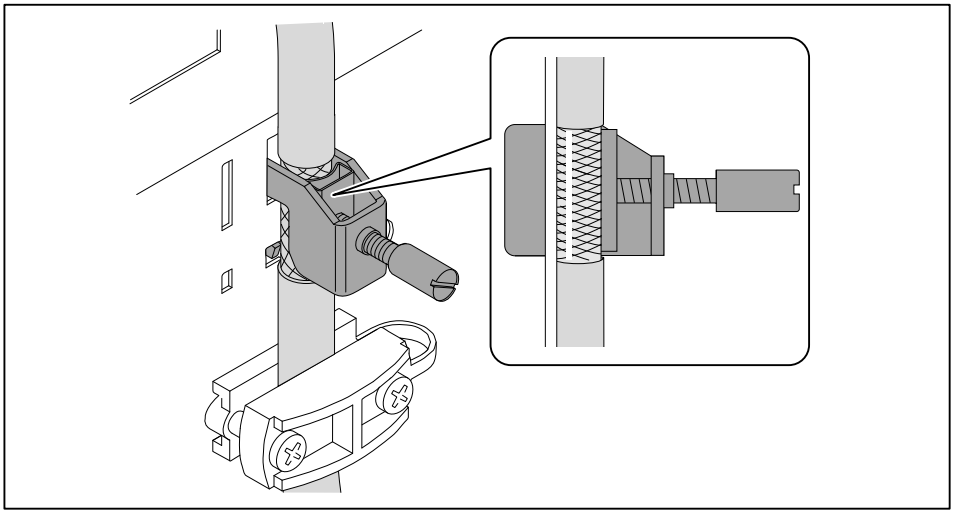
Electric shock when working with voltage applied
The consequence is serious injury or death.
- ► Isolate unit prior to carrying out work and protect against accidental reconnection to the mains.

The electrical installation must only be carried out by qualified electricians, local regulations must be observed.

Install Bus and external sensor cable separately and preferably using screened cables (metal braiding).

Separate ducts are provided for the separate installation of 230 V cables opposite to Bus and sensor cables (SELV).

- ► Feed the cables from the rear of the unit through the cable ducts to the connection box.
- ► Assign the inputs and outputs according to application (see Ch. 6.10).
- ► Fit screen of Bus and external sensor cable to the designated screen connection terminals.

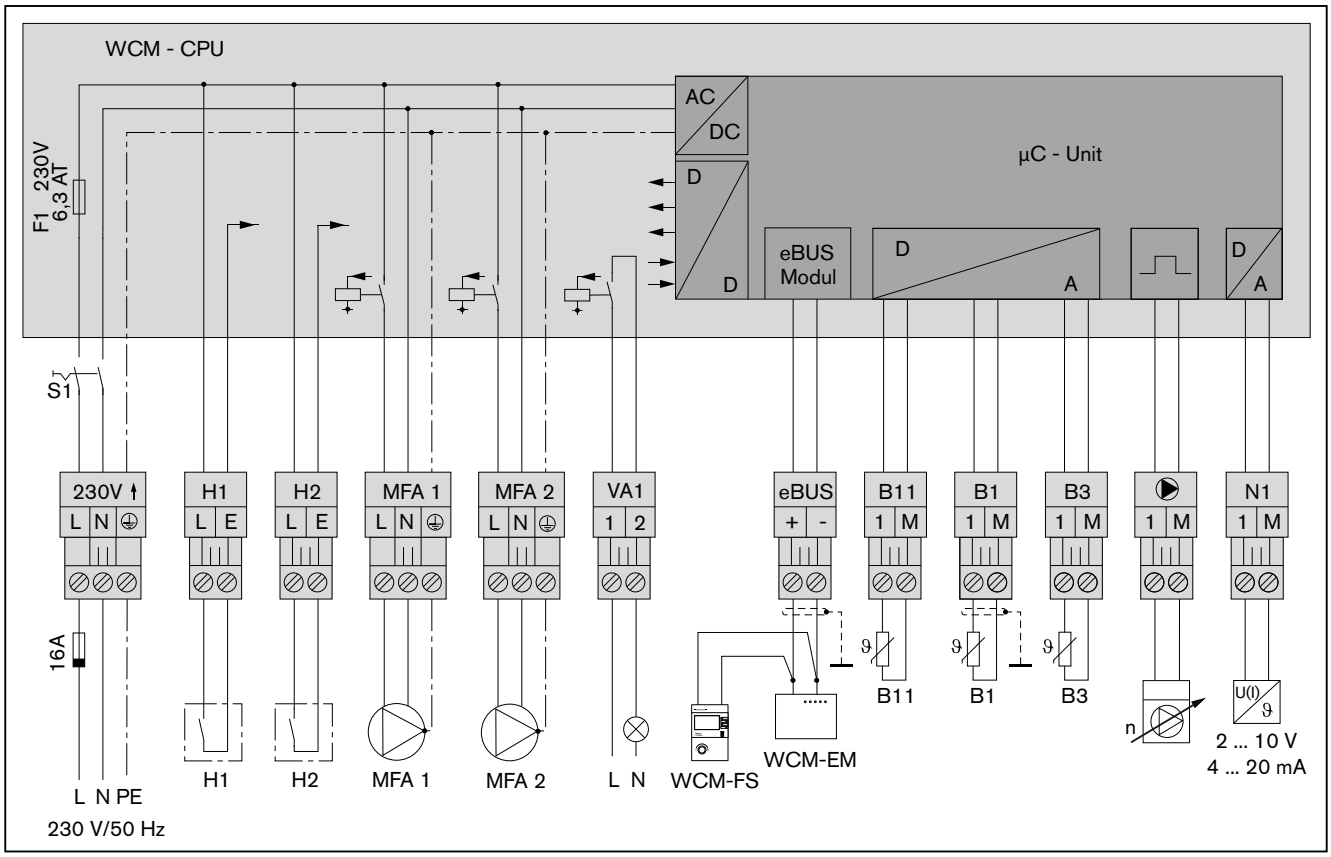


- ► Connect the cables according to the wiring diagram, in the process pay particular attention to the correct phase location of the voltage supply.

5.6.1 Wiring diagram

Observe the instructions for the electrical installation (see Ch. 5.6).

The maximum total current of all external loads must not exceed 4.5 A.

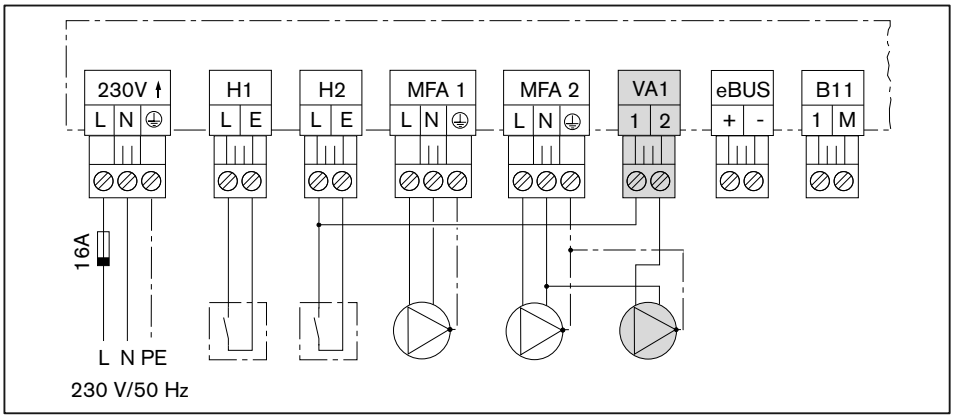


Plug	Colour	Connection	Remarks
230V ↑	Black	Voltage supply 230 V AC / 50 Hz	–
H1	Turquoise	Input 230 V AC/2 mA	–
H2	Red	Input 230 V AC/2 mA	–
MFA 1	Purple	Relay output 230 V AC	max 3 A (AC1)
MFA 2	Purple	Relay output 230 V AC	max 3 A (AC1)
VA1	Brown	Potential free relay output	230 V AC/max 3 A (AC1)
eBUS	Light blue	WCM components (FS, EM, KA, COM)	–
B11	White	De-couple sensor NTC 5 kΩ	0 … 99 °C
B1	Green	External sensor NTC 600 Ω	-40 … 50 °C
B3	Yellow	DHW sensor NTC 12 kΩ	0 … 99 °C
▶	Dark blue	Control signal for speed controlled pump PWM	–
N1	Orange	Temperature remote control 2 … 10 V; 4 … 20 mA	–

5.6.2 Connection additional pump via output VA1

Observe the instructions for the electrical installation (see Ch. 5.6).

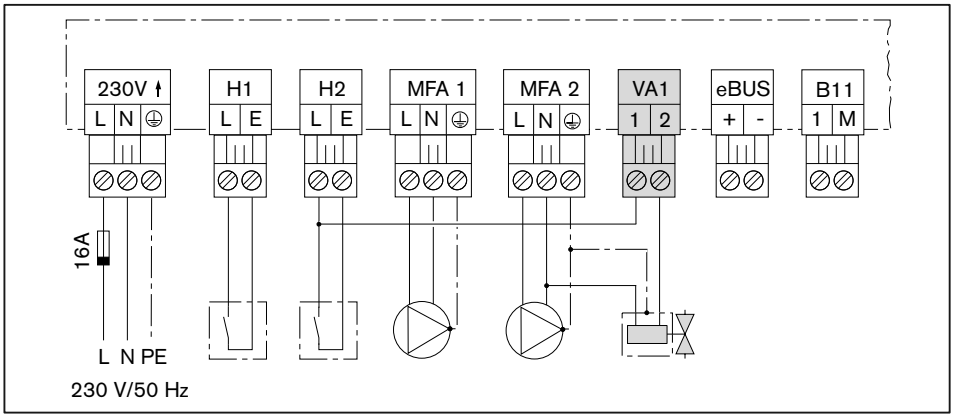
► Connect pump to wiring diagram.



5.6.3 Connection additional safety valve LPG via output VA1

Observe the instructions for the electrical installation (see Ch. 5.6).

► Connect valve to connection diagram.



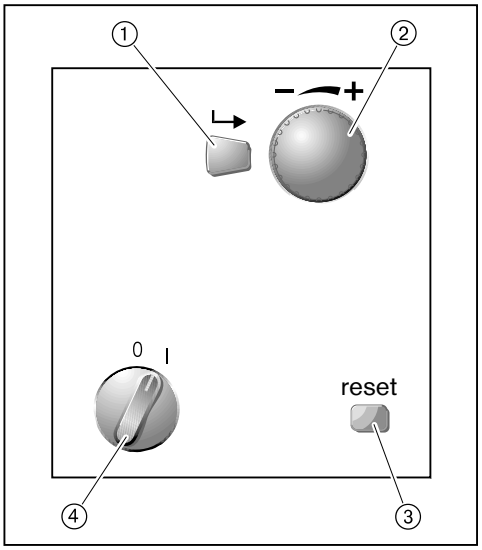
6 Operation

6.1 Operating interface

6.1.1 Operating panel

▶ Open flap.

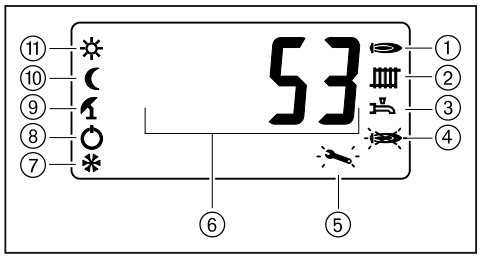
There are 4 operating elements available.



①	Enter button	Confirm selection, confirm input
②	Dial knob	Navigation through levels and parameters, change values
③	Reset button	Resetting fault conditions. The system will be restarted if there is no fault.
④	Switch S1	System ON/OFF

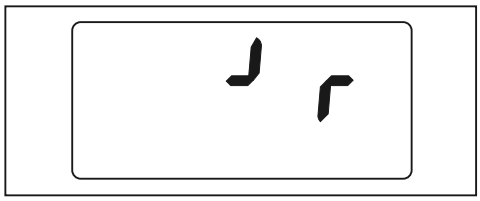
6.1.2 Display

The display shows current operating status and operating data.
Symbols are shown or hidden depending on the system variation.
When a remote control is connected (e. g. WCM-FS or WCM-EM) the symbols⑨ … ⑪ are not displayed.

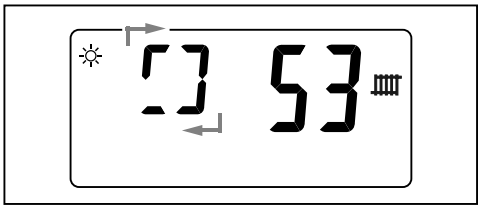


① Burner in operation
② Heating operation is activated
③ DHW operation is activated
④ Fault
⑤ Service note
⑥ Flow temperature (standard display); parameters and values
⑦ Frost protection is activated
⑧ Standby
⑨ Summer setting or no heating operation
⑩ Heating at night setback value
⑪ Heating at setpoint value

Display sensor interruption or short circuit



Display burner rapid cycle interlock (see Ch. 6.7)



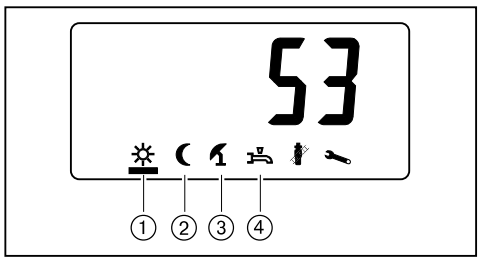
6.2 End User Level

Symbols are shown or hidden depending on the system variation.
When a remote control is connected (e. g. WCM-FS or WCM-EM) the symbols ① … ④ are not displayed. If communication between the electronics and the remote control fails, the symbols for emergency operation are displayed.

6.2.1 Display End User Level

Various information can be called up in the end user level.

► Turn the dial knob.
✓ Tool bar appears.
► Turn the dial knob.
✓ Selection cursor alternates between the symbols.

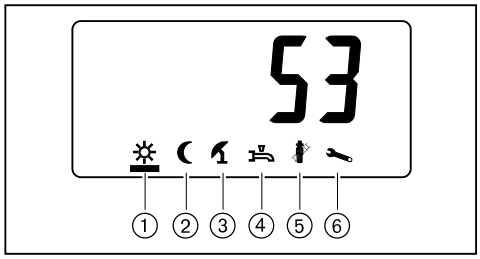


① Flow temperature(--- = standby)
② Flow temperature(--- = standby)
③ Type of operation: S = Summer setting, W = Winter setting
④ DHW temperature

6.2.2 Settings End User Level

Different settings can be changed in the end user level.

► Turn the dial knob.
✓ Tool bar appears.
► Turn the dial knob.
✓ Selection cursor alternates between the symbols.
► Press enter button.
✓ Set value will be shown flashing.
► Change the value with the dial knob.
► Save the value with the enter button.

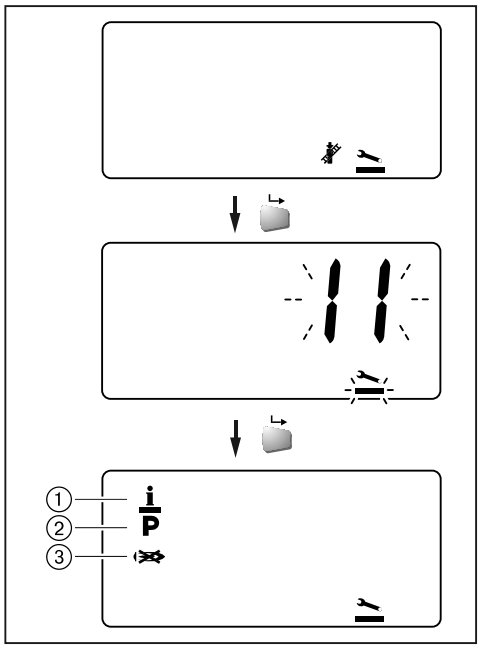


	Setting	Range	Factory setting
①	Normal supply temperature setpoint	Setback flow temperature --- maximum flow temperature (P 31) --- = standby	60 °C
②	Setback supply temperature setpoint	Minimum supply temperature (P 30) … normal supply temperature	30 °C
③	Type of operation	S = Summer W = Winter	W
④	DHW setpoint value	30 °C … 65 °C --- = DHW operation off	50 °C
⑤	Manual start up chimney sweep function	minimum load ... maximum load	–
⑥	Heating Engineer Level	–	–

6.3 Heating Engineer Level

Activate heating engineer level

► Turn the dial knob.
✓ Tool bar appears.
► Turn the dial knob and set the selection cursor below the spanner symbol.
► Press enter button.
► Turn the dial knob and set code `11`.
► Confirm setting with the enter button.
✓ Heating engineer level tool bar will appear.



① Info level
② Parameter level
③ Fault history

► Turn the dial knob and set the selection cursor below the required level.
► Press enter button.
✓ Level will be activated.

Exit heating engineer level

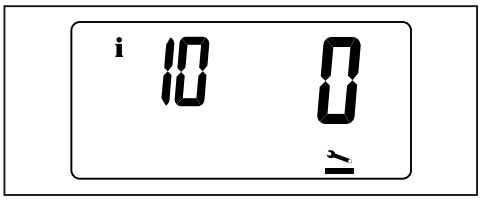
► Turn the dial knob until `ESC` appears.
► Press enter button.

