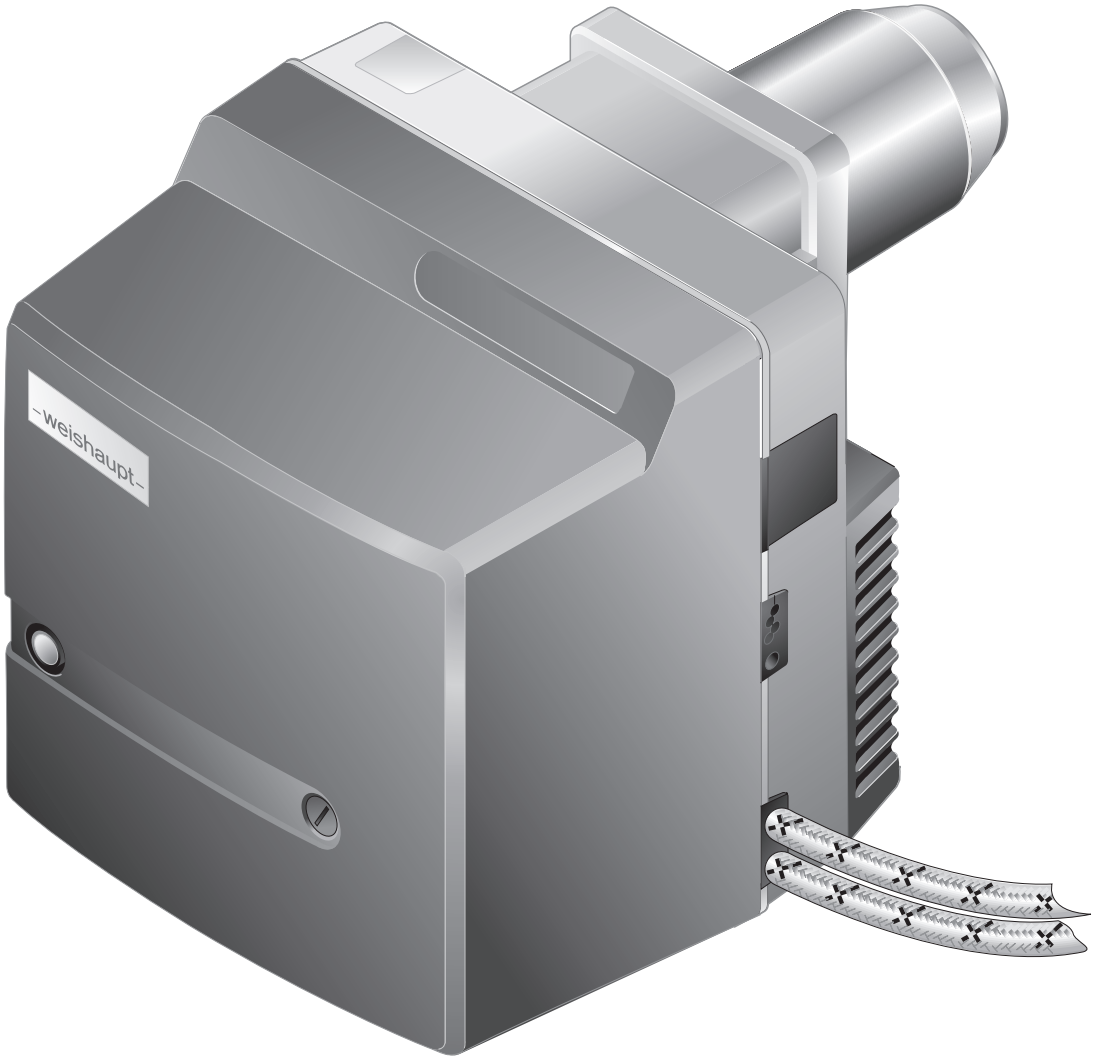
–weishaupt–

# manual

Installation and operating instruction




**Oil burner WL10/2-D**

83292502 ▪ 1/2019-04

**1 User instructions ... 4**
1.1 Target group ... 4
1.2 Symbols ... 4
1.3 Guarantee and Liability ... 5

**2 Safety ... 6**
2.1 Designated application ... 6
2.2 Safety measures ... 6
2.2.1 Normal operation ... 6
2.2.2 Electrical connection ... 6
2.3 Alterations to the construction of the equipment ... 7
2.4 Noise emission ... 7
2.5 Disposal ... 7

**3 Product description ... 8**
3.1 Type key ... 8
3.2 Serial number ... 8
3.3 Function ... 9
3.3.1 Air supply ... 9
3.3.2 Oil supply ... 10
3.3.3 Electrical components ... 11
3.3.4 Program sequence ... 12
3.4 Technical data ... 14
3.4.1 Approval data ... 14
3.4.2 Electrical data ... 14
3.4.3 Ambient conditions ... 14
3.4.4 Fuels ... 14
3.4.5 Emissions ... 15
3.4.6 Rating ... 16
3.4.7 Dimensions ... 17
3.4.8 Weight ... 17

**4 Installation ... 18**
4.1 Installation conditions ... 18
4.2 Selecting a nozzle ... 19
4.3 Burner installation ... 20
4.3.1 Rotate burner by 180° (optional) ... 21

**5 Installation ... 22**
5.1 Oil supply ... 22
5.2 Electrical connection ... 24

**6 Operation ... 25**
6.1 Operating panel ... 25
6.2 Display ... 25

**7 Commissioning ... 26**
7.1 Prerequisite ... 26
7.1.1 Connect measuring devices ... 26
7.1.2 Setting values ... 28
7.2 Adjusting the burner ... 30
7.3 Concluding work ... 31
7.4 Check combustion ... 32

**8 Shutdown ... 33**

**9 Servicing ... 34**
9.1 Notes on servicing ... 34
9.2 Service plan ... 36
9.3 Service position ... 37
9.4 Replace nozzle ... 38
9.5 Set ignition electrodes ... 39
9.6 Removing the mixing head ... 40
9.7 Set mixing head ... 41
9.8 Removing the air regulator ... 42
9.9 Removing and refitting angle drive ... 43
9.10 Removing and refitting oil pump ... 44
9.11 Removing and refitting fan wheel ... 45
9.12 Remove burner motor ... 46
9.13 Removing and refitting oil pump filter ... 47
9.14 Replacing the fuse ... 48

**10 Troubleshooting ... 49**
10.1 Procedures for fault conditions ... 49
10.1.1 Illuminated push button off ... 49
10.1.2 Illuminated push button red ... 50
10.1.3 Illuminated push button flashes ... 53
10.2 Operating problems ... 54

**11 Technical documentation ... 55**
11.1 Conversion table unit of pressure ... 55
11.2 Wiring diagram ... 56

**12 Project planning ... 58**
12.1 Oil supply ... 58

**13 Spares ... 60**

**14 Notes ... 72**

**15 Key word index ... 73**

# 1 User instructions

Translation of original operating instructions

This manual forms part of the equipment and must be kept on site.

Carefully read the manual prior to working on the unit.

## 1.1 Target group

The manual is intended for the operator and qualified personnel. They should be observed by all personnel working with the unit.

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

Persons with limited physical, sensory or mental capabilities may only work on the unit if they are supervised or have been trained by an authorised person.

Children must not play with the unit.

## 1.2 Symbols

| | |
|---|---|
|  DANGER | Immediate danger with high risk.<br>Non observance can lead to serious injury or death. |
|  WARNING | Danger with medium risk.<br>Non observance can lead to environmental damage, serious injury or death. |
|  CAUTION | Danger with low risk.<br>Non observance can cause damage to the equipment and injury to personnel. |
|  | Important information |
| ▸ | Requires direct action |
| ✓ | Result after an action |
| ▪ | Itemisation |
| … | Range of values |

## 1.3 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,
- non-observance of the manual,
- operation with faulty safety equipment,
- continual operation despite a fault,
- improper installation, commissioning, operation and service,
- repairs, which have been carried out incorrectly,
- the use of non original Weishaupt parts,
- force majeure,
- unauthorised modifications made 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,
- unsuitable fuels,
- defects in the inlet lines.

# 2 Safety

## 2.1 Designated application

The burner is suitable for operation on heat exchangers to EN 303 and EN 267.

If the burner is not used on combustion chambers to EN 303 and EN 267, a safety assessment of combustion and flame stability during individual process conditions and of the shutdown limits of the combustion plant has to be carried out and documented.

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 will be required. In this case ducted air intake is recommended.

The burner should only be used in enclosed rooms.

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 Safety measures

Safety relevant fault conditions must be eliminated immediately.

Components, which show increased wear and tear or whose design lifespan is or will be exceeded prior to the next service should be replaced as a precaution.

The design lifespan of the components is listed in the service plan [ch. 9.2].

### 2.2.1 Normal operation

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

### 2.2.2 Electrical connection

For work carried out on live components:
- Observe the accident prevention instructions DGUV Regulation 3 and adhere to local directives,
- tools in accordance with EN 60900 should be used.

## 2.3 Alterations to the construction of the equipment

All conversions require written approval from Max Weishaupt GmbH.

- No additional components may be fitted, which have not been tested for use with the equipment.
- Do not use combustion chamber inserts, which hinder flame burnout.
- Use only original Weishaupt replacement parts.

## 2.4 Noise emission

The noise emissions are determined by the acoustic behaviour of all components fitted to the combustion system.

Prolonged exposure to high noise levels can lead to loss of hearing. Provide operating personnel with protective equipment.

Noise emissions can further be reduced with a sound attenuator.

## 2.5 Disposal

Dispose of all materials and components in a safe and environmentally friendly way at an authorised location. Observe local regulations.

# 3 Product description

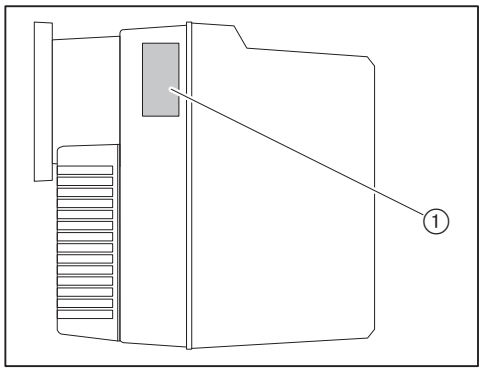
## 3.1 Type key

WL10/2-D

| | |
|---|---|
| W | Type: W burner |
| L | Fuel: Oil EL |
| 10 | Size |
| 2 | Ratings size |
| D | Construction |

## 3.2 Serial number

The serial number on the name plate identifies the product. This is required by Weishaupt's customer service department.




① Name plate

**Ser.No.** _____

## 3.3 Function

### 3.3.1 Air supply

**Air damper**

The air damper regulates the air quantity required for combustion. The air damper position is set using a setting screw on the air damper or the actuator (optional).

At burner shutdown the the actuator (optional) automatically closes the air damper. At burner shutdown the air dampers close automatically.

**Fan wheel**

The fan wheel supplies the air from the air intake housing to the combustion head.

**Diffuser**

The air gap between flame tube and diffuser is adjusted by positioning the diffuser. This adjusts the mixing pressure and the air quantity required for combustion.

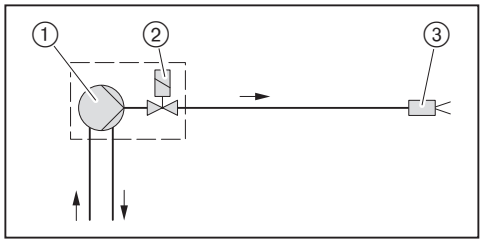
## 3.3.2 Oil supply

### Oil pump

The pump draws the oil through the supply line and carries it under pressure to the oil nozzle. The pressure regulating valve keeps the oil pressure constant.

A solenoid valve opens and closes the oil supply to the nozzle. The pressure regulating valve and solenoid valve are integrated into the pump.

### Sequence diagram




① Oil pump on burner
② Solenoid valve on the oil pump
③ Nozzle head with nozzle

### 3.3.3 Electrical components

**Combustion Manager**

The combustion manager W-FM is the control unit of the burner.

It controls the sequence of operation and monitors the flame.

**Burner motor**

The burner motor drives the fan wheel and the oil pump.

**Ignition unit**

The electronic ignition unit creates a spark at the electrode, which ignites the fuel/air mixture.

**Flame sensor**

The combustion manager monitors the flame signal via the flame sensor.

If the flame signal becomes too weak, the combustion manager carries out a controlled shutdown.

### 3.3.4 Program sequence

**Pre-purge without actuator**

At heat demand, the burner motor starts after the initialisation time ($T_I$) has elapsed.

The combustion chamber is pre-purged.

**Pre-purge with actuator (optional)**

At heat demand, the air damper actuator starts after the initialisation time ($T_I$) has elapsed.
If the actuator limit switch (S2) is closed, the burner motor starts.

The combustion chamber is pre-purged.

**Ignition**

Ignition starts with the pre-purge time ($T_V$).

**Fuel release**

Following the pre-purge time ($T_V$) the solenoid valve (K11) opens and releases the fuel.

**Safety time**

With fuel release, safety time ($T_S$) and post-ignition time ($T_{NZ}$) start.

The flame signal must be present within the safety time ($T_S$).

**Operation**

The combustion manager monitors the flame signal via the flame sensor.

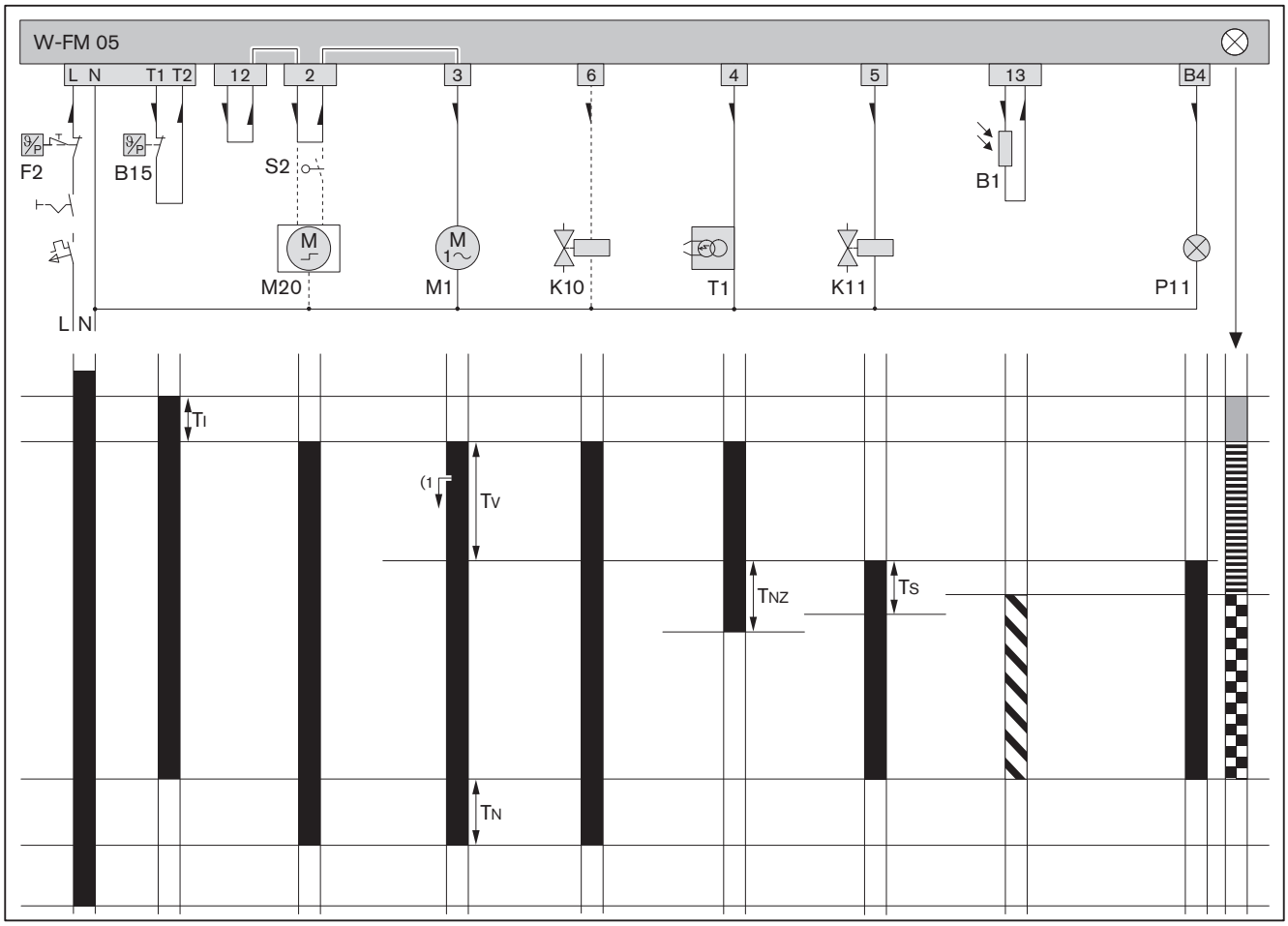
**Post-purge**

If there is no longer a heat demand, the solenoid valve (K11) closes and stops the fuel supply.

Post-purge time ($T_N$) begins.

Following the post-purge time ($T_N$) the burner motor switches off.

The actuator (optional) drives to Closed position.




| | | | |
|---|---|---|---|
| B1 | Flame sensor | $T_I$ | Initialisation time: 1 s |
| B15 | Temperature or pressure regulator | $T_N$ | Post-purge time: 1.2 s |
| F2 | Temperature or pressure limiter | $T_{NZ}$ | Post-purge time: 6.5 s |
| K10 | Anti siphon valve (optional) | $T_S$ | Safety time: 4.6 s |
| K11 | Solenoid valve | $T_V$ | Pre-purge time: 16.2 s |
| M1 | Burner motor | | Voltage is applied |
| M20 | Air damper actuator (optional) | | Flame signal present |
| P11 | Control lamp operation (optional) | | Current path |
| S2 | Actuator limit switch (optional) | | START (orange) |
| T1 | Ignition unit | | Ignition phase (flashing orange) |
| (1 | Actuator start delay (optional) | | Burner operation (green) |

## 3.4 Technical data

### 3.4.1 Approval data

| | |
|---|---|
| DIN CERTCO | 5G1005 |
| Basic standards | EN 267:2011<br>Additional standards, see EU conformity certification. |

### 3.4.2 Electrical data

| | |
|---|---|
| Mains voltage / mains frequency | 230 V/50 Hz |
| Consumption at start | max 315 W |
| Consumption during operation | max 215 W |
| Power consumption | max 1.3 A |
| Internal unit fuse | T6.3H, IEC 127-2/5 |
| External fuse | max 16 AB |

### 3.4.3 Ambient conditions

| | |
|---|---|
| Temperature in operation | –10(1 … +40 °C |
| Temperature during transport / storage | –20 … +70 °C |
| relative humidity | max 80 %, no dew point |

(1 with the relevant suitable fuel oil and layout of oil supply.

### 3.4.4 Fuels

- Fuel oil EL to DIN 51603-1
- Fuel oil EL A Bio 10 to DIN 51603-6
- Fuel oil EL to ÖNORM-C1109 (Austria)
- Fuel oil EL to SN 181 160-2 (Switzerland)

## 3.4.5 Emissions

### Flue gas

To EN 267 the burner complies with emission class 3.

The $NO_x$ values are influenced by:
- combustion chamber dimensions
- flue gas system
- fuel
- combustion air (temperature and humidity)
- medium temperature

### Sound levels

| Dual number noise emission values | |
|---|---|
| Measured sound power level $L_{WA}$ (re 1 pW) | 69 dB(A)(1 |
| Uncertainty value $K_{WA}$ | 4 dB(A) |
| Measured sound pressure level $L_{pA}$ (re 20 µPa) | 63 dB(A)(2 |
| Uncertainty value $K_{pA}$ | 4 dB(A) |

(1 Determined to ISO 9614-2.
(2 Determined at 1 metre distance from the front of the burner.
The measured noise levels plus uncertainty values form the upper limit value, which could occur when measuring.

