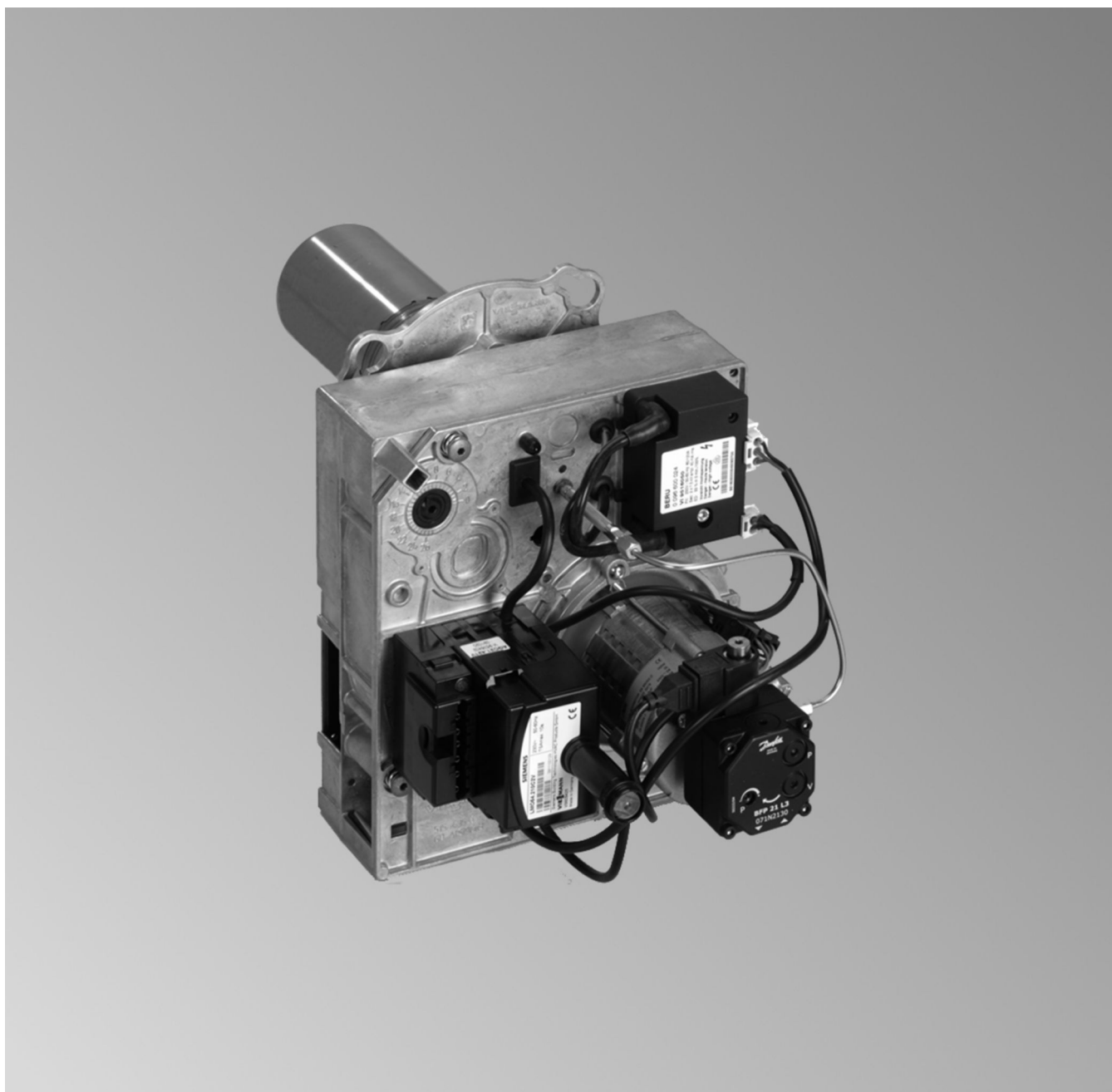


Vitoflame 300
Type VHG
Oil burner
with oil pre-heating
for Vitoladens 300-T, Vitola 200, type VX2A, and Vitorondens 200-T
Rated output 18 to 33 kW

For applicability, see the last page




VITOFLAME 300





Safety instructions

Safety instructions

 Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

 **Danger**
This symbol warns against the risk of injury.

 **Please note**
This symbol warns against the risk of material losses and environmental pollution.

Note

Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively designed for qualified personnel.


- Work on gas equipment must only be carried out by a qualified gas fitter.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations

Observe the following when working on this system


- all legal instructions regarding the prevention of accidents,
- all legal instructions regarding environmental protection,
- the Code of Practice of relevant trade associations.
- all current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards.

If you smell gas

 **Danger**
Escaping gas can lead to explosions which may lead to serious injury.

- Do not smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances ON or OFF.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supplier from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).


If you smell flue gas

 **Danger**
Flue gas can lead to life-threatening poisoning.


- Shut down the heating system.
- Ventilate the boiler room.
- Close all doors in the living space.

Working on the system


- When using gas as fuel, also close the main gas shut-off valve and safeguard against unauthorised reopening.
- Isolate the system from the power supply and check that it is no longer 'live', e.g. by removing a separate fuse or by means of a main isolator.
- Safeguard the system against unauthorised reconnection.

 **Please note**
Electronic modules can be damaged by electrostatic discharges.
Touch earthed objects, such as heating or water pipes, to discharge static loads.

Repair work

 **Please note**
Repairing components that fulfil a safety function can compromise the safe operation of your heating system.
Replace faulty components only with original Viessmann spare parts.

Ancillary components, spare and wearing parts

 **Please note**
Spare and wearing parts that have not been tested together with the heating system can compromise its function. Installing non-authorized components and non-approved modifications or conversions can compromise safety and may invalidate our warranty.
For replacements, use only original spare parts supplied or approved by Viessmann.

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Commissioning the heating system

To obtain optimum combustion values, the burner must be adjusted with the boiler at operating temperature (min. 60 °C).

(CH): The limits of the Swiss Clean Air Act LRV 92 must be maintained.



Service instructions boiler circuit control unit

Note

The Vitoflame 300 oil burner features very good combustion values which are achieved without the use of fuel oil additives (combustion improvers). The use of combustion improvers, which leave residues, is not permissible.

1. Check the heating system pressure and the oil level in the tank.
2. Open the shut-off valves in the oil lines on the oil tank and on the filter.

3. Fill the oil suction line and the filter with fuel oil using a manual oil suction pump **before** switching the burner ON.
4. Switch ON the main isolator (outside the installation room).
5. Switch ON system ON/OFF switch at the control unit.
If the fault indicator on the control unit illuminates, press the reset button on the burner (see chapter "Functions and fault displays of the signal indicator (LEC)").



Adjusting the air volume

The air volume is preset at the factory. Re-adjust the air volume if required.

Starting up the burner may require some fine adjustment.

Before making adjustments, check whether inlet air aperture (C) in the casing (pos. 034 in the spare parts list) is set to position "8.0" (factory setting).

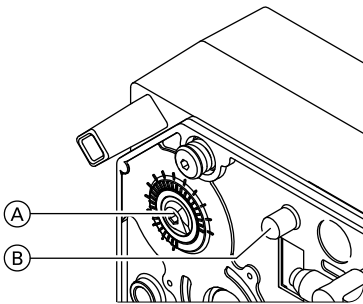


Abb. 1

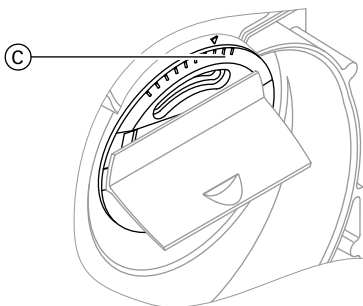


Abb. 2

1. Check static burner pressure at test nipple (B); to do so, remove the plastic cap.

Note

The actual static burner pressure must not vary from the standard values.

For standard burner settings, see the chapter with the same title.

2. If required, adjust static burner pressure at air damper (A):
 - Turn anti-clockwise
 - higher static burner pressure
 - more air
 - lower CO₂ content,
 - Turn clockwise
 - lower static burner pressure
 - less air
 - higher CO₂ content.



