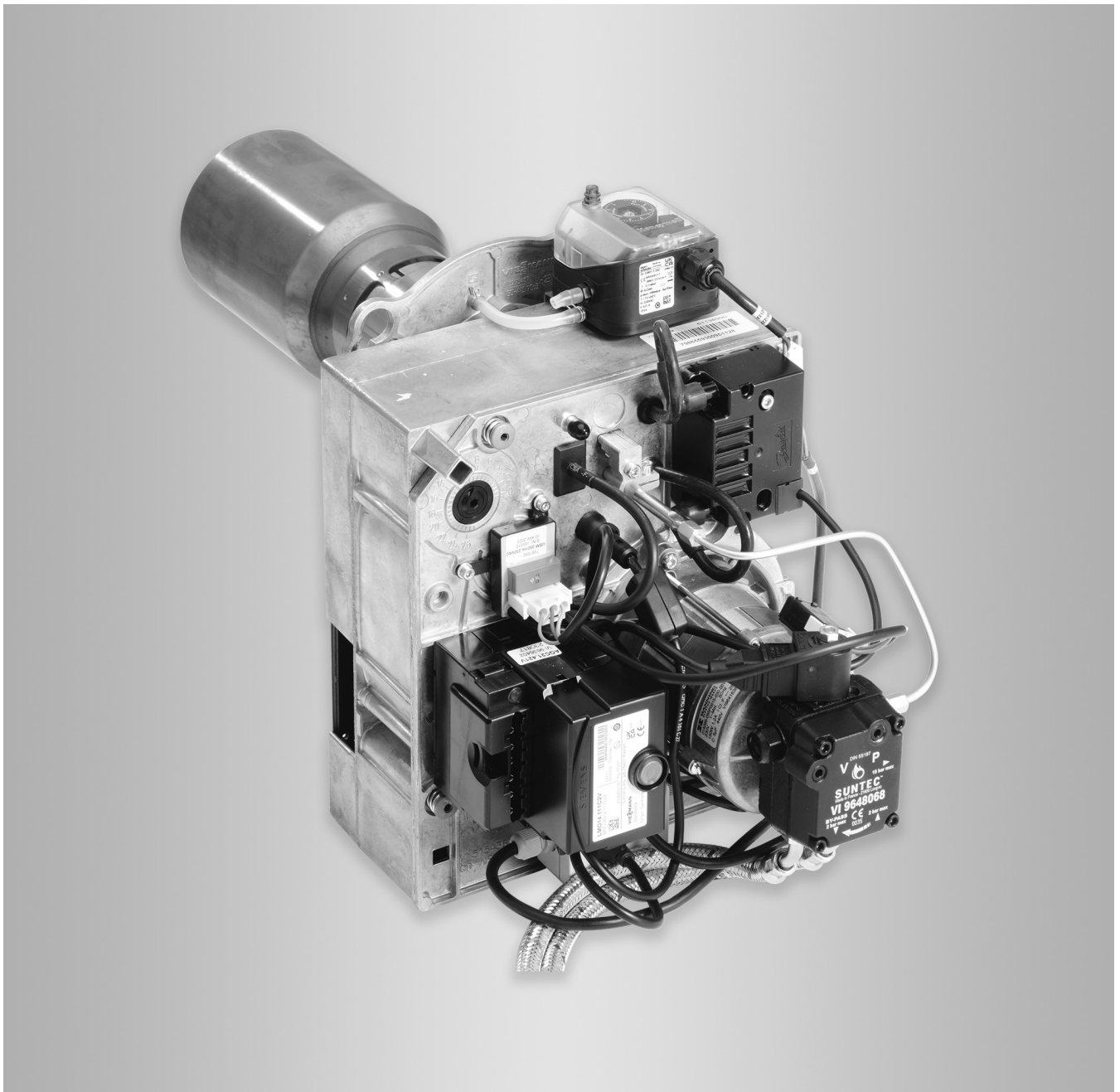



Vitoflame 300
Type VHG
Pressure-jet oil burner
with fuel oil preheating
for Vitoladens 300-T
Rated heating output 40 and 50 kW




VITOFLAME 300




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 intended for qualified contractors.

- Work on gas installations may only be carried out by a registered gas fitter.
- Work on electrical equipment may 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 to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Codes of practice of the relevant trade associations
- Relevant country-specific safety regulations

Safety instructions for working on the system

Working on the system

- Where gas is used as the fuel, close the main gas shut-off valve and safeguard it against unintentional reopening.
- Isolate the system from the power supply, e.g. by removing the separate fuse or by means of a mains isolator, and check that it is no longer live.
- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when carrying out any work.

Safety instructions (cont.)**Danger**

Hot surfaces and fluids can lead to burns or scalding.

- Before maintenance and service work, switch OFF the appliance and let it cool down.
- Never touch hot surfaces on the boiler, burner, flue system or pipe-work.

**Please note**

Electronic assemblies can be damaged by electrostatic discharge. Prior to commencing work, 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 the system. Replace faulty components only with genuine Viessmann spare parts.