## 3.4.6 Rating

### Combustion heat rating

| | |
|---|---|
| Combustion heat rating | 35 … 70 kW<br>2.9 … 5.9 kg/h(1 |
| Combustion head | W10/2-D |

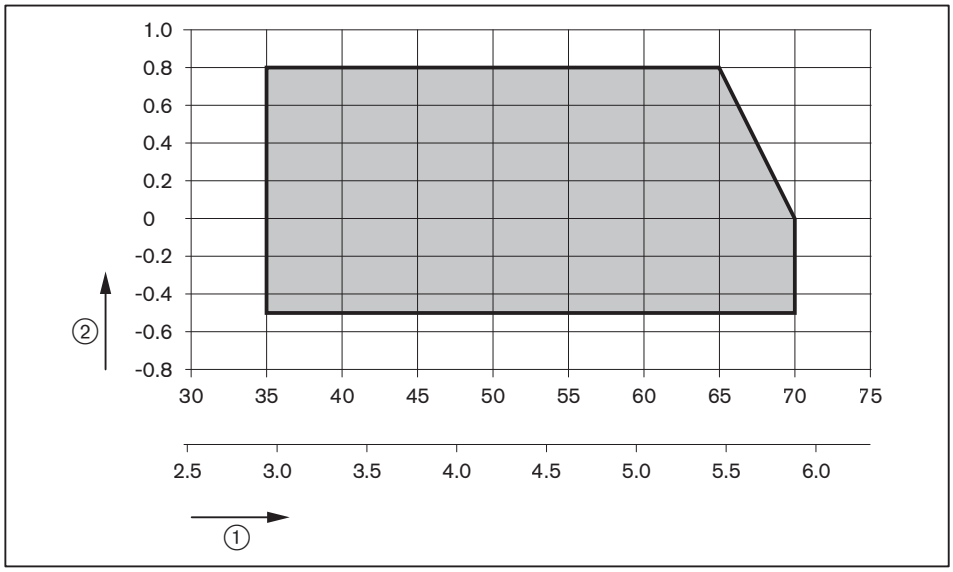
(1 The oil throughput data relates to a calorific value of 11.9 kWh/kg for fuel oil EL.

### Capacity graph

Capacity graph to EN 267.

The capacity data given relates to an installation elevation of 500 m above sea level. For installation elevations above 500 m a capacity reduction of approx. 1 % per 100 m applies.

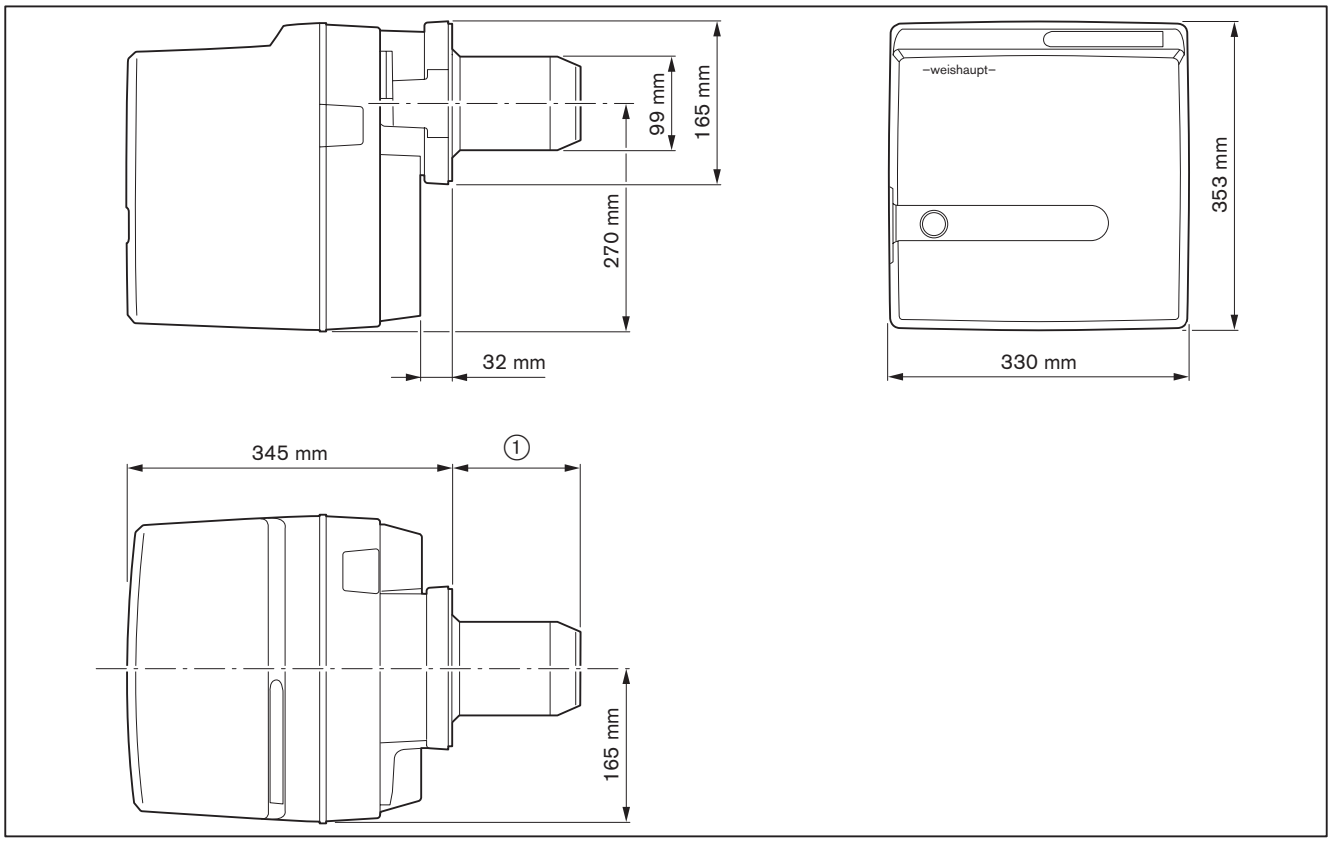
A limited capacity graph is valid for ducted air intake.




① Combustion heat rating [kW] or [kg/h]
② Combustion chamber pressure [mbar]

## 3.4.7 Dimensions

**Burner**




① 137 mm without combustion head extension
237 mm with combustion head extension (100 mm)
337 mm with combustion head extension (200 mm)
437 mm with combustion head extension (300 mm)

## 3.4.8 Weight

approx. 14 kg

# 4 Installation

## 4.1 Installation conditions

### Burner type and capacity graph

Burner and heat exchanger must be matched.

- ▶ Check burner type and burner capacity.

### Installation location

- ▶ Prior to installation ensure that:
  - sufficient space is available for normal and service position [ch. 3.4.7],
  - sufficient combustion air is available, if necessary install ducted air intake,

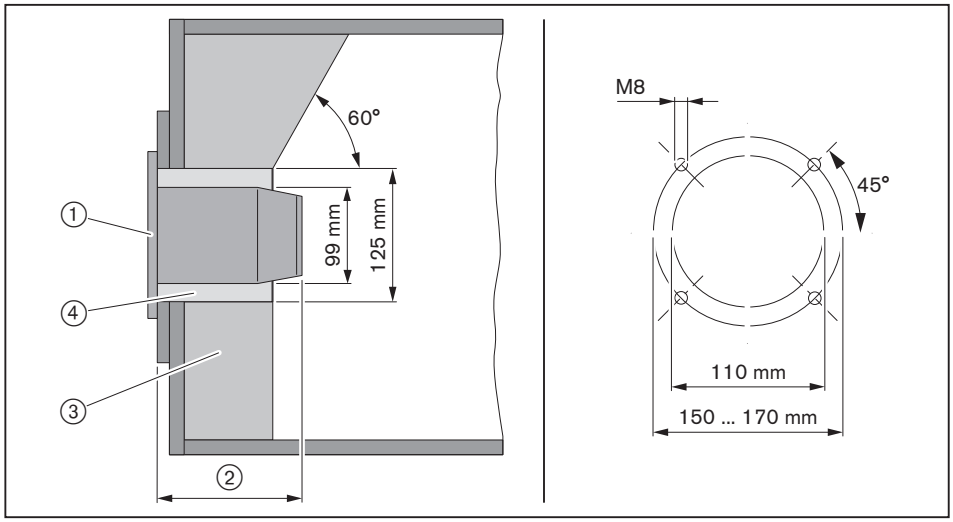
### Prepare heat exchanger

The refractory ③ must not protrude beyond the front edge of the combustion head. The refractory can take a conical shape (min 60°).

Refractory may not be required on boilers with water-cooled front, unless the manufacturer gives other instructions.

Following installation, the aperture ④ between flame tube and refractory should be filled with flame-proof, resilient insulating material. Do not make solid.

Heat exchangers with deep refractories or thick doors, or heat exchangers with reverse flame combustion chambers may require a combustion head extension. Head extensions of 100, 200 and 300 mm are available. Dimension ② then changes according to the head extension used.




① Flange gasket
② 137 mm
③ Refractory
④ Aperture

## 4.2 Selecting a nozzle

► Determine nozzle size.

### Recommended nozzles

| Make | Characteristics |
|---|---|
| Steinen[1] | 60°S, 60°H |
| Fluidics | 45°SF[2], 45°HF |

[1] We recommend Fluidics nozzles for nozzle sizes 1.00 gph and 1.10 gph.
[2] Only from 12 bar pump pressure and single pipe system (higher oil temperatures).

### Pump pressure setting

10 … **12** … 14 bar

Spray characteristic and spray angle varies depending on pump pressure.

### Nozzle selection table

Different load values are possible due to tolerances.

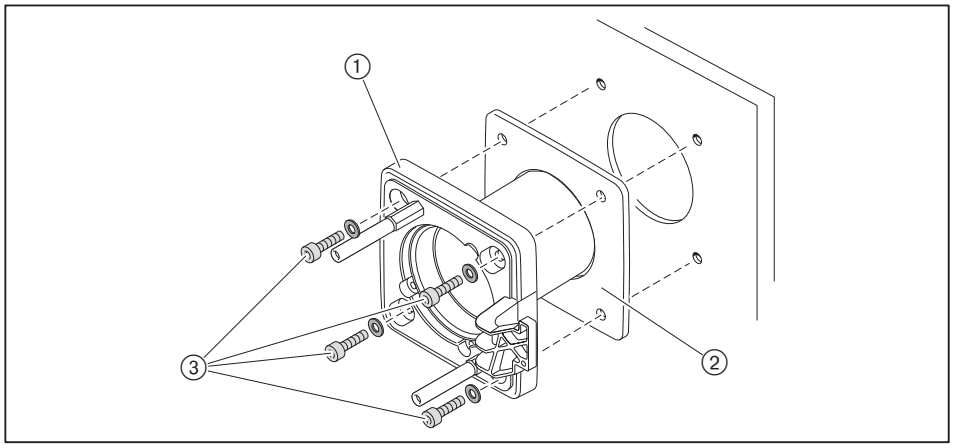
| | Burner capacity [kW] at pump pressure | | | | |
|---|---|---|---|---|---|
| Nozzle size [gph] | 10 bar | 11 bar | 12 bar | 13 bar | 14 bar |
| **0.75** | 33.3 | 35.7 | 36.9 | 38.1 | 40.5 |
| **0.85** | 38.1 | 40.5 | 41.7 | 44.0 | 45.2 |
| **1.00** | 45.2 | 47.6 | 49.5 | 51.2 | 53.6 |
| **1.10** | 49.5 | 52.4 | 54.7 | 57.1 | 58.3 |
| **1.25** | 55.9 | 59.5 | 61.9 | 64.3 | 66.6 |
| **1.35** | 60.7 | 64.3 | 66.6 | 69.0 | 72.6 |
| **1.50** | 67.8 | 71.4 | – | – | – |

Conversion of burner capacity to oil throughput see formula below.

$$\text{Oil throughput in kg/h} = \frac{\text{Burner capacity in kW}}{\text{11.9 kWh/kg}}$$

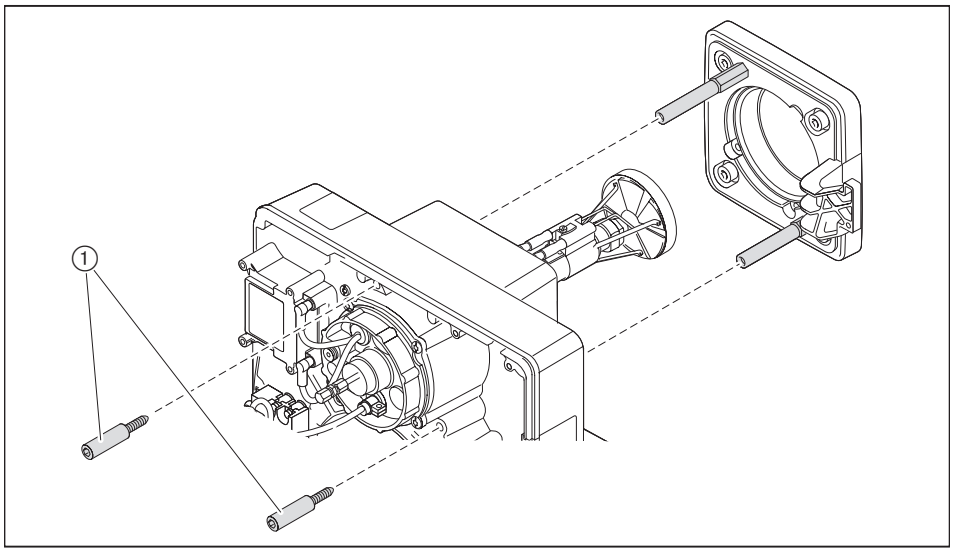
## 4.3 Burner installation

- ► Remove burner flange ① from burner housing.
- ► Fit flange gasket ② and burner flange ① to the heat exchanger using screws ③.
- ► The aperture between combustion head and refractory should be filled with flame-proof, resilient insulating material (do not make solid).




It is possible to install the burner rotated by 180 if space is limited. This requires conversion measures [ch. 4.3.1].

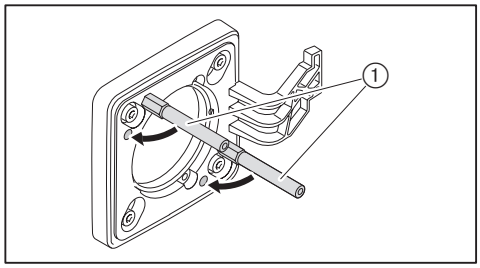
- ► Fit nozzle [ch. 9.4].
- ► Set ignition electrodes [ch. 9.5]
- ► Check nozzle distance and adjust if necessary [ch. 9.7].
- ► Mount burner with screws ① to burner flange.



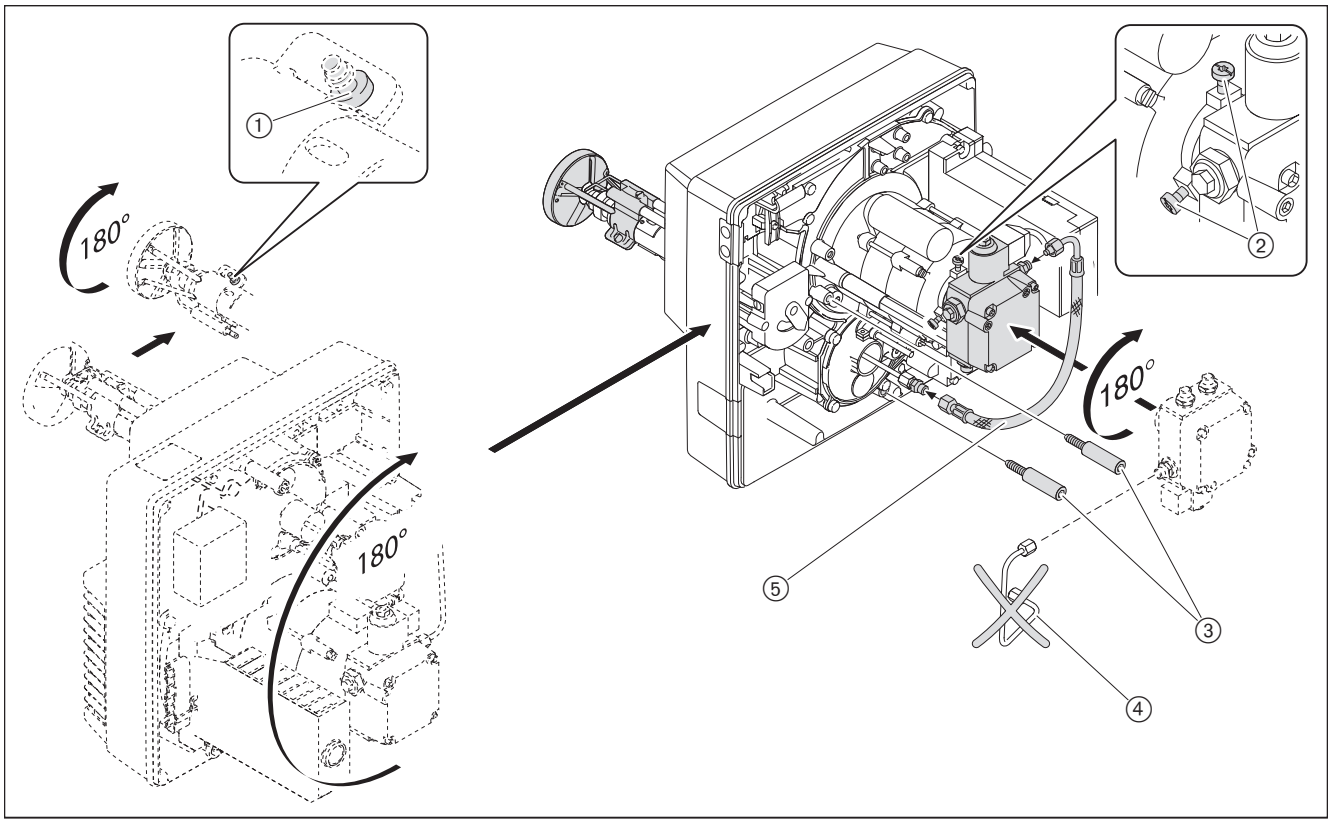
### 4.3.1 Rotate burner by 180° (optional)

A pressure hose (DN 4, 286 mm) for installation rotated by 180° is required.

- ▶ Place stay bolt ① into neighbouring threaded holes.




- ▶ Place burner into service position A [ch. 9.3].
- ▶ Undo screw ① on diffuser and turn diffuser by 180°.
- ▶ Fit nozzle [ch. 9.4].
- ▶ Set ignition electrodes [ch. 9.5]
- ▶ Check nozzle distance and adjust if necessary [ch. 9.7].
- ▶ Rotate burner by 180° and secure with screws ③.
- ▶ Remove oil line ④.
- ▶ Undo fixing screws ② for oil pump and rotate oil pump by 180°.
- ▶ Tighten screws ②.
- ▶ Fit pressure hose ⑤ supplied with conversion kit:
  - fit elbow end to pump,
  - fit straight end to nozzle assembly.



# 5 Installation

## 5.1 Oil supply

Observe EN 12514-2, DIN 4755, TRÖI and local regulations.

**Check conditions for oil pump**

| | |
|---|---|
| Suction resistance | max 0.4 bar(1 |
| Supply pressure | max 2 bar(1 |
| Supply temperature | max 60 °C(1 |

(1 Measured at the pump.

**Check conditions for oil hoses**

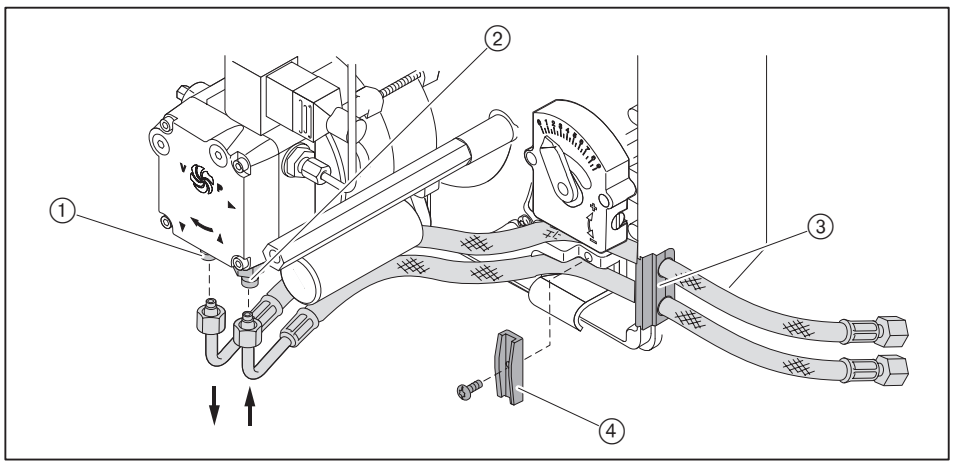
| | |
|---|---|
| Length | 1200 mm |
| Oil hose connection | G⅜ |
| Nominal pressure | 10 bar |
| Thermal load | max 100 °C |

**Connect oil supply**

**CAUTION**

**Damage to the oil pump caused by incorrect connection**
Mixing up supply and return can damage the oil pump.
► Ensure correct connection of oil hoses to the supply and return of the pump.