Adjusting the oil pressure and checking the vacuum

The oil pressure is preset at the factory according to the oil throughput. Adjust the oil pressure if required.

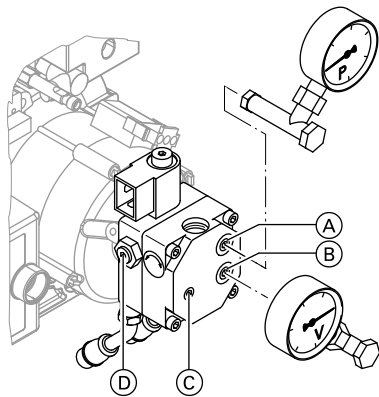


Abb. 3 Oil pump; make: Danfoss, type BFP 21 LE / LES or BFP 31 LE

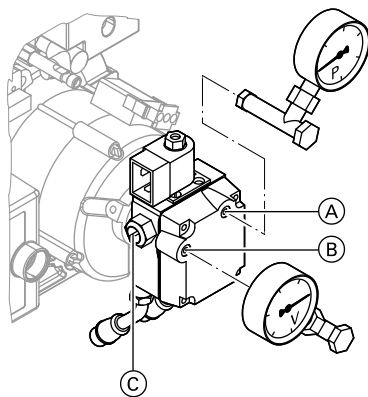


Abb. 4 Oil pump; make: Suntec, type ALE 35

1. Switch OFF the main isolator and safeguard against unauthorised reconnection.
2. Unscrew plug "P" (A) from the oil pump.
3. Unscrew plug "V" (B) from the oil pump.

Note

This allows the oil to drain from the oil pump.

4. Insert a pressure gauge (range 0 - 25 bar) and a vacuum gauge (range 0 - 1 bar).

Note

Seal the pressure and vacuum gauges only with copper or aluminium gaskets or with O-rings. Never use tape to seal these joints.

5. Start the burner.

Note

The solenoid valve opens.

6. Read off the oil and vacuum pressures of the pump on the relevant gauge (vacuum should be max. 0.3 bar given a height differential of 3 m between the oil pump and the bottom of the tank).

Note

Where vacuum measures higher than 0.3 bar, check the filter for contamination or check the pipe run.

7. If necessary, adjust the oil pressure at oil pump pressure setting screw (C).
Turn clockwise → pressure increases
Turning anti-clockwise → pressure decreases.

Note

Only with Danfoss oil pump, type BFP 21 LE or BFP 31 LE:

The LE nozzle shut-off function must be adjusted at LE setting screw (D) (LE = ON), located on the l.h. side of the oil pump.

Note

For standard burner settings, see the chapter with the same title.

8. Check the actual emission values after adjusting the oil pressure.
9. Switch OFF the main isolator and safeguard against unauthorised reconnection.
10. Remove the pressure and vacuum gauges.



Adjusting the oil pressure and checking the... (cont.)

11. Check the plug seal rings for damage and replace if required.
Insert plugs "P" (A) and "V" (B).
12. Start the burner and check the plugs for leaks.



Checking the burner and entering the actual values into the report

Note

In the case of balanced flue operation, observe the information regarding burner adjustments in the chapter with the same title.




Shutting down the system



Checking firm seating of electrical connections



Cleaning the burner

 For cleaning the combustion chamber and hot gas flues, see boiler service instructions.

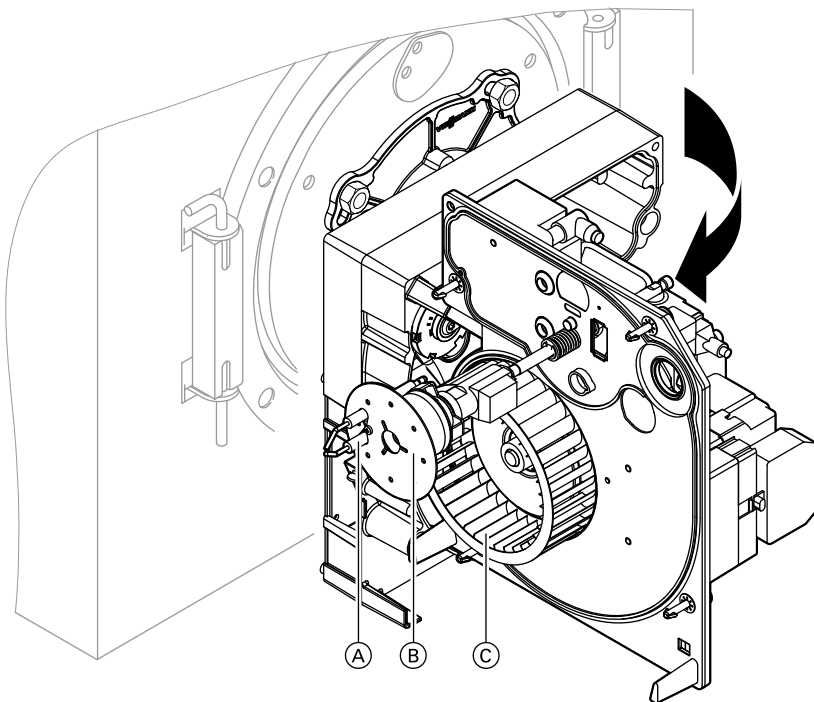


Abb. 5

1. Set the burner into its maintenance position.
2. Clean casing, flame tube, mixing assembly (B), ignition electrodes (A) and impeller (C).



Checking the impeller fixings



Checking the flame tube fixings



Replacing the nozzle

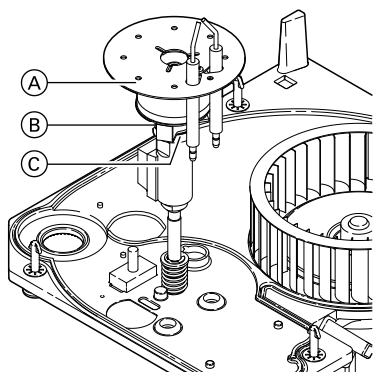


Abb. 6

1. Position the burner cover with blast tube connection above the burner casing (service position). This prevents the formation of bubbles in the blast tube connection.
2. Turn fixing screw (B) through two full turns to undo.
3. Remove mixing assembly (A) from the blast tube connection.
4. Replace the nozzle (counterholding the blast tube connection).

Note

For the make and type of nozzle, see *Standard values for burner adjustment in the chapter of the same title*.

5. Push mixing assembly (A) onto the blast tube connection up to the end-stop (C) (spacers) of the oil preheater.
6. Use spacers (C) of a suitable size to check distance "a" between nozzles with reference to the table in chapter "Checking and adjusting the mixing assembly".
7. Retighten fixing screw (B).

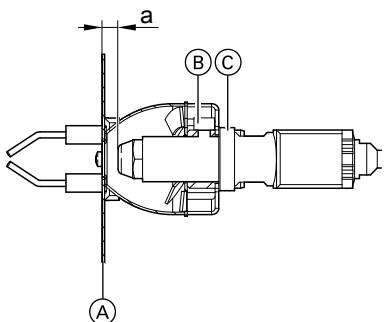


Abb. 7



Checking and adjusting the mixing assembly

Check ignition electrodes (A) for wear, contamination and size (see diagram) and replace if required.

Check sealing face (D) of baffle plate (B) to the flame tube prior to fitting for damage and contamination.



Checking and adjusting the mixing assembly (cont.)