Auxiliary components, spare and wearing parts**Please note**


Auxiliary components, spare parts and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorised components and making non-approved modifications or conversions can compromise safety and may invalidate our warranty. For installation and replacements, use only Viessmann original parts or parts approved by Viessmann.

Safety instructions for operating the system


If you smell gas


-  **Danger**
Escaping gas can lead to explosions which may result in 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.
 - Evacuate any people from the danger zone.
 - Notify your gas or electricity supply utility from outside the building.
 - Have the power supply to the building shut off 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 installation site.
 - Close doors to living spaces to prevent flue gases from spreading.

What to do if water escapes from the appliance

-  **Danger**
If water escapes from the appliance there is a risk of electrocution. Switch OFF the heating system at the external isolator (e.g. fuse box, domestic distribution board).


-  **Danger**
If water escapes from the appliance there is a risk of scalding. Never touch hot heating water.

Condensate

-  **Danger**
Contact with condensate can be harmful to health. Never let condensate touch your skin or eyes and do not swallow it.

Flue systems and combustion air

Ensure that flue systems are clear and cannot be sealed, for instance due to accumulation of condensate or other external causes. Ensure an adequate supply of combustion air. Inform system users that subsequent modifications to the building characteristics are not permissible (e.g. cable/pipe-work routing, cladding or partitions).

-  **Danger**
Leaking or blocked flue systems, or an inadequate supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas. Ensure the flue system is in good working order. Vents for supplying combustion air must be non-sealable.

Extractors

Operating appliances that extract air to the outside (extractor hoods, extractors, air conditioning units, central vacuum cleaning systems, etc.) can create negative pressure. If the boiler is operated at the same time, this can lead to a reverse flow of flue gas.

Safety instructions (cont.)**Danger**











The simultaneous operation of the boiler and appliances that exhausts air to the outside can result in life threatening poisoning due to a reverse flow of flue gas.

Fit an interlock circuit or take suitable steps to ensure an adequate supply of combustion air.







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Symbols

Symbol	Meaning
	Reference to other document containing further information
	Step in a diagram: The numbers correspond to the order in which the steps are carried out.
	Warning of personal injury
	Warning of material losses and environmental pollution
	Live electrical area
	Pay particular attention.
	<ul style="list-style-type: none"> ▪ Component must audibly click into place. or ▪ Acoustic signal
	<ul style="list-style-type: none"> ▪ Fit new component. or ▪ In conjunction with a tool: Clean the surface.
	Dispose of component correctly.
	Dispose of component at a suitable collection point. Do not dispose of component in domestic waste.

The steps in connection with commissioning, inspection and maintenance are found in the "Commissioning, inspection and maintenance" section and identified as follows:

Symbol	Meaning
	Steps required during commissioning
	Not required during commissioning
	Steps required during inspection
	Not required during inspection
	Steps required during maintenance
	Not required during maintenance

Maintenance parts and spare parts

Maintenance parts and spare parts can be identified and ordered directly online.

Maintenance parts and spare parts (cont.)

Viessmann Partnership

Login:

<https://shop.viessmann.com/>



Viessmann spare part app

www.viessmann.com/etapp





Steps - commissioning, inspection and maintenance

			Commissioning steps	
			Inspection steps	
			Maintenance steps	
				Page
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Commissioning the system

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

ⒸH: The limits of the Swiss Clean Air Regulations LRV 92 must be maintained.



Boiler control unit service instructions

Note

For fuel details, see chapter "Information on fuel oil".

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 mains isolator (outside the installation room).
5. When installing at geodetic heights from 900 m, adjust the air pressure switch in accordance with the data in the table on page 10.
6. Switch ON the system ON/OFF switch at the control unit.
If the fault indicator on the control unit lights up, press the reset button on the burner (see chapter "Function and fault indications of signal lamp (LED)").

Adjusting the air pressure switch

When installing at geodetic heights from 900 m, adjust the air pressure switch in accordance with the data in the table.

Boiler output at 80/60 °C		Factory setting (0 to 900 m)	Target setting (900 to 1800 m)	Correction via setting wheel
40.0 and 50.0 kW	Pa	530	450	- 80
	mbar	5.3	4.5	- 0.8

1. Remove the cover from the air pressure switch.
2. Select the value from the column.
3. Adjust the setting wheel on the air pressure switch to the appropriate value.
4. Fit the cover of the air pressure switch.



Adjusting the air flow rate

The air flow rate is preset at the factory. Readjust the air flow rate if necessary.
When commissioning the burner, some fine adjustment may be required.

Before making adjustments, check that inlet air aperture Ⓒ **inside the casing** is set to position "7.5" (factory setting).



Adjusting the air flow rate (cont.)