6.3.1 Info level

Display system values (i)

- ► Activate info level (see Ch. 6.3).
- ► Turn the dial knob.
- ✓ System values can be read.

Depending on system variation, specific values are shown or hidden.



Info	system	Unit
i 10	Operating phase 0 = Burner off 1 = Standby check fan 2 = Prepurge speed achieved 3 = Prepurge 4 = Ignition speed achieved 5 = Ignition Flame formation time (10 ≙ 1.0 seconds) 6 = Burner in operation 7 = Gas valve check 8 = Post purge speed achieved and post purge	–
i 11	Rating	%
i 12(1	average external temperature	°C
i 13	Single boiler = Flow setpoint value Cascade operation = Ratings setpoint value Remote operation DDC = temperature setpoint value Remote operation WCM-FS, WCM-EM, via N1 = peak heat demand	°C % °C °C
i 15	Temperature setpoint value via N1	°C

(1 can be reset

Info	Actuators	Unit
i 20	Type of operation H = Heating operation W = DHW	–
i 22	Pump rating	%
i 23	Fan speed	rpm x 10

Info	Sensors	Unit
i 30	eSTL temperature	°C
i 31	Flue gas temperature	°C
i 32	Ionisation signal Setpoint minimum rating: 9 … 16 µA Setpoint maximum rating: 10 … 20 µA Limit value: 4 µA	µA
i 33	External temperature	°C
i 34	DHW temperature	°C
i 35	Supply temperature	°C

6 Operation

Info	Sensors	Unit
i 37	Return temperature	°C
i 39	De-couple sensor temperature	°C

Info	System info	Unit
i 42	Burner starts	x 1000
i 43	Burner operating hours	h x 100
i 44	Software version WCM-CPU	–
i 45	Software version WCM-CUI	–
i 46(1	Time since last servicing	h x 10
i ESC	Exit menu	–

(1 can be reset

Reset system values

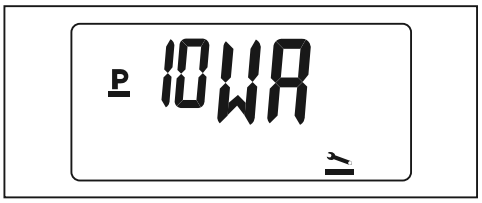
► Press enter button for 2 seconds.
✓ Values will be reset.

6.3.2 Parameter level

Show parameter (P)

- ▶ Activate parameter level (see Ch. 6.3).
- ▶ Turn the dial knob.
- ✓ Parameters can be read.

Depending on system variation, specific parameters are shown or hidden.



Changing values

- ▶ Press enter button.
- ✓ Set value will be shown flashing.
- ▶ Change the value with the dial knob.
- ▶ Save the value with the enter button.

Parameters	Basic configuration	Range of values	Factory setting
P 10	Unit configuration	(see Ch. 7.2)	–
P 11	Type of gas	E = Natural Gas EA = Natural Gas with flue gas damper (set P 13 = 9, P 16, 17 = 4) F = Liquid Petroleum Gas	E
P 12	Boiler address	1 = Single unit A = 1st unit of cascade, DDC System (set P 71 = 1) B … E = Consecutive units of cascade, DDC System (set P 71 = 0)	1
P 13	Function variable output MFA 1	0 = Forward reporting of operation (safety valve LPG) 1 = Forward reporting of lockout 2 = Pump (heating and DHW operation) 3 = Heating circuit pump (heating operation) 4 = DHW load pump (DHW operation) 6 = DHW circulation pump via WCM-FS 7 = Heating circuit pump via WCM-FS #1, #1+2 8 = Permanent voltage 9 = Activation flue gas damper (fixed, when P 11 = EA)	2
P 14	Function variable output MFA 2	0 = Forward reporting of operation (safety valve LPG) 1 = Forward reporting of lockout 2 = Pump (heating and DHW operation) 3 = Heating circuit pump (heating operation) 4 = DHW load pump (DHW operation) 6 = DHW circulation pump via WCM-FS #1, #1+2, #2 7 = Heating circuit pump via WCM-FS #1, #1+2 8 = Permanent voltage	3
P 15	Function variable output VA1	0 = Safety valve LPG 1 = Forward reporting of lockout 2 = Pump (heating and DHW operation) 3 = Heating circuit pump (heating operation) 4 = DHW load pump 6 = DHW circulation pump via WCM-FS #1, #1+2, #2 7 = Heating circuit pump via WCM-FS #1, #1+2	4

Parameters	Basic configuration	Range of values	Factory setting
P 16	Function input H1	0 = Heating circuit release 1 = Heating circuit setback/normal 3 = Standby with frost protection 4 = Return signal flue gas damper (fixed, when P 11 = EA)	1
P 17	Function input H2	0 = DHW release 2 = Heating operation with special level 3 = Burner lockout function 4 = Return signal flue gas damper (fixed, when P 11 = EA)	0
P 18	Special level heating operation (only when P 17 = 2)	8 °C … P 31	60
Parameters	**Weather compensation**	**Range of values**	**Factory setting**
P 20	External sensor adjustment	-4 … 4 K	0
P 23	System frost protection (see Ch. 6.9)	-10 … 10 °C	5
Parameters	**Heat exchanger**	**Range of values**	**Factory setting**
P 30	Minimum supply temperature	8 °C … (P 31 - P 32)	8
P 31	Maximum supply temperature	(P 30 + P 32) … (85 °C - P 32)	79
P 32	Switching differential supply temperature	+1 … 7 K	4
P 33	Switch-off temperature flue gas duct	80 … 120 °C	120
P 34	Burner rapid cycle interlock	1 … 15 min --- = deactivation	5
P 35	Ignition speed	50 … 70 %	60
P 36	Minimum load	24 % … P 37	24
P 37	Maximum load heating operation	P 36 … 100 %	100
P 38	Maximum load DHW	P 36 … 100 %	100
Parameters	**Circulation pump**	**Range of values**	**Factory setting**
P 40	Pump operation mode heating	0 = pump run-on 1 = pump continuous run	0
P 41	Pump run-on time heating operation (only when P 40 = 0)	1 … 60 min	10
P 42	Pump run-on time DHW Deactivation	1 … 10 min ---	3

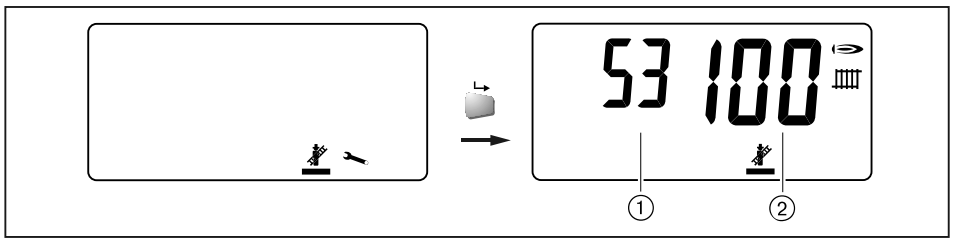
Parameters	Circulation pump	Range of values	Factory setting
P 43	Function speed controlled pump (see Ch. 6.8.2)	--- = No speed controlled pump 1 = Rating pump ~ rating WTC 2 = Rating pump ~ interconnection between supply and return temperature (temperature differential control) or 2 = Rating pump ~ interconnection between supply and de-couple temperature (de-couple control)	---
P 44	Minimum load speed controlled pump heating	20 % … P 45	20
P 45	Maximum load speed controlled pump heating	P 44 … 100 %	100
P 46	Load speed controlled pump in DHW operation (supply pump only)	20 … 100 %	100
P 47	Optimisation de-couple control Supply / de-couple temperature (only when P 43 = 2)	1 … 7 K	2
P 48	Optimisation temperature differential control Supply / return temperature (only when P 43 = 2)	10 … 22 K	20
P 49	Idleness temperature differential control	1 … 62 s	4

Parameters	DHW	Range of values	Factory setting
P 50	Temperature increase during DHW operation	10 … 30 K	10
P 51	Switching differential DHW	-3 … -10 K	-5

Parameters	System + Servicing	Range of values	Factory setting
P 70	Service interval	100 … 500 h x 10 --- = deactivation	400
P 71	eBus feed (only when P 12 = A … E)	0 = not activated 1 = activated	1
ESC	Exit menu	–	–

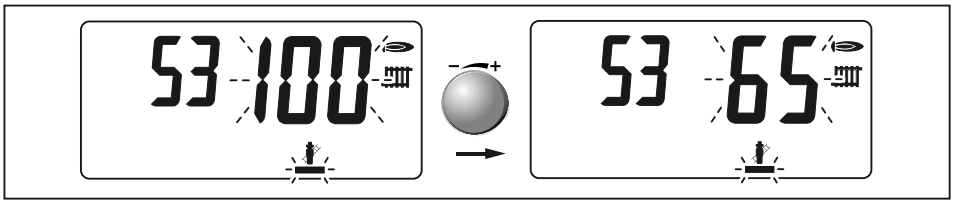
6.4 Manual start up

► Turn the dial knob.
✓ Tool bar appears.
► Set the selection cursor below the chimney sweep symbol.
► Press enter button.
✓ Maximum rating is started.



① Supply temperature
② Rating in %

► Press enter button.
► Set the required rating with the dial knob.
✓ The started rating remains active for 15 minutes.



The burner automatically reduces the rating, when the flow temperature approaches the maximum flow temperature (parameter 31).

Exit manual ratings setting

► Press enter button.
✓ You will exit manual ratings setting.
✓ The last rating set will remain activated for 2 minutes.

The time sequence of 2 minutes can be restarted by turning the dial knob in the heating engineer level within these 2 minutes. This provides the possibility of calling up system values in the info level at the relevant rating.

Display system values

► Activate info level (see Ch. 6.3).
✓ System values of the most recently set rating can be displayed.

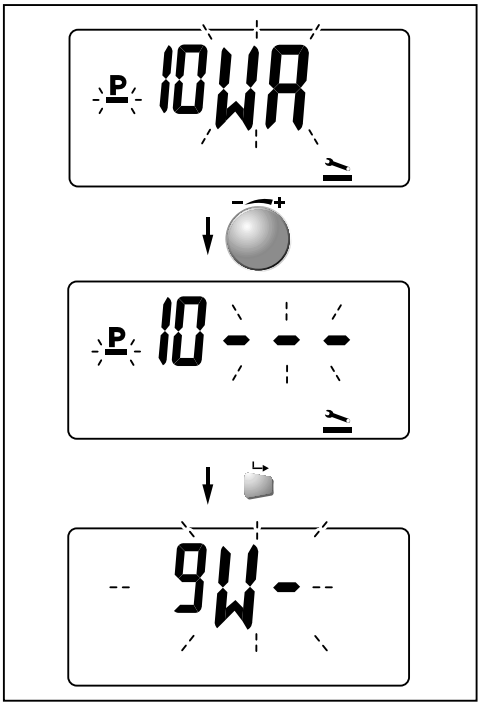
6.5 Start manual configuration

Manual configuration is used to match the settings with unit version. All sensors and actuators are re-entered during this process (see Ch. 7.2).

- ► Activate parameter level (see Ch. 6.3).
- ► Select parameter 10.
- ✓ Current configuration appears.
- ► Press enter button.
- ► Turn the dial knob until --- appears.
- ► Press enter button.
- ✓ New configuration is located and displayed.
- ► Press enter button.
- ✓ The configuration is stored.

Example

External sensor has been removed.



6.6 Control options

Constant flow temperature control

No additional sensors or thermostats are required for this control. The flow temperature is controlled at the value set in the end user level (see Ch. 6.2.2).

Weather compensation

A remote control station (WCM-FS) and an external sensor (QAC 31) are required for weather compensated control.

- ► Mount the external sensor to the north side or the north-west side of the building, half way up (min 2.5 m).

Avoid direct solar radiation and heat up by external heat sources.

- ► If necessary carry out a temperature adjustment of the external sensor via parameter 20.

DHW operation

DHW operation takes priority over the heating operation.
DHW preparation is carried out when the temperature in the water heater drops below the DHW setpoint value minus switch differential (parameter 51).

6.7 Control options

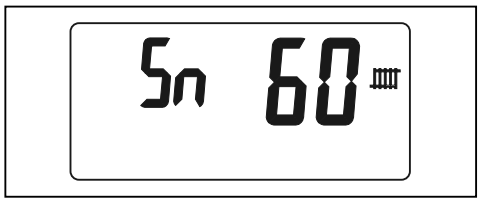
Heating operation with special level

This function is also effective in the Summer setting.

► Set parameter 17 at 2.

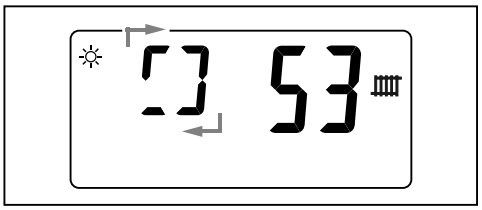
When contact H2 is closed, the system heats up to the temperature level preset in parameter 18. Higher target values of additional heating circuits will be taken into consideration. DHW loading usually takes precedence. If the contact is open the temperature is stipulated by the existing control variation.

When the heating operation with special level is activated, Sn and the current flow temperature will be displayed.



Dynamic burner rapid cycle interlock

The dynamic burner rapid cycle interlock prevents the burner from starting too often. It functions depending on certain boiler temperatures and cannot be deactivated. It is independent of parameter 34.



6 Operation

Temperature remote control 2 … 10 V

► Connect analogue setpoint signal 2 … 10 V to input N1 (see Ch. 5.6.1).
✓ Signal is interpreted as supply setpoint.

3 V	Minimum flow temperature (P 30)
10 V	Maximum flow temperature (P 31)
2 … 3 V	Burner off
<2 V	Signal fault (after ca. 15 minutes W89)

A maximum of six extension modules (WCM-EM) can be installed if a control signal is connected at input N1.

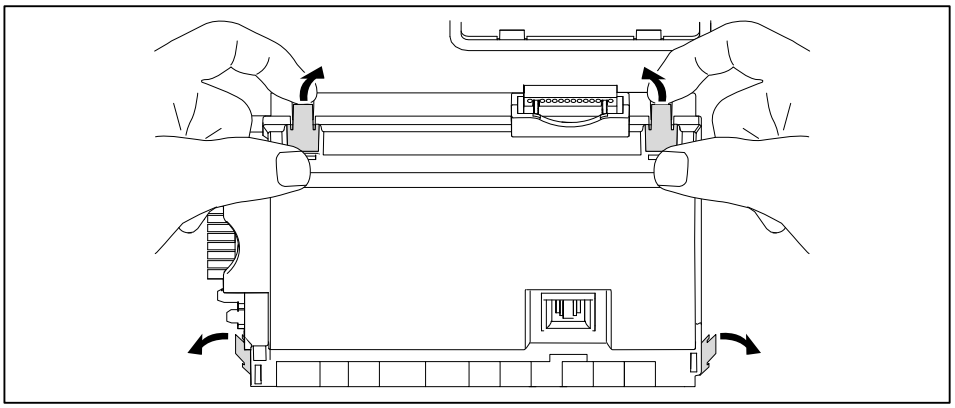
Temperature remote control 4 … 20 mA

It is possible to use input N1 as current input 4 … 20 mA. To do this, a switchover must be made via a jumper on the circuit board.

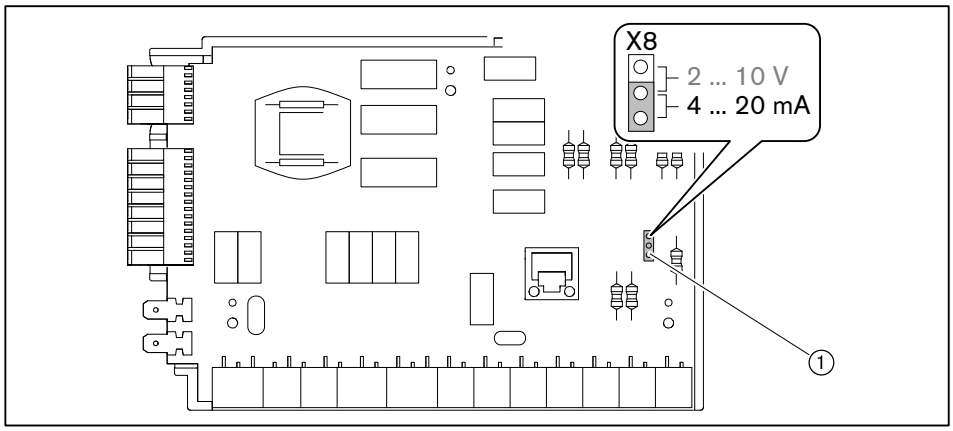
DANGER

Electric shock when working with voltage applied
The consequence is serious injury or death.
► Isolate unit from mains prior to carrying out work.

► Switch off system.
► Remove housing cover from connection box.



► Change over red jumper ① on circuit board.



6.8 Boiler circuit pump

6.8.1 General information

The unit can drive an external boiler circuit via outputs MFA 1, MFA 2 or VA1.

The pump remains activated as long as heat requirement prevails. When no more heat is needed, the pump runs for the specified run-on time (NLZ) preset in parameter 41.
Continuous pump operation can be set with parameter 40, if this is required.