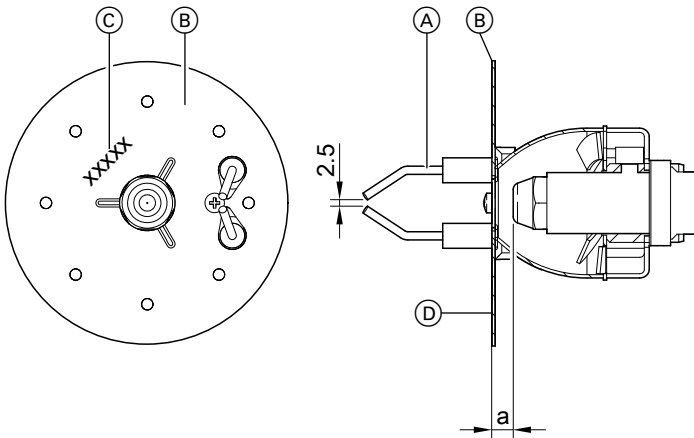


Abb. 8

Rated output	kW	18	22	27	33
Designation ©		VHG I-2	VHG I-3	VHG I-4	VHG I-5
Dimension a	mm	2.5	6.5	2.0	5.0



Installing the burner cover on the burner casing



Cleaning or if required replacing the oil pump filter

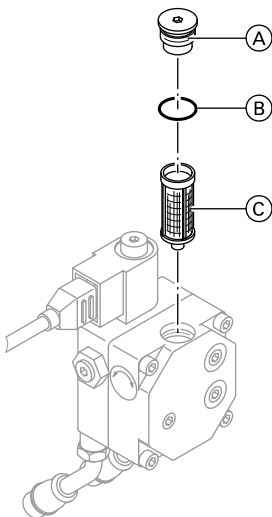


Abb. 9 Oil pump; make: Danfoss, type BFP 21 LE / LES or BFP 31 LE

- Ⓐ Filter plug
- Ⓑ O-ring (replace)
- Ⓒ Filter (replace)



Cleaning or if required replacing the oil pump... (cont.)

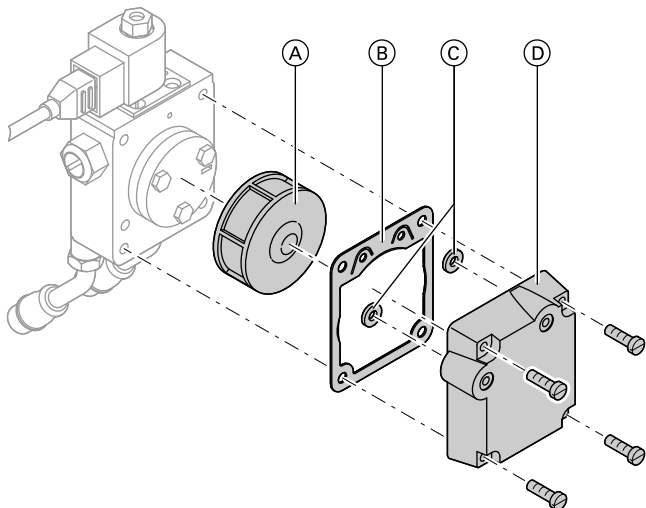


Abb. 10 Oil pump; make: Suntec, type ALE 35

- Ⓐ Filter (clean or replace)
- Ⓑ Flat gasket (replace)

- Ⓒ O-rings (replace)
- Ⓓ Cover



Replacing pre-filter elements



Commissioning the system



Checking the oil lines and connections for leaks



Checking the burner again and entering the actual values into the report



Operating and service documents

1. Complete and detach the customer registration card:
 - Hand the system user this part for safekeeping.
 - Retain the heating contractor's part.
2. File all parts lists, operating and service instructions in the folder and hand this over to the system user. The installation instructions are no longer required after the installation and, therefore, do not need to be retained.

Burner control unit LMO 14.111 C2V

Program sequence during commissioning

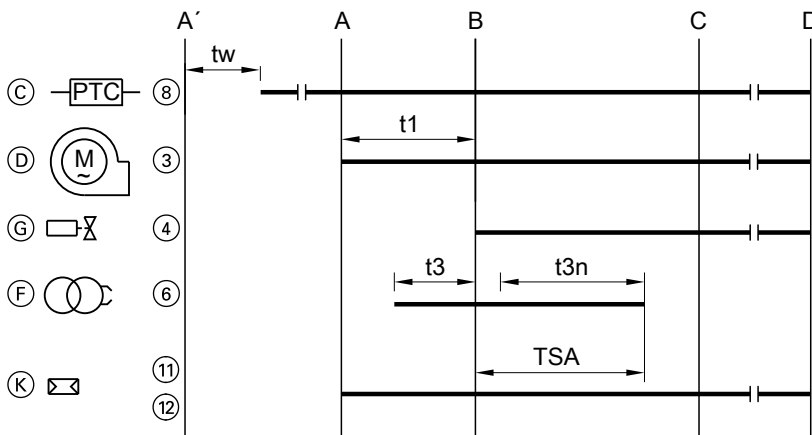


Abb. 11

- | | | | |
|-----|--|---|--------------------------------|
| A' | Start of oil preheat time | Ⓒ | Oil preheater |
| A | Start-up | Ⓓ | Burner motor |
| B | Time of flame formation | Ⓕ | HF ignition unit |
| C | Operating position | Ⓖ | Solenoid valve on the oil pump |
| D | Controlled shutdown | Ⓚ | Flame monitor |
| Ⓒ-Ⓓ | Plug-in terminals on the burner control unit | | |

tw	Oil preheat time	up to 2 min ^{*1}
t1	Pre-flush time	min. 16 s
t3	Pre-ignition time	min. 15 s
t3n	Re-ignition time	max. 10 s
TSA	Start-up safety time	max. 10 s

Flame monitor sensor current

- min. required 70 µA.
- max. permissible without flame 5.5 µA.
- max. possible with flame 100 µA.

Undervoltage

If the mains voltage is lower than 165 V~, the burner control unit initiates a safety shutdown. The system restarts when the mains voltage is above approx. 175 V~.

Note

If the power supply is 2 × 127 V, the flashing code is red, 10 x flashing (see chapter "Faults with flashing code display"), contact your local Viessmann sales office.

Controlled intermittent operation

After a maximum of 24 hours non-stop operation, the burner control unit implements an automatic safety shutdown with subsequent restart.

Control sequence in case of faults

If a fault shutdown occurs, the fuel valve outputs and the ignition system are immediately shut down (<1 s).

Cause	Response
After a power failure	Restart
After falling below the undervoltage level	Restart
If there is a premature, faulty flame signal during the pre-flush time t1	Fault shutdown at the end of the pre-flush time t1
If there is a premature, faulty flame signal during the oil preheat time tw	Starting will be inhibited after a fault shutdown of max. 40 s

*1 Subject to the temperature of the fuel oil supplied.

Burner control unit LMO 14.111 C2V (cont.)

Cause	Response
If the burner does not light within the safety time TSA	Fault shutdown at the end of the safety time TSA
If the flame fails during operation	Max. 3 restarts, then fault shutdown
No heating or oil preheater enabling within 10 min	Fault shutdown

Fault shutdown

After a fault shutdown, the burner control unit remains locked out (non-modifiable fault shutdown) and the red lamp lights up. This state is also maintained if the power supply fails.

Resetting the burner control unit

The system can be immediately reset after a fault shutdown. Hold down the reset button for approx. 1 s (<3 s).

Ignition sequence

If the flame fails within the safety time, the system re-ignites, but only until the end of the maximum safety time at the longest. This allows several ignition attempts within the safety time; see the above program sequence.

Repeat limitation

For flame failure during operation, up to three re-ignition attempts can be made. The fourth flame failure during operation triggers a fault shutdown. The count of these repeats begins with every controlled start-up (through temperature or pressure regulators, thermostat or pressure switches or safety limiters).

Function and fault indications of the signal indicator (LED)

In standard mode, operating conditions are displayed by colour code on the end of reset button (A) (see the following table). The indicator illuminates permanently red after a fault shutdown. In this condition, the optical fault cause display can be activated (see the following chapter "Burner fault sequence diagram").