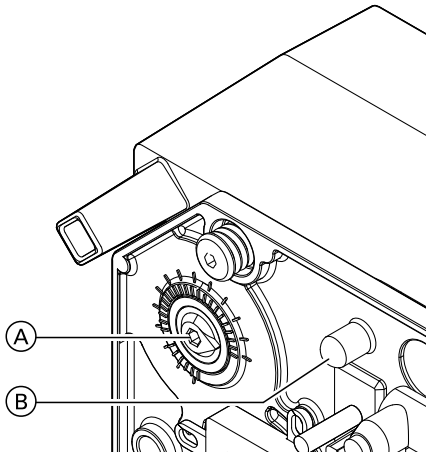


Fig. 1

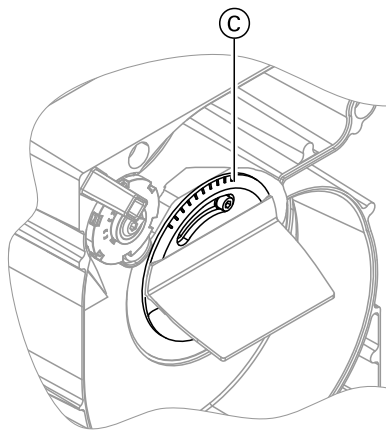


Fig. 2

1. Check the static burner pressure at test nipple (B); remove the plastic cap for this.

Note

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

For standard values for burner adjustment, see the relevant chapter.

2. If required, adjust the static burner pressure at air damper (A):
 - Anti-clockwise turn
 - Higher static burner pressure
 - More air
 - Lower CO₂ content
 - Clockwise turn
 - 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 in accordance with the oil throughput.

Readjust the oil pressure if necessary.

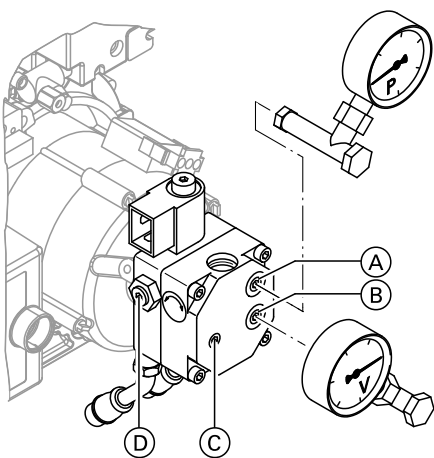


Fig. 3 Danfoss oil pump, type BFP 31

1. Switch off the mains isolator and safeguard against unauthorised reconnection.
 2. Unscrew sealing plug "P" (A) from the oil pump.
 3. Unscrew sealing plug "V" (B) from the oil pump.
- Note**
Oil may leak from the oil pump when doing this.
4. Insert a pressure gauge (measuring range 0 - 25 bar) and a vacuum gauge (measuring range 0 - 1 bar).

Note

Only seal in the pressure and vacuum gauges with copper or aluminium gaskets or with O-rings. Do not use sealing tape.

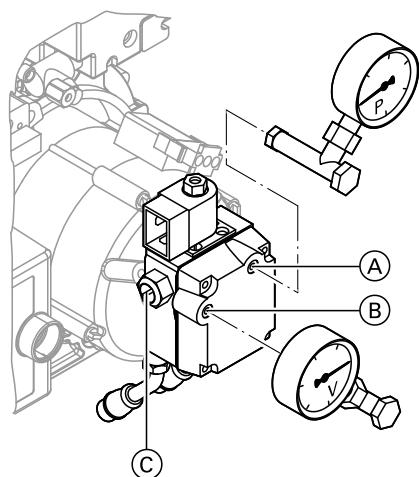


Fig. 4 Suntec oil pump, type ALE 35

5. Start the burner.

Note

The solenoid valve opens.

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

Note

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

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

Note

Only for Danfoss oil pump:

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

Note

For standard values for burner adjustment, see the relevant chapter.

8. Test to check the actual emission values after adjusting the oil pressure.
9. Switch off the mains isolator and safeguard against unauthorised reconnection.
10. Undo the pressure and vacuum gauges.
11. Check the seal rings of the sealing plugs for damage and replace if necessary.
Insert sealing plugs "P" (A) and "V" (B).
12. Start the burner and check the sealing plugs for leaks.



Note

For room sealed operation, observe the information regarding burner adjustment in the relevant chapter.



Cleaning and testing the flame monitor

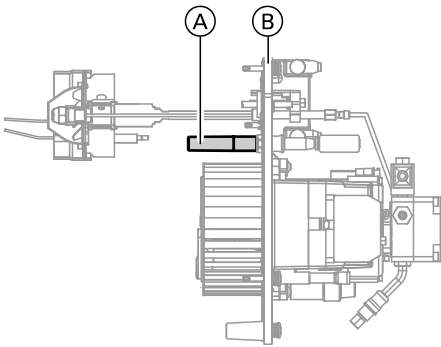


Fig. 5

1. Pull flame monitor (A) from burner cover (B).
2. Clean the flame monitor.
For this, remove push-on restrictor (see chapter "Installing and adjusting the flame monitor") and replace it when you have finished.