Pump control logic

Type of operation	Standby/ Summer			
Control option	with external sensor		without external sensor	
Setting P 40	P 40 = 1	P 40 = 0	P 40 = 1	P 40 = 0
Pump operation	NLZ, OFF	NLZ, OFF	Continuous operation	NLZ, OFF

Type of operation	Winter			
Control option	with external sensor		without external sensor	
Setting P 40	P 40 = 1	P 40 = 0	P 40 = 1	P 40 = 0
Pump operation	Continuous operation	NLZ, OFF(1	Continuous operation	Continuous operation

(1 The specified functions for the pump control apply to setback operation. In normal operation, the pump runs continuously and independently of P 40.

6.8.2 Speed controlled pump

If a speed controlled pump is used, the control is carried out via a PWM control signal. Without control signal the PWM pump control to 100 %.

► Connect control signal at plug (see Ch. 5.6.1).

Standard control

Here, the pump rating is assigned to the required burner load. The pump is operated at minimum load when the burner is switched off.

► Set parameter 43 at 1.
► Set the modulation limits for the pump via parameter 44 and 45.

Temperature differential control

With this control option, the pump is controlled depending on the differential temperature between the flow and return sensors set in parameter 48.

► Set parameter 43 at 2.

De-couple control

With this control option, the pump is controlled depending on the differential temperature between the de-couple sensor and the flow sensor. The differential temperature control prevents a return flow temperature increase caused by unbalanced volume flows in the primary and secondary circuit. The function can be adapted to the conditions of the system via parameter 47.

As the control influences the de-couple sensor, DHW loading is not possible ahead of the hydraulic de-couple.

► Set parameter 43 at 2.
► Connect de-couple sensor to input B11.

6.9 Frost protection

Boiler frost protection

Flow temperature < 8°C
- Burner is operated at minimum load.
- Outputs MFA and VA are active, if they have been parametered as heating circuit pump or feeder pump.

Flow temperature > 20 °C:
- Burner switches off,
- Pump run-on is activated (parameter 41).

System frost protection (with external sensor)

External temperature < system frost protection temperature (parameter 23) minus 5 Kelvin:
- Outputs MFA and VA are active, if they have been parametered as heating circuit pump or feeder pump,
- load pumps on eBus are active,
- thermal protection via boiler frost protection.

External temperature > system frost protection temperature (parameter 23)

Pump continuous run is deactivated.

DHW frost protection (version W)

DHW temperature < 8°C
- Burner is operated at minimum load.
- Outputs MFA and VA are active, if they are parametered as feeder pump, DHW load pump or circulation pump.

DHW temperature > 8 °C plus half the DHW switch differential (parameter 51):
- Burner switches off,
- Pump run-on is activated (parameter 42).

During DHW frost protection, the tap symbol flashes in the display.

6.10 Inputs and outputs

Different applications can be realised with the freely selectable inputs and outputs.

Output MFA and VA

Output MFA is a non-isolated relay output. Output VA is potential free.

All relay outputs can have a maximum loading of 3 A (AC1). The maximum total current from all external loads must not exceed 4.5 A.

Setting parameters 13, 14, 15	**Description**
0 = forward reporting of operation (safety valve LPG)	The contact closes as soon as heat demand is present or if the gas supply is insufficient.
1 = Forward reporting of lockouts and warnings	The contact closes as soon as a fault occurs or when a warning is triggered for at least 4 minutes.
2 = external feeder pump	The output is activated in the same way as an internal heating circuit pump (for heating and DHW).
3 = External heating circuit pump	The output is activated during heating operation.
4 = DHW load pump	The output is activated during DHW operation.
6 = DHW circulation pump via WCM-FS	The output is activated depending on the WCM-FS.
7 = Heating circuit pump via WCM-FS	Single unit (parameter 12 = 1) The output is activated when heating operation is requested by the WCM-FS. When there is no longer a demand for heat, the pump runs on for 3 minutes. The output is deactivated immediately DHW loading is carried out (DHW priority). Cascade (parameter 12 = A … E) The output is activated by the cascade manager.
8 = Permanent voltage (only parameters 13, 14)	The output is permanently active.
9 = Flue gas damper (only parameter 13)	The output is activated prior to burner start to open the flue gas damper.

Input H1

Setting parameter 16	**Description**
0 = Release of heat exchanger in heating operation	The release is given for heating operation when the input is closed. The WTC is disabled for heating operations when the input is open.
1 = Heating circuit setback / normal	The normal setpoint is effective when the input is closed. The setback value is effective when the input is open.
3 = Standby with frost protection	The system is in standby when the input is closed. The operating modes DHW and heating are disabled. Frost protection is activated. Systems with external WCM-FS or WCM-EM heating circuits are also disabled.
4 = Return signal flue gas damper open	Burner start is only released once the flue gas damper is open and a return signal has been sent to H1.

Input H2

Setting parameter 17	**Description**
0 = Release of heat exchanger in DHW operation	The release for DHW is given when the input is closed. The WTC is disabled for hot water operation when the input is open.
2 = Heating operation with special level	(see Ch. 6.7)

Setting parameter 17	Description
3 = Burner lockout function	The boiler and the pump switch off when the input is closed. Frost protection is not activated. The display shows W24, when the contact is closed. For example, this function can be used to connect a safety switch of a condensate lift pump.
4 = Return signal flue gas damper closed	When the flue gas damper is closed, a return signal is sent to H2.

6.11 Special system parameters

System parameters can be set in the heating engineer level. In rare cases it may be necessary to more closely adapt the WTC to the heating system using the WCM Diagnostic Software. For further information see the Software Operating Instructions.

For remote control with WCM-FS the eBus adapter WEA must be supplied with voltage via a separate mains adapter.

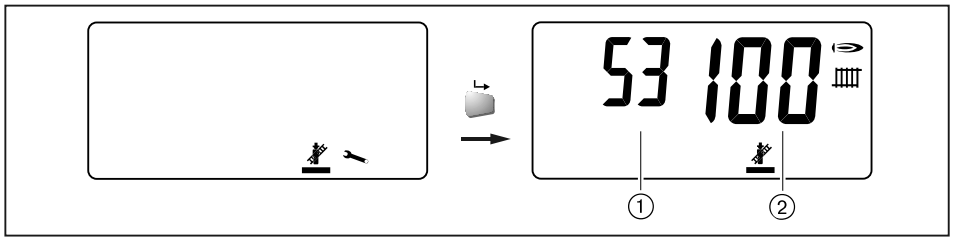
Desc.	Parameters	Range of values	Unit	Factory setting
A1	HC and DHW controller P Part	1 … 255		8
A2	HC and DHW controller I Part	1 … 255		2
A4	Fan controller P Part	1 … 255	x 0.25	6
A5	Fan controller I Part	1 … 255	x 0.125 s	4
A6	Fan controller adjustment	0 … 15		1
A7(1	Fan controller start PWM	15 … 30	%	24
A10	Max fan speed boiler	6600 … 7200	rpm	6900
A11	Max speed change (modulating up)	60 … 360	rpm/s	120
A12	Max speed change (modulating down)	60 … 360	rpm/s	120
A13	Max speed change (modulating down after burner start)	30 … 360	rpm/s	180
A14	Rating delayed heating operation	24 … 100	%	24
A15	Duration delayed heating operation	0 … 5	min	2
A21(1	Max temperature spread Flow B12/return B13	20 … 40	K	40
A22(1	Max temperature spread Flow eSTL/B12	20 … 25	K	25
A23(1	Max temperature gradient eSTL (0 = no monitoring)	0.5 … 2.0	K/s	2.0
A31	Max run time flue gas damper	15 … 35	s	25
A32	PWM setpoint pump inverse	0 / 1	–	1

(1 Parameter is safety relevant. Alterations are only permitted following consultation with the Weishaupt service department.

6.12 Chimney sweep function

Activate chimney sweep function

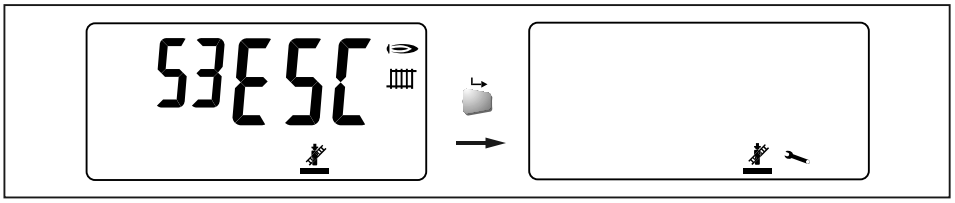
► Turn the dial knob.
✓ Tool bar appears.
► Set the selection cursor below the chimney sweep symbol.
► Press enter button.
✓ The chimney sweep function remains active for 15 minutes.



① Supply temperature
② Rating in %

Deactivate chimney sweep function.

► Turn the dial knob.
✓ ESC appears.
► Press enter button.
✓ Chimney sweep function is deactivated.



The standard display re-appears after approx. 90 seconds.

7 Commissioning

7.1 Prerequisite

The commissioning may only be carried out by qualified personnel.

Only correctly carried out commissioning ensures the operational safety of the unit.

► Prior to commissioning check:
- All installation work must be completed and checked prior to commissioning.
- Electrical installation duly completed, electric circuits duly fused and measures for contact protection of electrical components and of all wiring checked.
- Boiler and heating system have been adequately filled with water and vented.
- Siphon has been filled.
- An adequate supply of fresh air is guaranteed.
- The flue gas ducts and combustion air ducts are unimpeded.
- All regulating, control and safety devices are functioning and set correctly.
- Heat demand is ensured.

Additional system-related tests could be necessary. Please observe the operating guidelines for the individual components.

7.1.1 Check soundness of gas valve train

Soundness test

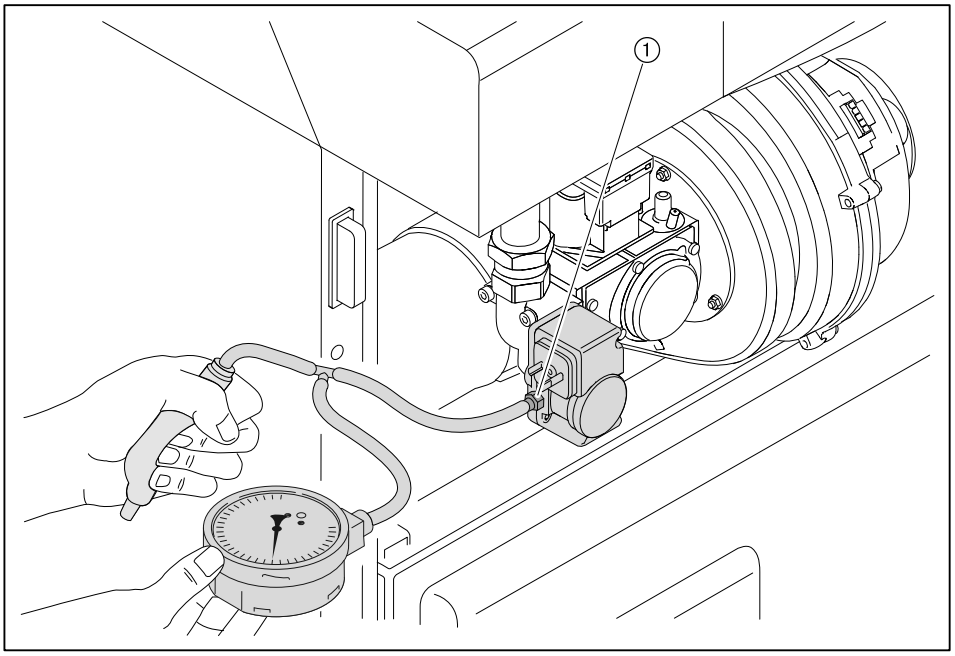
- ▶ Carry out soundness test:
  - prior to commissioning,
  - after all service and maintenance work.
- ▶ Switch off system.
- ▶ Close gas isolating valve.
- ▶ Open screw on test point Pe ① of the gas pressure switch.
- ▶ Connect test equipment to Pe.
- ▶ Generate test pressure of 100 … 150 mbar.
- ▶ Wait for pressure equalisation for 5 minutes.
- ▶ Initiate a test period of 5 minutes.
- ▶ Check pressure loss.

✓ The gas section is sound, if the pressure does not drop by more than 1 mbar.

DANGER

Risk of explosion due to leaking gas
Improper work can lead to escaping gas and explosions.
- ▶ Tightly close screws after working on the test points of the gas combi valve.

- ▶ Document result of the soundness test on the engineers report.



7.1.2 Check gas connection pressure

The gas connection pressure must be within the following ranges:

Natural Gas E/H	17.0 … **20** … 25.0 mbar
Natural Gas LL	20.0 … **25** … 30.0 mbar
Liquid Petroleum Gas P (*P*n 37)	25.0 … **37** … 45.0 mbar
Liquid Petroleum Gas P (*P*n 50)	42.5 … **50** … 57.5 mbar

- ► Open screw on test point Pe the gas pressure switch (see Ch. 7.1.1).
- ► Connect pressure measuring device.
- ► Slowly open isolating valve whilst checking the pressure increase.

Gas connection pressure exceeds 60 mbar pressure:
- ► Immediately close isolating valve.
- ► Do not start plant.
- ► Inform system operator.

Gas connection pressure is insufficient:
- ► Do not start plant.
- ► Inform system operator.

DANGER

Risk of explosion due to leaking gas
Improper work can lead to escaping gas and explosions.
- ► Tightly close screws after working on the test points of the gas combi valve.

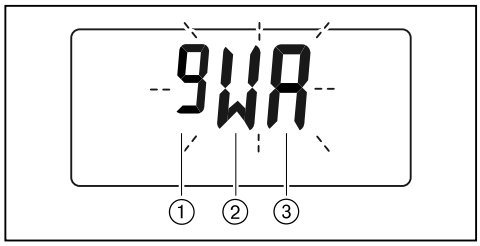
7.2 Adjusting the boiler

- ► During commissioning check:
  - Maximum possible water throughput is ensured.
  - Heat up is carried out with low flow temperatures and at low rating.
  - Operate all boilers on multi boiler systems at the same time at low rating.
  - Gas connection pressure at maximum rating within range (see Ch. 7.1.2).

1. Configuring the system

- ► Close gas isolating valve.
- ► Switch on system at switch S1 (see Ch. 6.1.1).

On activation of the voltage supply the WTC recognises the boiler type, all connected sensors and actuators. The recognised configuration is indicated by a flashing display every 30 seconds.



①	Unit type	9 = WTC 90 P3 = De-couple sensor(1
②	Version	H = heating operation W = heating operation and DHW operation
③	External sensor	A = external sensor – = no external sensor

(1 If a de-couple sensor has been fitted P3 will be displayed after approx. 7 seconds.

- ► Press enter button.

✓ The configuration is stored.

The display shows W47 because the gas isolating valve is closed.

If the enter button is not activated within 30 seconds, the configuration will be stored automatically after 24 hours. The configuration can also be started manually (see Ch. 6.5). A configured boiler indicates the saved configuration whenever the power supply is switched on.

The boiler must be reconfigured if sensors or actuators are replaced (see Ch. 6.5). Automatic configuration is only performed during the initial commissioning.

2. Set parameters

- ► Activate parameter level (see Ch. 6.3).
- ► Select individual parameters and adapt to the requirements of the system.

7 Commissioning

3. Adjust combustion

The condensing boiler is factory preset to Natural Gas E, H (G20).

The O_2 content must be checked and if necessary adjusted.

If the WTC is operated with Liquid Petroleum Gas continue with chapter "Changing gas"type" (see Ch. 7.3).

Set O_2 content at maximum rating

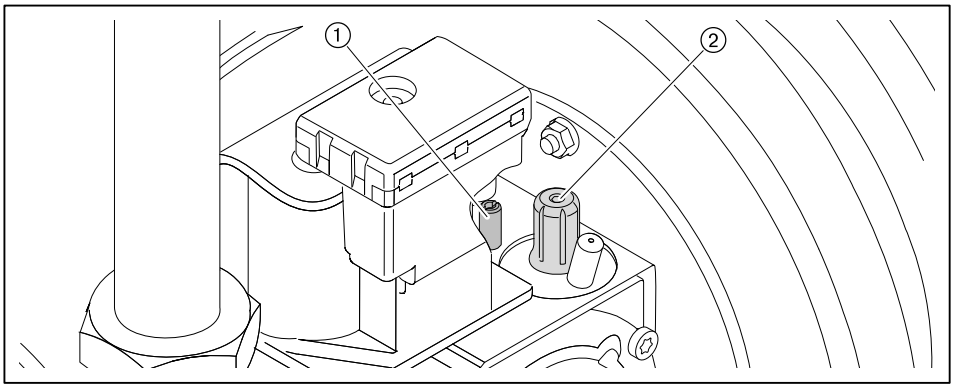
- ► Open gas isolating valve.
- ► Manually drive rating to maximum (see Ch. 6.4).
- ► Check combustion and if necessary adjust.

When changing the rotational direction of setting screw ①, the O_2 content only changes after approx. $^1/_2$ a rotation.

- ► Set O_2 content at the setting screw (Inbus 2.5) ① to table:
  - Clockwise rotation = O_2 content increases
  - Anticlockwise rotation = O_2 content decreases

Set O_2 content at minimum rating.