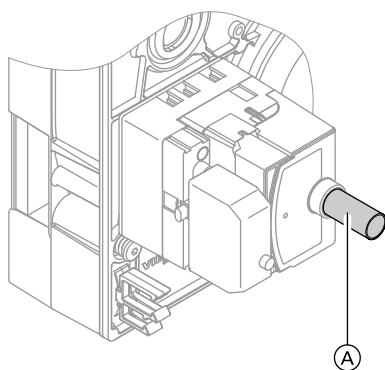


Abb. 12

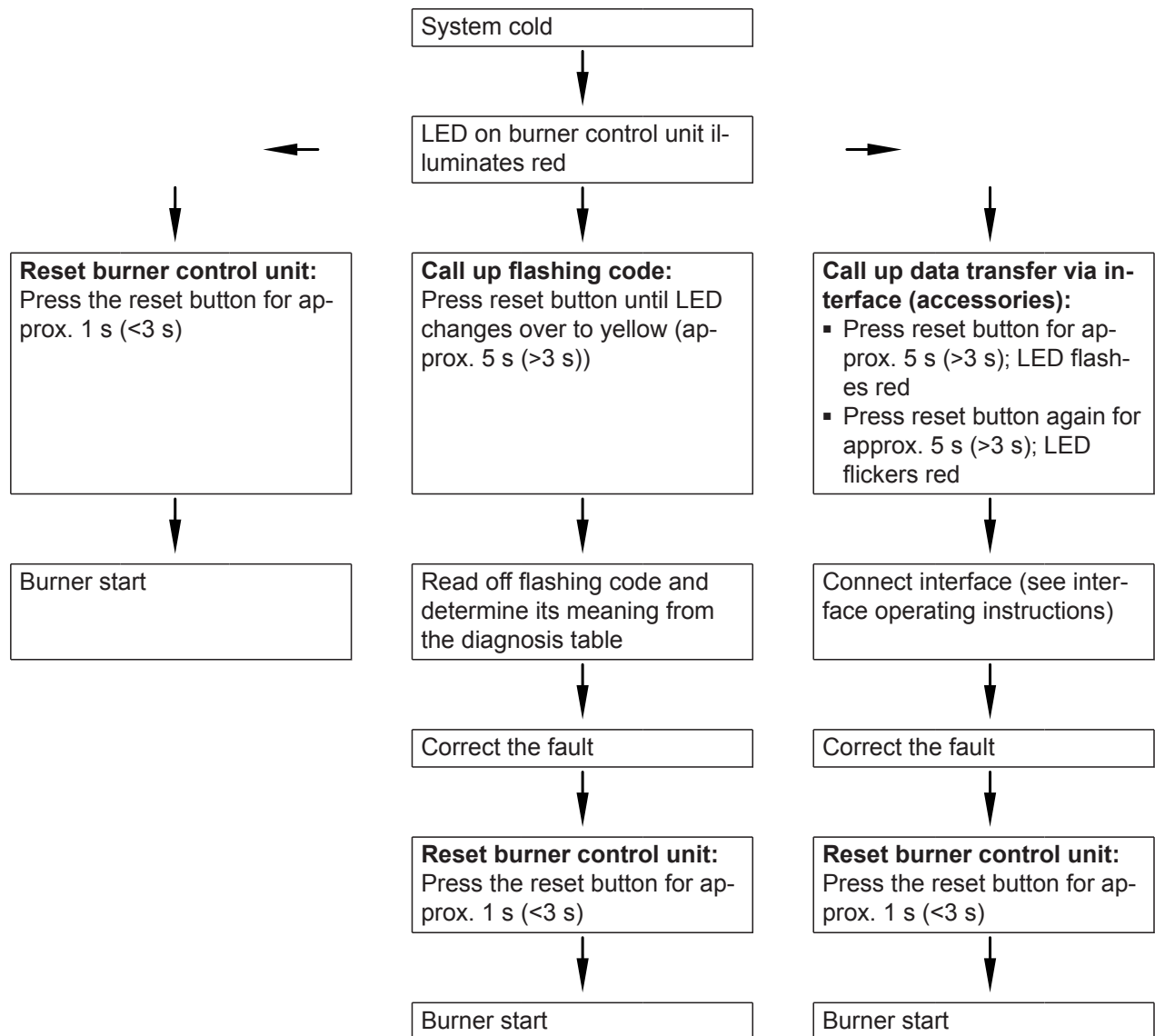
1. Press reset button (A) for approx. 5 s (>3 s) until the signal lamp shines yellow.
2. A flashing code will then be displayed. The number of flashing signals in a sequence will indicate the type of fault. For an explanation, see the table in chapter "Faults with flashing code display".
3. To reset the burner and exit the fault display, press the reset button for approx. 1 s (<3 s).

LED colours	Operating condition
constant yellow	Oil preheater active, oil preheat time tw
yellow flashing	Ignition phase pre-purge, ignition activated
constant green	Operation, flame stable
green flashing	Operation, poor flame stability
yellow-red flashing alternately	Undervoltage (< 165 V)
constant red	Fault, burner locked out

Burner control unit LMO 14.111 C2V (cont.)

LED colours	Operating condition
flashing red	Fault indication (for an explanation, see chapter "Faults with flashing code display")
green-red alternately	Extraneous light before burner start
red flickering	Interface diagnosis For diagnosis with interface adaptor (accessories)

Sequence diagram for burner fault



Diagnosis

Faults with flashing code display

Fault	Flashing code red	Cause	Measures
Burner does not start (with fault display), signal indicator illuminates	10 x	Faulty electrical connection, wires "L 1" and "N" interchanged or faulty burner control unit	Check the electrical connection. If phases are correctly connected, replace burner control unit.
	10 x	External voltage at "S3" or "B4"	Check the electrical connection
Burner does not start (with fault display)	2 x	Motor faulty	Replace motor
	2 x	Coupling between motor and oil pump faulty	Replace coupling
	2 x	Oil pump seized or stiff	Clean or if required replace oil pump
	8 x	Oil preheater faulty	Replace the oil preheater
Burner starts, but no flame is formed	2 x	Ignition electrodes poorly adjusted	Set correctly (see chapter "Checking and adjusting the mixing assembly")
	2 x	Ignition electrodes damp and contaminated	Clean ignition electrode block
	2 x	Insulation body of ignition electrodes cracked	Replace ignition electrode block
	2 x	Ignition transformer faulty	Replace ignition transformer
	2 x	Ignition cable faulty	Replace ignition cable
	2 x	Pump does not supply oil	Install pressure and vacuum gauges at the pump and check build-up of pressure (see following paragraph)
Pump does not supply oil	2 x	Shut-off valves closed at filter or in oil line	Open valves
	2 x	Filter blocked	Clean filter (pre-filter and pump filter), replace if necessary
	2 x	Coupling between motor and pump faulty	Replace coupling
	2 x	Leak in suction line or filter bowl	Retighten connections. Check oil lines and connections for leaks, and tighten if required.
	2 x	Oil flow and return hoses interchanged	Connect correctly acc. to instructions on pump
	2 x	Vacuum in suction line too high (in excess of 0.3 bar)	Check cross-section of oil lines. Replace filter. Check the external oil valve.
	2 x	External anti-lift valve faulty	Check and if required replace the external anti-lift valve
Fan motor faulty	2 x	Fan motor occasionally does not start because auxiliary winding or capacitor is faulty	Replace the motor or capacitor
Burner starts, but no oil is injected	2 x	Solenoid valve coil faulty	Replace solenoid valve coil
	2 x	Oil pump faulty	Replace oil pump
	2 x	Nozzle blocked	Replace nozzle

Diagnosis (cont.)