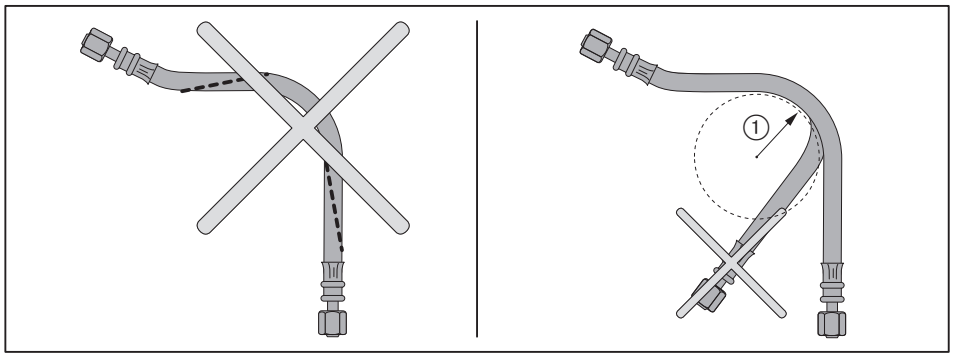
► Fit oil hoses with bracket ④ and grommet ③ to burner.




① Return
② Supply

► Connect oil supply and observe:
- do not twist oil hoses
- avoid mechanical tension
- consider length of hose required for the service position,
- do not kink oil hoses (curve radius ① of 50 mm must be maintained).

If these conditions for connection can not be met:
► Adapt oil supply on site.




**Purge oil supply and ensure it is tight**

**CAUTION**

**Oil pump seized due to running dry**
Pump could be damaged.
► Fill oil supply with oil and purge.

► Ensure oil supply is tight.

## 5.2 Electrical connection

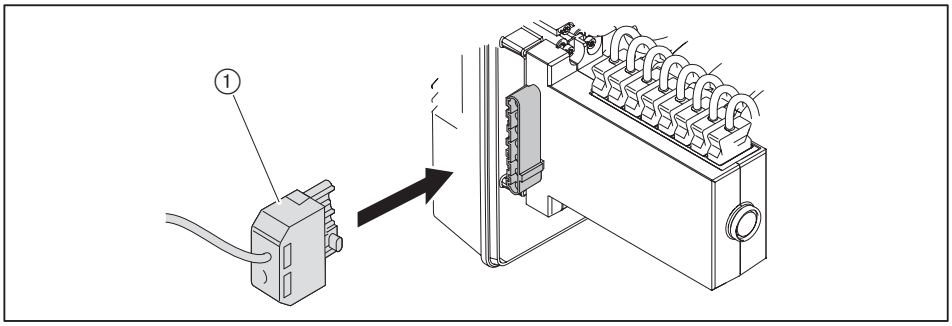
DANGER

**Risk of electric shock**
Working on the device when voltage is applied can lead to electric shock.
- ► Isolate the device from the power supply prior to starting any work.
- ► Safeguard against accidental restart.

The electrical connection must only be carried out by qualified electricians. Observe local regulations.

Observe wiring diagram [ch. 11.2].

- ► Check polarity and wiring of 7 pole connection plug ①.
- ► Plug in connection plug ①.




With remote reset, install connection line separately. Do not exceed maximum cable length of 10 metres.

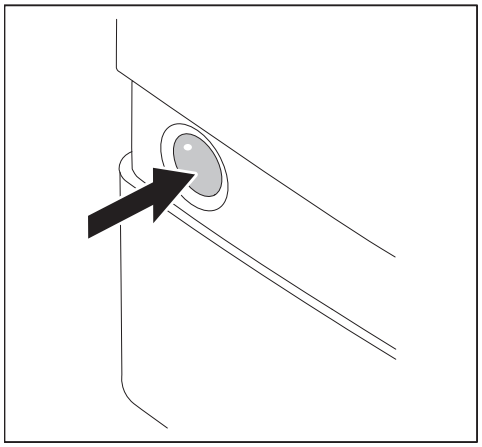
# 6 Operation

## 6.1 Operating panel

CAUTION

**Damage to the combustion manager due to incorrect operation**
Excessive pressure applied to the illuminated push button can damage the combustion manager.
► Only lightly press illuminated push button.

The illuminated push button on the combustion manager has the following functions:
- display operating condition [ch. 6.2],
- display fault codes [ch. 10.1.2],
- reset burner lockout [ch. 10.1.2].



Re-starting the burner during burner operation:
► Press illuminated push button for 1 second.

## 6.2 Display

| Illuminated push button | Operating condition |
|---|---|
| orange | Start phase |
| Flashing orange | Ignition and pre-purge phase |
| Green | Operation |
| red | Fault [ch. 10] |

Additional flashing signals can be read off as fault code [ch. 10].

# 7 Commissioning

## 7.1 Prerequisite

Commissioning must only be carried out by qualified personnel.

Only correctly carried out commissioning ensures the operational safety.

► Prior to commissioning ensure that:
- all assembly and installation work has been carried out correctly,
- sufficient combustion air is available, if necessary install ducted air intake
- the annulus between flame tube and heat exchanger is filled
- the heat exchanger is filled with medium
- the regulating, control and safety devices are functioning and set correctly
- the flue gas ducts are unimpeded
- a measuring point conforming to standards is available to measure the flue gas
- the heat exchanger and flue gas ducting up to the test point are sound (extraneous air influences the test results)
- the operating instructions of the heat exchanger are complied with
- a heat demand is available

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

On installations with process equipment, the conditions for safe operation and commissioning must be met, see worksheet 8-1 (Print No. 831880xx).

### 7.1.1 Connect measuring devices

**Pressure measuring device and ammeter**

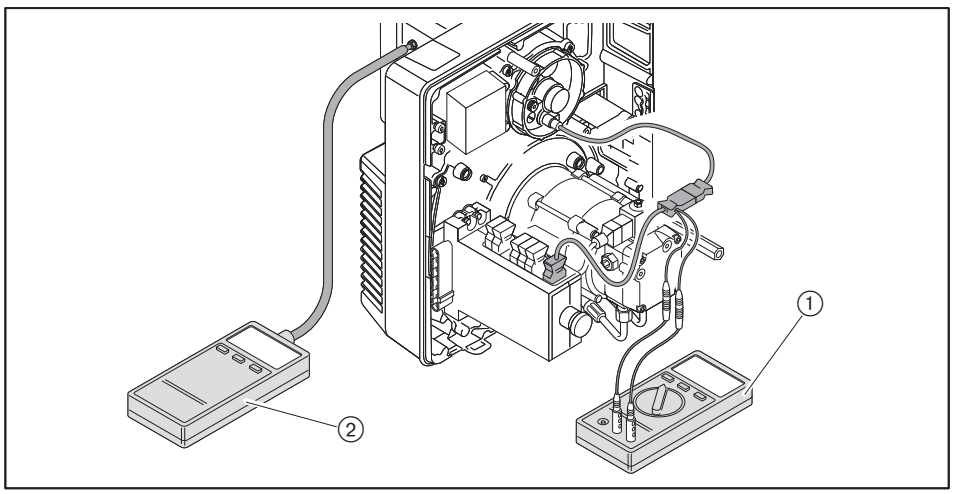
- Pressure measuring device for mixing pressure.
- Ammeter for flame signal.

► Connect pressure measuring device ②.

Test adapter No. 13 required (Order No. 240 050 12 052).
► Unplug plug No. 13.
► Plug in test adapter No. 13.
► Connect ammeter ①.

**Flame signal QRB4**

| | |
|---|---|
| Extraneous light detection from | 16 µA |
| Minimum flame signal | 35 µA |
| Recommended flame signal | 45 … 72 µA |



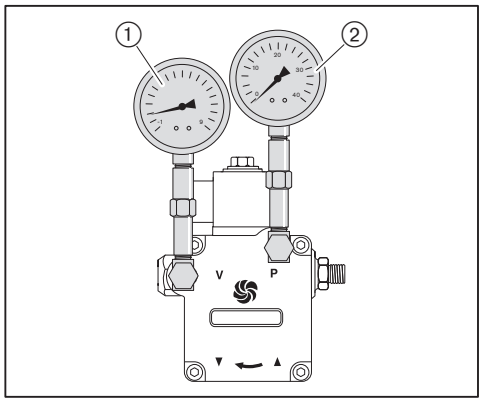
**Oil pressure measuring devices on oil pump**

- Vacuum gauge for suction resistance/supply pressure.
- Pressure gauge for pump pressure.

**WARNING**

**Oil leakage from oil pressure measuring devices due to constant load**
Oil pressure measuring devices could be damaged and cause environmental pollution through leakage.
► Remove oil measuring devices once commissioning is complete.

► Close fuel shut off devices.
► Remove closing plug on the pump.
► Connect vacuum gauge ① and pressure gauge ②.



## 7.1.2 Setting values

Set mixing head relative to the combustion heat rating required. For this, the diffuser setting and the air damper setting should be matched.

**Determine diffuser setting and air damper setting**

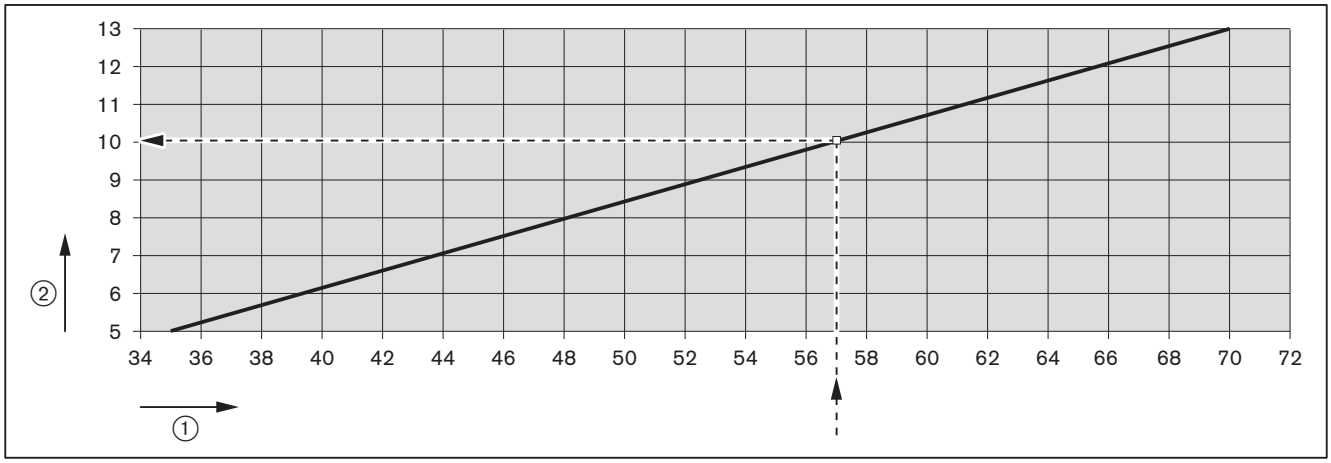
Do not operate the burner outside of the capacity graph.

► Determine the diffuser setting (dimension X) and air damper setting required from the diagram and note down.

**Example**

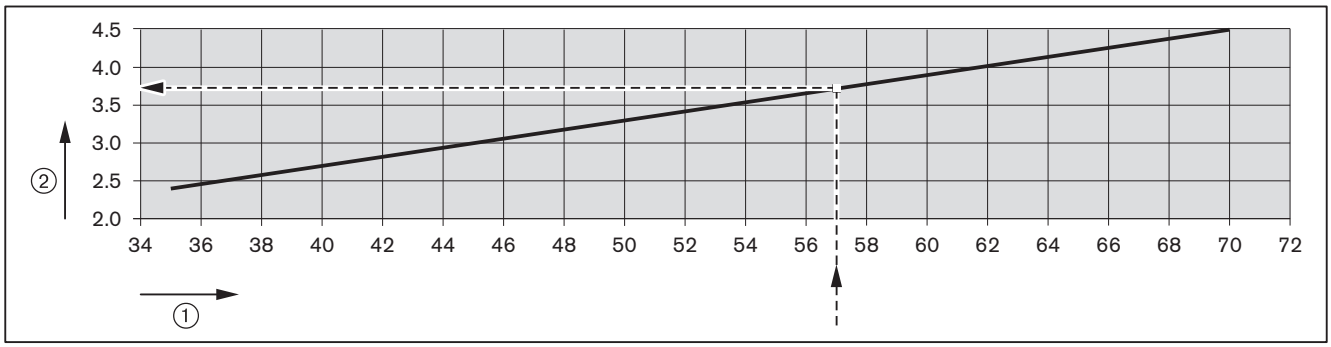
| | |
|---|---|
| Burner capacity required | 57 kW |
| Diffuser setting (dimension X) | 10.0 mm |
| Air damper setting | 3.7 |

**Diffuser default settings**




① Combustion heat rating [kW]
② Diffuser settings (dimension X) [mm]

**Air damper default settings**

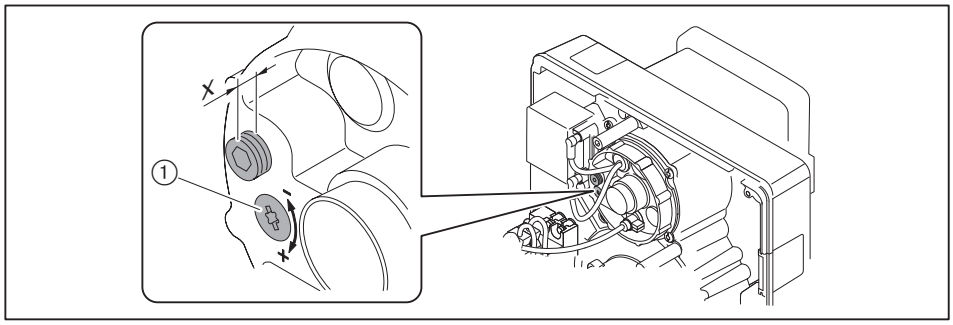



① Combustion heat rating [kW]
② Air damper setting

### Set diffuser

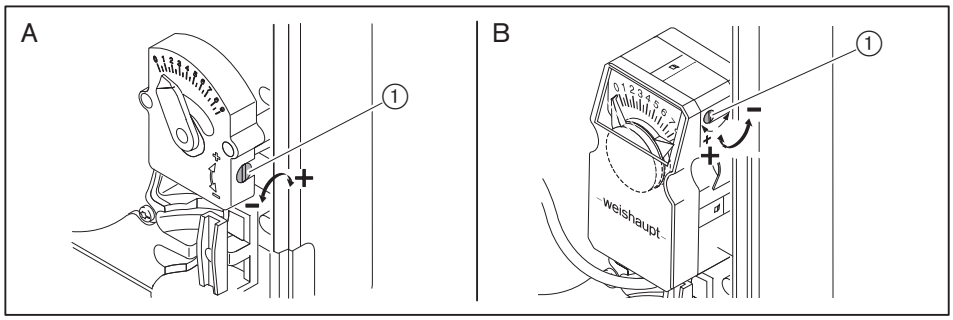
With dimension X = 0mm the indicating bolt is flush with the nozzle assembly cover.

► Turn screw ①, until dimension X equals the value determined.




### Set air damper

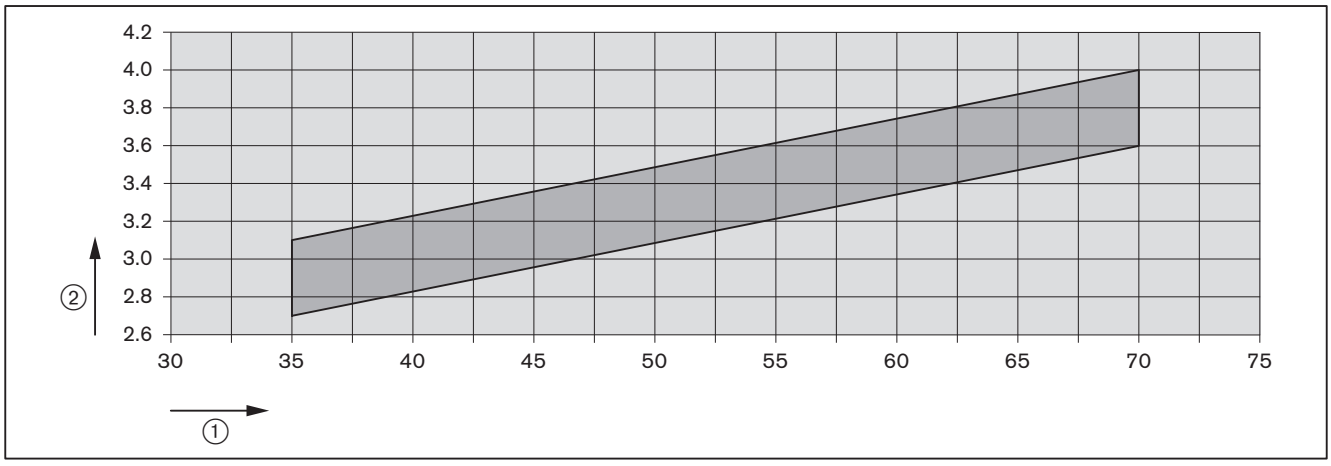
► Turn setting screw ① until the scale shows the value determined.




A Manual adjustment
B Actuator (optional)

### Determine mixing pressure

► Determine the mixing pressure required for the preset combustion heat rating from the diagram and note down.




① Combustion heat rating [kW]
② Mixing pressure [mbar]
Guide values, which may vary depending on combustion chamber resistance.

## 7.2 Adjusting the burner

DANGER

**Risk of electric shock**
Touching the ignition device can lead to electric shock.
► Do not touch ignition device during the ignition process.

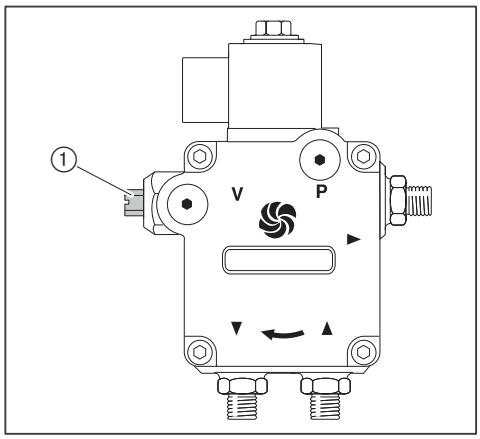
► During commissioning check:
  ▪ flame signal [ch. 7.1.1],
  ▪ suction resistance or flow pressure of oil pump [ch. 5.1],
  ▪ mixing pressure [ch. 7.1.2].

**1. Start the burner**

Heat demand from the boiler controller required.
► Open fuel shut off devices.
► Switch on voltage supply.
✓ Illuminated push button lights up red.
► Press illuminated push button for 1 second.
✓ Burner starts in accordance with the programme sequence [ch. 3.3.4].

**2. Adjust combustion**

The pump pressure must be set according to the nozzle selected [ch. 4.2].
► Check pump pressure at pressure gauge.
► Set pressure using pressure regulating screw ①:
  ▪ increase pressure: clockwise rotation,
  ▪ decrease pressure: anticlockwise rotation.




► Check combustion values
► Determine combustion limit [ch. 7.4].
► Set excess air using air damper and diffuser setting, whilst observing mixing pressure determined [ch. 7.1.2].

## 7.3 Concluding work


WARNING

**Oil leakage from oil pressure measuring devices due to constant load**
Oil pressure measuring devices could be damaged and cause environmental pollution through leakage.
- ▶ Remove oil measuring devices once commissioning is complete.

- ▶ Check control and safety devices.
- ▶ Check tightness of oil carrying components.
- ▶ Enter combustion values and settings in the commissioning record and/or test sheet.
- ▶ Mount cover on burner.
- ▶ Inform the operator about the use of the equipment.
- ▶ Hand the installation and operating manual to the operator and inform him that this should be kept with the appliance.
- ▶ Point out to operator that the installation should be serviced annually.

## 7.4 Check combustion

### Determine excess air

- ► Slowly close air damper(s) in the relevant operating point, until the combustion limit is reached (soot number approx. 1).
- ► Measure and document $O_2$ content.
- ► Read air number (λ).

Increase air number to ensure sufficient excess air:
- by 0.15 … 0.2 (equates to 15 … 20 % excess air),
- by more than 0.2 for more difficult conditions, such as:
  - dirty combustion air,
  - fluctuating intake temperature,
  - fluctuating chimney draught.

**Example**

$$\lambda + 0.15 = \lambda^*$$

- ► Set air number (λ*), do not exceed CO content of 50 ppm.
- ► Measure and document $O_2$ content.

### Check flue gas temperature

- ► Check flue gas temperature.
- ► Ensure that the flue gas temperature complies with the data provided by the boiler manufacturer.
- ► If necessary adjust flue gas temperature, e g.:
  - Increase burner capacity to avoid condensation in the flue gas ducts, except on condensing units.
  - Reduce burner capacity to improve efficiency.
  - Adjust heat exchanger to the data provided by the manufacturer.