- ► Manually drive rating to minimum (see Ch. 6.4).
- ► Check combustion and if necessary adjust.
- ► Set O_2 content at the setting screw (Inbus 2.5) ② to table:
  - Anticlockwise rotation = O_2 content increased
  - Clockwise rotation = O_2 content reduces



	O_2 minimum rating	O_2 maximum rating
Natural Gas	4.6 % ±0.2	4.3 % ±0.2

7 Commissioning

4. Concluding work

DANGER

Risk of explosion due to leaking gas
Improper work can lead to escaping gas and explosions.
► Tightly close screws after working on the test points of the gas combi valve.

► Recheck O_2 content at maximum and minimum rating and optimise if necessary.
► Close the test points and replace covers.
► Enter combustion values and settings in the commissioning record.
► Inform the operator about the use of the equipment.
► Hand the installation and operating manual to the operator and inform him that this must be kept on site.
► The operator should be told that the installation must be serviced annually.

If the type of gas is different to the factory set type:
► Apply the enclosed sticker for type of gas and gas pressure.

7.3 Change gas type

Change over WTC to operation with Liquid Petroleum Gas

- ► Close gas isolating valve.
- ► Turn setting screw ① 2 rotations to the right.
- ► Set parameter 11 to F (see Ch. 6.3.2).

Set O_2 content at maximum rating

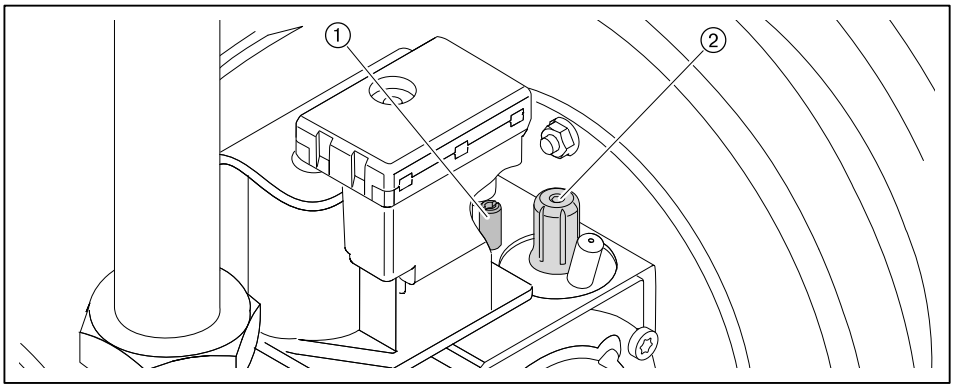
- ► Open gas isolating valve.
- ► Manually drive rating to maximum (see Ch. 6.4).
- ► Check and adjust combustion.

When changing the rotational direction of setting screw ①, the O_2 content only changes after approx. $^1/_2$ a rotation.

- ► Set O_2 content at the setting screw (Inbus 2.5) ① to table:
  - Clockwise rotation = O_2 content increases
  - Anticlockwise rotation = O_2 content decreases

Set O_2 content at minimum rating.

- ► Manually drive rating to minimum (see Ch. 6.4).
- ► Check and adjust combustion.
- ► Set O_2 content at the setting screw (Inbus 2.5) ② to table:
  - Anticlockwise rotation = O_2 content increased
  - Clockwise rotation = O_2 content reduces



	O_2 minimum rating	O_2 maximum rating
Liquid Petroleum Gas P	5.3 % ±0.2	4.8 % ±0.2

LPG safety valve

- ► Connect valve to output VA1 (see Ch. 5.6.1).
- ► Set parameter 15 to 0 (see Ch. 6.3.2).

7 Commissioning

Concluding work

DANGER

Risk of explosion due to leaking gas
Improper work can lead to escaping gas and explosions.
► Tightly close screws after working on the test points of the gas combi valve.

► Recheck O_2 content at maximum and minimum rating and optimise if necessary.
► Close the test points and replace covers.
► Enter combustion values and settings in the commissioning record.
► Inform the operator about the use of the equipment.
► Hand the installation and operating manual to the operator and inform him that this must be kept on site.
► The operator should be told that the installation must be serviced annually.

If the type of gas is different to the factory set type:
► Apply the enclosed sticker for type of gas and gas pressure.

7.4 Calculating the burner rating

V_B	Operating volume in m^3/h (gas throughput)
V_N	Normal volume in m^3/h (gas throughput at 0 °C and 1013 mbar)
V_G	Gas throughput determined at gas meter
T_M	Time measured during gas throughput determination (V_G)
f	Conversion factor
t_{Gas}	Gas temperature at meter in °C
P_{Gas}	Gas pressure at meter in mbar
P_{Baro}	Barometric air pressure in mbar (see table)
Q_F	Combustion heat rating in kW
H_i	Calorific value in kWh/m^3 (at 0 °C and 1013 mbar)

Determine operating volume (gas throughput)

- ► Measure gas throughout V_G at gas meter, measuring time T_M should be a minimum of 60 seconds.
- ► Calculate operating volume (V_B) using the following formula.

$$V_B = \frac{3600 \cdot V_G}{T_M}$$

Calculate conversion factor

- ► Determine gas temperature (t_{Gas}) and gas pressure (P_{Gas}) at gas meter.
- ► Determine air pressure (P_{Baro}) from the following table.

Height above sea level (m)	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
P_{Baro} in mbar	1013	1001	990	978	966	955	943	932	921	910	899	888	877	866

- ► Calculate conversion factor (f) using the following formula.

$$f = \frac{P_{Baro} + P_{Gas}}{1013} \cdot \frac{273}{273 + t_{Gas}}$$

Calculate normal volume

- ► Calculate normal volume (V_n) using the following formula.

$$Q_F = V_N \cdot H_{i,n}$$

Calculate burner rating

- ► Calculate burner rating (Q_{Br}) using the following formula.

$$Q_{Br} = V_N \cdot H_{i,n}$$

8 Shutdown

- ► Switch off the boiler and close the fuel shut-off devices during extended shut down periods.
- ► The system must be drained if there is a risk of frost during extended shut down periods.

9 Servicing

DANGER

Risk of explosion due to leaking gas
Improper service and maintenance work can lead to escaping gas and explosions.
- ► Close fuel shut off devices prior to any service work.
- ► Care should be taken when dismantling and assembling gas carrying system components.
- ► Tightly close the screws on the test points.

DANGER

Electric shock when working with voltage applied
The consequence is serious injury or death.
- ► Isolate unit prior to carrying out service work and protect against accidental reconnection to the mains.

DANGER

Danger of poisoning by escaping flue gas
Inhalation leads to dizziness, nausea and eventually death.
- ► Check the fill level of the siphon at regular intervals and replenish, if necessary, in particular when the system has been shut down for longer periods or has been operated at high return temperatures (> 55 °C).

WARNING

Danger of getting burned on the unit
Hot components can lead to burns.
- ► Allow components to cool before touching.

The operator should ensure that the combustion plant is serviced at least once a year. Service work must only be carried out by qualified personnel with the relevant expertise. Depending on site conditions it may be necessary to inspect the installation more frequently. During the service, all system components with high wear and tear or with a specific life span should be replaced.

Weishaupt recommends a service contract is entered into to ensure regular inspections.

Prior to every servicing

- ► Inform operator.
- ► Switch off mains switch of installation and safeguard against accidental reactivation.
- ► Close fuel shut off devices.
- ► Remove front panel (see Ch. 4).

- ► Carry out servicing in accordance with the enclosed inspection card (Print No. 7570).

After every servicing

- ► Check soundness of gas valve train (see Ch. 7.1.1).
- ► Check soundness of flue gas and condensate carrying components.
- ► Check tightness of water carrying components.
- ► Check tightness of air carrying components.
- ► Check combustion values and O_2 content, if necessary re-adjust.
- ► Enter combustion values and settings in the commissioning record.
- ► Refit front panel.

9.1 Safety components

Vital safety components must be replaced as soon as they reach their predefined lifetime.

The predefined lifetime is not the warranty time specified in the terms and conditions of delivery and payment.

Safety component	Lifetime according to construction	CEN-Standard
Printed circuit board (WCM-CPU)	10 years or 250 000 operating cycles	EN 298-2003
Gas combi valve	10 years or 250 000 operating cycles	EN 126-1993
Gas pressure switch	10 years	EN 1854-1997
Air pressure switch	10 years	EN 1854-1997
Flue gas pressure switch	1 000 000 operating cycles	EN 1854-1997
Gasket fan air outlet	10 years	EN 549 H3/B1
O ring 70 x 3 Gas valve/fan	10 years	EN 549 H3/B1
O ring 33 x 2 Gas valve/gas connection piece	10 years	EN 549 H3/B1
O ring 10.5 x 2.25 Pressure switch/gas connection piece	10 years	EN 549 H3/B1
Safety valve 3 bar	10 years	TRD 721-1997

9.2 Servicing display

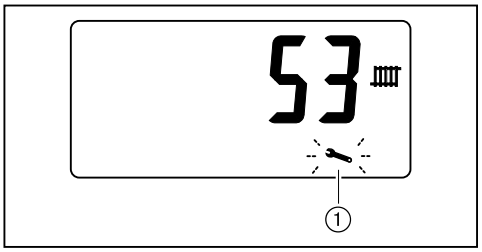
The time interval to the next service can be set. A flashing spanner will appear in the display when the set interval has expired. `Servicing` is displayed, if a remote control station is used.

Setting the service interval

- ► Activate parameter level (see Ch. 6.3).
- ► Set service interval via parameter `70`.

Resetting the service display

The service display ① must be reset after servicing.

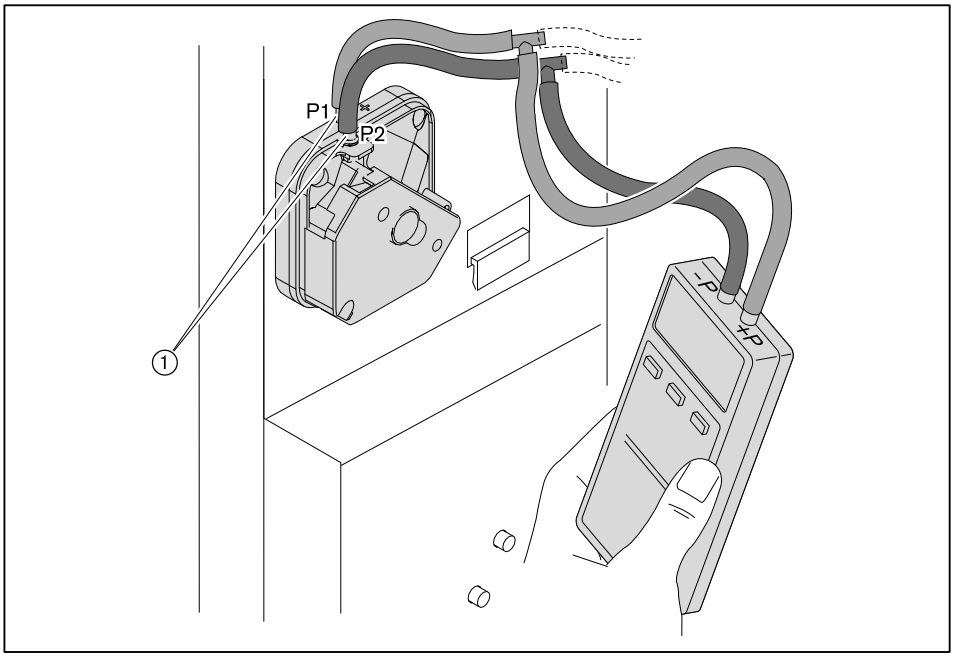


- ► Activate info level (see Ch. 6.3).
- ► Select `46` in Info level i (see Ch. 6.3.1).
- ► Press enter button for 2 seconds.
- ✓ Service display and timer will be reset.

9.3 Check differential pressure at air pressure switch

Observe notes on servicing (see Ch. 9).

- ► Remove right side panel.
- ► Remove hoses from the test points ① on the air pressure switch.
- ► Connect test equipment:
  - + to P1,
  - - to P2.



During testing the maximum heating operation rating (parameter 37) must be set 100 %.

- ► Switch on main switch.
- ► Check parameter 37, if necessary set to 100 %.
- ► Manually drive to rating (see Ch. 6.4).
- ► Set rating to 70 %.
- ► Read differential pressure from measuring device.

If the pressure is above 1.2 mbar the test is ok.

If the pressure is lower:

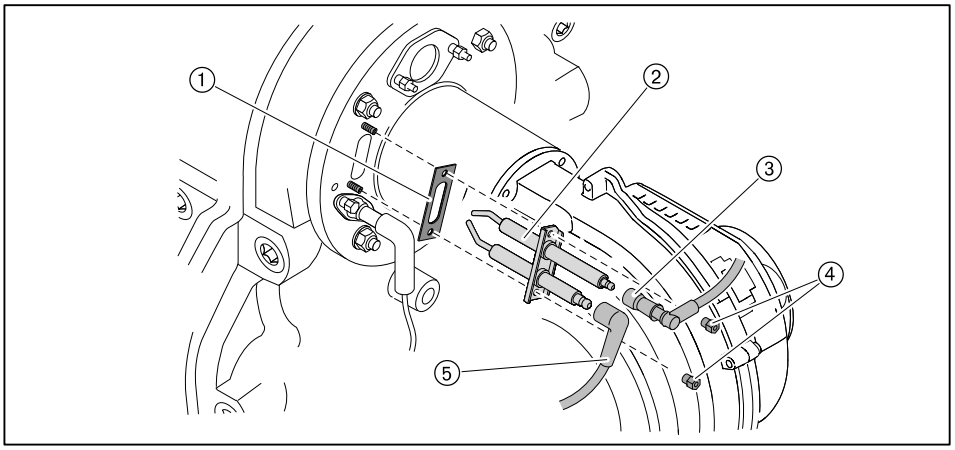
- ► Check the following components:
  - Hoses of the air pressure switch
  - Burner tube for soiling
  - Heat exchanger for soiling
  - Air and flue gas ducting unimpeded
- ► If necessary reset parameter 37 after testing.

9.4 Replacing electrodes

Observe notes on servicing (see Ch. 9).

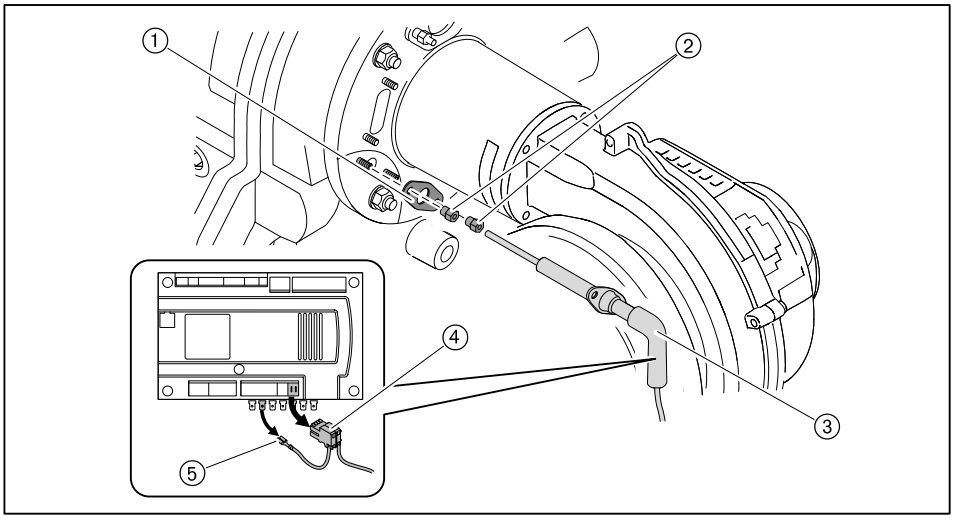
Ignition electrode

- ▶ Remove the ignition plug ⑤ and the earth wire ③.
- ▶ Remove bolts ④.
- ▶ Replace ignition electrode ② and gasket ①, whilst observing the ignition electrode distance of 4.0 mm.



Ionisation electrode

- ▶ remove plug (X14) ④ and earth wire ⑤ from boiler electronics.
- ▶ Remove bolts ②.
- ▶ Replace ionisation electrode ③ and gasket ①.