Fault	Flashing code red	Cause	Measures
Extraneous light during the pre-purge phase	4 x	Oil pump solenoid valve fails to close	Replace oil pump
	4 x	Ignition electrodes badly adjusted or worn	Check the ignition electrodes and replace if required
Burner starts and flame builds, but burner enters a fault state after safety time expires	2 x	Burner control unit faulty	Replace burner control unit
	2 x	Carbon deposits on the flame tube or mixing assembly	Clean flame tube and mixing assembly
Flame extinguishes during operation	7 x	Air in suction line	Seal line and filter
	7 x	Flue gas recirculation	Check the flue. Test the annular gap
	7 x	Condensate drain	Check condensate drain
	7 x	Nozzle faulty	Replace nozzle
	7 x	Burner incorrectly adjusted	Set standard values (see chapter "Standard values for burner adjustment")
	7 x	Sensor plate contaminated	Clean sensor plate
Ignition switches ON during operation	7 x	Sensor plate contaminated	Clean sensor plate
	7 x	Nozzle contaminated or faulty	Replace nozzle
	7 x	Condensate backup in flue gas heat exchanger	Clean siphon and neutralising system
	7 x	Heating surfaces of flue gas heat exchanger contaminated	Clean heating surfaces of flue gas heat exchanger

Faults without flashing code display

Fault	Cause	Measures
Burner does not start (no fault display), signal indicator does not illuminate	No voltage	Check fuse/MCB or plug-in connector 150 in the control unit, the electrical connections, the setting of the system ON/OFF switch on the control unit and the main isolator
	High limit safety cut-out activated	Press the reset button at the boiler circuit control unit
Flame pulsates or tears off	Fan pressure too high	Check the static burner pressure via the test nipple on top of the fan casing (U-tube pressure gauge). Adjust the air damper or blast tube connection so that the lower static burner pressure (see chapter "Standard values for burner adjustment") is not exceeded.
	CO ₂ content too low	Checking settings
	Excessive oil throughput	Adjust the oil pressure correctly (see chapter "Standard values for burner adjustment")
	Condensate backup in flue gas heat exchanger	Clean siphon and neutralising system
	Condensate drain blocked on site	Clean condensate drain
	Condensate lifting pump (if installed) faulty	Replace condensate lifting pump

Diagnosis (cont.)

Fault	Cause	Measures
	Heating surfaces of boiler or flue gas heat exchanger dirty	Clean heating surfaces of boiler or flue gas heat exchanger
	In balanced flue operation, flue gas is drawn in via the annular gap in the flue system.	Test annular gap (measure directly at burner connection adaptor). If flue gas is detected, ensure the flue system is gas-tight. Immediate remedy: temporarily operate the burner in open flue mode.
	Flue gas may also be drawn in if other combustion equipment is connected to the same chimney	Observe installation regulations
	Flue gas from other combustion equipment is drawn in via annular gap	Extend flue on site, for example
	Nozzle faulty	Replace nozzle
Burner sooty; higher CO concentration in flue gas	Too little or too much air	Adjust correctly. Check and clean impeller. Check ventilation of installation room.
	Insufficient chimney draught	Check flue and flue gas routing
	Nozzle faulty	Replace the nozzle, fit the right nozzle (see chapter "Standard values for burner adjustment")
	Flue gas in the combustion air supply	Check flue gas system for tightness
	Insufficient combustion air supply	Check combustion air supply
	In balanced flue operation, flue gas is drawn in as well	Check flue system
	Condensate backup in flue gas heat exchanger	Clean siphon and neutralising system
CO ₂ content too low	Incorrect setting	Check setting (see chapter "Standard values for burner adjustment")
	Infiltrating air	Seal flue pipe at boiler flue outlet. Retighten the combustion chamber cover screws and those on the flue outlet cover
Excessive flue gas temperature	Excessive oil throughput	Match oil throughput to rated boiler output
	Boiler and flue gas heat exchanger dirty	Clean boiler and flue gas heat exchanger; correct burner settings
	Air in flue gas heat exchanger	Vent flue gas heat exchanger
	Insufficient circulation volume due to faulty heating circuit pump	Check heating circuit pump; replace if required
	Incorrect hydraulic connection; not all heating circuits are connected to the flue gas heat exchanger	Connect all heating circuits to the flue gas heat exchanger
Burner operates, constant red flickering light on the burner control unit	No fault, interface diagnosis	Press reset button >3 s

Component overview

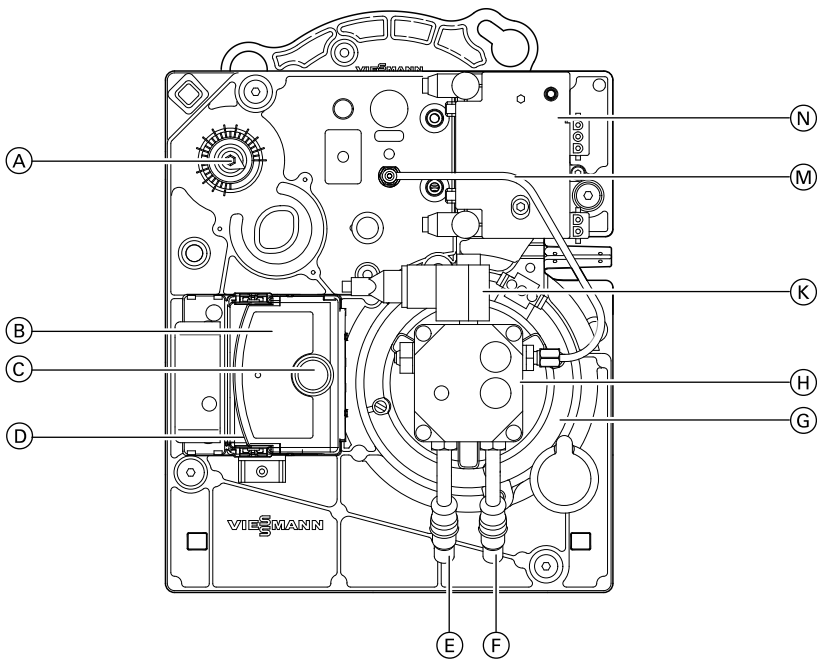


Abb. 13

- | | |
|---------------------------------|---|
| (A) Air regulating valve | (G) Fan motor |
| (B) Burner control unit | (H) Oil pump |
| (C) Reset button with extension | (K) Solenoid valve |
| (D) Connection panel | (M) Oil line |
| (E) Return line | (N) HF ignition unit
(with flame monitoring) |
| (F) Suction line | |

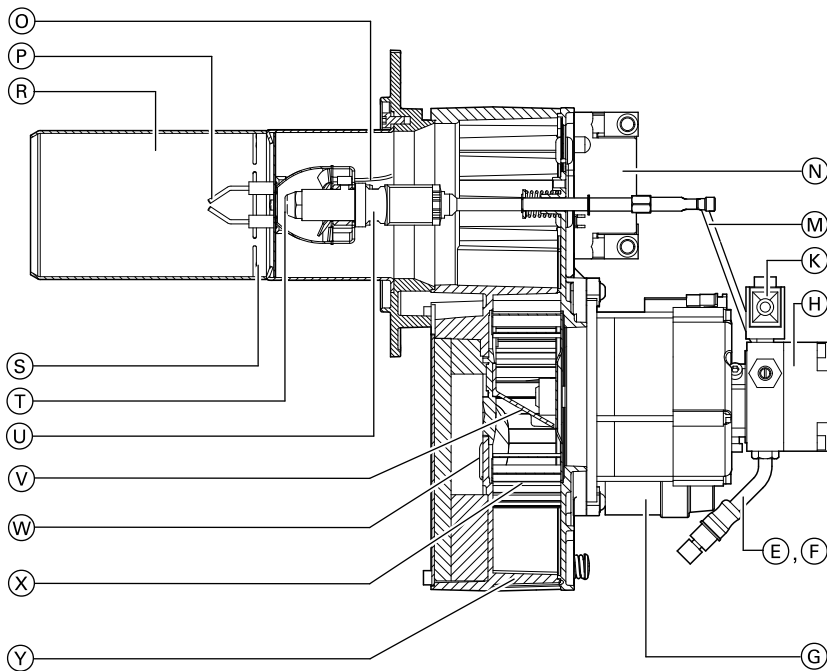


Abb. 14

- | | |
|------------------|---|
| (E) Return line | (K) Solenoid valve |
| (F) Suction line | (M) Oil line |
| (G) Fan motor | (N) HF ignition unit
(with flame monitoring) |
| (H) Oil pump | |

Component overview

Component overview (cont.)