Safety check	Response
Burner start with darkened flame monitor	Fault shutdown at the end of the safety time
Burner start with externally lit flame monitor	Fault shutdown after max. 40 s

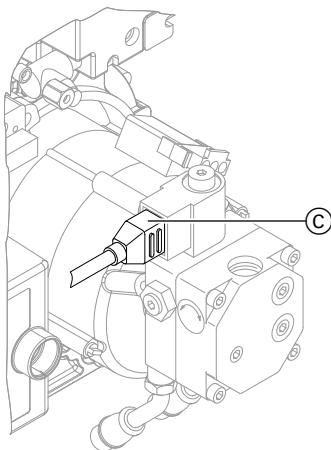


Fig. 6

3. Push flame monitor (A) into burner cover (B).

Safety check	Response
Burner operation with simulated flame blow-off – pull plug (C) from the solenoid valve during operation and leave in this condition	Restart followed by a fault shutdown at the end of the safety time



Installing and adjusting the flame monitor

Before fitting, check whether slider sleeve (B) is pushed as far forward as it will go (x = max.).

Push-on restrictor (A) must sit on flame monitor (C).

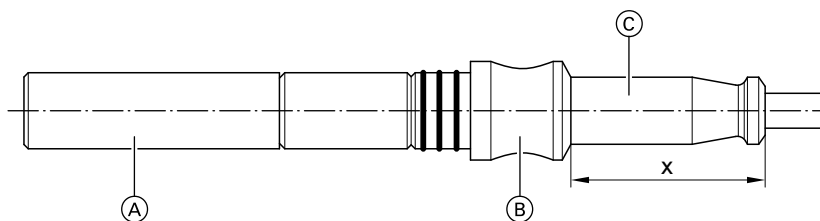


Fig. 7



Shutting down the system



Checking the electrical connections for firm seating

Commissioning, inspection, maintenance



Checking the air pressure switch

The air pressure switch trips when the combustion chamber pressure is too high.

Check whether the air pressure switch has tripped

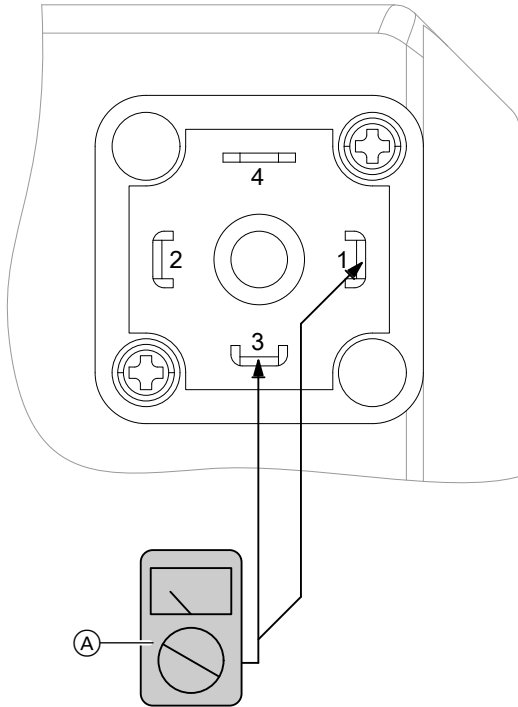


Fig. 8

(A) Multimeter

Measure the resistance across terminals 1 and 3. If the resistance is $> 0 \Omega$, the air pressure switch has tripped.

If the air pressure switch has tripped, check the following components and replace if necessary:

- Electrodes
- Flame tube
- Ignition transformer and ignition cables
- Check the flue system for damage and leaks.



Cleaning the burner



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



Cleaning the burner (cont.)

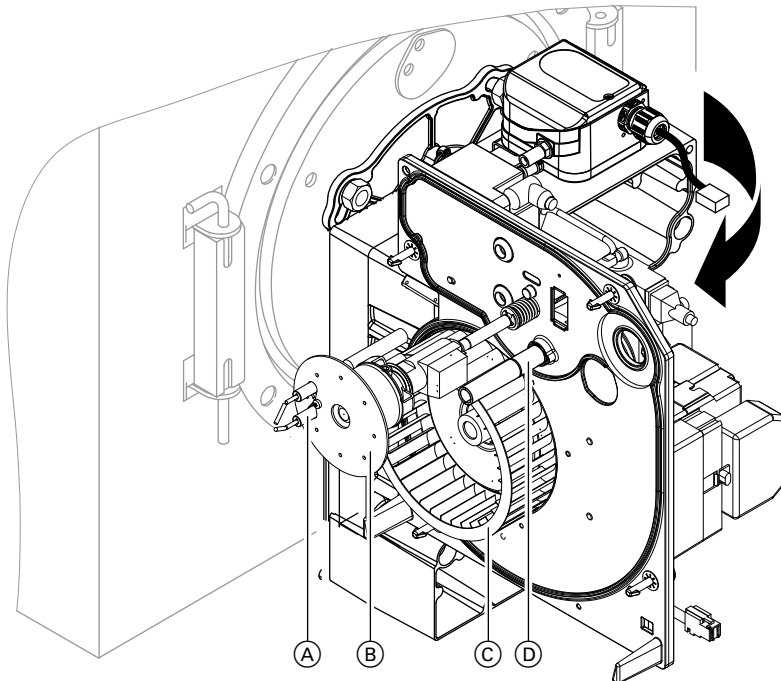


Fig. 9

1. Pull out plug.
Bring the burner into its maintenance position.
2. Clean casing, flame tube, mixer assembly (B), ignition electrodes (A), flame monitor (D) and impeller (C).