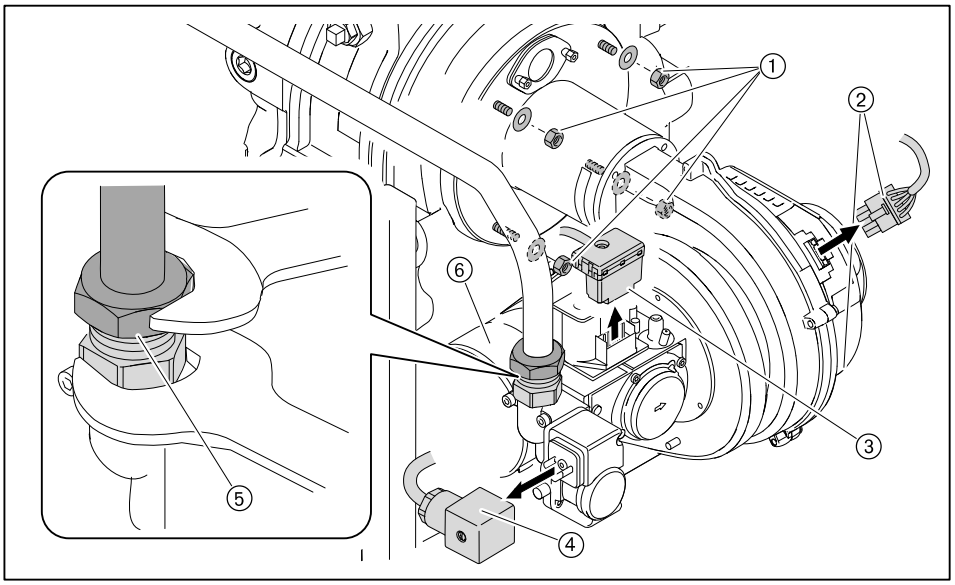


9.5 Removing and refitting burner tube

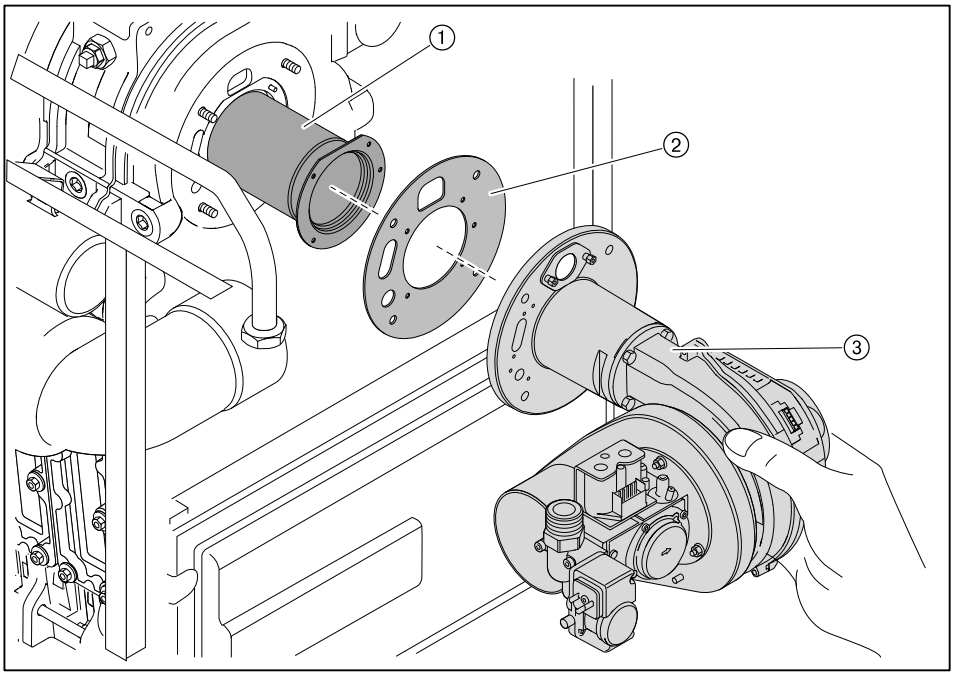
Observe notes on servicing (see Ch. 9).

Removing

- ▶ Close gas isolating valve.
- ▶ Remove electrodes (see Ch. 9.4).
- ▶ Remove plugs for gas pressure switch ④, gas valve ③ and fan ②.
- ▶ Undo screwed union ⑤ on gas pipe, counter holding with a spanner.
- ▶ Loosen clamp ⑥ on air intake pipe and push on to gas/air interconnection.
- ▶ Remove hoses on gas/air interconnection.
- ▶ Remove nuts ① with spring washers on burner flange.



- ▶ Remove burner flange with gas/air interconnection ③.
- ▶ Remove gasket on burner flange ②.
- ▶ Remove burner tube ①.
- ▶ Remove deposits from combustion chamber.
- ▶ Check burner tube for visible damage, replace if necessary.



9 Servicing

Cleaning the burner tube

Clean burner tube if required:

- ► Clean the inside of the burner tube (if necessary use compressed air to blow through from outside to inside).
- ► If dust deposits are present, brush out burner fleece using a soft brush to prevent damaging the burner fleece.

Once finished cleaning, ensure that the fibres of the burner fleece do not stick out too far in the area near the ionisation electrode (danger of short circuit with ionisation electrode).

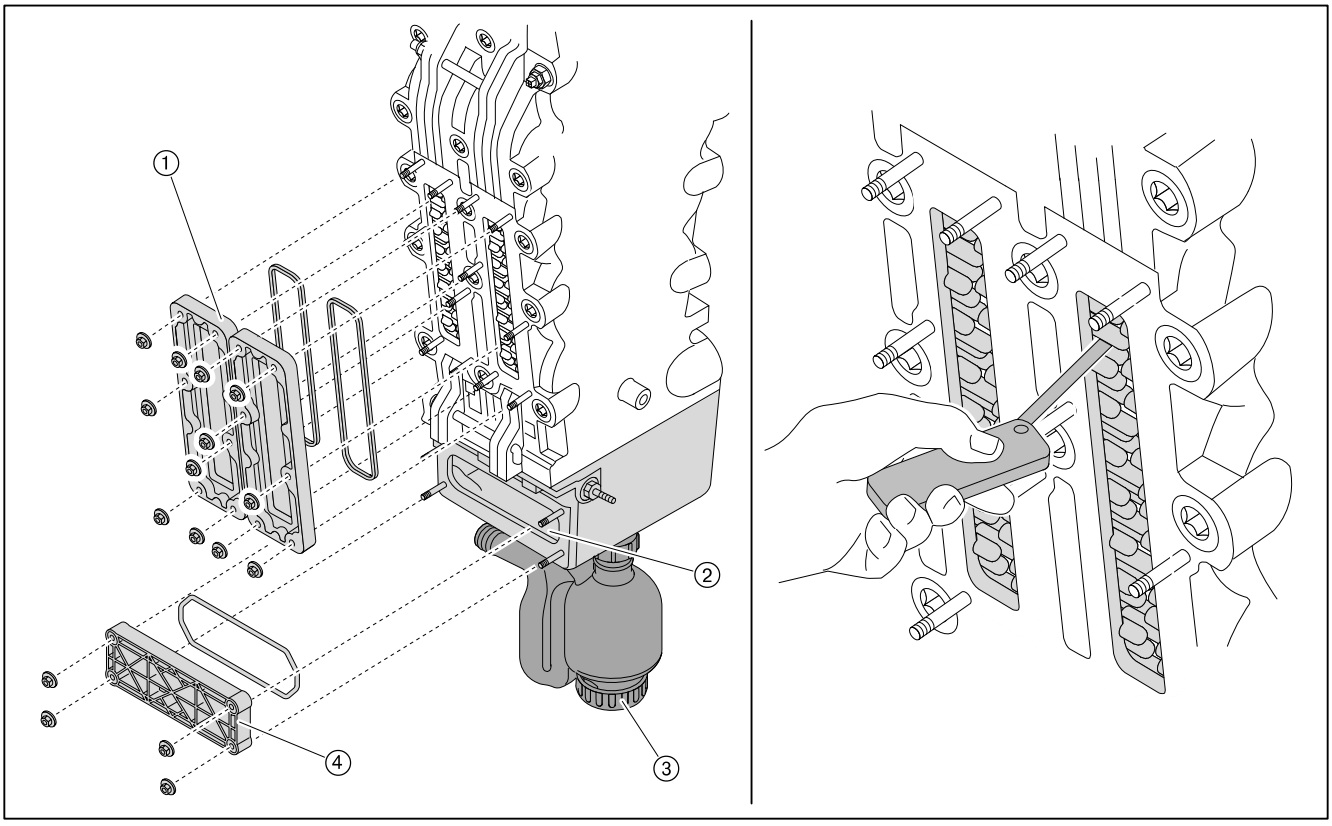
Refitting

- ► Refit burner tube in reverse order by:
  - fitting burner tube to locator pins in heat exchanger and ensuring correct alignment of groove pins,
  - replacing burner flange gasket and gas gasket,
  - and observing correct fitting of hoses (see Ch. 12.3).

9.6 Cleaning the heat exchanger

Observe notes on servicing (see Ch. 9).

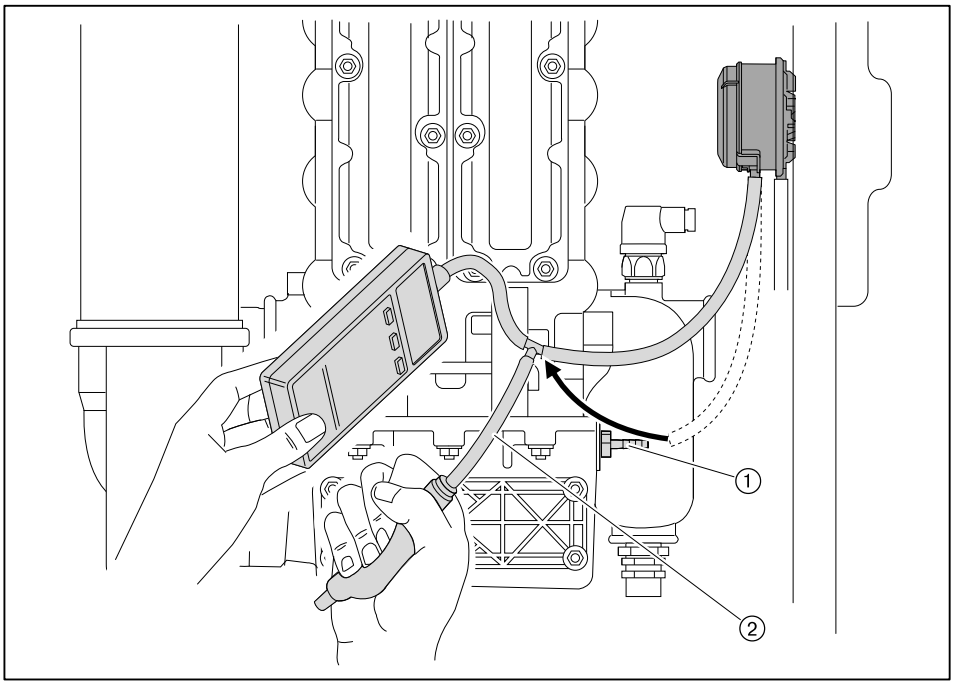
- ► Remove left panel.
- ► Remove service covers from heat exchanger ① and the condensate collector ④.
- ► Clean heat exchanger using the cleaning kit (accessory).
- ► Remove deposits from heat exchanger and condensate collector ②.
- ► Remove closing cap ③ and clean siphon.
- ► Fill siphon with water.
- ► Replace seals of service covers.
- ► Close all covers.



9.7 Check flue gas pressure switch

Observe notes on servicing (see Ch. 9).

- ► Switch on main switch.
- ► Set boiler to Standby (see Ch. 6.2.2). If a remote control station is fitted, see operating instructions WCM-FS.
- ► Remove pressure measuring hose from test point ① on the condensate collector.
- ► Check pressure measuring hose for damage.
- ► Connect test equipment ②.
- ► Generate test pressure of > 5.5 mbar.
- ✓ The flue gas pressure switch functions correctly if the display shows `F38`.



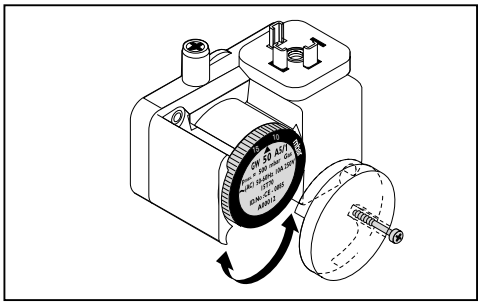
- ► Reconnect pressure measuring hose.
- ► Reset system using [reset] button.
- ► Exit Standby mode.

9.8 Check gas pressure switch

► Check setting of 13 mbar and adjust if necessary.

► Drive burner to 40 … 50 % of the rating.
► Slowly close gas isolating valve.
✓ The gas pressure drops.

The flue gas pressure switch functions correctly, if the burner switches off and the display shows W47.



9.9 Removing and refitting fan

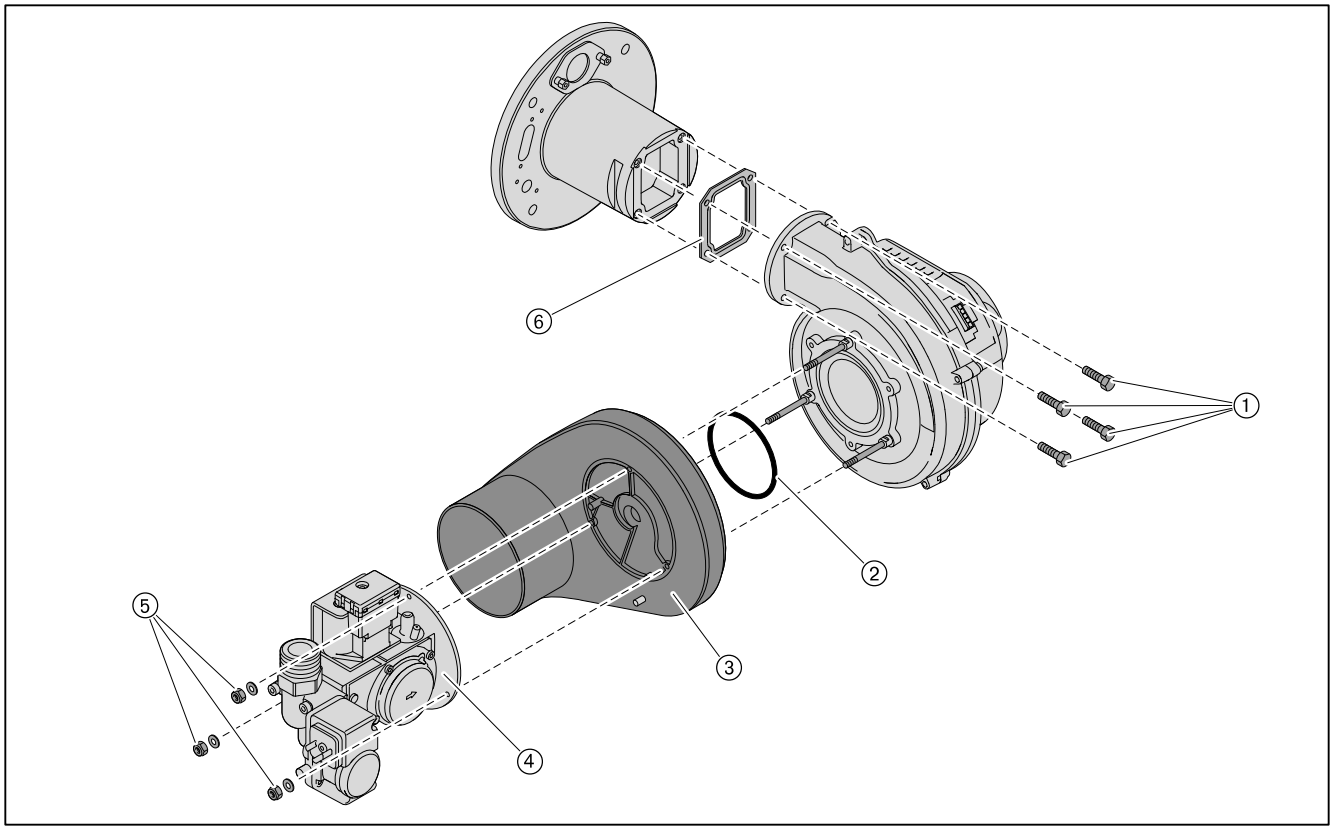
Observe notes on servicing (see Ch. 9).

Removing

- ► Remove burner flange with gas/air interconnection (see Ch. 9.5).
- ► Remove nuts ⑤ with spring washers, remove gas valve ④ and air intake collector ③.
- ► Undo and remove screws ① and remove fan.

Refitting

- ► Refit fan in reverse order, ensuring:
  - correct seating of O rings ② and gasket ⑥.
  - Tighten nuts ⑤ with a torque of 1.5 Nm.



The air intake collector ③ is glued together and must not be opened.

10 Troubleshooting

10.1 Procedures for fault conditions

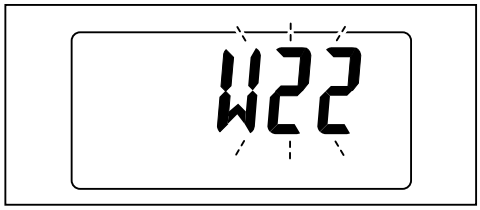
CAUTION

Damage resulting from incorrect servicing
The combustion plant could be damaged.
- ► Do not carry out more than 2 lockout resets successively.
- ► Faults must be rectified by qualified personnel.

Irregularities of the boiler operation are detected and indicated by a flashing display. A distinction is made between warnings and faults.

Warnings

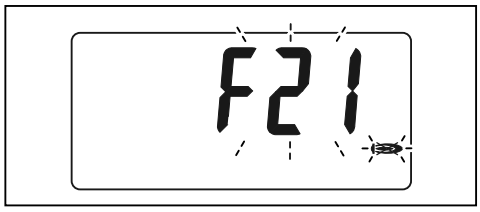
A warning is indicated with a W and a number in the display. The signal will extinguish automatically as soon as the cause of the warning has been eliminated. The boiler does not lock out during a warning.



- ► Read the warning code.
- ► Rectify the cause of the warning with the aid of the table in chapter 10.3.1.
- ► If a warning appears more than once, the system should be checked by qualified personnel.

Faults

A fault is indicated with an F and a number in the display. If a fault occurs, the systems goes to lockout.



- ► Read the fault code.
- ► Rectify the cause of the fault using the table in chapter 10.3.2.
- ► Reset the fault using the reset button and wait for a few seconds.
- ✓ The system is reset.