- ⓐ Ignition cable
- ⓑ Ignition electrodes
- ⓒ Flame tube
- ⓓ Mixing assembly
- ⓔ Oil burner nozzle
- Ⓤ Blast tube connection with oil preheater
- Ⓥ Air routing
- Ⓦ Inlet air aperture
- Ⓧ Impeller
- Ⓨ Burner casing

Connection and wiring diagram

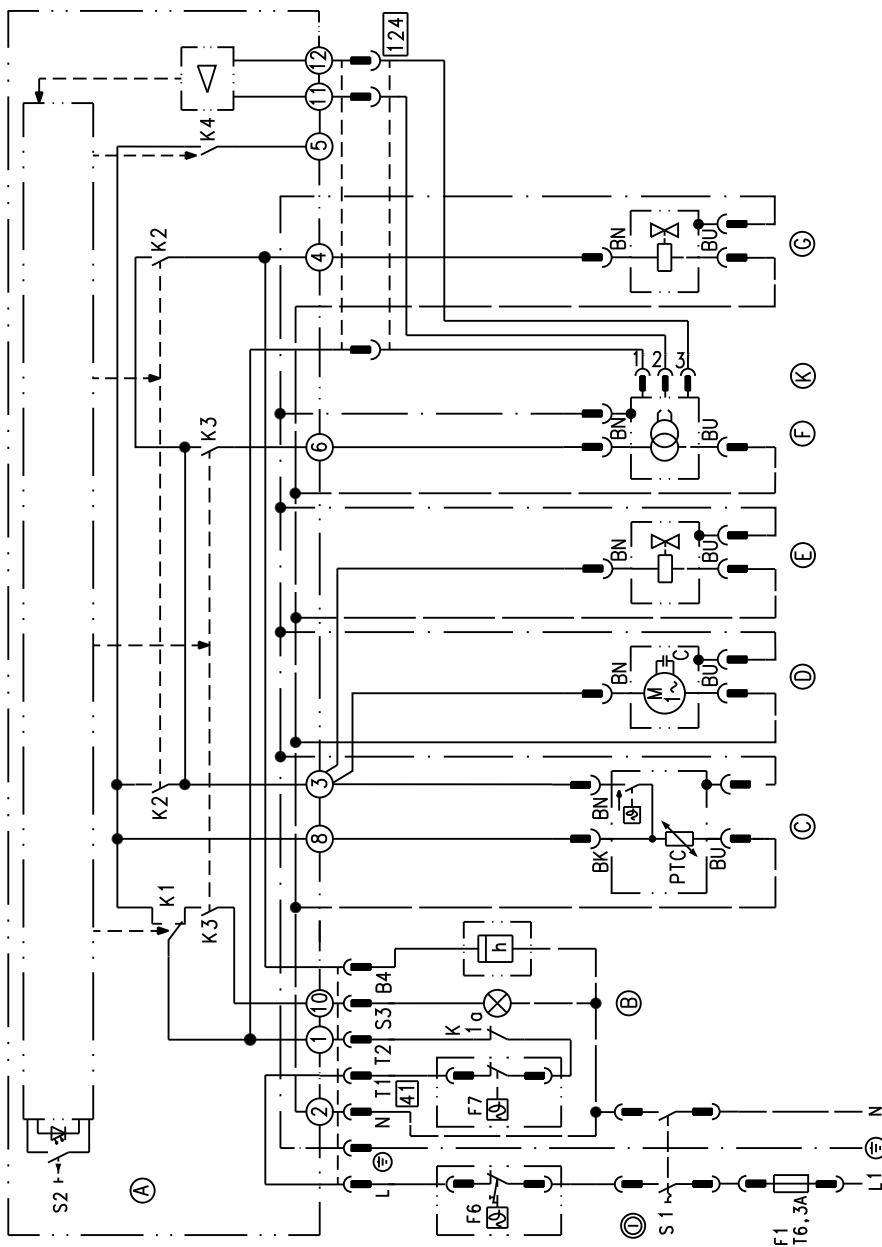


Abb. 15

Note

This wiring diagram only applies in conjunction with Viessmann products.

- 41 Burner plug at the control unit
- F1 Fuse in the control unit
- F6 High limit safety cut-out
- F7 Temperature controller
- S1 ON/OFF switch on the control unit
- S2 Reset button
- K1-K4 Relay contacts
- K1a Control unit relay contact
- ③-⑫ Plug-in terminals at the burner control unit
- Ⓐ Burner control unit (see chapter "Program sequence during commissioning")
- Ⓑ Fault display in the control unit
- Ⓒ Oil preheater
- Ⓓ Burner motor

- Ⓔ Solenoid valve for external connection via adaptor
- Ⓕ HF ignition unit
- Ⓖ Solenoid valve on the oil pump
- Ⓚ Flame monitoring

Colour coding to DIN IEC 60757

BK	black
BN	brown
BU	blue

Parts list

When ordering spare parts:

Quote the part and serial numbers (see type plate) and the position number of the required part (as per this parts list).

Obtain standard parts from your local supplier.

Parts

- 001 Suntec oil pump
- 002 Solenoid valve core for Suntec oil pump
- 003 Solenoid valve coil for Suntec oil pump
- 008 Danfoss oil pump
- 009 Solenoid valve coil for Danfoss oil pump
- 010 Oil hoses, 1000 mm, spare part set (flow and return)
- 012 Oil line
- 013 Impeller
- 014 Ignition cables (set)
- 015 Sealing plate pack
- 016 Burner hood
- 018 Burner hood latch
- 019 Profile stud
- 020 Mixing assembly (with pos. 038 and 042)
- 023 Burner control unit connection panel
- 024 Burner control unit
- 025 Reset button extension
- 026 Burner casing
- 027 Burner cover
- 028 Burner flange
- 029 Blast tube connection with oil preheater
- 032 Electronic ignition unit with flame monitoring
- 033 Fan motor
- 034 Inlet air aperture
- 035 Air routing
- 036 Air damper
- 080 Small parts comprising:
 - 80a Plug spigot
 - 80b Compression spring

- 80c Locking washer
- 80d Cheese head screw M 5 × 10
- 80e Cheese head screw M 5 × 45
- 80f Cheese head screw M 6 × 20
- 80g Cable clamp
- 80h Cheese head screw M 6 × 25
- 80i Grub screw M 6 × 8
- 80k Cheese head screw M 4 × 10
- 80l Spring washer A 5
- 80m O-ring 19 - 2.5 mm
- 80o Fitting body
- 80p Seal ring A 10 × 14 × 1.5
- 80r Cheese head screw M 5 × 12
- 80s Washer 18.9 × 28 × 1 mm
- 80t Washer 18.9 × 28 × 2 mm
- 80u Washer 19 × 26 × 0.5 mm
- 80v Serrated lock washer A 4.3
- 80w Spring washer B 6
- 80x Protective cap \varnothing 7 × 10 mm
- 80y Washer 19 × 26 × 2.5 mm
- 80z Washer 19 × 26 × 6.0 mm

Parts not shown

- 048 Installation instructions
- 049 Service instructions
- 050 Burner pack

Wearing parts

- 039 Nozzle
- 042 Ignition electrode block
- 043 Flame tube
- 045 Plug-in coupler
- 046 Filter cartridge (for pos. 008)
- 047 Spare part set (for pos. 001)

Ⓐ Type plate

Parts list (cont.)