### Determine flue gas losses

- ► Measure combustion air temperature ($t_L$) near the air damper(s).
- ► Measure oxygen content ($O_2$) and flue gas temperature ($t_A$) at the same time at one point.
- ► Determine flue gas losses using the following formula:

$$q_A = (t_A - t_L) \cdot \left(\frac{A_2}{21 - O_2}\right) + B$$

$q_A$ Flue gas losses [%]

$t_A$ Flue gas temperature [°C]

$t_L$ Combustion air temperature [°C]

$O_2$ Volumetric content of oxygen in dry flue gas [%]

| Fuel factors | Fuel oil |
|---|---|
| A2 | 0.68 |
| B | 0.007 |

## 8 Shutdown

For breaks in operation:
- ► Switch off burner.
- ► Close fuel shut off devices.

# 9 Servicing

## 9.1 Notes on servicing



**DANGER**

**Risk of electric shock**
Working on the device when voltage is applied can lead to electric shock.
- ► Isolate the device from the power supply prior to starting any work.
- ► Safeguard against accidental restart.



**WARNING**

**Danger of getting burned on hot components**
Hot components can lead to burns.
- ► Allow components to cool.

Servicing must only be carried out by qualified personnel. The combustion plant should be serviced annually. Depending on site conditions more frequent checks may be required.

Components, which show increased wear and tear or whose design lifespan is or will be exceeded prior to the next service should be replaced as a precaution.

The design lifespan of the components is listed in the service plan [ch. 9.2].



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

The following components must only be replaced and must not be repaired:
- combustion manager
- flame sensor
- actuator
- oil solenoid valve
- pressure switch

**Prior to every servicing**

- ► Inform the operator about the extent of service work to be carried out.
- ► Switch off mains switch of installation and safeguard against accidental reactivation.
- ► Close fuel shut off devices.
- ► Remove cover.
- ► Unplug boiler control connection plug from combustion manager.

## Following servicing



**DANGER**

**Risk of electric shock**
Touching the ignition device can lead to electric shock.
► Do not touch ignition device during the ignition process.

► Check tightness of oil carrying components.
► Check function of:
  ▪ ignition,
  ▪ flame monitoring,
  ▪ oil pump (pump pressure and suction resistance),
  ▪ control and safety devices.
► Check combustion values, if necessary re-adjust the burner.
► Enter combustion values and settings in the commissioning record.
► Refit cover.

## 9.2 Service plan

| Components | Criteria / design lifespan[1] | Service procedure |
|---|---|---|
| Fan wheel | Soiling | ▶ Clean |
| | Damage | ▶ Replace |
| Air duct | Soiling | ▶ Clean |
| Air damper | Soiling | ▶ Clean |
| Ignition cable | Damage | ▶ Replace |
| Ignition electrode | Soiling | ▶ Clean |
| | Damage/wear | ▶ Replace |
| Combustion Manager | 250 000 burner starts or 10 years[2] | ▶ Replace |
| Flame sensor | Soiling | ▶ Clean |
| | Damage<br>250 000 burner starts or 10 years[2] | ▶ Replace |
| Flame tube/diffuser | Soiling | ▶ Clean |
| | Damage | ▶ Replace |
| Oil nozzle | Soiling/wear | ▶ Replace<br>Recommendation: at least every 2 years |
| Oil pump filter | Soiling | ▶ Replace |
| Oil hose | Damage/oil escaping | ▶ Replace<br>Recommendation: every 5 years |
| Oil solenoid valve | Soundness<br>250 000 burner starts or 10 years[2] | ▶ Replace oil pump |

[1] The specified design lifespan applies for typical use in heating, hot water and steam systems as well as for thermal process systems to EN 746.
[2] If a criterion is reached, carry out maintenance measures.

## 9.3 Service position

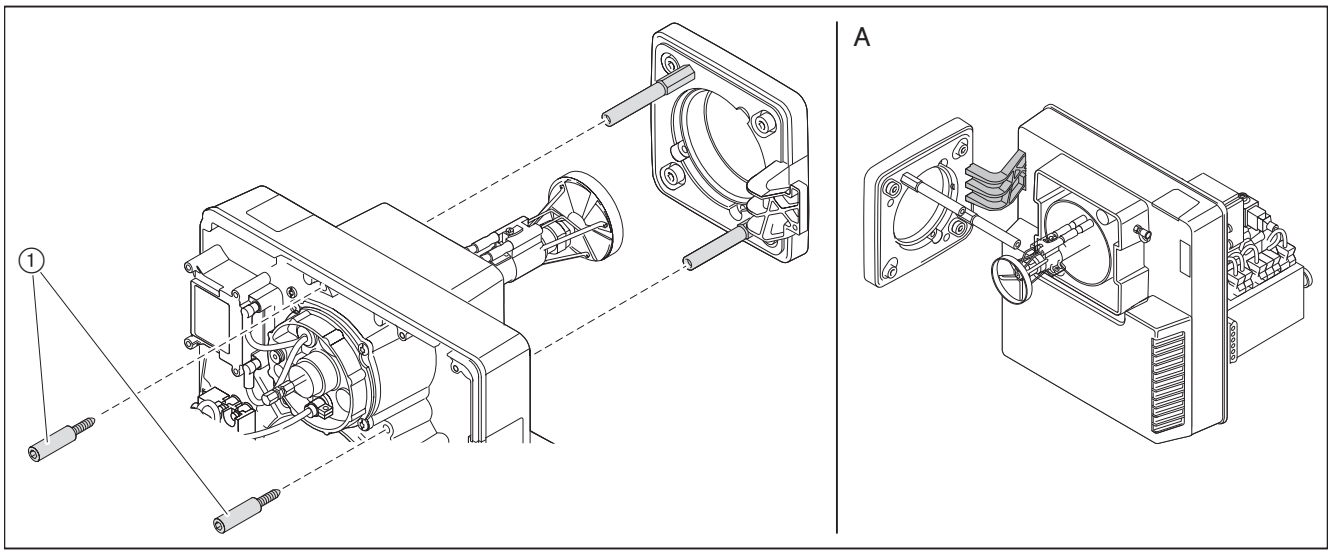
Observe notes on servicing [ch. 9.1].

- ► Remove bolts ①.
- ► If necessary remove oil hoses.

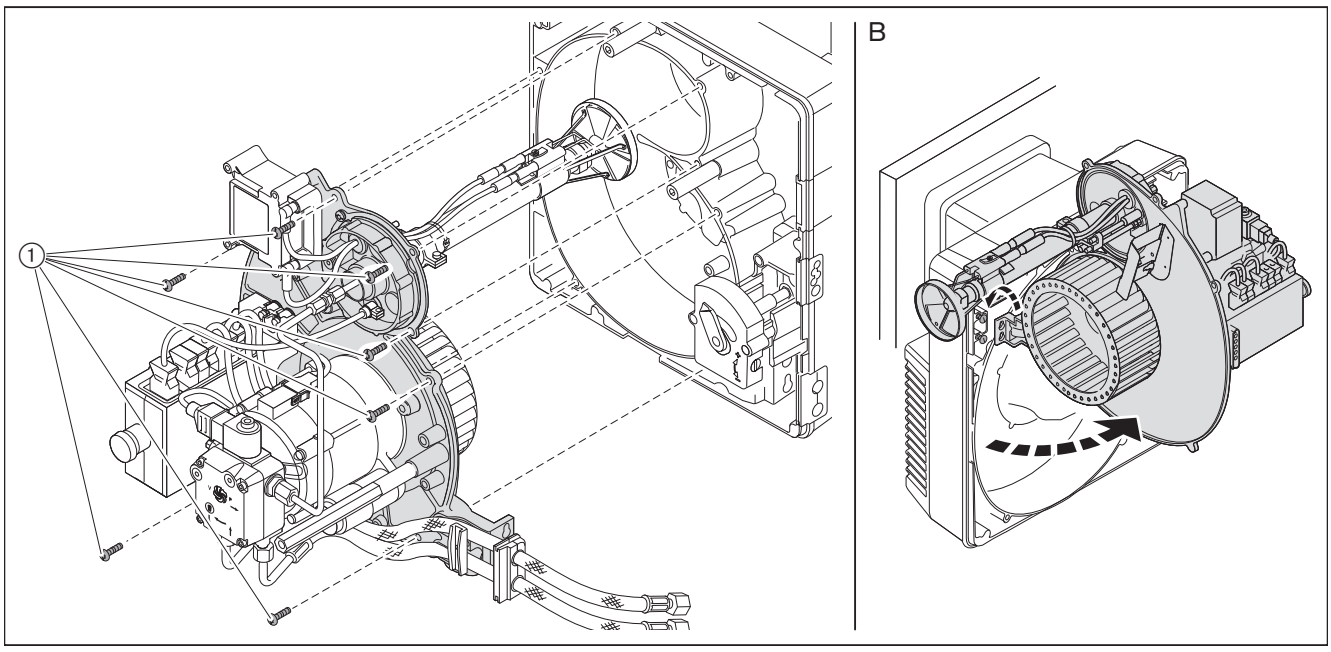
If the burner is placed into service position B:

- ► If necessary unplug actuator plug.
- ► Place the burner into the required service position.

**Service position A**




**Service position B**

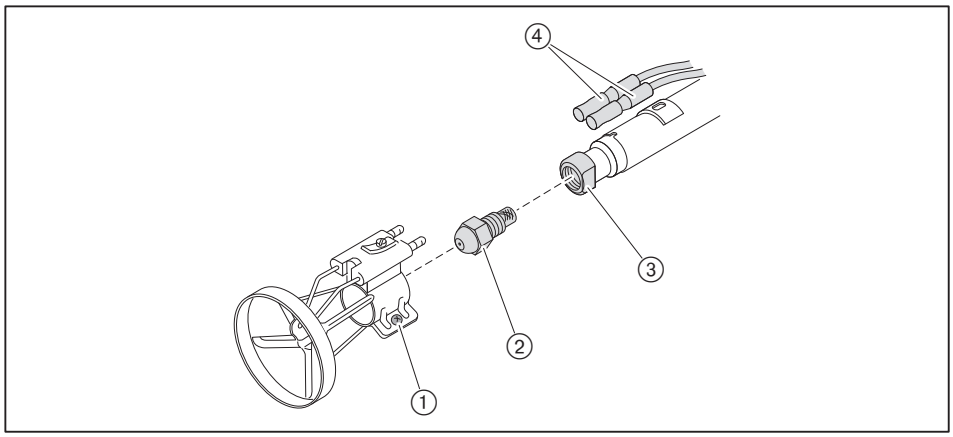


## 9.4 Replace nozzle

Observe notes on servicing [ch. 9.1].

Do not clean nozzles, always fit new nozzles.

- ► Place burner into service position A [ch. 9.3].
- ► Unplug ignition cable ④.
- ► Undo screw ① and remove diffuser.
- ► Counter-hold on the nozzle body ③ using a spanner and remove nozzle ②.
- ► Fit new nozzle ensuring it is seated tightly.
- ► Refit diffuser in reverse order.
- ► Set nozzle distance [ch. 9.7]
- ► Set ignition electrodes [ch. 9.5]

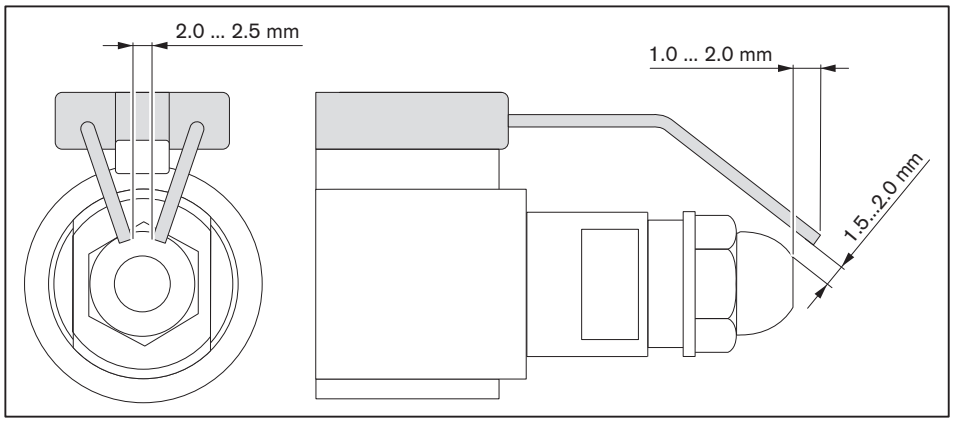


## 9.5 Set ignition electrodes

Observe notes on servicing [ch. 9.1].

The ignition electrodes must not touch the nozzle's atomising cone.

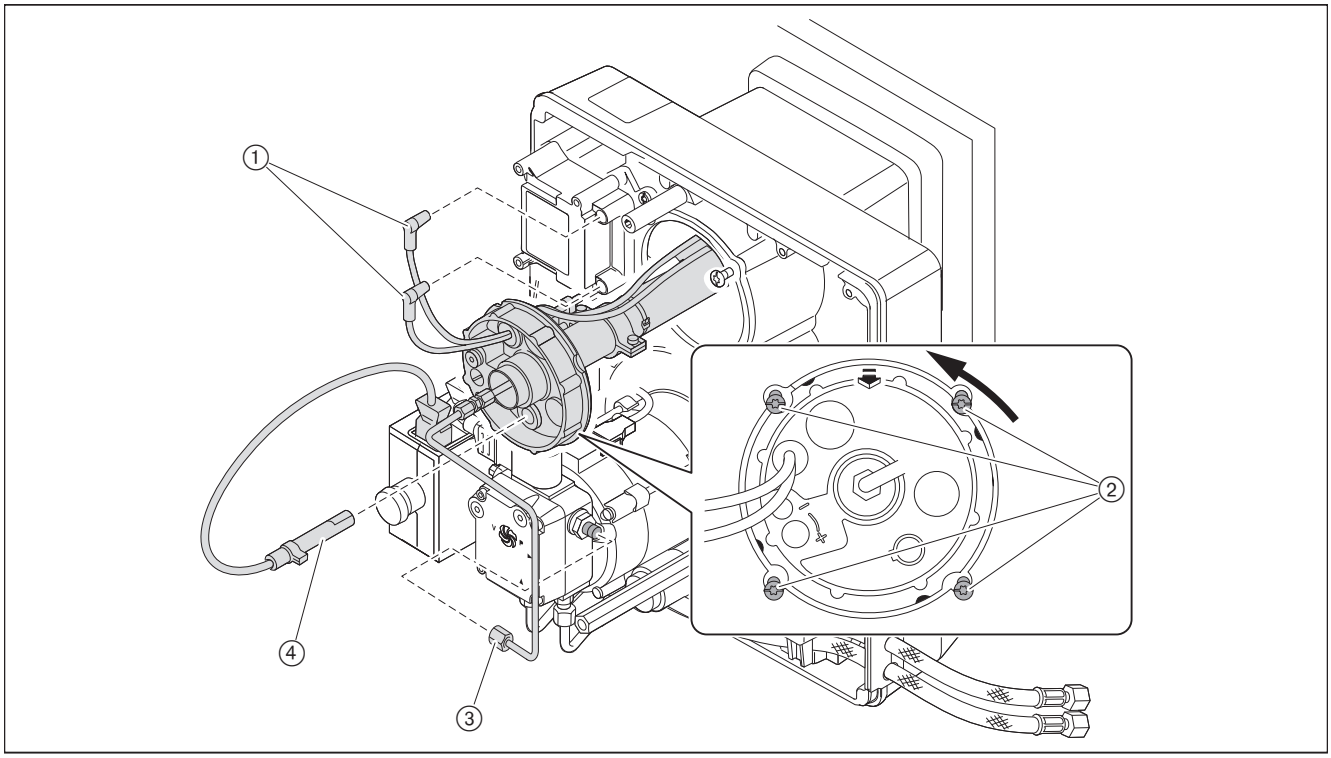
- ► Place burner into service position A [ch. 9.3].
- ► Check distance of ignition electrodes.
- ► If necessary adjust ignition electrodes by slightly bending.



## 9.6 Removing the mixing head

Observe notes on servicing [ch. 9.1].

- ► Unplug ignition cable ①.
- ► Remove oil line ③.
- ► Remove flame sensor ④.
- ► Undo screws ②.
- ► Turn mixing head to the left up to the recess and remove.



## 9.7 Set mixing head

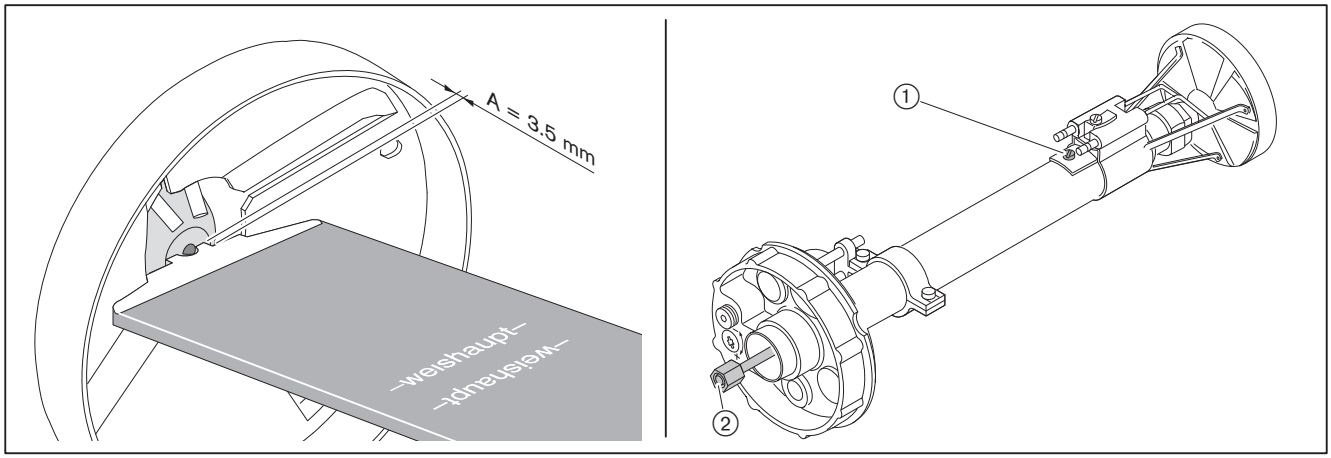
Observe notes on servicing [ch. 9.1].

### Set nozzle distance

- ► Place burner into service position A [ch. 9.3].
- ► Insert checking gauge and check dimension A (3.5 mm).

If the value measured deviates from dimension A:

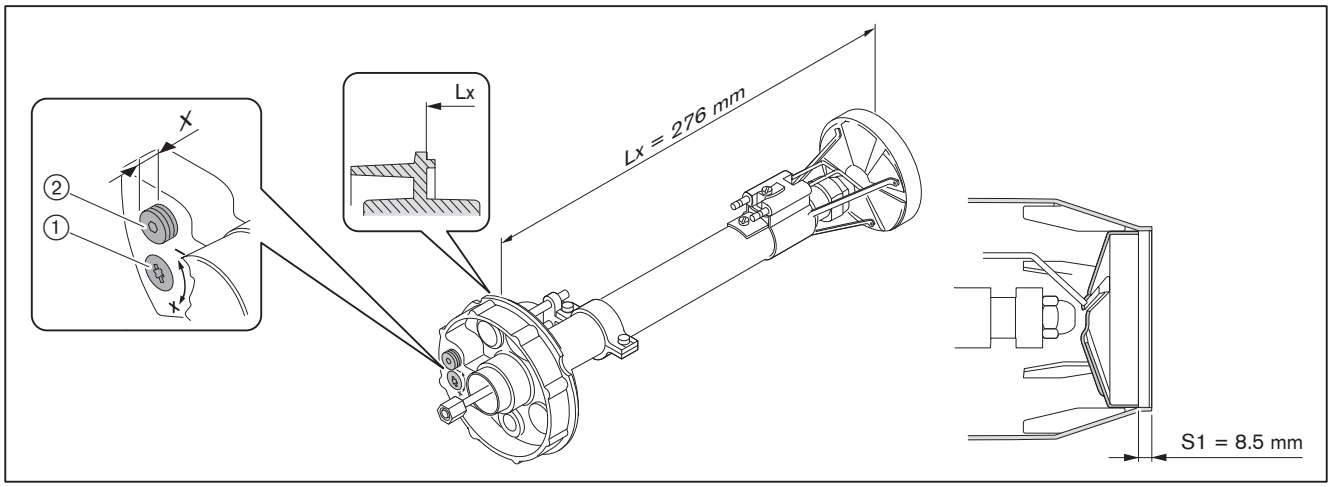
- ► Undo screw ①.
- ► Adjust nozzle body ② until dimension A is reached.
- ► Re-tighten screw ①.