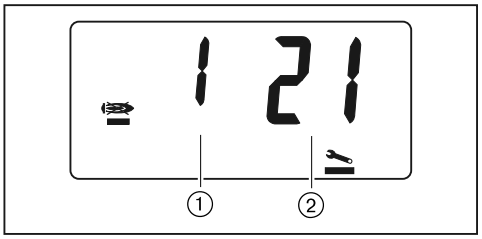
If the fault cannot be reset using the [reset] button, briefly switch off power supply using switch S1.

10.2 Fault history

The last 6 faults and the system status at the time of the faults are recorded in the fault history.

Display the fault

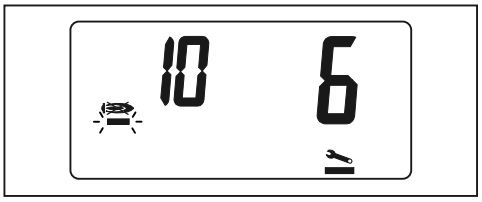
► Activate the fault level (see Ch. 6.3).
✓ The most recent fault will be displayed.
► Turn the dial knob.
✓ Fault 1 … 6 can be selected.



① Fault 1 … 6
② Error codes

Interrogate the system status

► Select fault with dial knob.
► Press enter button.
✓ System status when fault occurred is displayed.
► Turn the dial knob to interrogate the system status.



	Process value	Unit
10	Operating phase 0 = Burner off 1 = Standby check fan 2 = Prepurge speed achieved 3 = Prepurge 4 = Ignition speed achieved 5 = Ignition 6 = Burner in operation 7 = Gas valve check 8 = Post purge speed achieved and post purge	–
11	Rating	%
22(1	Setpoint speed pump	%
30	eSTL	°C
31	Flue gas temperature	°C
32	Ionisation signal	µA
37	Return temperature	°C
ESC	Exit menu	–

(1 Display only if speed controlled pump is fitted.

10.3 Rectifying faults

10.3.1 Warning codes

Warning code	Cause	Rectification
W12	Temperature at eSTB > 95 °C Temperature at supply sensor > 95 °C Temperature at return sensor > 95 °C	▶ Check the water flow. ▶ Check function of the pumps. ▶ Check parameter A32. ▶ Vent boiler on the water side.
W14	Temperature at eSTL increases too rapidly	▶ Check the water flow. ▶ Check function of the pumps. ▶ Check parameter A32. ▶ Vent boiler on the water side.
W15	Temperature differential between flow and return to high (The system goes to lockout after 30 warnings with F15)	▶ Check function of pump, if necessary increase pump rating. ▶ Check parameter A32. ▶ Safeguard system circulation.
W16	Flue gas temperature is too high (see parameter 33)	▶ Check the heat exchanger (see Ch. 9.6).
W18	Difference eSTL and flow temperature too great (The system goes to lockout after 30 warnings with F18)	▶ Check function of the pumps. ▶ Check parameter A32. ▶ Safeguard system circulation.
W21	No flame formation when the burner starts (The system goes to lockout after 5 failed start attempts with F21)	▶ Check the ignition unit and replace if necessary. ▶ Check gas combi valve and cable and replace if necessary. ▶ Check setting of gas combi valve. ▶ Clean or replace burner tube (see Ch. 9.5). ▶ Check phase of voltage supply.
W22	Flame failure during operation (the system goes to lockout with F21 after one failed restart)	▶ Check the ionisation electrode and replace, if necessary (see Ch. 9.4). ▶ Check O_2 settings. ▶ Clean or replace burner tube (see Ch. 9.5).
W24	Input H2 is closed, parameter 17 = 3 (lockout function)	▶ Check components connected to input H2 (see Ch. 6.10).
W33	External sensor is defective	▶ Check the sensor and cable and replace if necessary.
W34	DHW sensor defective	▶ Check the sensor and cable and replace if necessary.
W39	De-couple sensor defective	▶ Check the sensor and cable and replace if necessary.
W47	Gas pressure insufficient (< 13 mbar)	▶ Check gas connection pressure (see Ch. 7.1.2).
W57	Communication WCM-CPU and WCM-CUI faulty.	▶ Check the connection ▶ Rectify electromagnetic disturbance source.
W80	Communication to the cascade manager is faulty	▶ Check the connection ▶ Check the cascade manager. ▶ Check the address setting parameter 12. ▶ Check the feed in from the eBus.
W81	Communication to WCM-FS is faulty	▶ Check the connection ▶ Replace the remote control station.
W82	Communication to EM#2 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.

Warning code	Cause	Rectification
W83	Communication to EM#3 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W84	Communication to EM#4 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W85	Communication to EM#5 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W86	Communication to EM#6 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W87	Communication to EM#7 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W88	Communication to EM#8 is faulty	▶ Check address. ▶ Check the connection ▶ Replace the extension module.
W89	Remote control signal (input N1) faulty	▶ Test the setpoint signal (see Ch. 6.7). ▶ Check the connection

10.3.2 Error codes

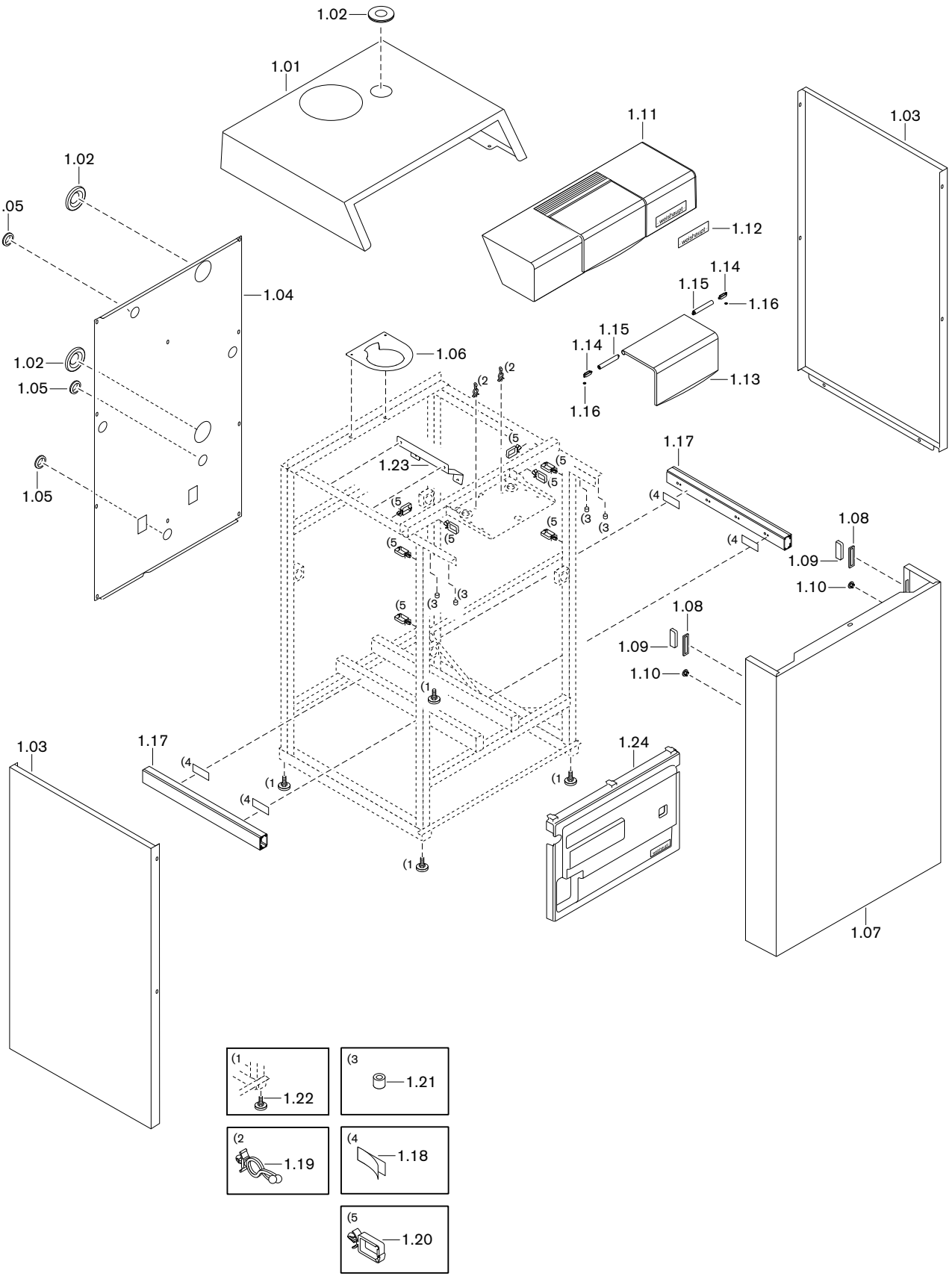
Error code	Cause	Rectification
F11	Temperature at eSTL > 105 °C	▶ Check the water flow. ▶ Check function of the pumps. ▶ Check parameter A32. ▶ Vent boiler on the water side.
F15	Temperature differential between flow and return too high (see also W15)	▶ Check function of pump, if necessary increase pump rating. ▶ Check parameter A32. ▶ Safeguard system circulation.
F18	Difference eSTL and flow temperature too great (see also W18)	▶ Check function of the pumps. ▶ Check parameter A32. ▶ Safeguard system circulation.
F21	No flame formation when the burner starts (see also W21)	▶ Check the ignition unit and replace if necessary. ▶ Check gas combi valve and cable and replace if necessary. ▶ Check setting of gas combi valve. ▶ Clean or replace burner tube (see Ch. 9.5). ▶ Check phase of voltage supply.
F23	Flame simulation	▶ Check earth connections. ▶ Install mains filter. ▶ Check burner tube and ionisation electrode (short circuit). ▶ Reset appliance, replace WCM-CPU on repeat occurrence.
F30	eSTL defective	▶ Check the sensor and cable and replace if necessary.
F31	Flue gas sensor is defective	▶ Check the sensor and cable and replace if necessary.
F32	Switch contact of air pressure switch not in Standby	▶ Check air pressure switch and cable and replace if necessary. ▶ Chimney draught too great.
F35	The supply sensor is defective	▶ Check the sensor and cable and replace if necessary.
F36	Water pressure insufficient	▶ Check system pressure and top up.
F37	return sensor defective	▶ Check the sensor and cable and replace if necessary.
F38	Flue gas pressure switch does not drop out during the fan standby check	▶ Check flue gas pressure switch and cable, if necessary replace.
F41	Gas valve (internal) leaking	▶ Replace gas combi valve.
F43	Specified fan speed is not achieved	▶ Check the fan and cable and replace if necessary.
F44	Fan standby defective	▶ Check fan and replace if necessary.
F45	Air pressure switch does not switch (on/off pressure 1.0/0.7 mbar)	▶ Check flue gas ducting and air supply. ▶ Check air pressure switch and cable and replace if necessary. ▶ Clean burner tube (see Ch. 9.5).
F46	Flue gas side pressure too high (release pressure 5.5 mbar)	▶ Check flue gas ducting. ▶ Check flue gas pressure switch and cable, if necessary replace.
F48	Maximum run time of flue gas damper exceeded (see installation instructions WAL-PP)	▶ Check flue gas damper and cable, if necessary replace.

Error code	Cause	Rectification
F51	Data record error boiler	▶ Check the BCC connector and replace if necessary. ▶ Restart configuration (see Ch. 6.5). ▶ Reset appliance, replace WCM-CPU on repeat occurrence.
F52	Data record error burner	▶ Check the BCC connector and replace if necessary. ▶ Reset appliance, replace WCM-CPU on repeat occurrence.
F53	Supply voltage or power frequency outside the tolerance limits	▶ Check mains supply. ▶ Reset appliance, replace WCM-CPU on repeat occurrence.
F54	Electronic fault	▶ Rectify electromagnetic disturbance source. ▶ Reset appliance, replace WCM-CPU on repeat occurrence.
F55	System has been reset too often (max 5 times within 5 minutes)	▶ Temporarily interrupt voltage supply.
F57	Communication WCM-CPU and WCM-CUI faulty.	▶ Check the connection ▶ Rectify electromagnetic disturbance source.

10.3.3 Operating problems

Observation	Cause	Rectification
Burner does not operate in spite of heat demand	Burner rapid cycle interlock activated eSTB, supply sensor, return sensor must lie within a temperature range of 4 K.	▶ Wait for the cooling down. ▶ Check sensor and replace if necessary.
Whistling noises / burner booming	Incorrect combustion values	▶ Check combustion values
	Burner tube is contaminated/ damaged	▶ Check the burner tube and replace if necessary
Smell of flue gas	Siphon fill level insufficient	▶ Fill siphon
Poor start behaviour	Ignition electrode set incorrectly or damaged	▶ Set ignition electrode, or replace if necessary (see Ch. 9.4)
	Incorrect combustion values	▶ Check combustion values

11 Spares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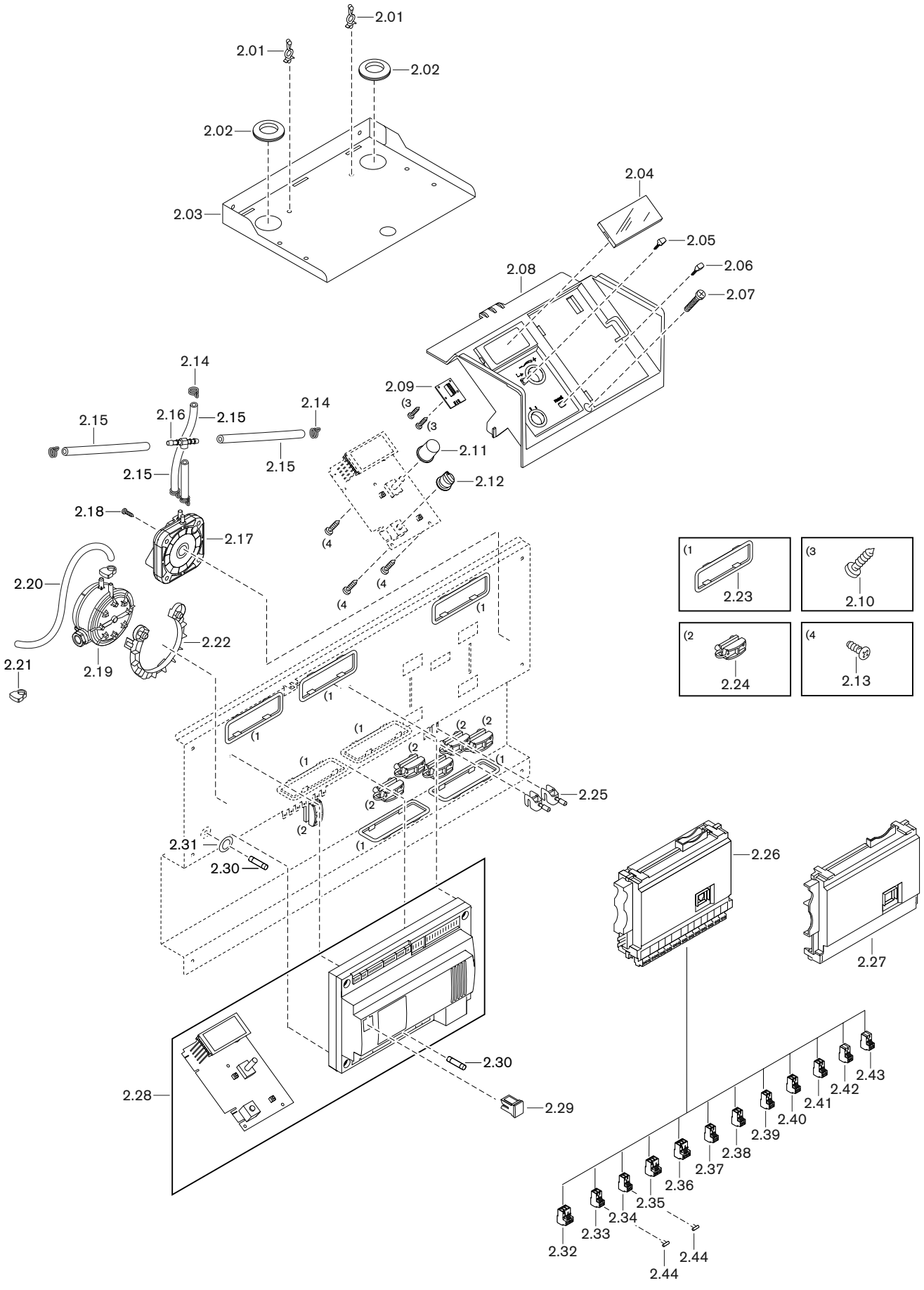
11 Spares

Pos.	Description	Order No.
1.01	Top part	482 001 02 18 7
1.02	Grommet Dm.I 35	481 011 40 22 7
1.03	Side panel right/left	482 001 02 19 7
1.04	Rear panel	482 001 02 21 2
1.05	Grommet Dm.I 24	481 011 02 23 7
1.06	Holder boiler connection piece 160/110	482 001 30 48 7
1.07	Front panel	482 001 02 20 2
1.08	Spacer	401 110 02 20 7
1.09	Magnetic fastener	499 223
1.10	Plug 6 mm white	446 034
1.11	Operating panel complete (without boiler control panel)	482 101 22 09 2
1.12	Name plate -weishaupt- 125 x 35	793 815
1.13	Flap operating panel	482 101 22 12 7
1.14	Attachment for soft closing hinge	482 101 22 11 7
1.15	Soft closing hinge	482 101 22 21 7
1.16	Locking washer Quicklock BQ3	431 803
1.17	Cable duct 45 x 30 x 510	482 001 22 20 7
1.18	Sticky tape 30 x 50 x 2	343 146
1.19	Cable tie with rivet	481 011 22 11 7
1.20	Cable holder WPC20 with anchor bolt	482 101 30 74 7
1.21	Spacer sleeve d5 x D10 x 10	482 101 02 26 7
1.22	Unit foot M10	482 101 02 17 7
1.23	Bracket sound attenuator	482 001 31 03 7
1.24	Cover boiler control	482 101 22 37 2