Checking the recirculation gap

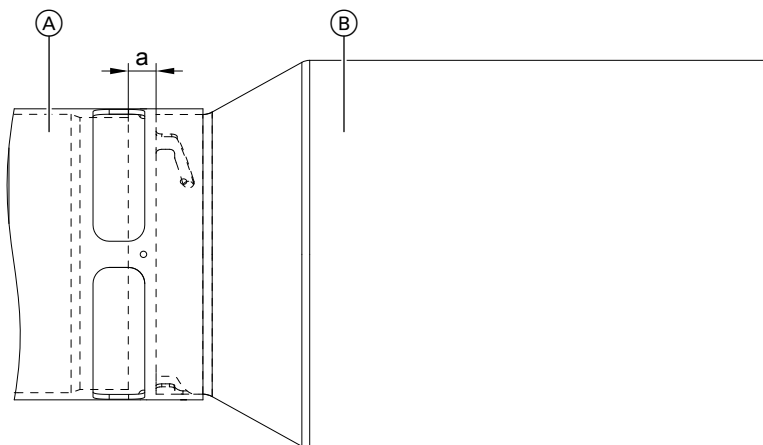


Fig. 10

- (A) Adaptor pipe and dosing ring
- (B) Flame tube

1. Measure existing recirculation gap "a".
If it deviates from dimension "a", adjust set dimension "a".
2. Adjust recirculation gap "a".
For this, turn the setting screw of the blast tube connection ((A) – see diagram in chapter "Checking the 0 point of the blast tube connection").
 - Turn anti-clockwise: Recirculation gap "a" widens
 - Turn clockwise: Recirculation gap "a" narrows

Rated burner heating output kW	Target dim. a mm
40	3
50	6



Checking the impeller fixings



Checking the flame tube fixings

Check that the flame tube is correctly engaged with the adaptor pipe.



Replacing the nozzle

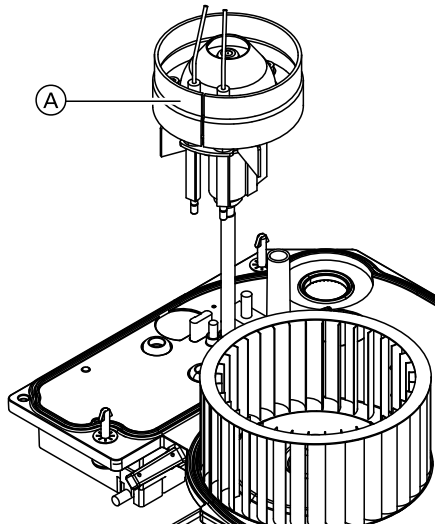


Fig. 11

1. Place the burner cover with the blast tube connection facing upward on 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 mixer assembly (A) from the blast tube connection.
4. Replace the nozzle (hold the blast tube connection).

Note

For the make and type of nozzle, see standard values for burner adjustment in the relevant chapter.

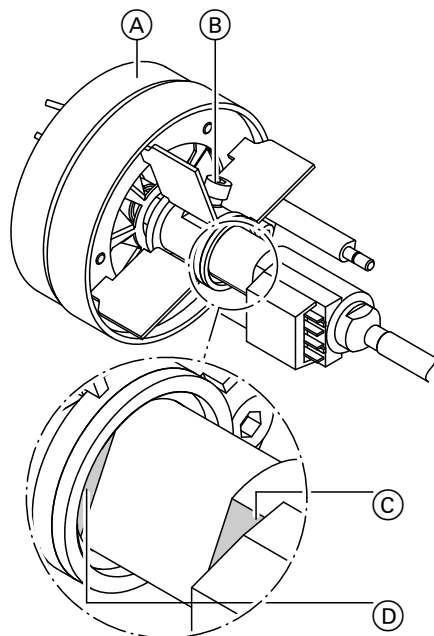


Fig. 12

5. Push mixer assembly (A), with surface (D) in the annular groove, as far as it will go over recess (C) of the oil preheater, onto the blast tube connection.

Note

The mixer assembly must audibly click into the correct position on the blast tube connection.

In this position (surfaces (C) and (D) aligned), the mixer assembly can no longer be rotated on the blast tube connection.

The plug-in connection must be pointing towards 9 o'clock.



Replacing the nozzle (cont.)

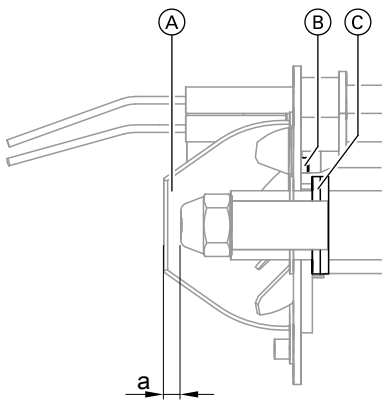


Fig. 13

6. Use burner setting gauge (C) to check gap "a" between the nozzles with reference to the table in chapter "Checking and adjusting the mixer assembly".
7. Retighten fixing screw (B).