### Check basic setting

Dimension S1 can only be checked when the burner is mounted to a boiler door, which is hinged open.

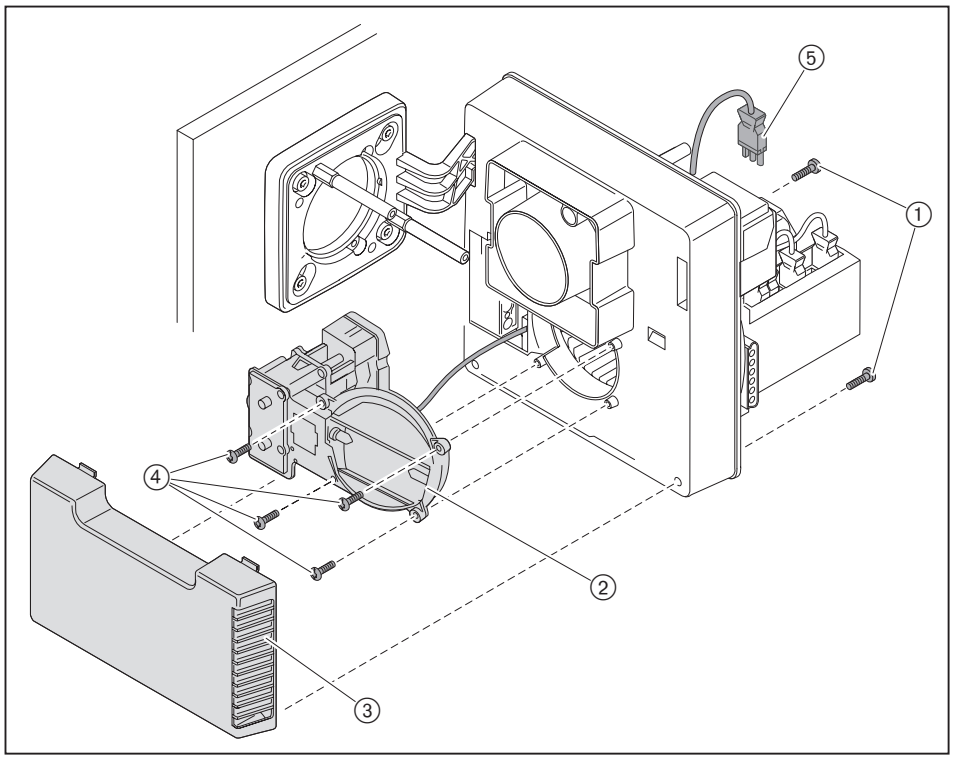
- ► Hinge open boiler door or if necessary remove mixing head [ch. 9.6].
- ► Turn setting screw ① until the indicating bolt ② is flush with the nozzle assembly cover (dimension X = 0 mm).
- ► Check dimension S1 and/or dimension Lx.
- ► Set dimension S1 and/or dimension Lx using setting screw ①.
- ► Remove plug from indicating bolt ②.
- ► Turn indicating bolt until it is flush with the nozzle assembly cover (dimension X = 0 mm).
- ► Replace plug.



## 9.8 Removing the air regulator

Observe notes on servicing [ch. 9.1].

- ► If necessary unplug actuator plug ⑤.
- ► Place burner into service position A [ch. 9.3].
- ► Remove bolts ①.
- ► Remove intake housing ③.
- ► Remove bolts ④.
- ► Remove air regulator ②.



## 9.9 Removing and refitting angle drive

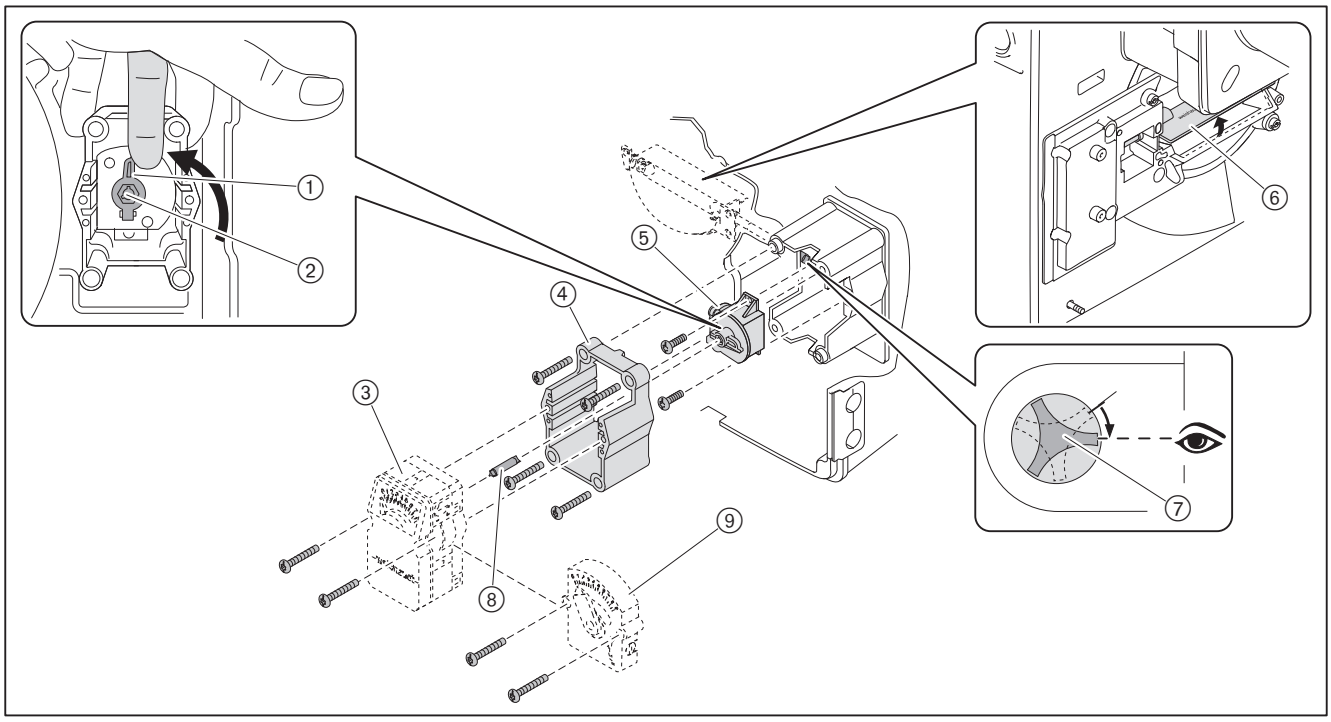
Observe notes on servicing [ch. 9.1].

### Removing

- ► Remove actuator ③ or manual adjuster ⑨.
- ► Remove frame ④.
- ► Remove angle drive ⑤.

### Refitting

- ► Remove intake housing [ch. 9.8].
- ► Open air damper ⑥ until position ⑦ has been reached and hold tight.
- ► Fit angle drive to shaft.
- ► Secure angle drive.
- ► Mount intake housing [ch. 9.8].
- ► Fit frame ④.
- ► For manual adjustment, record the air damper position and turn back to zero.
- ► Turn indicator ① to CLOSED position and hold.
- ► Place actuator or manual adjuster with shaft ⑧ into the star shaped groove ② and secure.
- ► For manual adjustment, reset the air damper to the position recorded.



## 9.10 Removing and refitting oil pump

Observe notes on servicing [ch. 9.1].

### Removing

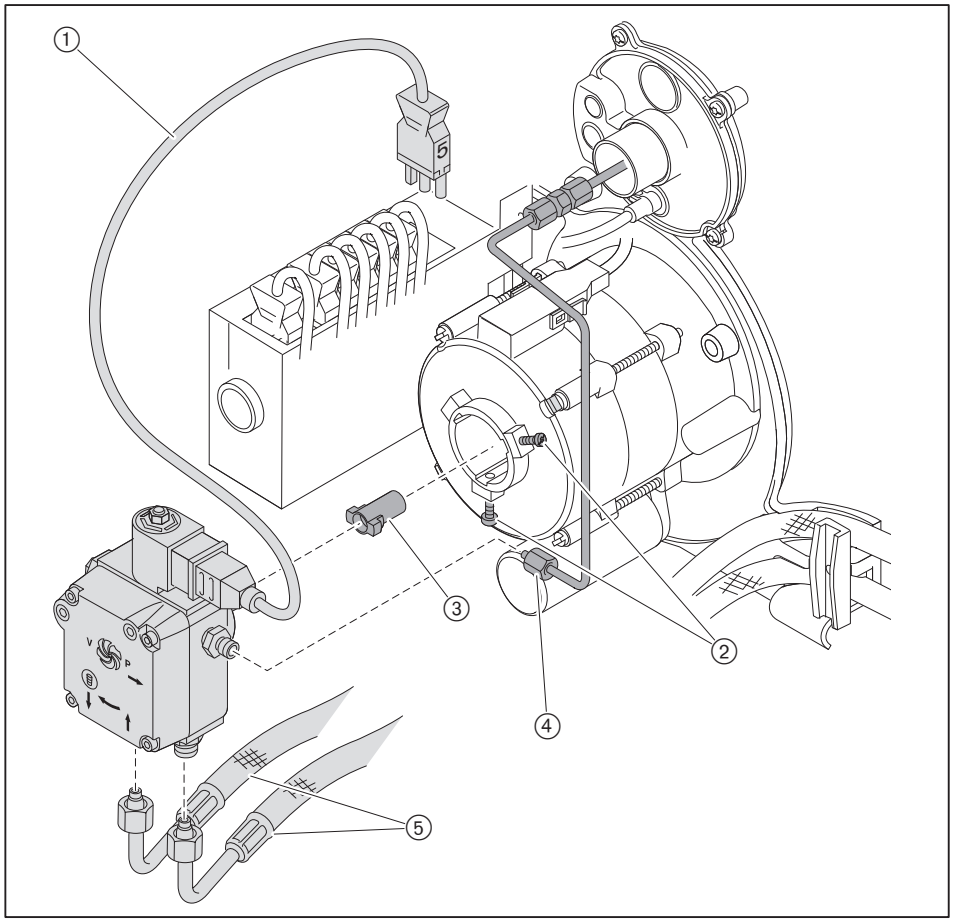
- ► Close fuel shut off devices.
- ► Unplug plug ①.
- ► Remove oil hoses ⑤.
- ► Remove oil line ④.
- ► Undo screws ② and remove oil pump.

### Refitting

- ► Install oil pump in reverse order and:
  - ensure correct alignment of coupling ③,
  - ensure correct allocation of flow and return of the oil hoses.

**CAUTION**

**Damage to the oil pump caused by incorrect connection**
Mixing up supply and return can damage the oil pump.
- ► Ensure correct connection of oil hoses to the supply and return of the pump.



## 9.11 Removing and refitting fan wheel

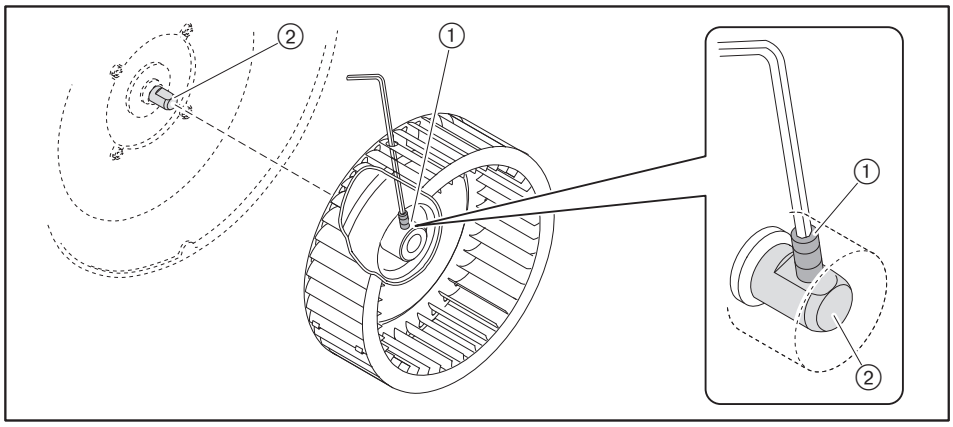
Observe notes on servicing [ch. 9.1].

### Removing

- ► Place housing cover into service position B [ch. 9.3].
- ► Remove grub screw ① and remove fan wheel.

### Refitting

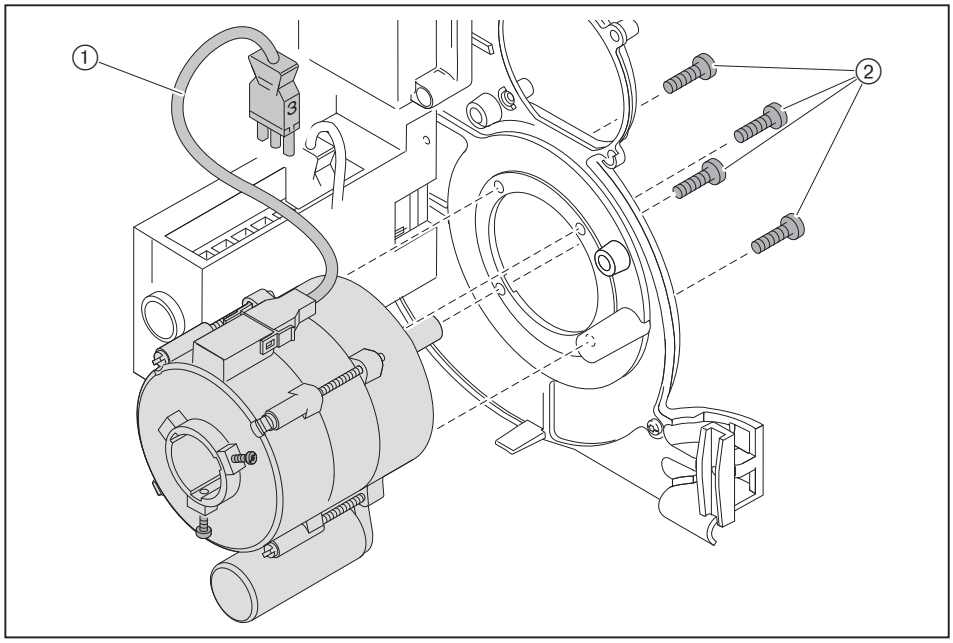
- ► Refit fan wheel in reverse order and
  - ensure correct alignment on the motor shaft ②,
  - screw in new grub screw ①,
  - turn fan wheel to ensure it moves freely.



## 9.12 Remove burner motor

Observe notes on servicing [ch. 9.1].

- ▶ Remove the oil pump [ch. 9.10].
- ▶ Remove fan wheel [ch. 9.11].
- ▶ Unplug plug ①.
- ▶ Hold motor and remove screws ②.
- ▶ Remove motor.

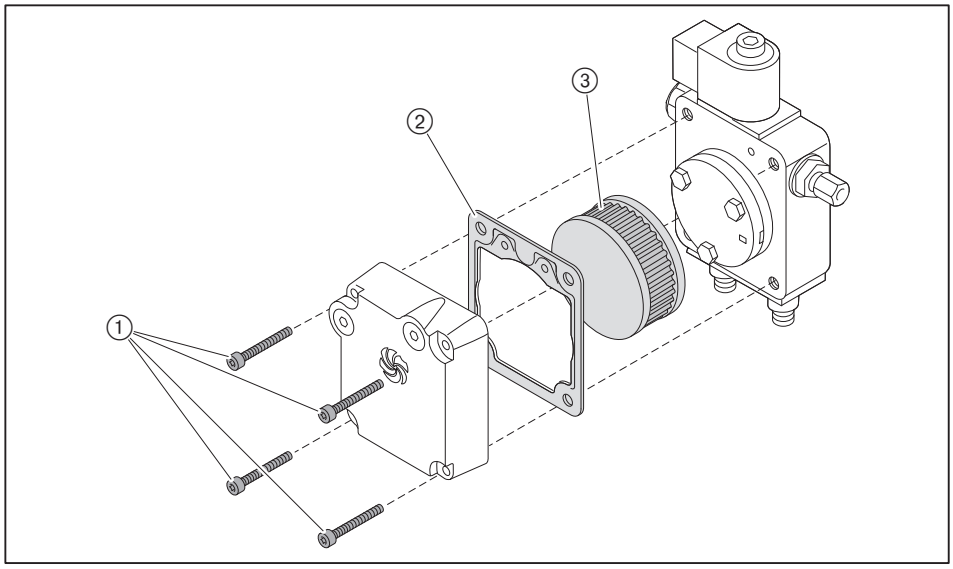


## 9.13 Removing and refitting oil pump filter

Observe notes on servicing [ch. 9.1].

### Removing

- ► Close fuel shut off devices.
- ► Remove bolts ①.
- ► Remove pump cover.
- ► Replace filter ③ and gasket ②.



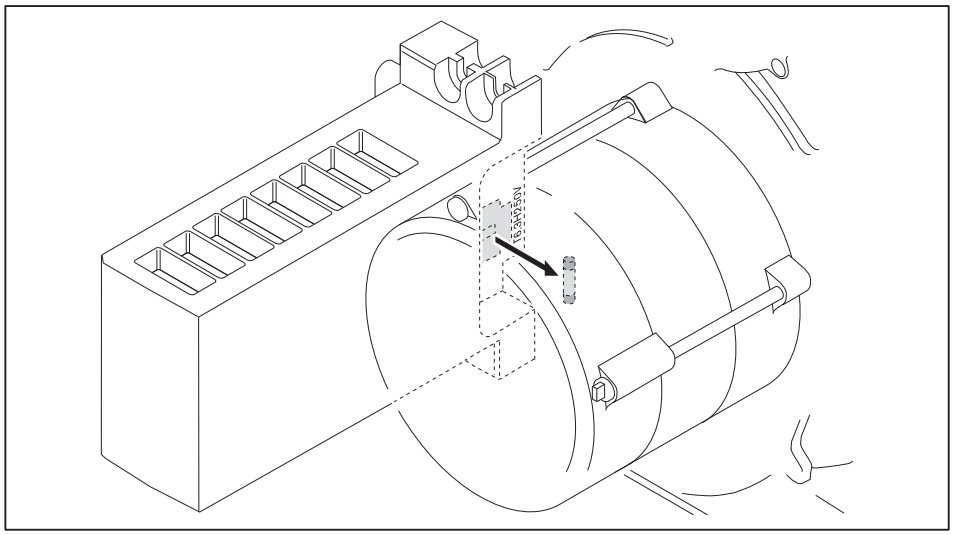

### Refitting

- ► Refit filter in reverse order ensuring sealing surfaces are clean.

## 9.14 Replacing the fuse

Observe notes on servicing [ch. 9.1].

- ► Remove all plugs from the combustion manager.
- ► Remove screws from the combustion manager.
- ► Remove combustion manager.
- ► Replace fuse (T6.3H, IEC 127-2/5).

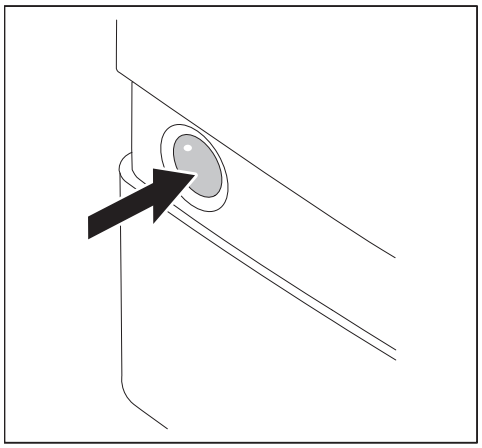


# 10 Troubleshooting

## 10.1 Procedures for fault conditions

The combustion manager recognises irregularities of the burner and indicates these with the illuminated push button.

The following conditions can occur:
- illuminated push button off [ch. 10.1.1],
- illuminated push button red [ch. 10.1.2],
- illuminated push button flashes [ch. 10.1.3].



### 10.1.1 Illuminated push button off

The following faults may be corrected by the operator:

| Fault | Cause | Rectification |
|---|---|---|
| Burner not operating | External fuse has tripped(1 | ▶ Check fuse. |
| | Heating switch is set to Off | ▶ Switch on heating switch. |
| | Temperature limiter or pressure limiter on heat exchanger has triggered(1 | ▶ Reset temperature limiter or pressure limiter on heat exchanger. |
| | Low water safety interlock on heat exchanger has triggered(1 | ▶ Top up water.<br>▶ Reset low water safety interlock on heat exchanger. |
| | Temperature regulator or pressure regulator on heat exchanger has been set incorrectly | ▶ Adjust temperature regulator or pressure regulator on heat exchanger. |
| | Boiler or heating circuit control is not functioning or has not been set correctly | ▶ Check function and setting of boiler or heating circuit control. |

(1 Notify your heating contractor or Weishaupt Customer Service if the problem occurs repeatedly.