11 Spares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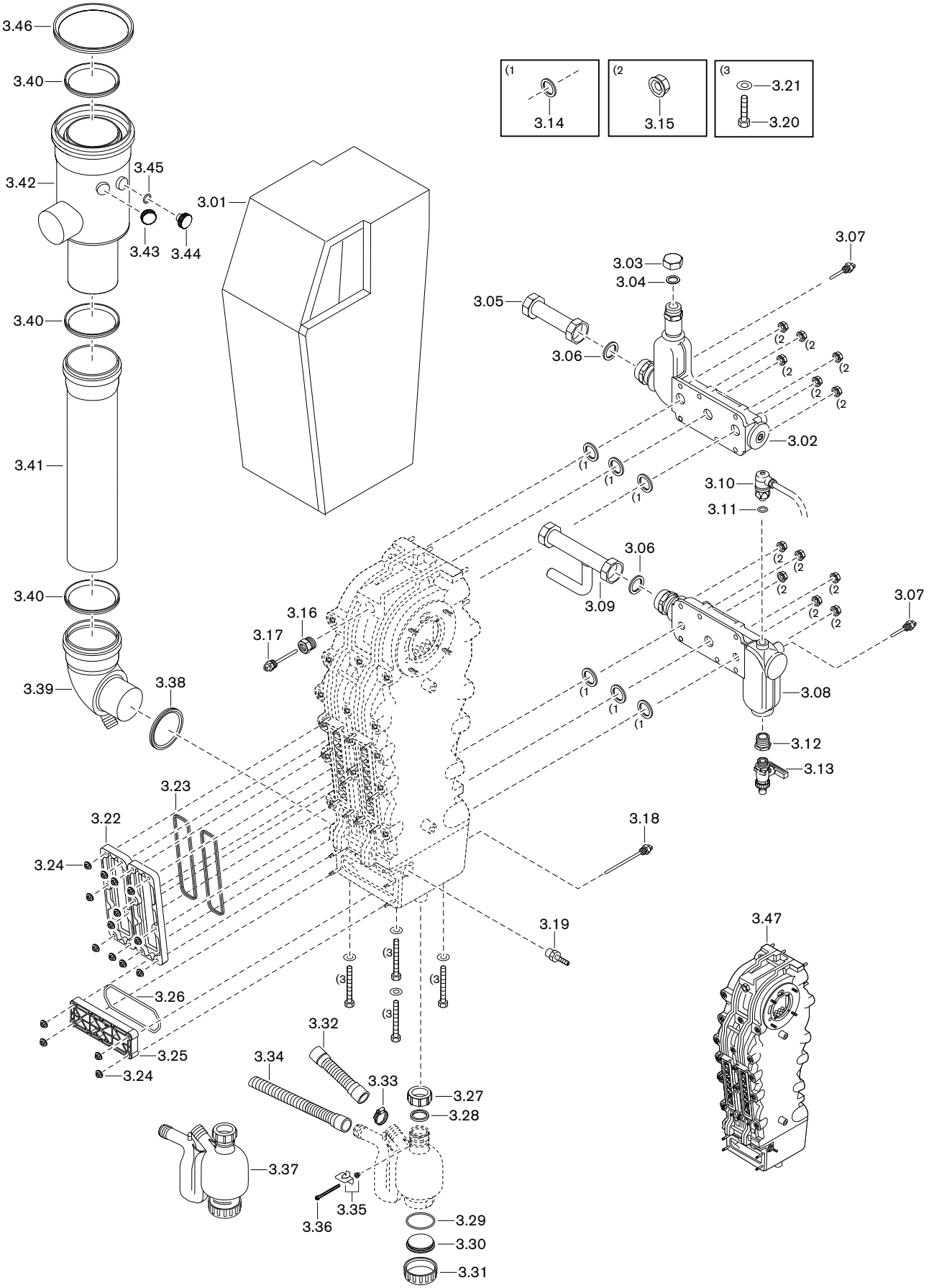
11 Spares

Pos.	Description	Order No.
2.01	Cable tie with rivet	481 011 22 11 7
2.02	Grommet Dm.I 24	481 011 02 23 7
2.03	Fixing plate operating unit	482 101 22 19 7
2.04	LCD cover	482 101 22 14 7
2.05	Enter button	482 101 22 33 2
2.06	Reset button	481 011 22 19 2
2.07	Screw M 5 x 30	403 268
2.08	Boiler control panel	482 101 22 13 7
2.09	Printed circuit board KSF-FS	482 101 22 07 2
2.10	Screw PT KA22 x 6 H	409 368
2.11	Button WCM-CUI	482 101 22 15 7
2.12	On/Off switch knob	482 101 22 32 2
2.13	Screw PT KA30 x 10 H	409 367
2.14	Hose clamp 7.5	790 218
2.15	Silicone hose 3.5 x 2.0 transparent	750 418
2.16	T connection TS4	453 009
2.17	Pressure switch LGW 3 A1(air)	691 394
2.18	Screw 3 x 8 Plastite	409 305
2.19	Flue gas pressure switch 5.5 mbar	482 101 30 68 2
2.20	Hose NW 6 x 2 Viton 75° Shore	750 421
2.21	Hose clamp 9.2 x 10.5 x 5	790 220
2.22	Ring clamp for pressure switch	482 101 22 18 7
2.23	Edge trim plate	401 110 02 08 7
2.24	Traction relief clamp	790 528
2.25	Screen connection terminal SK8	735 569
2.26	Connection box W-EAB with plug	482 001 22 02 2
2.27	Connection box housing top W-EAB	482 001 22 03 2
2.28	Boiler electronics set (WCM-CPU / WCM-CUI)	482 101 22 36 2
2.29	Coded plug BCC	482 001 22 11 2
2.30	Micro fuse 6.3 A IEC 127-2/V, slow	722 024
2.31	Grommet safety switch	482 101 22 34 7
2.32	Plug 230V 3pole black	716 275
2.33	Plug H1 2 pole turquoise	716 276
2.34	Plug H2 2 pole red	716 286
2.35	Plug MFA1 3 pole lilac	716 277
2.36	Plug MFA2 3 pole lilac	716 287
2.37	Plug VA1 2 pole brown	716 288
2.38	Plug eBUS 2 pole light blue	716 279
2.39	Plug B11 2 pole white	716 290
2.40	Plug B1 2 pole green	716 280
2.41	Plug B3 2 pole yellow	716 281
2.42	Plug 2 pole dark blue	716 283
2.43	Plug N1 2 pole orange	716 274
2.44	Jumper 2 pole	716 232

11 Spares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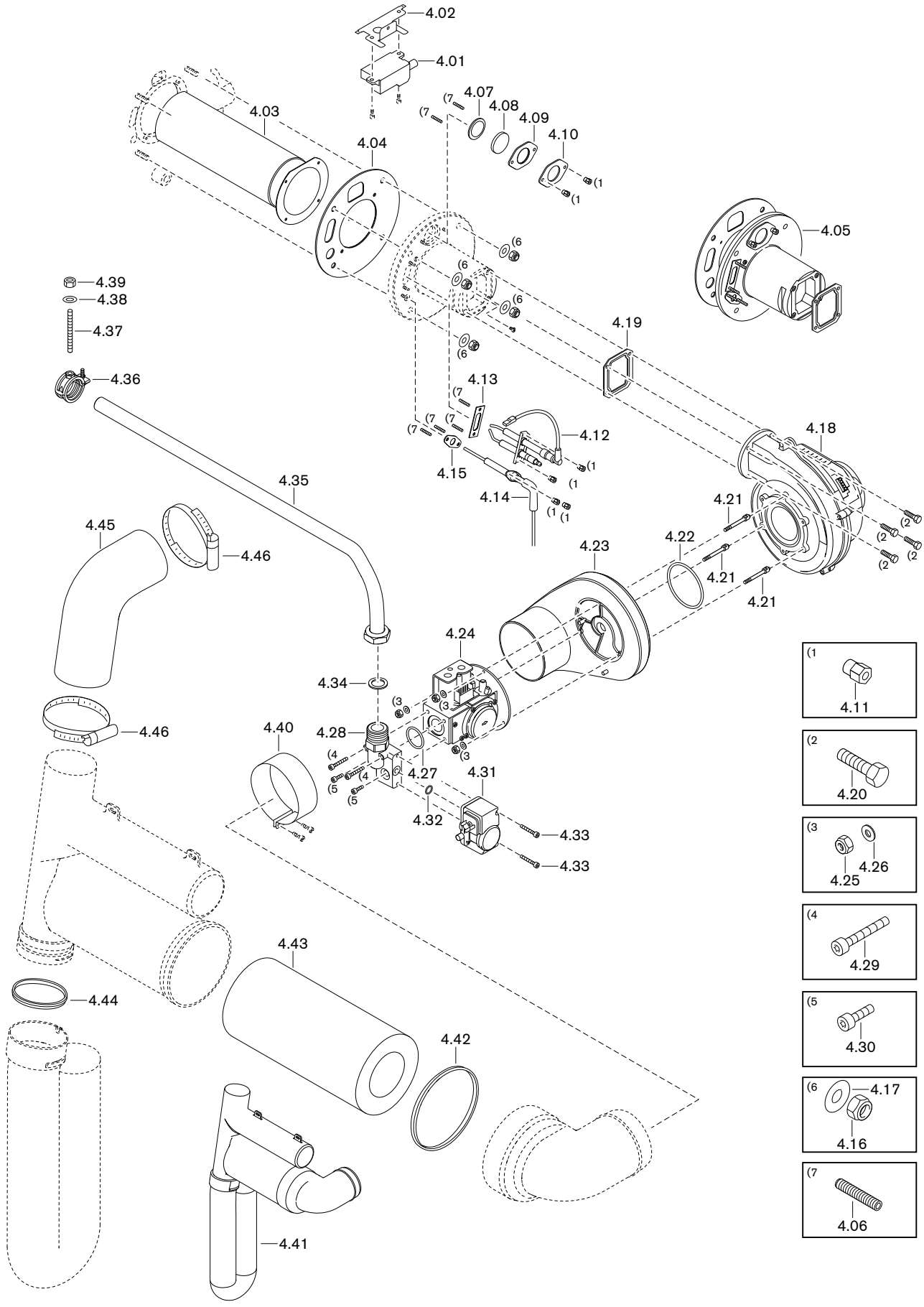
11 Spares

Pos.	Description	Order No.
3.01	Insulation	482 001 30 42 7
3.02	Flow manifold	482 001 30 71 2
3.03	Closing cap G1	482 001 30 20 7
3.04	Gasket 20 x 29 x 2 (1)	481 401 40 04 7
3.05	Supply pipe G1 1/2	482 001 30 18 7
3.06	Gasket 32 x 44 x 2 (1 1/2)	482 301 30 43 7
3.07	NTC-VL/RL sensor 5 kOhm	482 101 40 01 7
3.08	Return manifold	482 001 30 72 2
3.09	Return pipe G1 1/2 with connection 22 x 1	482 001 30 19 7
3.10	Water level interlock G1/4 with plug cable	482 101 40 02 2
3.11	Seal water level interlock 20 x 13 x 2	482 101 40 03 7
3.12	Nipple N4/1 - 3/4 x 1/2	453 084
3.13	Drain cock G 1/2 PN 10	454 090
3.14	Seal collector 42 x 32 x 3	482 101 30 21 7
3.15	Locknut Serpress M8	499 318
3.16	Reducing nipple R 3/4A x G 3/8I x 26	482 101 30 12 7
3.17	NTC-STL sensor 5 kOhm G 3/8	482 101 30 06 7
3.18	Flue gas sensor NTC G 1/4	482 101 30 07 7
3.19	Pressure test nipple R1/4 x Dm6	482 101 30 16 7
3.20	Screw M8 x 70	401 506
3.21	Spring washer B 8 DIN 127	435 250
3.22	Service cover heat exchanger	482 101 30 14 7
3.23	Seal service cover heat exchanger	482 101 30 15 7
3.24	Disk nut M6 A2G	412 508
3.25	Service cover condensate collector	481 401 30 02 7
3.26	Seal service cover condensate collector	481 401 30 05 7
3.27	Union nut G 1 1/4 siphon	481 011 40 19 7
3.28	Seal siphon union nut G 1 1/4	481 011 40 21 7
3.29	O ring for cap	482 101 30 59 7
3.30	Cap siphon	482 101 30 58 7
3.31	Closing cap	482 101 30 57 7
3.32	Condensate hose 25 x 175 long	482 001 30 64 7
3.33	Hose clamp	499 286
3.34	Condensate hose 25 x 1000 long	400 110 50 21 7
3.35	Bracket siphon complete	482 101 30 60 2
3.36	Fillister head screw M5 x 65	482 101 30 61 7
3.37	Siphon complete	482 101 30 56 2
3.38	Gasket DN 80	669 252
3.39	Elbow PP DN 110 87 degrees	482 001 30 47 7
3.40	Gasket DN 110	669 212
3.41	Pipe PP DN 110 0.5 m	480 000 05 08 7
3.42	Boiler connection piece DN 160/110 complete	482 001 30 48 2
3.43	Plug DN 20 white	669 189
3.44	Knurled screw M14	669 185
3.45	Round gasket DN 14	669 186
3.46	Gasket DN 160	669 296
3.47	Heat cell pre-mounted with gasket set	482 001 30 07 2