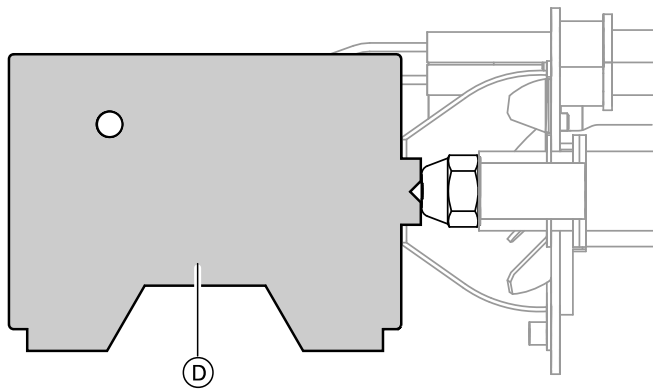


Fig. 14



Checking and adjusting the mixer assembly

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

Note

To check the distance between the ignition electrodes, use burner setting gauge (D).

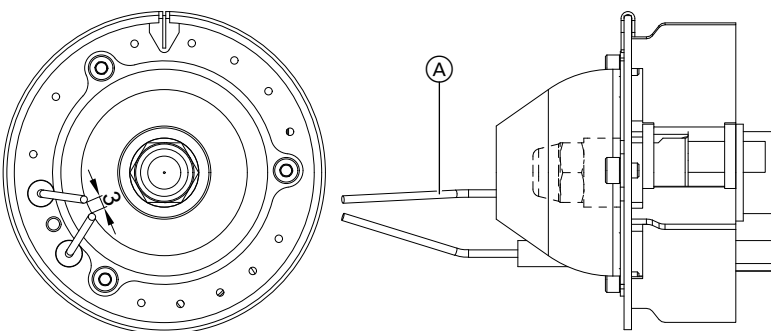


Fig. 15

Rated heating output	kW	40	50
Dimension a	mm	4.5	4.5



Checking and adjusting the mixer assembly (cont.)

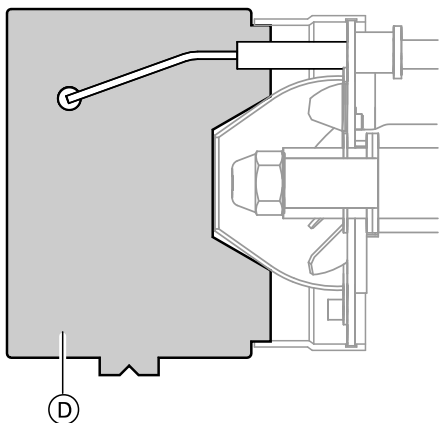


Fig. 16

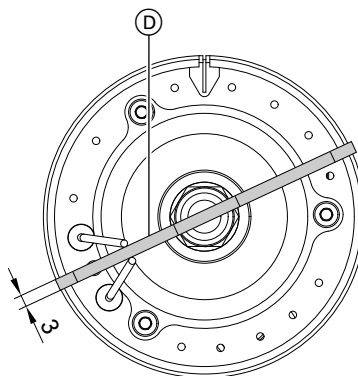


Fig. 17



Checking the 0 point of the blast tube connection

This adjustment is **only** required if optimum combustion characteristics are not achieved with the standard values for burner adjustment (see chapter "Standard values for burner adjustment") or if a fault shutdown occurs due to the flame tearing off.

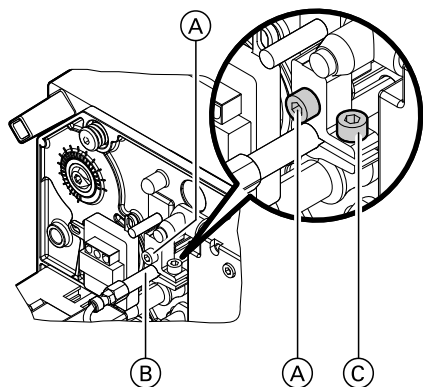


Fig. 18

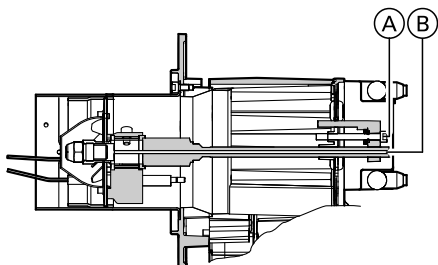


Fig. 19

1. Fit the burner cover on the burner casing.
2. With the setting screw of blast tube connection (A), set the scale for blast tube connection adjustment to dimension 2 mm = 0 point.
3. Undo locking screw (C).
4. Push blast tube connection (B) forward as far as it will go.
5. Retighten locking screw (C).
6. Adjust the blast tube connection in accordance with the standard values for burner adjustment. For the dimensions for adjusting the recirculation gap, see chapter "Checking the recirculation gap".