### 10.1.2 Illuminated push button red

A burner fault has occurred. The burner is in lockout. Prior to resetting, the error code can be called up and used to control the cause of the fault.

**Read error code**

Only 5 seconds after a fault occurred can it be been analysed and read.

- ► Press illuminated push button for 5 seconds.
- ✓ Illuminated push button briefly lights up orange.
- ✓ Illuminated push button flashes red.
- ► Count between the flashing pauses and flashing signals and note down.
- ► Rectify cause of fault, see table.

**Resetting**



**WARNING**

**Damage resulting from incorrect fault repair**
Incorrect fault repair can cause damage to the equipment and injure personnel.
- ► Do not carry out more than 2 lockout resets successively.
- ► Faults must be rectified by qualified personnel.

- ► Press illuminated push button for 1 second.
- ✓ Red signal extinguishes.
- ✓ Burner has been reset.

### Error codes with lockout

The following faults must only be rectified by qualified personnel:

| Fault codes | Fault | Cause | Rectification |
|---|---|---|---|
| 2 x flashing<br>No flame,<br>end of safety time | Oil pump supplies no oil | Oil supply leaking | ▶ Check oil supply |
| | | Anti siphon valve does not open | ▶ Check valve, if necessary replace |
| | | Shut off device closed | ▶ Open shut off device |
| | | Pre-filter strainer soiled | ▶ Replace pre-filter strainer |
| | | Oil pump defective | ▶ Replace oil pump [ch. 9.10] |
| | No oil throughput at the nozzle | Oil nozzle blocked | ▶ Replace nozzle |
| | No ignition | Ignition electrode dirty or wet | ▶ Clean ignition electrode |
| | | Ignition electrode spark gap too big or short circuited | ▶ Set ignition electrode [ch. 9.5] |
| | | Ceramic insulator defective | ▶ Replace ignition electrodes |
| | | Ignition cable defective | ▶ Replace ignition cable |
| | | Ignition unit defective | ▶ Replace ignition unit |
| | Solenoid valve does not open | Coil defective | ▶ Replace coil |
| | Combustion manager does not detect a flame signal | Flame sensor soiled | ▶ Clean flame sensor |
| | | Flame sensor defective | ▶ Replace flame sensor |
| | | Illumination insufficient | ▶ Check burner setting |
| | Burner motor does not run | Oil pump seized | ▶ Replace oil pump [ch. 9.10] |
| | | Capacitor defective | ▶ Replace capacitor |
| | | Burner motor defective | ▶ Replace burner motor [ch. 9.12] |
| | No flame formation despite ignition and oil supply | Nozzle distance incorrect | ▶ Check nozzle distance, adjust if necessary [ch. 9.7] |
| | | Mixing pressure too high | ▶ Check mixing pressure [ch. 7.1.2] |
| Flashing 4 times<br>Flame simulation/ extraneous light | Flame signal prior to or after operation | Extraneous light source present | Extraneous light detection from 13 µA<br>▶ Find and eliminate extraneous light source |
| | | Flame sensor defective | ▶ Check flame sensor, if necessary replace |
| | Flame formation during pre-purge | Solenoid valve leaking | ▶ Replace oil pump [ch. 9.10] |

## 10 Troubleshooting

The following faults must only be rectified by qualified personnel:

| Fault codes | Fault | Cause | Rectification |
|---|---|---|---|
| Flashing 7 times<br>Flame failure during operation | Flame has failed | Oil supply leaking | ▶ Check oil supply |
| | | Suction resistance in front of pump too high | |
| | | Oil nozzle soiled | ▶ Replace oil nozzle |
| | Flame signal insufficient | Burner setting incorrect | ▶ Check burner setting<br>▶ Check flame signal [ch. 7.1.1] |
| | | Flame sensor soiled | ▶ Clean flame sensor |
| | | Flame sensor defective | ▶ Check flame sensor, if necessary replace |
| Flashing 8 times<br>Release contact fault | Actuator limit switch does not close | Actuator defective | ▶ Check actuator, replace if necessary |
| | Contact X3:2 not closed | Bridging plug No. 2 is missing | ▶ Plug in bridging plug No. 2 |
| | Contact X3:12 not closed | Bridging plug No. 12 is missing | ▶ Plug in bridging plug No. 12 |
| Flashing 10 times<br>Combustion manager fault | Burner does not start | Parameters have been changed | ▶ Reset burner [ch. 10.1.2] |
| | | Combustion manager defective | ▶ Reset burner [ch. 10.1.2], if fault reoccurs replace combustion manager |

### 10.1.3 Illuminated push button flashes

An irregularity is present. The burner does not go to lockout. Once the fault has been rectified, the error code ceases.

**Error codes without lockout**

The following faults must only be rectified by qualified personnel:

| Fault codes | Cause | Rectification |
|---|---|---|
| Flashing green/red | Extraneous light prior to heat demand | ▶ Find and eliminate extraneous light source |
| Flashing red/orange with pause | Excess voltage | ▶ Check voltage supply |
| Flashing orange/red | Low voltage | ▶ Check voltage supply |
| | Internal unit fuse (F7) faulty | ▶ Replace fuse [ch. 9.14] |
| | Combustion manager fault | ▶ Replace combustion manager |
| Flashing green | Flame sensor soiled | ▶ Clean flame sensor |
| | Flame sensor defective | ▶ Replace flame sensor |
| | Burner operation with weak flame signal (< 45 µA) | ▶ Adjust burner whilst observing the recommended flame signal [ch. 7.1.1] |
| Glimmering red | OCI mode activated (not used) | ▶ Press illuminated push button for more than 5 seconds<br>✓ Combustion manager changes to operating mode |

## 10.2 Operating problems

The following faults must only be rectified by qualified personnel:

| Observation | Cause | Rectification |
|---|---|---|
| Poor start behaviour of burner | Mixing pressure too high | ▸ Correct mixing pressure |
| | Ignition electrodes set incorrectly | ▸ Set ignition electrodes [ch. 9.5] |
| | Mixing head set incorrectly | ▸ Set mixing head [ch. 9.7] |
| Oil pump makes severe mechanical noise | Oil pump sucks air | ▸ Ensure oil supply is tight |
| | Suction resistance in oil line too high | ▸ Clean filter<br>▸ Check oil supply |
| Oil nozzle atomisation uneven | Nozzle blocked/soiled | ▸ Replace nozzle |
| | Nozzle worn | |
| Flame tube/diffuser has heavy soot deposit | Oil nozzle defective | ▸ Replace nozzle |
| | Mixing head set incorrectly | ▸ Set mixing head [ch. 9.7] |
| | Incorrect combustion air quantity | ▸ Adjust burner |
| | Boiler room ventilated insufficient | ▸ Ensure sufficient boiler room ventilation |
| | Wrong oil nozzle | ▸ Check nozzle type |
| | Nozzle distance incorrect | ▸ Check nozzle distance, adjust if necessary [ch. 9.7] |
| Combustion pulsating or burner booming | Mixing head set incorrectly | ▸ Set mixing head [ch. 9.7] |
| | Incorrect combustion air quantity | ▸ Adjust burner |
| | Wrong oil nozzle | ▸ Check nozzle type |
| CO content too high | Nozzle distance too big | ▸ Check nozzle distance, adjust if necessary [ch. 9.7] |
| Stability problems | Nozzle distance incorrect | ▸ Check nozzle distance, adjust if necessary [ch. 9.7] |
| | Wrong oil nozzle | ▸ Check nozzle type |
| Restart after flame failure | Burner repeats start process | ▸ See error codes flashing 7 times |

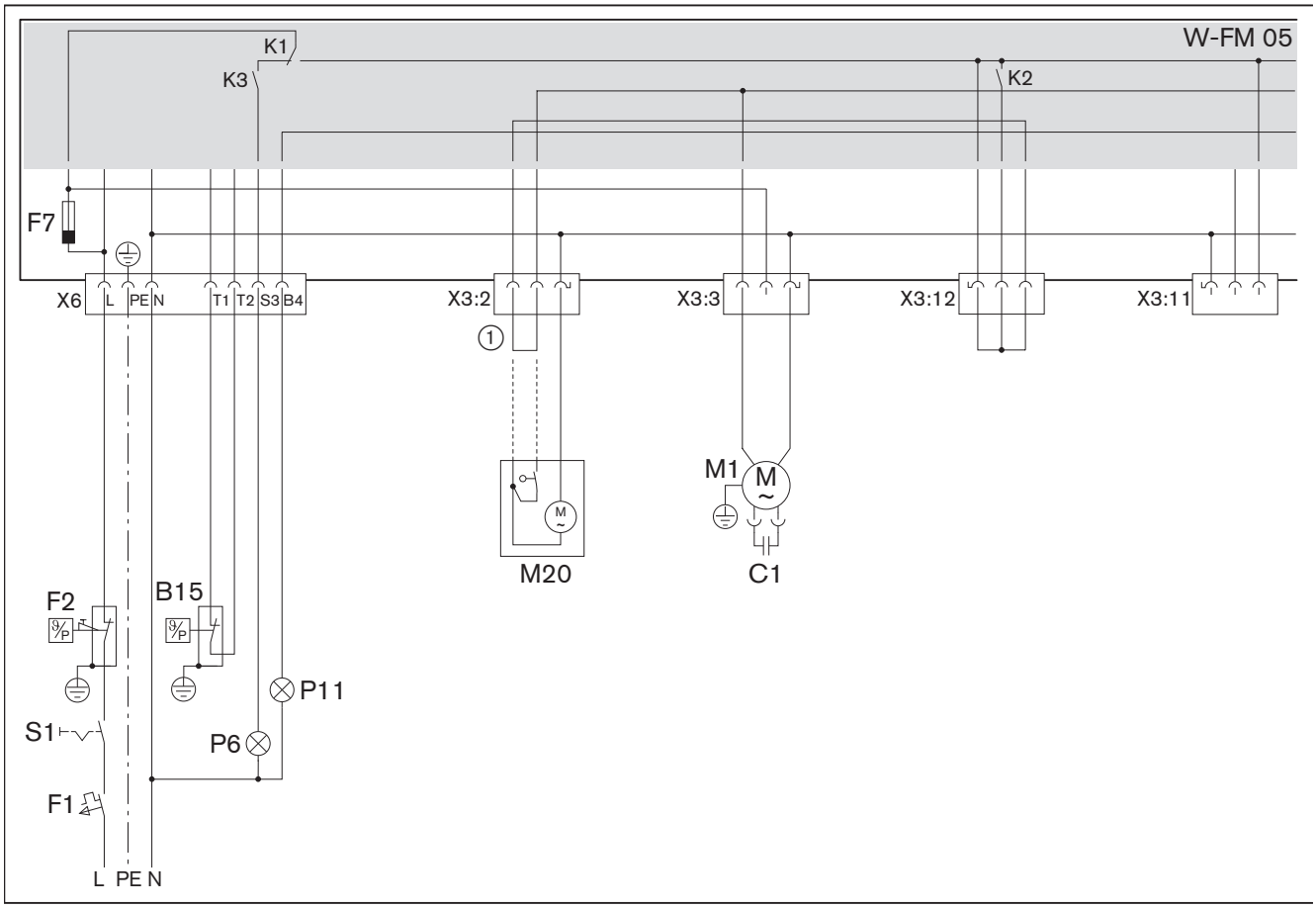
# 11 Technical documentation

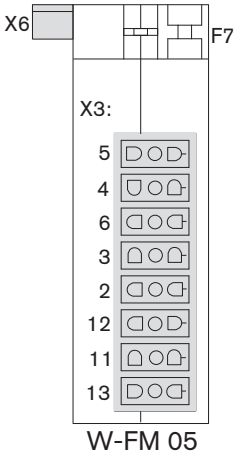
## 11.1 Conversion table unit of pressure

| Bar | Pascal | | | |
|---|---|---|---|---|
| | Pa | hPa | kPa | MPa |
| 0.1 mbar | 10 | 0.1 | 0.01 | 0.00001 |
| 1 mbar | 100 | 1 | 0.1 | 0.0001 |
| 10 mbar | 1 000 | 10 | 1 | 0.001 |
| 100 mbar | 10 000 | 100 | 10 | 0.01 |
| 1 bar | 100 000 | 1 000 | 100 | 0.1 |
| 10 bar | 1 000 000 | 10 000 | 1 000 | 1 |

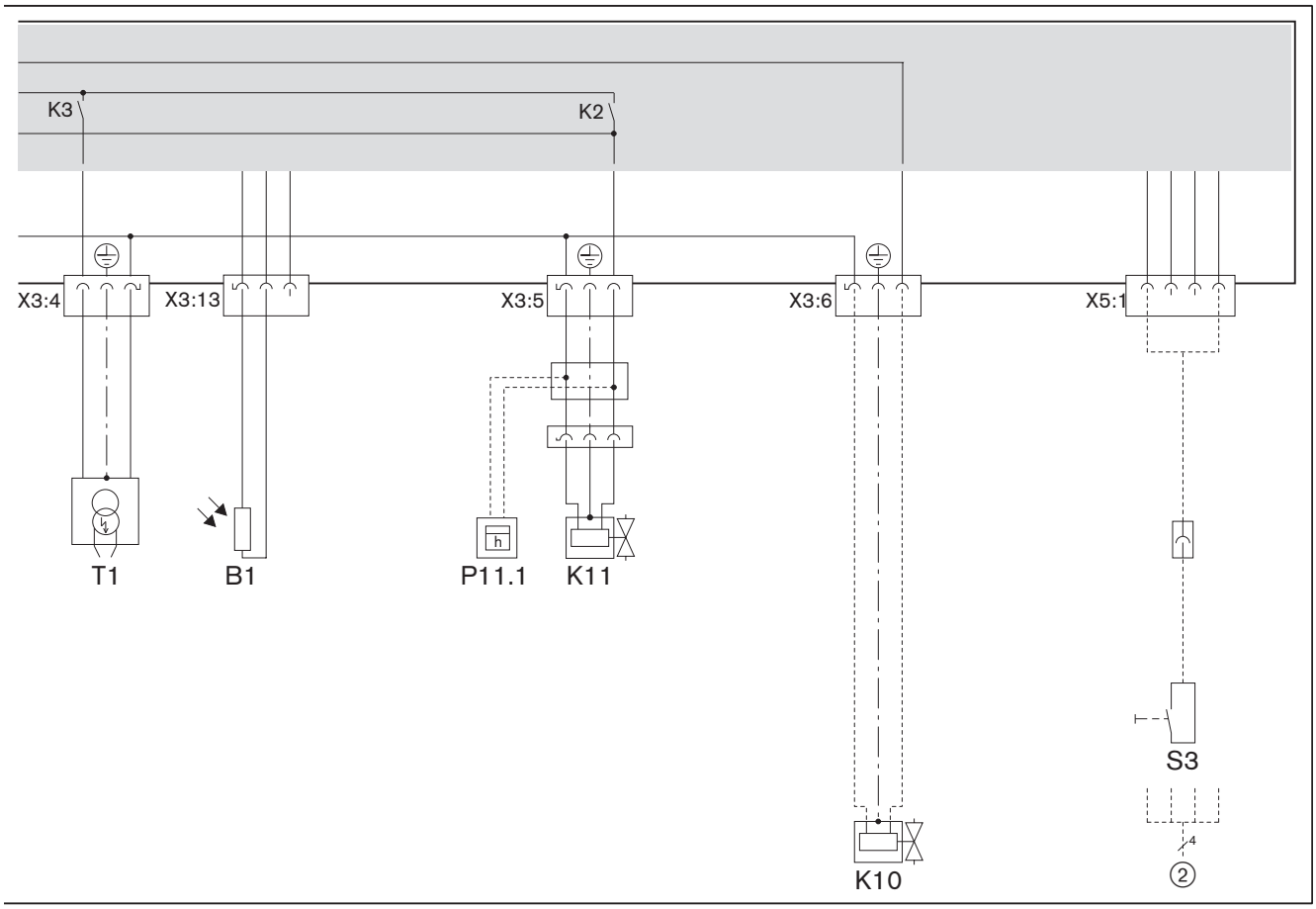
## 11.2 Wiring diagram

For special version observe wiring diagram supplied.




| | |
|---|---|
| B15 | Temperature or pressure regulator |
| C1 | Motor capacitor |
| F1 | External fuse |
| F2 | Temperature or pressure limiter |
| F7 | Internal unit fuse (T6.3H, IEC 127-2/5) |
| M1 | Burner motor |
| M20 | Air damper actuator (optional) |
| P6 | Control lamp lockout (optional) |
| P11 | Control lamp operation (optional) |
| S1 | Operating switch |
| ① | Bridge for air regulator with manual adjustment |




| | |
|---|---|
| B1 | Flame sensor |
| K10 | Anti siphon valve (optional) |
| K11 | Solenoid valve |
| P11.1 | Hours counter (optional) |
| S3 | Remote reset (optional) |
| T1 | Ignition unit |
| ② | Bus interface (optional) |

# 12 Project planning

## 12.1 Oil supply

Observe EN 12514-2, DIN 4755, TRÖI and local regulations.

**General information relating to the oil supply**

- Do not use cathode protection system with steel tanks.
- With oil temperatures < 5 °C, the separation of paraffin can cause oil lines, oil filters and nozzles to become blocked. Avoid placing oil tanks and pipelines in areas subject to frost.
- The oil supply should be installed in such a way that the oil hoses can be connected free of tension.
- Fit oil filter in front of pump, recommended mesh aperture 70 µm.

**Suction resistance and supply pressure**



**CAUTION**

**Pump damage due to excessive suction resistance**
A suction resistance greater than 0.4 bar can damage the pump.
► Reduce suction resistance – or – install oil supply pump or suction unit, whilst observing the maximum supply pressure at the oil filter.

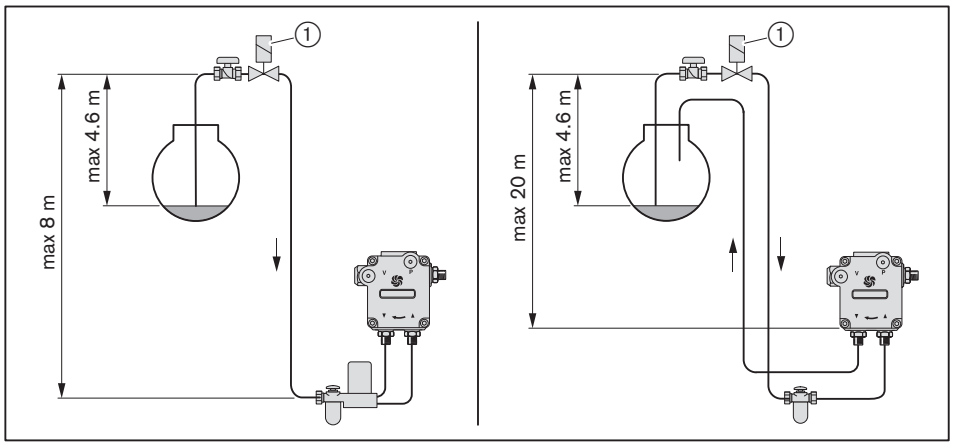
The suction resistance depends on:
- suction line length and diameter,
- pressure loss of oil filter and other components,
- lowest oil level in the oil storage tank (max 3.5 m below the oil pump).

If an oil feeder pump is installed:
- max 1.5 bar supply pressure at oil filter,
- max 0.7 bar supply pressure into automatic de-aerator.

### Elevated oil level

- If the suction line is leaking the tank can be siphoned dry. An electric anti siphon valve ① can prevent this.
- Observe manufacturers instructions regarding pressure loss caused by anti siphon valve.
- The anti siphon valve must close with a delay and show a pressure relief towards the oil storage tank.

Maintain height differences:
- max 4.6 m between oil level and anti siphon valve,
- on single pipe system max 8 m between anti siphon valve and automatic de-aerator,
- on two pipe system max 20 m between anti siphon valve and oil pump.

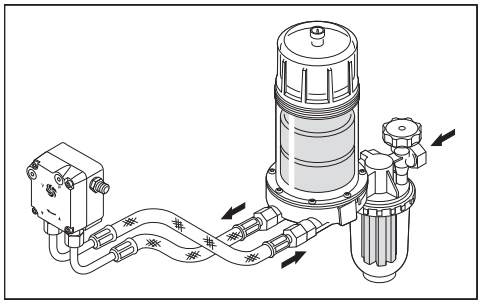



### Single pipe system

**CAUTION**

**Damage to the oil pump caused by incorrect connection**
Mixing up supply and return can damage the oil pump.
► Ensure correct connection of oil hoses to the supply and return of the pump.