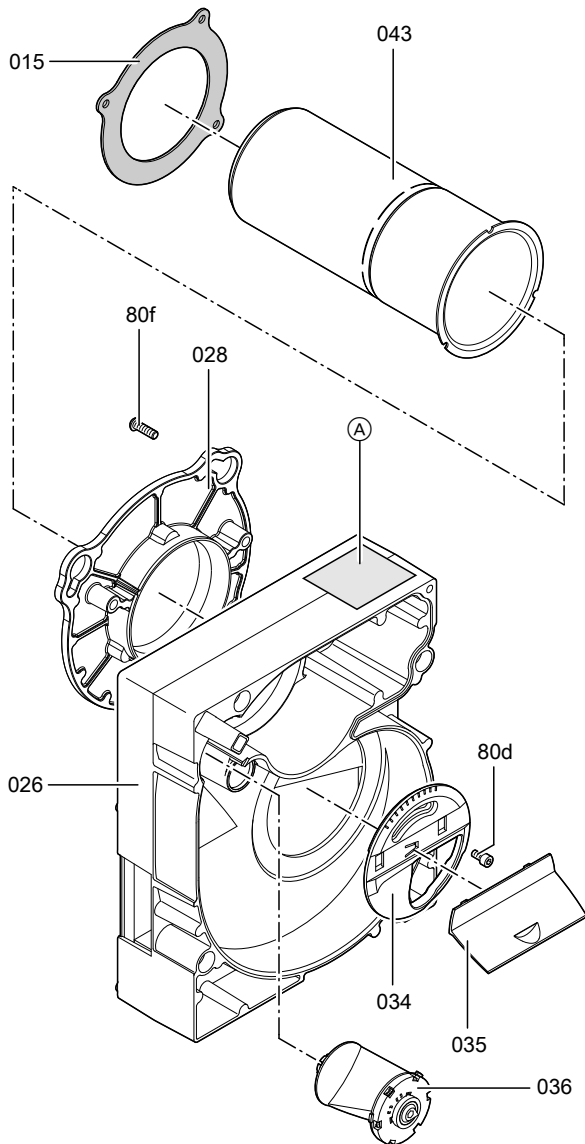


Abb. 16

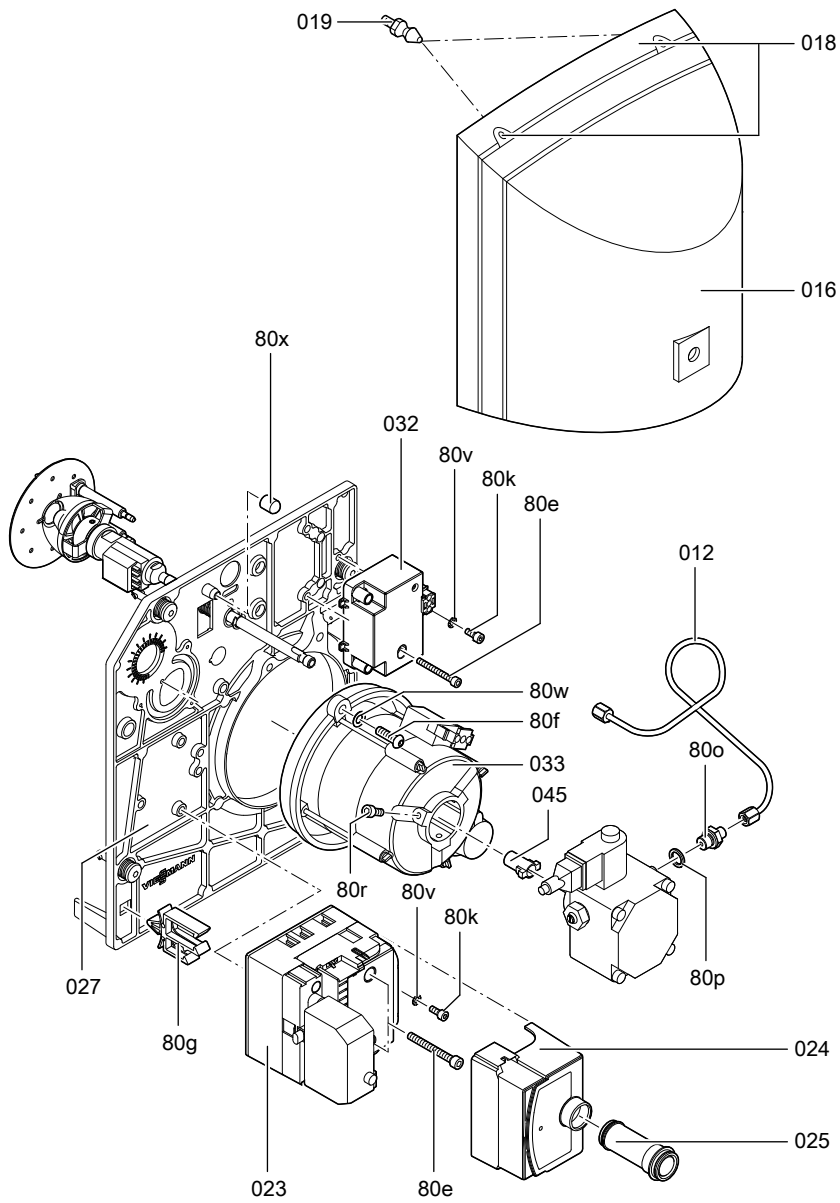


Abb. 17

Parts list (cont.)

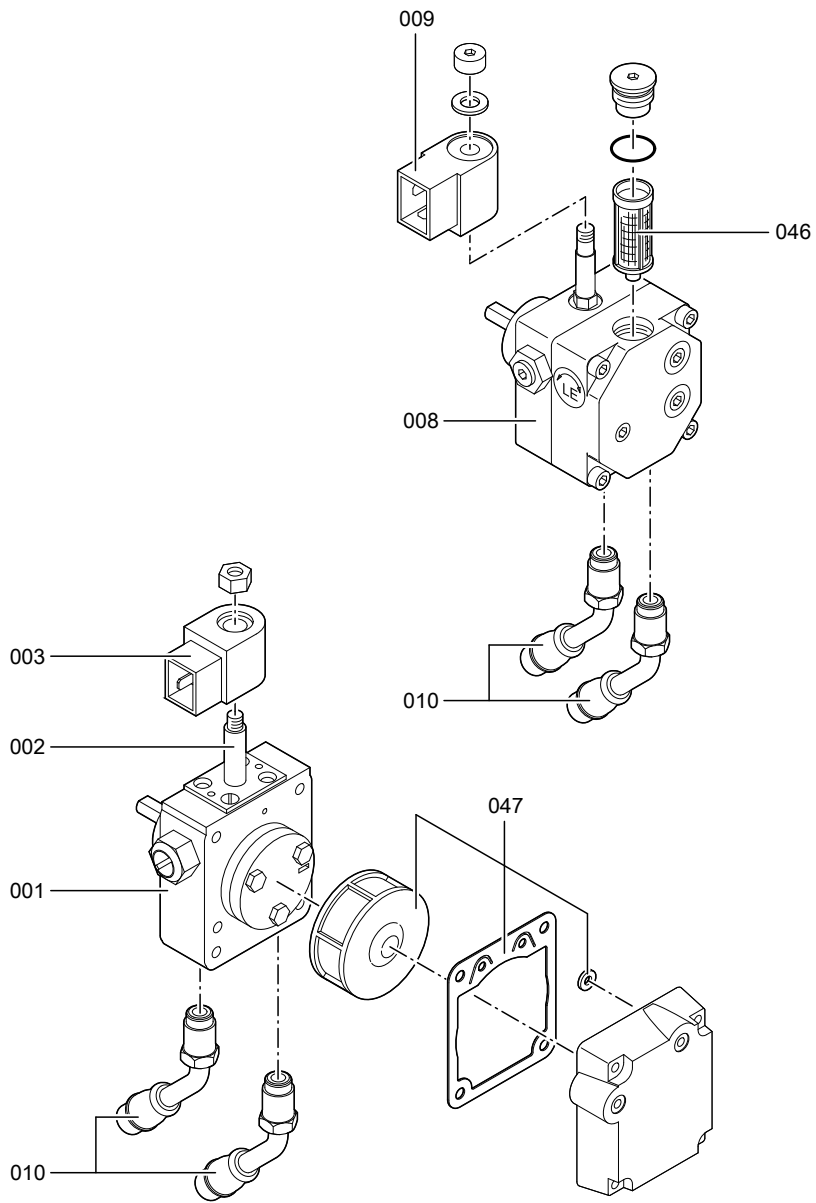


Abb. 18

Parts list

Parts list (cont.)