Fitting the burner cover on the burner casing



Cleaning the oil pump filter and replacing it if required

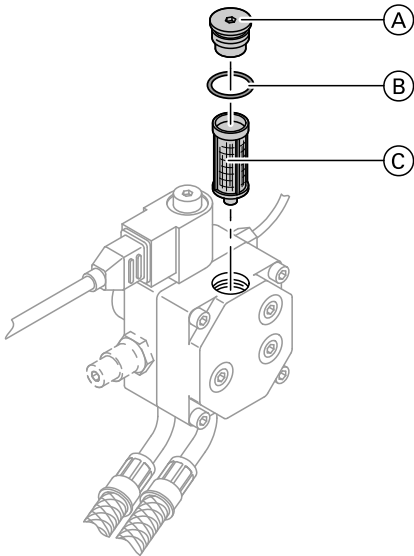


Fig. 20 Danfoss oil pump, type BFP 31

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

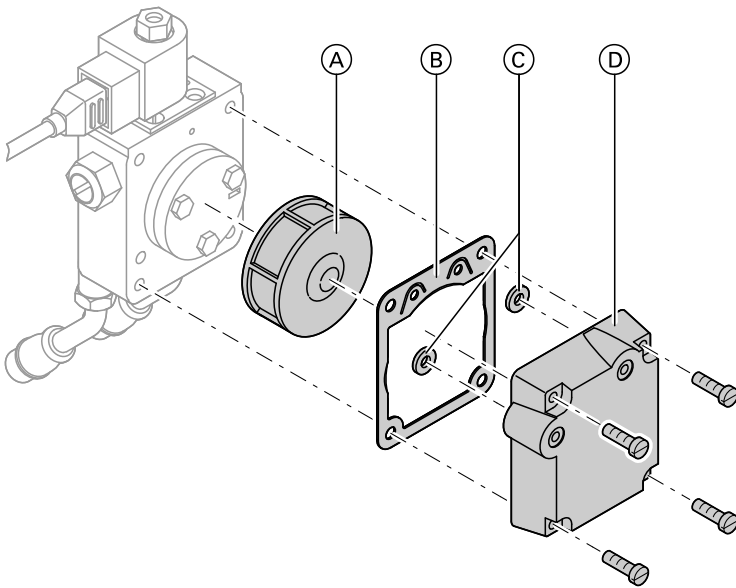


Fig. 21 Suntec oil pump, type ALE 35

- (A) Filter (clean or replace)
- (B) Flat gasket (replace)
- (C) O-rings (replace)
- (D) Cover



Replacing the pre-filter element

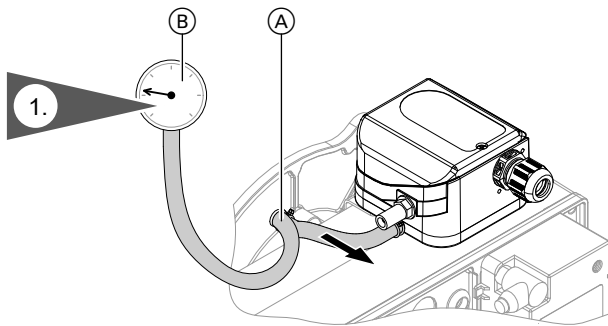


Commissioning the system





Checking the pressure drop on the hot gas side



Connect pressure gauge (B) to burner casing connector (A).

Fig. 22



Checking the oil lines and connections for leaks

Note

The European Control Manufacturers Association (Afe-cor) recommends replacing oil hose lines after **5 years** in accordance with EN ISO 6806.

For replacements, use only original spare parts supplied or approved by Viessmann.



Re-testing the burner and entering the measured values into the report



Instructing the system user

The system installer should hand the operating instructions to the system user and explain to the user how to operate the system.

This also includes all components added as accessories, such as remote controls. The system installer should also provide information on the required maintenance.

Burner control unit LMO 64.200 C2V

! Please note
 An incorrect burner control unit prevents the burner from switching off when the set boiler water temperature has been reached and can cause damage to the burner. The burner is only locked out when the high limit safety cut-out is triggered.
 Only use burner control unit LMO 64.200C2V.