If the oil is supplied via a single pipe system, and automatic de-aerator must be installed in front of the oil pump.



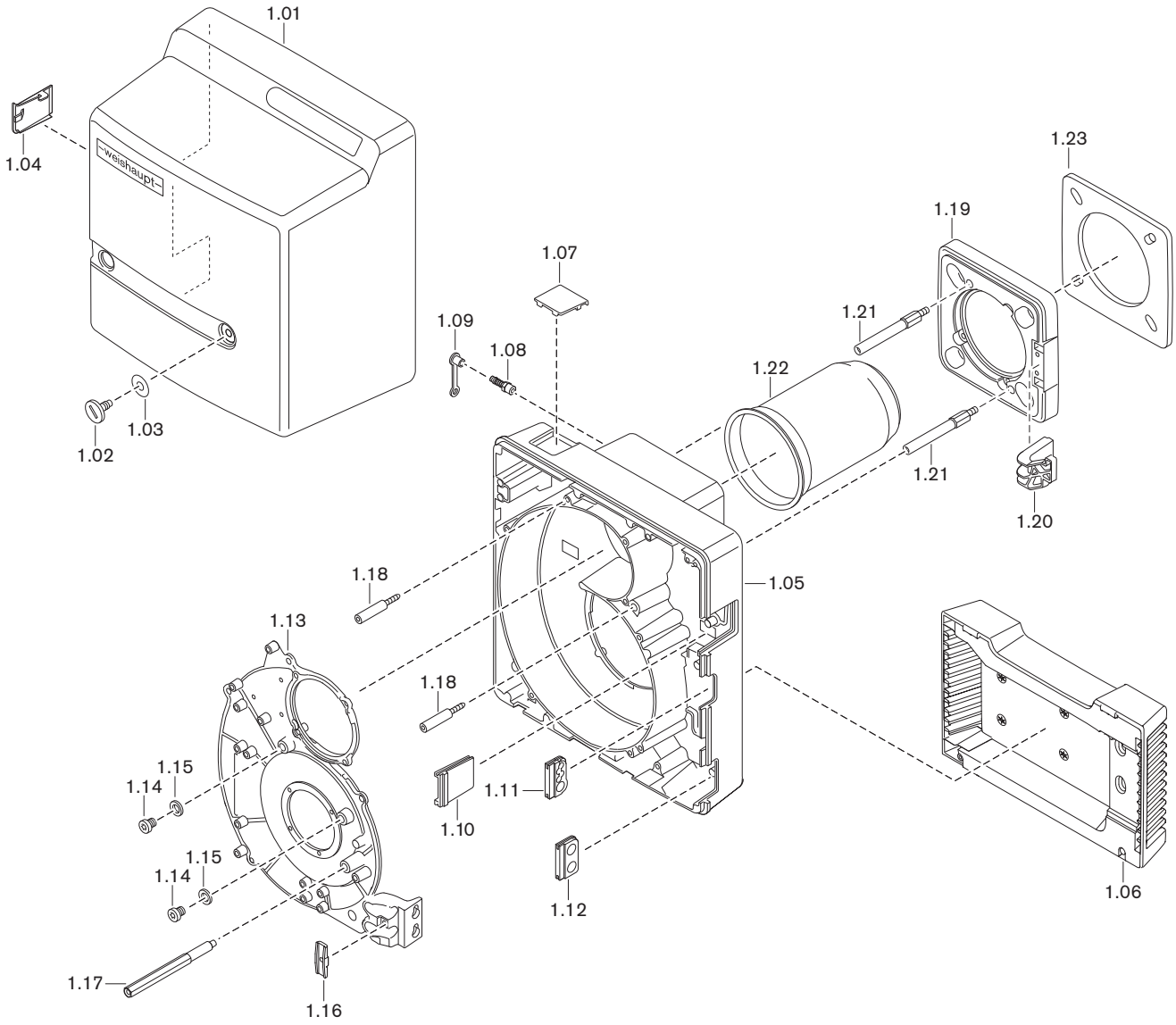
### Two pipe system

In a two pipe system the oil pump is vented automatically.

### Ring main operation

Weishaupt recommends the use of a ring main when operating several burners.

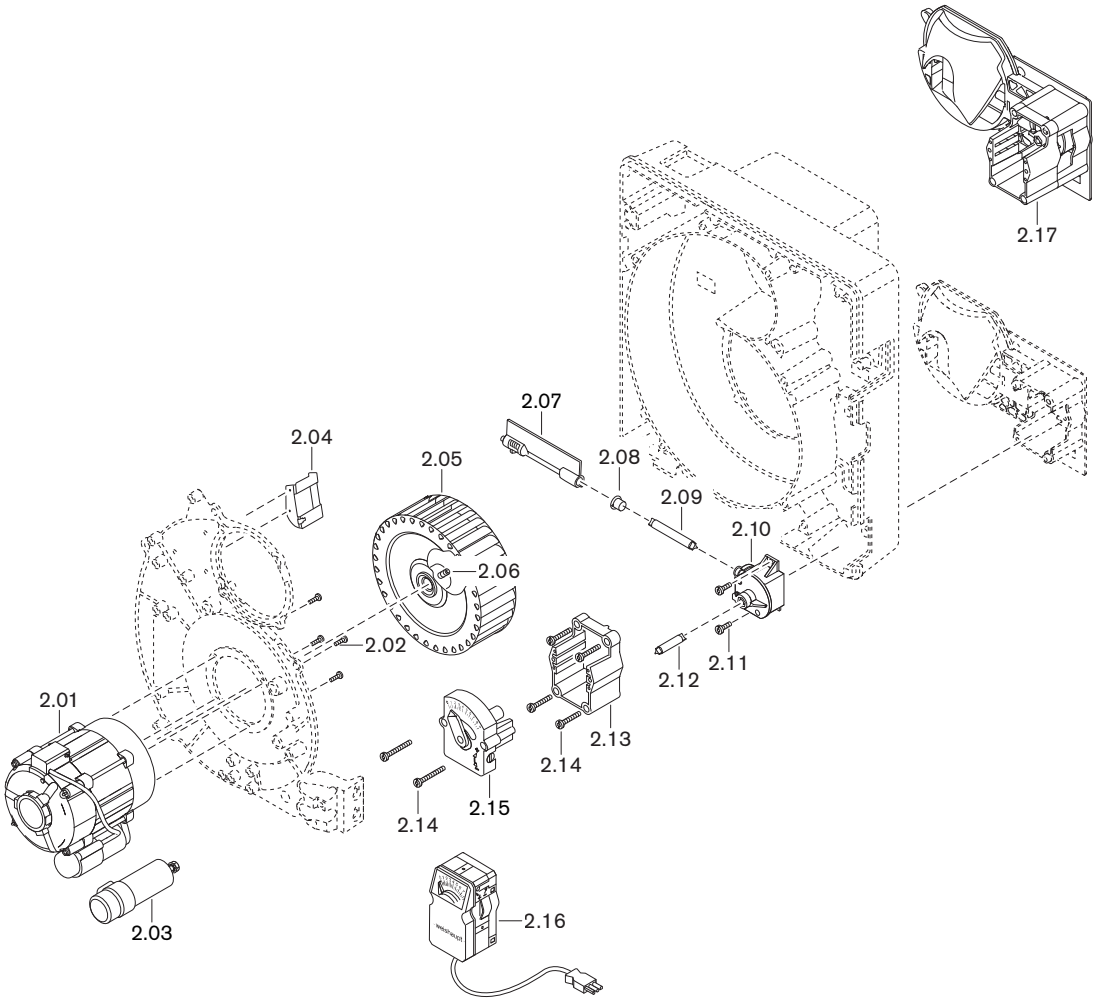
## 13 Spares


1.01
1.04
1.02
1.03
1.07
1.09
1.08
1.22
1.23
1.19
1.21
1.21
1.20
1.18
1.05
1.13
1.18
1.15
1.14
1.15
1.14
1.11
1.10
1.12
1.06
1.17
1.16

| Pos. | Description | Order No. |
|---|---|---|
| 1.01 | Cover complete | 241 110 01 112 |
| 1.02 | Screw M8 x 15 | 142 013 01 157 |
| 1.03 | Washer 7 x 18 | 430 016 |
| 1.04 | Cover | 241 210 01 127 |
| 1.05 | Burner housing | 241 110 01 307 |
| 1.06 | Intake housing complete | 241 110 01 082 |
| | – Screw 4 x 30 Torx-Plus | 409 325 |
| 1.07 | View port on hours counter cover | 241 210 01 197 |
| 1.08 | Threaded socket R1/8" GES6 | 453 017 |
| 1.09 | Protective cap DN 6 SELF 50/2 CF | 232 300 01 047 |
| 1.10 | Housing cover | 241 110 01 177 |
| 1.11 | Grommet for connection cable | 241 200 01 247 |
| 1.12 | Grommet for oil hose | 241 400 01 177 |
| 1.13 | Housing cover | 241 110 01 317 |
| 1.14 | Screw $G^{1}/_{8}$A DIN 908 | 409 004 |
| 1.15 | Sealing ring 10 x 13.5 x 1.5 DIN 7603 | 441 033 |
| 1.16 | Bracket for oil hose and cable | 241 400 01 367 |
| 1.17 | Stay bolt cover | 241 210 01 207 |
| 1.18 | Screw M6 burner housing | 241 110 01 297 |
| 1.19 | Burner flange | 241 110 01 057 |
| | – Screw M8 x 30 DIN 912 | 402 517 |
| | – Washer 8.4 DIN 433 | 430 504 |
| 1.20 | Support bracket for service position | 241 110 01 067 |
| 1.21 | Stay bolt for burner flange | 241 050 01 187 |
| 1.22 | Flame tube | |
| | – Standard | 241 110 14 022 |
| | – extended by 100 mm* | 240 110 14 012 |
| | – extended by 200 mm* | 240 110 14 022 |
| | – extended by 300 mm* | 240 110 14 032 |
| 1.23 | Flange gasket | 241 110 01 107 |

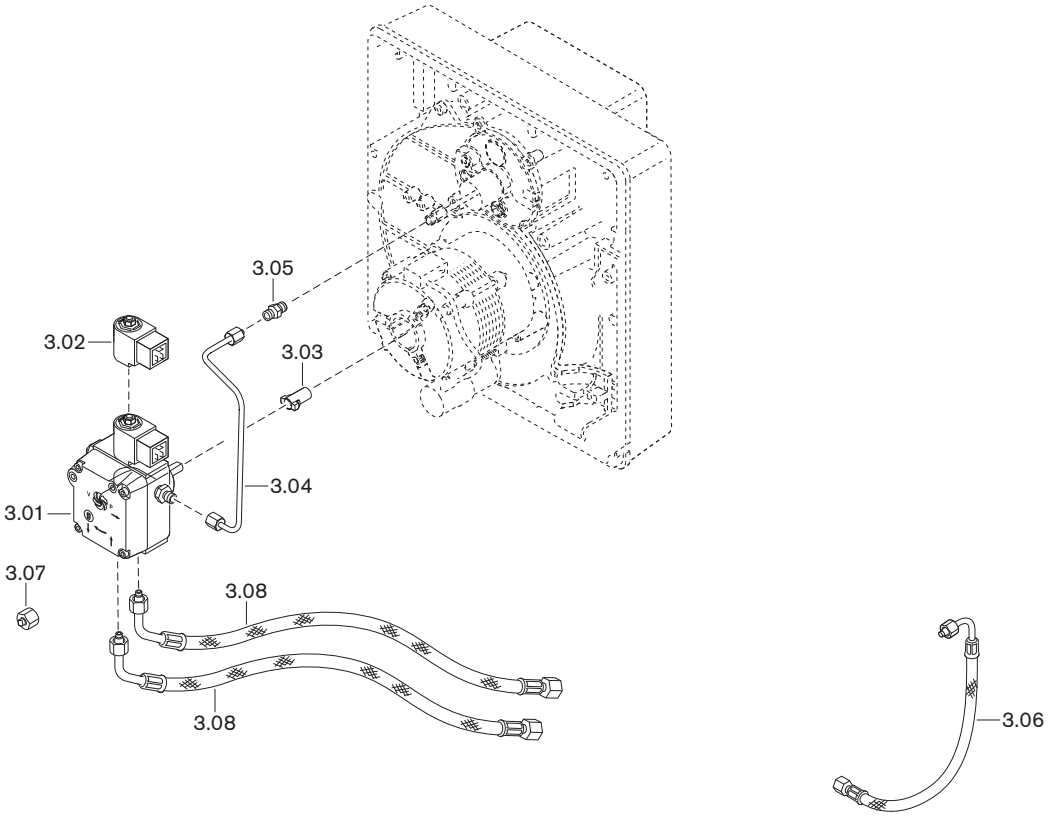
* Only in conjunction with combustion head extension.

## 13 Spares


2.17
2.07
2.04
2.05
2.08
2.09
2.10
2.06
2.02
2.12
2.11
2.01
2.13
2.14
2.15
2.14
2.16
2.03

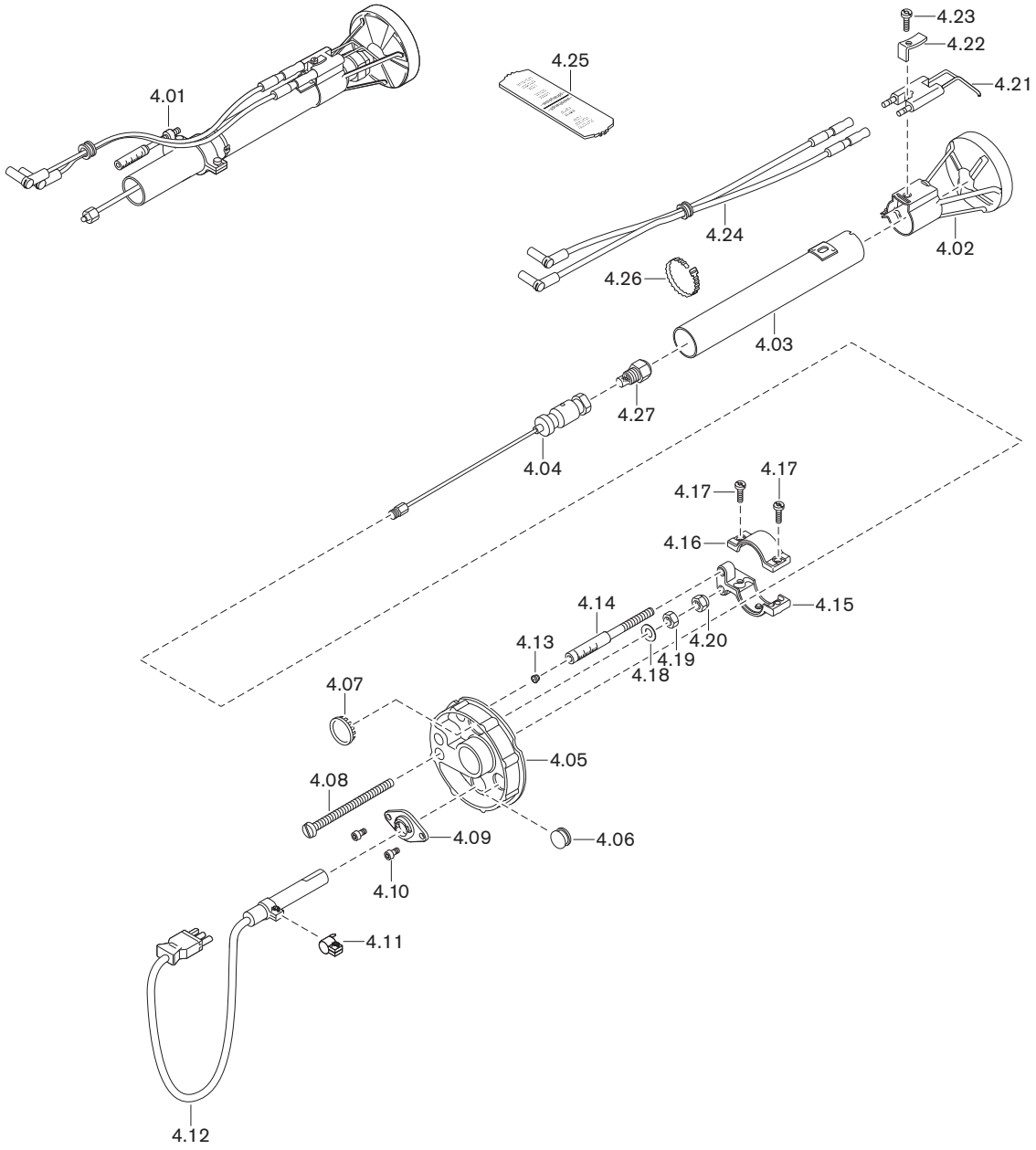
| Pos. | Description | Order No. |
|---|---|---|
| 2.01 | Motor ECK03/H-2 230V 50Hz | 652 110 |
| 2.02 | Screw M4 x 10 Torx-Plus | 409 323 |
| 2.03 | Capacitor 5.0 µF 420V, AC, DB | 713 474 |
| 2.04 | Air guide | 241 110 01 267 |
| 2.05 | Fan wheel TLR 157 x 47 -L S1 50 Hz | 241 110 08 042 |
| 2.06 | Grub screw M6x8 w. ann. cut. edge (Tuflok) | 420 549 |
| 2.07 | Air damper complete | 241 110 02 102 |
| 2.08 | Bearing for air damper shaft | 241 110 02 107 |
| 2.09 | Shaft air damper - angle drive | 241 210 02 057 |
| 2.10 | Angle drive spring 1 | 241 110 02 052 |
| 2.11 | Screw 4 x 12 Torx-Plus Remform | 409 320 |
| 2.12 | Shaft angle drive - actuator | 241 400 02 157 |
| 2.13 | Frame for actuator | 241 210 02 037 |
| 2.14 | Screw 4 x 30 Torx-Plus Delta PT | 409 325 |
| 2.15 | Manual adjustment | 241 050 02 022 |
| 2.16 | Actuator W-St02/2 220-240V 50Hz | 651 049 |
| 2.17 | Air regulator W10D spring 1 | 241 110 02 082 |

**13 Spares**



| Pos. | Description | Order No. |
|---|---|---|
| 3.01 | Pump ALEV 30 C | 601 857 |
| | – Filter set with seal | 601 107 |
| 3.02 | Solenoid coil T80 Suntec 220-240V 50-60Hz | 604 495 |
| 3.03 | Plug coupling | 652 135 |
| 3.04 | Oil line pump-nozzle assembly | 241 110 06 018 |
| 3.05 | Screwed union 24-SX-LL04-ST | 452 020 |
| 3.06 | Pressure hose DN 4, 286 mm (for installation rotated by 180 ) | 491 246 |
| 3.07 | Bypass plug BUZ 06-LL with nut | 241 100 06 012 |
| 3.08 | Oil hose DN 4, 1200 mm | |
| | – Standard | 491 126 |
| | – diffusion resistant | 491 131 |