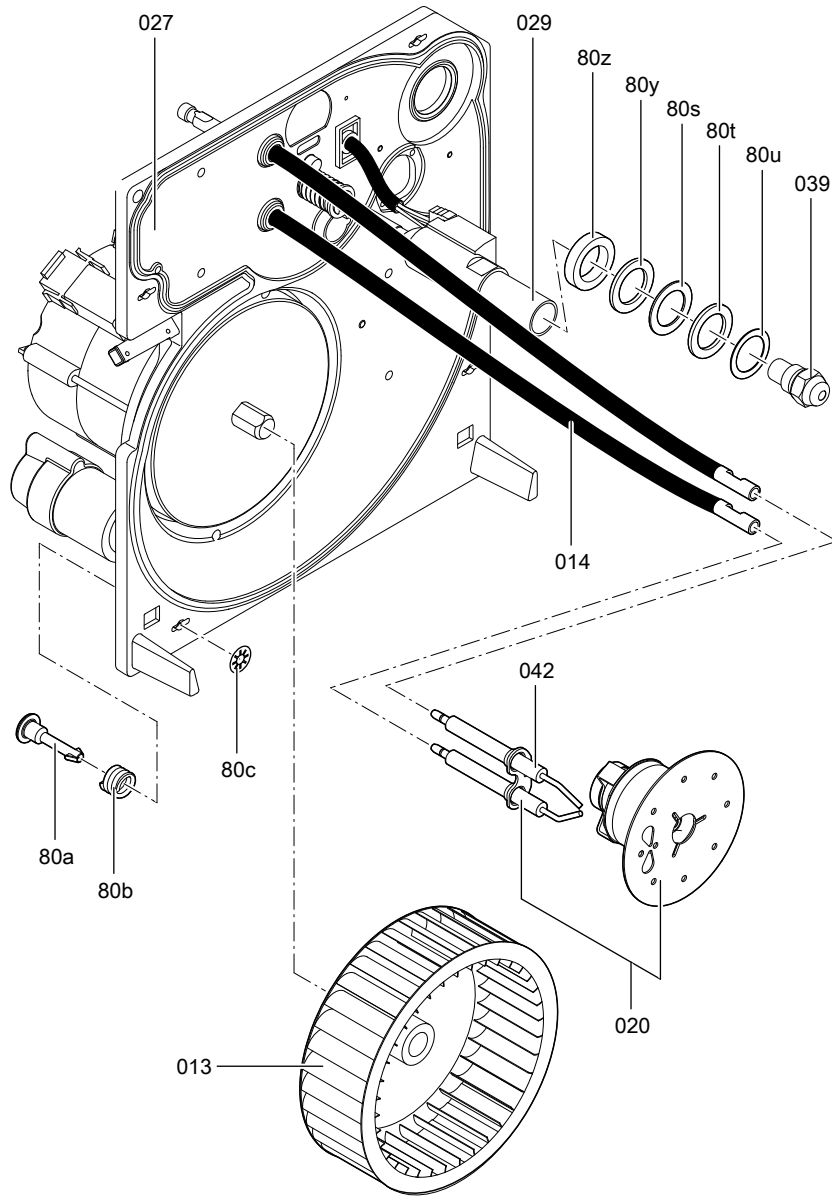


Abb. 19

Report			Commissioning	Maintenance/service
Setting and test values	actual	<i>bar</i>		
	adjusted	<i>bar</i>		
Oil pressure	actual	<i>bar</i>		
	after maintenance	<i>bar</i>		
Vacuum	actual	<i>bar</i>		
	after maintenance	<i>bar</i>		
Soot value	actual			
	after maintenance			
Carbon dioxide content CO₂	actual	<i>% by vol.</i>		
	adjusted	<i>% by vol.</i>		
Carbon monoxide con- tent CO	actual	<i>ppm</i>		
	adjusted	<i>ppm</i>		
Oxygen content O₂	actual	<i>% by vol.</i>		
	adjusted	<i>% by vol.</i>		
Gross flue gas tempera- ture	actual	<i>°C</i>		
	adjusted	<i>°C</i>		
Flue gas loss	actual	<i>%</i>		
	adjusted	<i>%</i>		
Draught	actual	<i>hPa</i>		
	adjusted	<i>hPa</i>		
Distance between noz- zles (external)	actual	<i>mm</i>		
	adjusted	<i>mm</i>		
Air damper setting	actual			
	adjusted			

Specification

Specification

Rated boiler output	kW	18	22	27	33
Burner type		VHG I-2	VHG I-3	VHG I-4	VHG I-5
DIN reg. no. to EN 267		5G999/08S			
Voltage	V	230			
Frequency	Hz	50			
Power consumption comprising 4 ignition processes per hour	W	220	220	235	250
Motor speed	rpm	2800			
Version		single stage			
Oil pump rate	l/h	45			
Connections Suction and return lines on the supplied oil hoses	R (female thread)	$\frac{3}{8}$			

Standard values for burner adjustment

Notes regarding burner settings for balanced flue operation

The burner must be adjusted with all associated pipes adapted (ventilation air, flue gas, etc.).

Once it has been adjusted, no further pipes may be connected and existing pipes may not be removed or altered.

If using room sealed or coaxial ventilation air and flue systems

To make burner settings, the boiler water temperature must be at least 60 °C.

If using separate or parallel ventilation air and flue systems

If, at the time when burner settings are made, the outside air temperature is not +15°C, we recommend adjusting the CO₂ value by adjusting the air volume (for adjustment procedure, see chapter "Adjusting the air volume"; standard values for air damper and blast tube connection settings can vary slightly on account of geodetic height, air pressure and temperature) in accordance with the table below.

When making the adjustments, also take account of the **average** local air pressure.

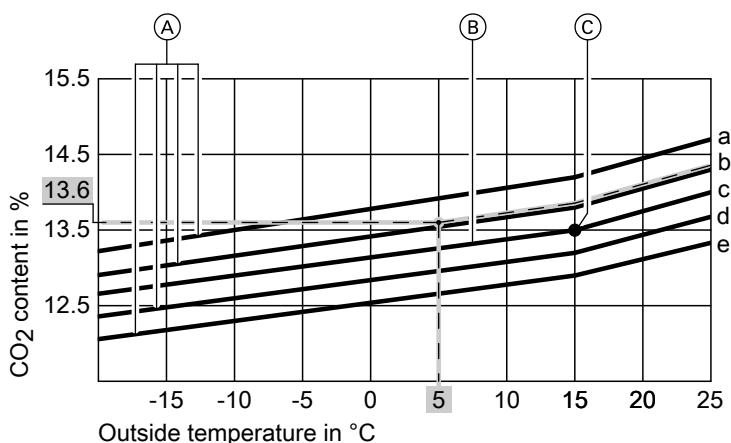


Abb. 20

- (A) Actual air pressure
- (B) Assumed average air pressure
- (C) Reference point outside temperature/CO₂ content

Assumptions regarding the table:

- Length of the ventilation air pipe (∅ 80 mm) in the building 5 m
- Boiler room temperature 18 to 22 °C

Air pressure at geodetic height	m	up to 300	up to 600	up to 1000
a	mbar	940	905	860
b	mbar	960	925	880
c	mbar	980	945	900
d	mbar	1000	965	920
e	mbar	1020	985	940

Example:

Geodetic height 600 m above sea level
Outside temperature 5 °C

Standard values for burner adjustment

Standard values for burner adjustment (cont.)

Air pressure 925 mbar

Result: Adjust CO₂ content to 13.6 %

Note

Check that the service instructions are applicable for the burner concerned (see notes on applicability, page 32 and the serial no. on the burner type plate).

Rated output	kW	18	22	27	33
Oil burner nozzle					
Make: Danfoss ^{*2}	type		80°S-LE		
	Gph	0.4	0.5	0.5	0.6
Oil pressure approx. ^{*3}	bar	14.0-17.0	12.5-15.5	18.0-25.0	16.0-19.0
Oil throughput	kg/h	1.7	2.0	2.5	2.9
	l/h	2.0	2.4	2.9	3.4
Air damper setting		9.0	6.5	15.5	10.0
Air inlet aperture position		8.0			
Static burner pressure ^{*4}	mbar	13.0	10.0	11.0	12.0

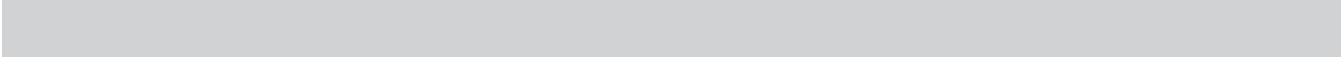
^{*2} The requirements for the certificate of environmental excellence were verified only with the nozzles specified.

^{*3} Due to nozzle tolerances and varying oil quality, the oil pressure may vary from the values shown.

^{*4} To check the burner settings.

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Applicability

Serial no.:

7428499

7428500

7428501

7428502

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