11 Spares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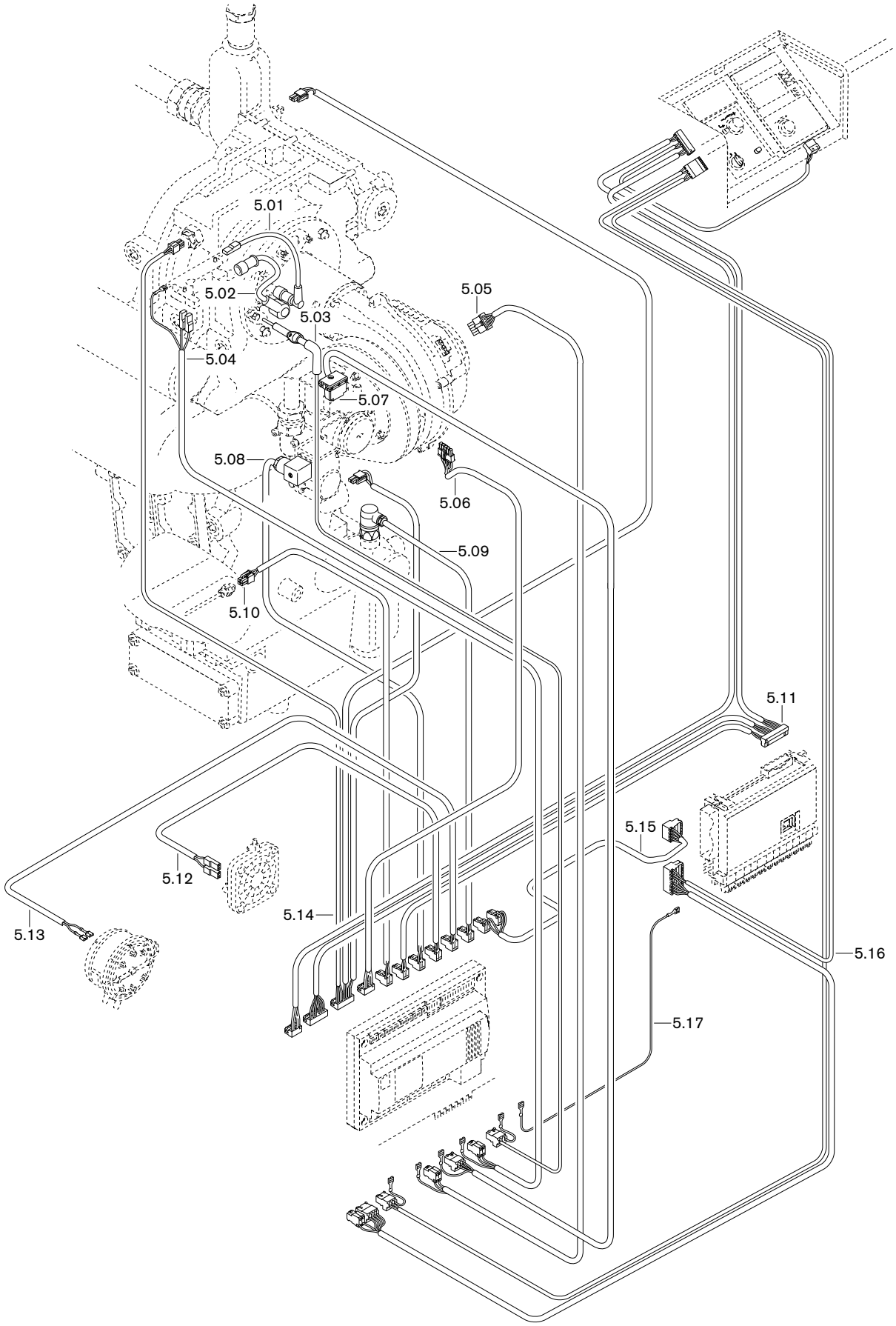
11 Spares

Pos.	Description	Order No.
4.01	Ignition unit ZAG 1 220-240V 50-60Hz 10VA	603 189
4.02	Bracket ignition unit	482 001 30 77 7
4.03	Burner tube	482 001 30 23 7
4.04	Gasket burner flange	482 101 30 24 7
4.05	Burner flange complete	482 001 30 64 2
4.06	Grub screw M4 x 20 DIN 916-A2	420 451
4.07	Seal view port internal 26 x 35 x 2	481 401 30 11 7
4.08	View port glass	481 401 30 06 7
4.09	Seal view port external	482 101 30 50 7
4.10	View port cover	482 101 30 49 7
4.11	Nut M4 x 10 long SW 7	482 101 30 28 7
4.12	Ignition electrode with earth cable	482 001 30 26 2
4.13	Gasket ignition electrode	482 101 30 27 7
4.14	Ionisation electrode	482 101 30 05 2
4.15	Gasket ionisation electrode	482 101 30 44 7
4.16	Hexagonal nut M8 DIN 985 -5	411 408
4.17	Spring washer B 8 DIN 137	431 622
4.18	Fan NGR137 with gaskets and mounting pins	482 001 30 66 2
4.19	Gasket fan air outlet	482 001 30 67 7
4.20	Screw M5 x 20 DIN 933	401 207
4.21	Mounting pin M6 / M4	482 001 30 52 7
4.22	O ring 70 x 3 NBR 70	482 001 30 37 2
4.23	Air intake collector	482 001 30 70 2
4.24	Compact gas combi valve	482 001 30 13 2
4.25	Hexagonal nut M4 DIN 985 -5	411 104
4.26	Spring washer B 4 DIN 137	431 652
4.27	O ring 33 x 2 NBR	482 101 30 32 2
4.28	Gas connection piece G1	482 001 30 50 2
4.29	Screw M5 x 35 DIN 912	402 255
4.30	Screw M5 x 12 DIN 912	402 207
4.31	Pressure switch GW50 A5/1 5.0-50	691 395
4.32	O ring 10.5 x 2.25	445 512
4.33	Screw M4 x 20 DIN 912	402 115
4.34	Gasket 20 x 29 x 2 (1)	481 401 40 04 7
4.35	Gas tube	482 001 30 41 2
4.36	Pipe clamp for gas pipe 22 mm / 1/2"	482 001 30 46 7
4.37	Threaded rod M8 x 75	482 101 02 25 7
4.38	Washer A 8.4 DIN 125	430 501
4.39	Hexagonal nut M8 DIN 934 -8	411 401
4.40	Clamp supply air	482 001 31 04 7
4.41	Sound attenuator complete	482 001 31 07 2
4.42	Sound attenuator seal IDM133	482 001 31 11 7
4.43	Sound attenuator insulation	482 001 31 12 7
4.44	Sound attenuator seal IDM80	482 001 31 10 7
4.45	Air inlet hose DN 80	482 001 31 02 7
4.46	Hose clamp DN 80	499 319

11 Spares


5.01
5.02
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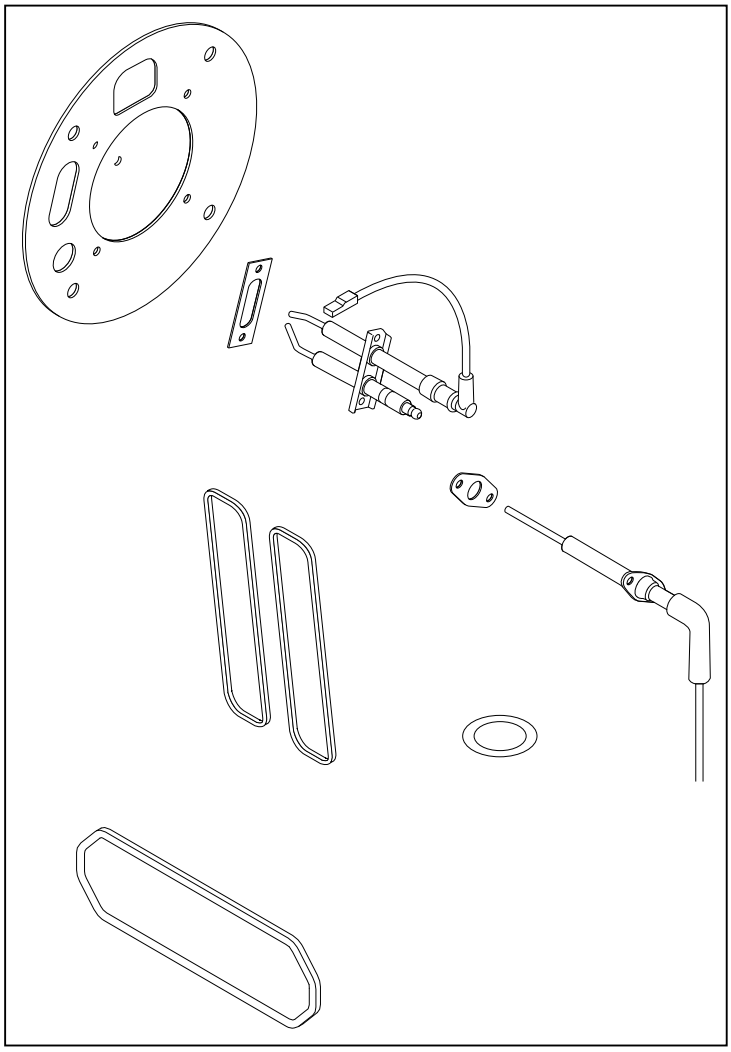
5.12
5.13
5.14
5.15
5.16
5.17

11 Spares

Pos.	Description	Order No.
5.01	Earth cable for ignition unit	482 001 30 27 7
5.02	Ignition cable	482 001 30 28 2
5.03	Ionisation electrode	482 101 30 05 2
5.04	Plug cable ignition transformer	482 001 22 28 2
5.05	Plug cable fan 230V	482 001 22 27 2
5.06	Plug cable fan control	482 001 22 26 2
5.07	Plug cable gas valve	482 001 22 29 2
5.08	Plug cable gas pressure switch	482 001 22 23 2
5.09	Plug cable water level interlock	482 101 22 20 2
5.10	Plug cable B14, flue gas sensor	482 001 22 25 2
5.11	Plug cable SELV signals	482 001 22 21 2
5.12	Plug cable air pressure switch	482 101 22 24 2
5.13	Plug cable pressure switch flue gas	482 101 22 31 2
5.14	Plug cable eSTL, B12, B13	482 001 22 22 2
5.15	Plug cable H1 H2	482 101 22 18 2
5.16	Plug cable mains 230V	482 101 22 19 2
5.17	Chassis earth GNGE 1.0 x 240 Chassis-PE	482 101 22 30 2

11 Spares

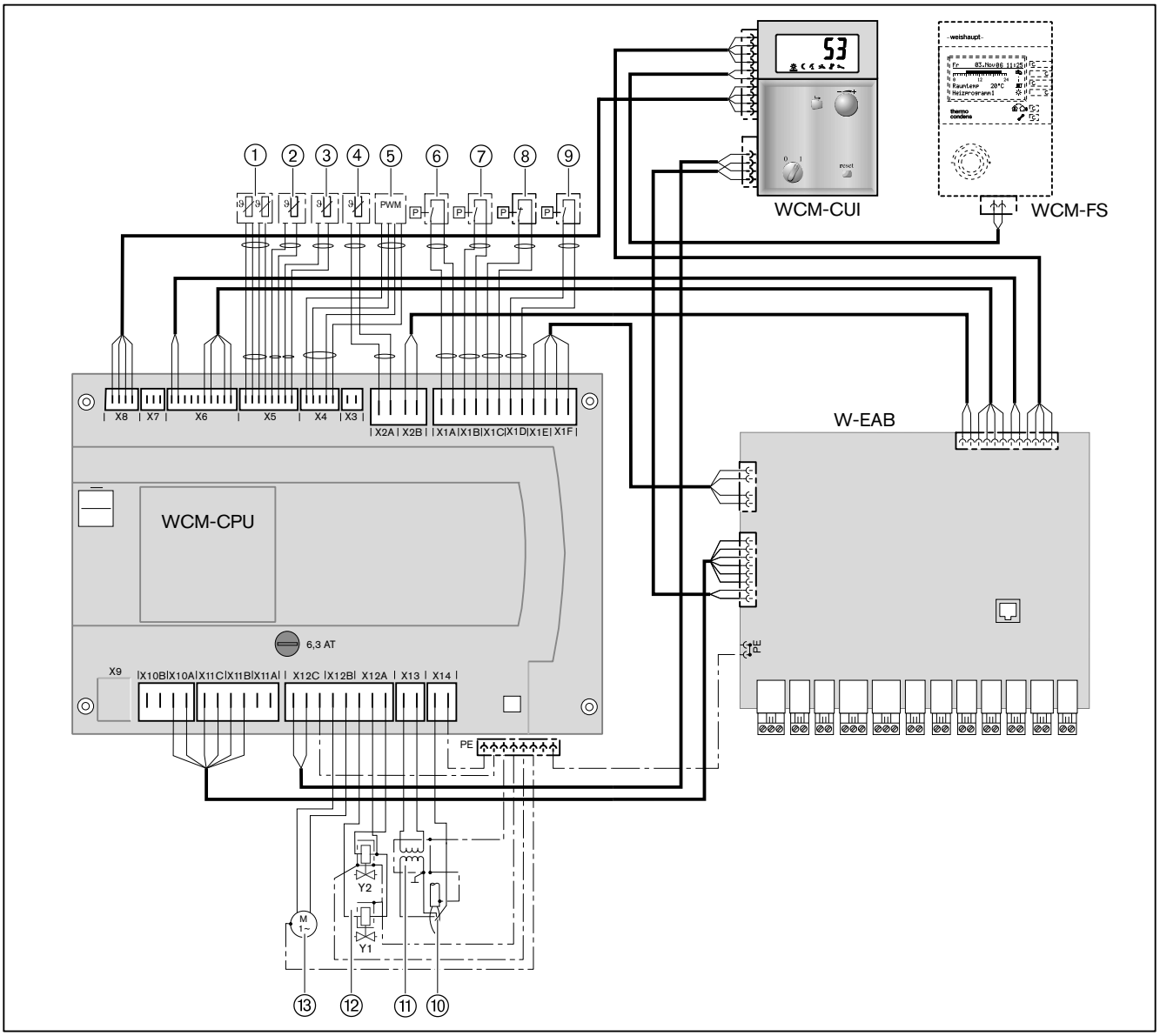


11 Spares

Pos.	Description	Order No.
6.01	Service set Consisting of: ▪ Gasket burner flange ▪ Ignition electrode with earth cable ▪ Gasket ignition electrode ▪ Ionisation electrode ▪ Gasket ionisation electrode ▪ Gasket 20 x 29 x 2 (1) ▪ Seals service cover heat exchanger ▪ Seal service cover condensate collector	482 001 00 16 2

12 Technical documentation

12.1 Internal boiler wiring



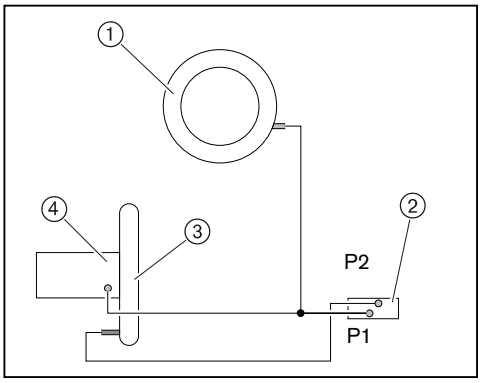
① eSTB
② Flow sensor
③ Return sensor
④ Flue gas sensor
⑤ Fan control
⑥ Gas pressure switch
⑦ Air pressure switch
⑧ Flue gas pressure switch
⑨ Water level interlock
⑩ Ionisation
⑪ Ignition unit
⑫ Fuel valves (gas combi valve)
⑬ Fan motor

12.2 Sensor variables

eSTL Return sensor Flow sensor De-couple sensor Flue gas sensor		External sensor(QAC 31)		DHW sensor (B3)	
	NTC 5 kΩ		NTC 600Ω		NTC 12 kΩ
°C	Ω	°C	Ω	°C	Ω
-20	48180	-35	672	-15	71800
-15	36250	-30	668	-10	55900
-10	27523	-25	663	-5	44000
-5	21078	-20	657	0	35500
0	16277	-15	650	5	27700
5	12669	-10	642	10	22800
10	9936	-8	638	15	17800
15	7849	-6	635	20	14800
20	6244	-4	631	25	12000
25	5000	-2	627	30	9800
30	4029	0	623	35	8300
35	3267	2	618	40	6600
40	2665	4	614	45	5400
45	2185	6	609	50	4500
50	1802	8	605	55	3800
55	1494	10	600	60	3200
60	1245	12	595	65	2700
65	1042	14	590	70	2300
70	876	16	585	75	2000
75	740	18	580	80	1700
80	628	20	575	85	1500
85	535	22	570	90	1300
90	457	24	565		
95	393	26	561		
100	338	28	556		
105	292	30	551		
110	254	35	539		

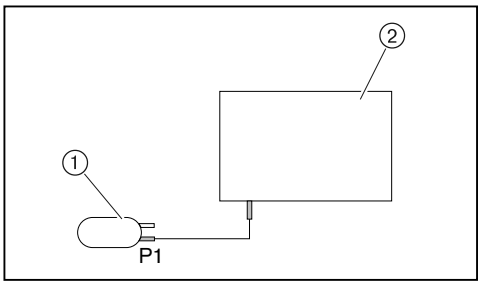
12.3 Pneumatic control lines

12.3.1 Air pressure switch connection diagram



① Air inlet pipe
② Air pressure switch (on/off pressure 1.0/0.7 mbar)
③ Air intake collector
④ Gas combi valve

12.3.2 Flue gas pressure switch connection diagram



① Flue gas pressure switch (release pressure 5.5 mbar)
② Condensate collector

12.4 Conversion table O2/CO2

O_2 content dry in %v	CO_2 content in %		
	Natural Gas E (max 11.7 % CO_2)	**Natural Gas LL** (max 11.5 % CO_2)	**Propane** (max 13.7 % CO_2)
2.2	10.5	10.3	12.3
2.6	10.3	10.1	12.0
3.0	10.0	9.9	11.7
3.4	9.8	9.6	11.5
3.8	9.6	9.4	11.2
4.2	9.4	9.2	11.0
4.6	9.1	9.0	10.7
5.0	8.9	8.8	10.4
5.4	8.7	8.5	10.2
5.8	8.5	8.3	9.9
6.2	8.2	8.1	9.7
6.6	8.0	7.9	9.4
7.0	7.8	7.7	9.1
7.4	7.6	7.4	8.9
7.8	7.4	7.2	8.6
8.2	7.1	7.0	8.4

13 Key word index

13 Key word index

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www.weishaupt.co.uk

–weishaupt–

Product		Description	Performance
	**W-Burners**	The compact series, proven millions of times over: Economical, reliable, fully automatic. Gas, oil and dual fuel burners for domestic and commercial applications. The purflam burner gives almost soot-free combustion of oil with greatly reduced NO_x emissions.	Up to 570 kW
	**Monarch and industrial burners**	The legendary industrial burner: Tried and tested, long lived, clear construction. Gas, oil and dual fuel burners for district heat provision.	Up to 11,700 kW
	**multiflam® burners**	Innovative Weishaupt technology for large burners: Minimal emission values particularly at ratings over one megawatt. Oil, gas and dual fuel burners with patented fuel distribution system.	Up to 17,000 kW
	**WK industrial burners**	Modular powerhouses: Adaptable, robust, powerful. Oil, gas and dual fuel burners for industrial plant.	Up to 22,000 kW
	**Thermo Unit**	The Thermo Unit heating systems from cast iron or steel: Modern, economic, reliable. For environmentally friendly heating. Fuel: Gas or oil as desired.	Up to 55 kW
	**Thermo Condens**	The innovative condensing boilers with the SCOT system: Efficient, low in emissions, versatile. Ideal for domestic heating. Floor standing gas condensing boiler with ratings of up to 1200 kW (cascade), for higher heat demands.	Up to 1,200 kW
	**Heat pumps**	The heat pump programme offers solutions for utilisation of heat from air, soil and ground water. The systems are suitable for refurbishment or new builds. It is possible to use several heat pumps in cascade operation.	Up to 130 kW
	**Solar systems**	Free energy from the sun: Perfectly coordinated components, innovative, proven. Pleasantly shaped flat roof collectors to support heating and of domestic water	
	**Water heater / energy reservoir**	The attractive domestic water heating range includes classic water heaters which are supplied through a heating system and energy reservoirs which can be fed through solar systems.	
	**Control technology / building management**	From control panels to complete building management systems – at Weishaupt you can find the entire spectrum of modern control technology. Future oriented, economical and flexible.	