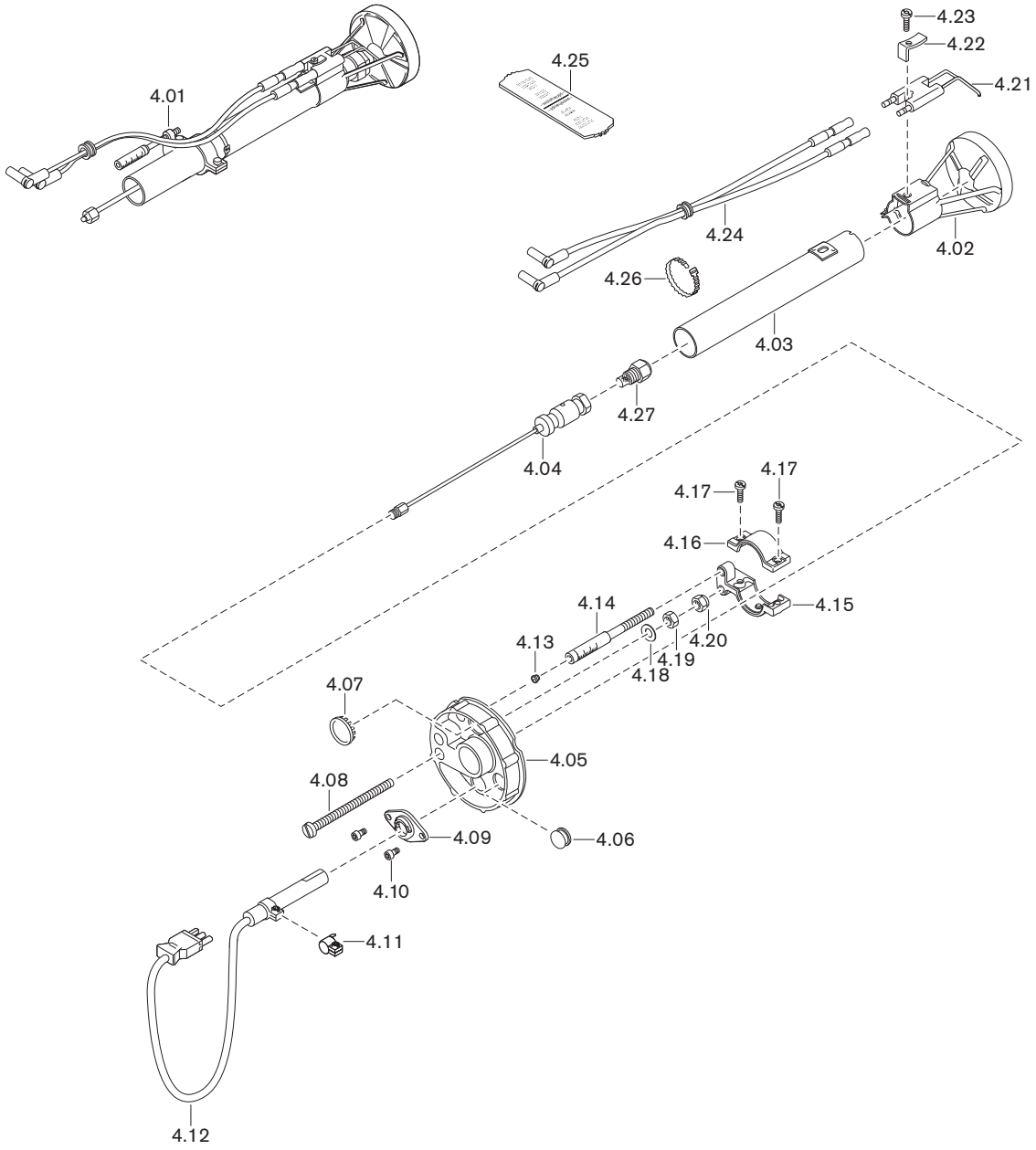
**13 Spares**


4.01
4.25
4.23
4.22
4.21
4.24
4.02
4.26
4.03
4.27
4.04
4.17
4.17
4.16
4.14
4.15
4.13
4.20
4.19
4.18
4.07
4.05
4.08
4.09
4.06
4.10
4.11
4.12

| Pos. | Description | Order No. |
|---|---|---|
| 4.01 | Nozzle assembly complete | |
| | – Standard | 241 110 10 020 |
| | – extended by 100 mm* | 240 110 10 010 |
| | – extended by 200 mm* | 240 110 10 020 |
| | – extended by 300 mm* | 240 110 10 030 |
| 4.02 | Diffuser | 241 110 14 042 |
| 4.03 | Guide tube with stop | |
| | – Standard | 241 110 10 012 |
| | – extended by 100 mm* | 240 110 10 022 |
| | – extended by 200 mm* | 240 110 10 042 |
| | – extended by 300 mm* | 240 110 10 062 |
| 4.04 | Nozzle head complete | |
| | – Standard | 241 110 10 052 |
| | – extended by 100 mm* | 240 110 10 012 |
| | – extended by 200 mm* | 240 110 10 032 |
| | – extended by 300 mm* | 240 110 10 052 |
| 4.05 | Nozzle assembly cover complete (QRB4) | 241 110 01 342 |
| 4.06 | Shut off grommet | 756 159 |
| 4.07 | View port glass | 241 400 01 377 |
| 4.08 | Adjusting screw M6 x 88 | 241 400 10 097 |
| 4.09 | Flange AGK42 QRB4 | 600 682 |
| 4.10 | Screw 4 x 12 Torx-Plus 20IP | 409 320 |
| 4.11 | Strap AKG43 for QRB4 | 600 681 |
| 4.12 | Flame sensor QRB4B | 241 050 12 072 |
| 4.13 | Plug 5.25 | 241 110 10 087 |
| 4.14 | Indicating bolt M6 x 90 | 241 110 10 097 |
| 4.15 | Adjusting lever bottom part | 241 110 10 067 |
| 4.16 | Adjusting lever top part | 241 110 10 077 |
| 4.17 | Screw M4 x 12 Torx-Plus 20IP | 409 237 |
| 4.18 | Spring washer A6 DIN 137 | 431 615 |
| 4.19 | Hexagonal nut M6 DIN 934 -8 | 411 301 |
| 4.20 | Hexagonal nut M6 DIN 985 -6 | 411 302 |
| 4.21 | Ignition electrode | 241 050 10 137 |
| 4.22 | Tension spring | 142 013 10 247 |
| 4.23 | Screw M4 x 14 Torx-Plus 20IP | 409 268 |
| 4.24 | Ignition cable | |
| | – 380 mm (Standard) | 241 110 11 032 |
| | – 480mm (for 100 mm extension)* | 240 110 11 042 |
| | – 540mm (for 200 mm extension)* | 240 110 11 052 |
| | – 640mm (for 300 mm extension)* | 240 110 11 062 |
| 4.25 | Setting gauge | 241 050 00 027 |
| 4.26 | Reopening belt 4.7 x 200 | 794 089 |

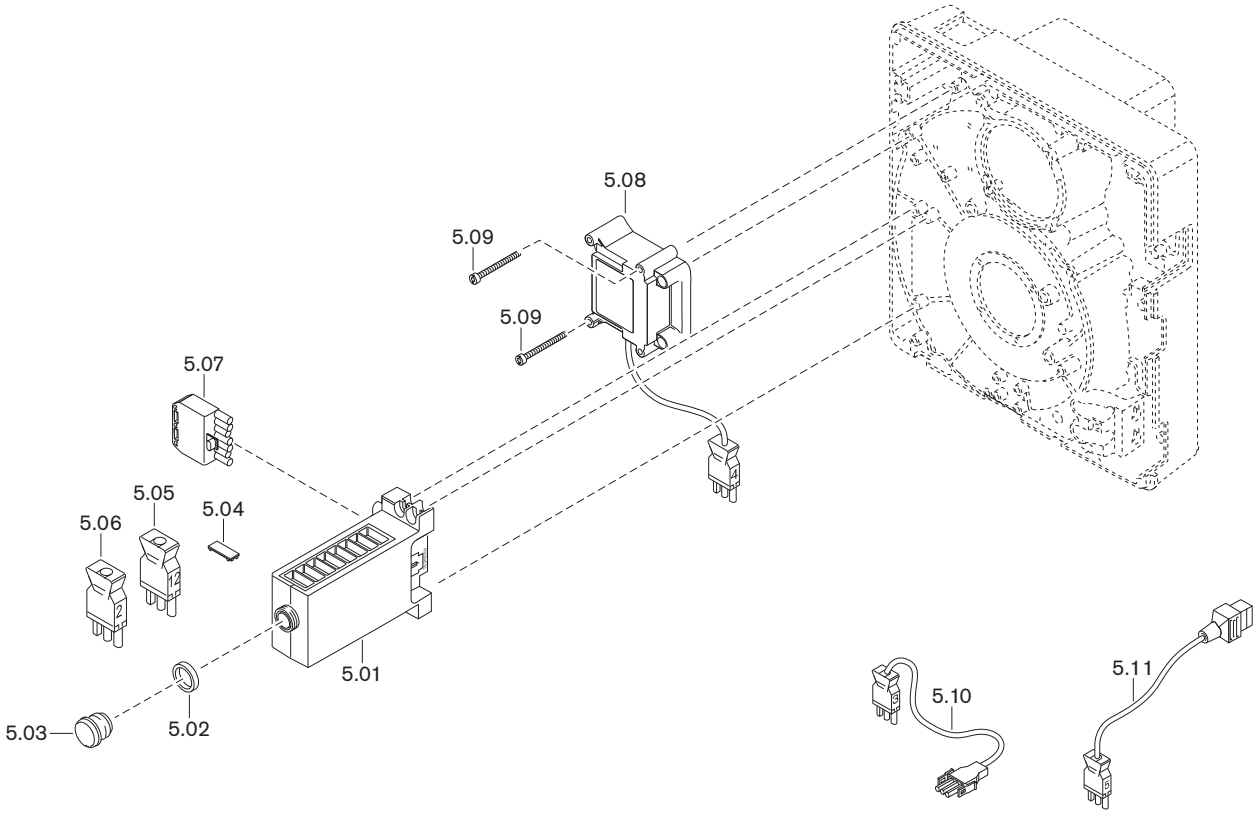
* Only in conjunction with combustion head extension.

## 13 Spares


4.01
4.25
4.23
4.22
4.21
4.24
4.02
4.26
4.03
4.27
4.04
4.17
4.17
4.16
4.14
4.15
4.13
4.20
4.19
4.18
4.07
4.05
4.08
4.09
4.06
4.10
4.11
4.12

| Pos. | Description | Order No. |
|---|---|---|
| 4.27 | Oil nozzle | |
| | – 0.75 gph 60°S Steinen | 612 203 |
| | – 0.85 gph 60°S Steinen | 612 206 |
| | – 1.00 gph 60°S Steinen | 612 207 |
| | – 1.10 gph 60°S Steinen | 612 208 |
| | – 1.25 gph 60°S Steinen | 612 210 |
| | – 1.35 gph 60°S Steinen | 612 211 |
| | – 1.50 gph 60°S Steinen | 612 212 |
| | – 0.75 gph 60°H Steinen | 612 513 |
| | – 0.85 gph 60°H Steinen | 612 514 |
| | – 1.00 gph 60°H Steinen | 612 517 |
| | – 1.10 gph 60°H Steinen | 612 518 |
| | – 1.25 gph 60°H Steinen | 612 519 |
| | – 1.35 gph 60°H Steinen | 612 520 |
| | – 1.50 gph 60°H Steinen | 612 521 |
| | – 0.75 gph 45°SF Fluidics | 602 060 |
| | – 0.85 gph 45°SF Fluidics | 602 061 |
| | – 1.00 gph 45°SF Fluidics | 602 062 |
| | – 1.10 gph 45°SF Fluidics | 602 063 |
| | – 1.25 gph 45°SF Fluidics | 602 064 |
| | – 1.35 gph 45°SF Fluidics | 602 065 |
| | – 1.50 gph 45°SF Fluidics | 602 066 |
| | – 0.75 gph 45°HF Fluidics | 602 683 |
| | – 0.85 gph 45°HF Fluidics | 602 684 |
| | – 1.00 gph 45°HF Fluidics | 602 710 |
| | – 1.10 gph 45°HF Fluidics | 602 711 |
| | – 1.25 gph 45°HF Fluidics | 602 713 |
| | – 1.35 gph 45°HF Fluidics | 602 714 |
| | – 1.50 gph 45°HF Fluidics | 602 715 |

**13 Spares**



| Pos. | Description | Order No. |
|---|---|---|
| 5.01 | Combustion manager W-FM 05, 230 V / 50/60 Hz | 600 470 |
| | – Micro fuse T6.3H, IEC 127-2/5 | 483 011 22 457 |
| 5.02 | Adapter ring 22 x 4 for extension | 600 358 |
| 5.03 | Reset button extension AGK20.19 | 600 357 |
| 5.04 | Cover clip AGK63 | 600 312 |
| 5.05 | Bridging plug No. 12 | 241 050 12 032 |
| 5.06 | Bridging plug No. 2 | 240 200 12 012 |
| 5.07 | Plug unit ST18/7 | 716 549 |
| 5.08 | Ignition unit type W-ZG01V 230 V 100 VA | 603 221 |
| 5.09 | Screw M4 x 42 Combi-Torx-Plus 20IP | 409 260 |
| 5.10 | Plug cable No. 3 motor | 241 050 12 062 |
| 5.11 | Plug cable No. 5 solenoid valve | 241 050 12 052 |

# 14 Notes

**A**

Air damper ... 9, 28, 29, 42, 43
Air damper setting ... 28
Air number ... 32
Air regulator ... 42
Ambient conditions ... 14
Ammeter ... 26
Angle drive ... 43
Anti siphon valve ... 59
Aperture ... 18, 20
Approval data ... 14
Atomising pressure ... 19, 30

**B**

Bar ... 55
Basic setting ... 41
Basic settings ... 28
Boiler room ... 6
Booming ... 54
Breaks in operation ... 33
Burner motor ... 11, 46

**C**

Capacity ... 16
Capacity graph ... 16
CO content ... 32
Combustion air ... 6
Combustion chamber pressure ... 16
Combustion control ... 32
Combustion head ... 16
Combustion head extension ... 18
Combustion heat rating ... 16, 28
Combustion manager ... 11, 25
Commissioning ... 26
Consumption ... 14
Conversion table ... 55

**D**

Default settings ... 28
Design lifespan ... 6, 34
Diffuser ... 9, 28, 29
Diffuser setting ... 28
Dimensions ... 17
Display ... 25
Disposal ... 7
Drilling diagram ... 18
Ducted air intake ... 6, 16

**E**

Electrical connection ... 24
Electrical data ... 14
Electrodes ... 39
Emission ... 15
Emission class ... 15
Error code ... 50
Error codes ... 51, 53
Errors ... 51
Excess air ... 32
Extraneous light ... 26

**F**

Fabrication number ... 8
Fan motor ... 46
Fan pressure ... 26, 29
Fan wheel ... 9, 45
Fault ... 49, 54
Fault history ... 50
Faults ... 53
Filter ... 47, 58
Flame sensor ... 11
Flame signal ... 11, 26
Flame tube ... 18
Flashing codes ... 51, 53
Flow pressure ... 22, 58
Flow temperature ... 22
Flue gas losses ... 32
Flue gas measurement ... 32
Flue gas temperature ... 32
Fuel ... 14
Fuel oil ... 14
Fuel release ... 12
Fuse ... 48
Fusing ... 14

**G**

Guarantee ... 5

**H**

Heat exchanger ... 18
Hours counter ... 57
hPa ... 55
Humidity ... 14

**I**

Ignition ... 12
Ignition electrode ... 39
Ignition unit ... 11
Illuminated push button ... 25, 49, 50
Indicating bolt ... 29, 41
Initialisation time ... 13
Installation ... 18
Installation elevation ... 16
Installation location ... 18
Intake housing ... 42

**K**

kPa ... 55

**L**

Liability ... 5
Lifespan ... 6, 34
Lockout ... 49, 51, 53

**M**

Mains voltage ... 14
Maintenance position ... 37
mbar ... 55
Measuring device ... 26

## 15 Key word index

Mixing head ..... 9, 28, 40, 41
Mixing pressure ..... 26, 29
Monitoring current ..... 26
Motor ..... 11, 46
MPa ..... 55

**N**

Name plate ..... 8
Noise ..... 54
Nozzle ..... 19, 38
Nozzle assembly ..... 41
Nozzle distance ..... 41
Nozzle selection ..... 19
Nozzle selection table ..... 19

**O**

Oil feeder pump ..... 58
Oil filter ..... 47, 58
Oil hose ..... 22
Oil nozzle ..... 19, 38
Oil pressure measuring device ..... 27
Oil pump ..... 10, 22, 27, 44, 59
Oil pump filter ..... 47
Oil supply ..... 22, 58, 59
Oil temperature ..... 58
Operating hours counter ..... 57
Operating problems ..... 54

**P**

Pa ..... 55
Pascal ..... 55
Plug assignment ..... 56
Post-purge ..... 12
Post-purge time ..... 13
Pre-filter ..... 58
Pre-purge ..... 12
Pre-purge time ..... 13
Pressure gauge ..... 27
Pressure measuring device ..... 26, 27
Pressure regulating screw ..... 30
Program sequence ..... 12
Pulsating ..... 54
Pump ..... 10, 22, 27, 44, 59
Pump filter ..... 47
Pump pressure ..... 19, 27, 30

**R**

Recommended nozzles ..... 19
Refractory ..... 18
Remote reset ..... 24
Reset ..... 50
Reset button ..... 25
Return ..... 22
Ring main operation ..... 59

**S**

Safety measures ..... 6
Safety time ..... 12, 13
Sequence diagram ..... 10, 12
Serial number ..... 8
Service ..... 34
Service contract ..... 34
Service interval ..... 34
Service plan ..... 36
Service position ..... 37
Setting dimension ..... 41
Setting gauge ..... 41
Setting screw ..... 41
Shutdown ..... 33
Shutdown time ..... 33
Signal lamp ..... 25
Single pip system ..... 59
Single pipe system ..... 59
Solenoid valve ..... 10
Soot deposit ..... 54
Sound ..... 15
Sound power level ..... 15
Sound power levels ..... 15
Sound pressure level ..... 15
Spares ..... 61
Stability problems ..... 54
Standards ..... 14
Storage ..... 14
Suction resistance ..... 22, 58
Supply ..... 22
Supply pressure ..... 22, 27, 58
Supply temperature ..... 22

**T**

Temperature ..... 14
Transport ..... 14
Troubleshooting ..... 54
Two pipe system ..... 59
Type key ..... 8

**U**

Unit ..... 55
Unit fuse ..... 48
Unit of pressure ..... 55

**V**

Vacuum ..... 58
Vacuum gauge ..... 27
Voltage supply ..... 14

**W**

Weight ..... 17
Wiring diagram ..... 56

–weishaupt–

**Max Weishaupt GmbH** · 88475 Schwendi

Weishaupt close by? Addresses, telephone numbers etc. can be found at www.weishaupt.de

We reserve the right to make changes. All rights reserved.

# The complete program: Reliable technology and prompt, professional service



**W Burners** **up to 570 kW**

The compact burners, proven millions of times over, are economical and reliable. Available as gas, oil and dual fuel burners for domestic and commercial applications.
The purflam® burner version with special mixing head gives almost soot-free combustion of oil with greatly reduced NOx emissions.



**monarch® WM Burners and Industrial Burners** **up to 11,700 kW**

These legendary industrial burners are durable and versatile.
Numerous variations of oil, gas and dual fuel burners meet a wide range of applications and capacity requirements.



**WKmono 80 Burners** **up to 17,000 kW**

The WKmono 80 burners are the most powerful monoblock burners from Weishaupt. They are available as oil, gas or dual fuel burners and are designed for tough industrial application.



**WK Burners** **up to 32,000 kW**

These industrial burners of modular construction are adaptable, robust and powerful.
Even on the toughest industrial applications these oil, gas and dual fuel burners operate reliably.



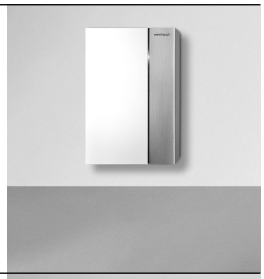
**MCR Technology / Building Automation from Neuberger**

From control panels to complete building management systems - at Weishaupt you can find the entire spectrum of modern control technology. Future orientated, economical and flexible.



**Service**

Weishaupt customers can be assured that specialist knowledge and tools are available whenever they are needed. Our service engineers are fully qualified and have extensive product knowledge, be it for burners, heat pumps, condensing boilers or solar collectors.



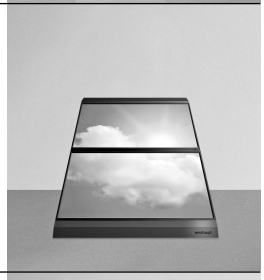
**Wall-hung condensing boilers for gas** **up to 240 kW**

The wall-hung condensing boilers WTC-GW have been developed to meet the highest demands in ease of operation and efficiency. Modulating operation means these units operate quietly and economically.



**Floor-standing condensing boilers for oil and gas** **up to 1,200 kW**

The floor-standing condensing boilers WTC-GB (up to 300 kW) and WTC-OB (up to 45 kW) are efficient, low in pollutants and versatile in use.
Even the largest capacities can be covered by cascading up to four gas condensing boilers.



**Solar systems**

The stylish flat-plate collectors are the ideal complement for any Weishaupt heating system. They are suitable for solar water heating and for combined heating support. With versions for on-roof, in-roof and flat roof installations, solar energy can be utilised on almost any roof.



**Water heaters/Energy storage**

The diverse program of potable water and energy storage for various heat sources includes storage volumes of 70 to 3,000 litres. In order to minimize storage losses, potable water cylinders from 140 to 500 litres are available with highly efficient insulation using vacuum insulation panels.



**Heat pumps** **up to 180 kW**

The heat pump range offers solutions for the utilisation of heat from the air, the soil or ground water.
Some systems are also suitable for cooling buildings.



**Geothermal probe drilling**

With its daughter company, BauGrund Süd, Weishaupt also offers geothermal probe and well drilling. With the experience of more than 10,000 systems and more than 2 million meters of drilling, BauGrund Süd offers a comprehensive service program.