Burner control unit program sequence

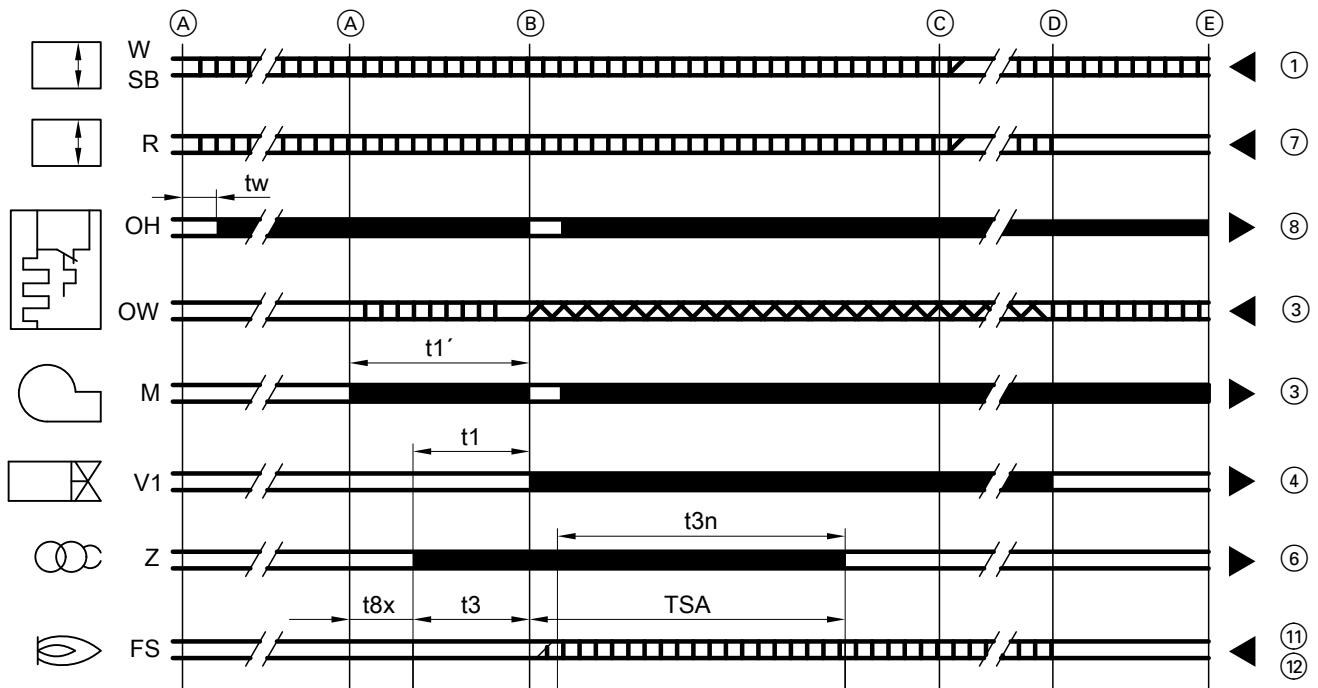


Fig. 23

- (A) Beginning of start-up for burners with oil pre-heater (OH)
- (A) Beginning of start-up for burners without oil preheater (OH)
- (B) Point of flame formation
- (C) Operating position
- (D) Controlled shutdown by temperature controller or pressure regulator (R)
- (E) End of start-up
- W Temperature limiter or pressure switch
- SB Safety limiter
- R Temperature controller or pressure regulator
- OH Oil preheater
- OW Enable contact of oil preheater
- M Burner motor
- V1 Fuel valve
- FS Flame signal
- TSA Start-up safety time
- tw Delay time
- t1' Purge time
- t1 Pre-purge time
- t3 Pre-ignition time
- t3n Re-ignition time
- t8x Post-purge time before restart due to flame failure during operation
- Control signals
- Required input signals
- Permissible input signals
- (1)-(12) Screwless terminals on burner control unit (see chapter "Connection and wiring diagram")

TSA	Start-up safety time	max. 10 s
tw	Delay time	max. 2.5 s
t1	Pre-purge time	min. 15 s
t1 ^{*1}	Purge time	min. 16 s
t3	Pre-ignition time	min. 15 s

t3n	Re-ignition time	max. 10 s
t8x	Post-purge time/intermediate purge time for flame tear-off	max. 90 s

*1 Bridging contact, oil preheater

Burner control unit LMO 64.200 C2V (cont.)

Flame monitor sensor current

- Min. required 45 µA
- Max. permissible without flame 5.5 µA

Undervoltage

If the mains voltage drops below 165 V~, the burner control unit initiates a safety shutdown. When the mains voltage rises above approx. 175 V~, the system restarts.

Note

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

Controlled intermittent operation

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

Control sequence in the event of faults

If a fault shutdown occurs, the outputs for the fuel valves and the ignition system are immediately switched off (< 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-purge time t1	Fault shutdown at the end of the pre-purge time t1
If there is a premature, faulty flame signal during the oil preheat time tw	Starting is prevented, fault shutdown after max. 40 s
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 enabling of oil preheater 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 signal lamp shines. 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 approximately 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. This allows several ignition attempts within the safety time; see the above program sequence.

Repeat limitation

In the event of flame failure during operation, up to 3 re-ignition attempts can be made. The fourth flame failure during operation triggers a fault shutdown.

Counting of the repeats begins anew with each of the following controlled starts:

- Via temperature controller or pressure regulator
- Via temperature limiter or pressure switch
- Via safety limiter

Burner control unit LMO 64.200 C2V (cont.)

Function and fault indications of the signal lamp (LED)

In standard mode, operating conditions are displayed as colour codes at the end of reset button (A) (see the following table). After a fault shutdown, the signal shines constant red. In this condition, the optical fault cause indicator can be activated (see the following chapter "Burner fault flowchart").

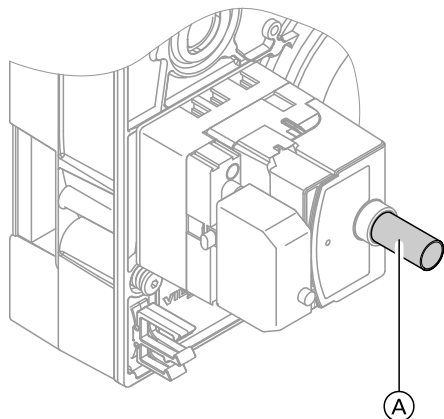
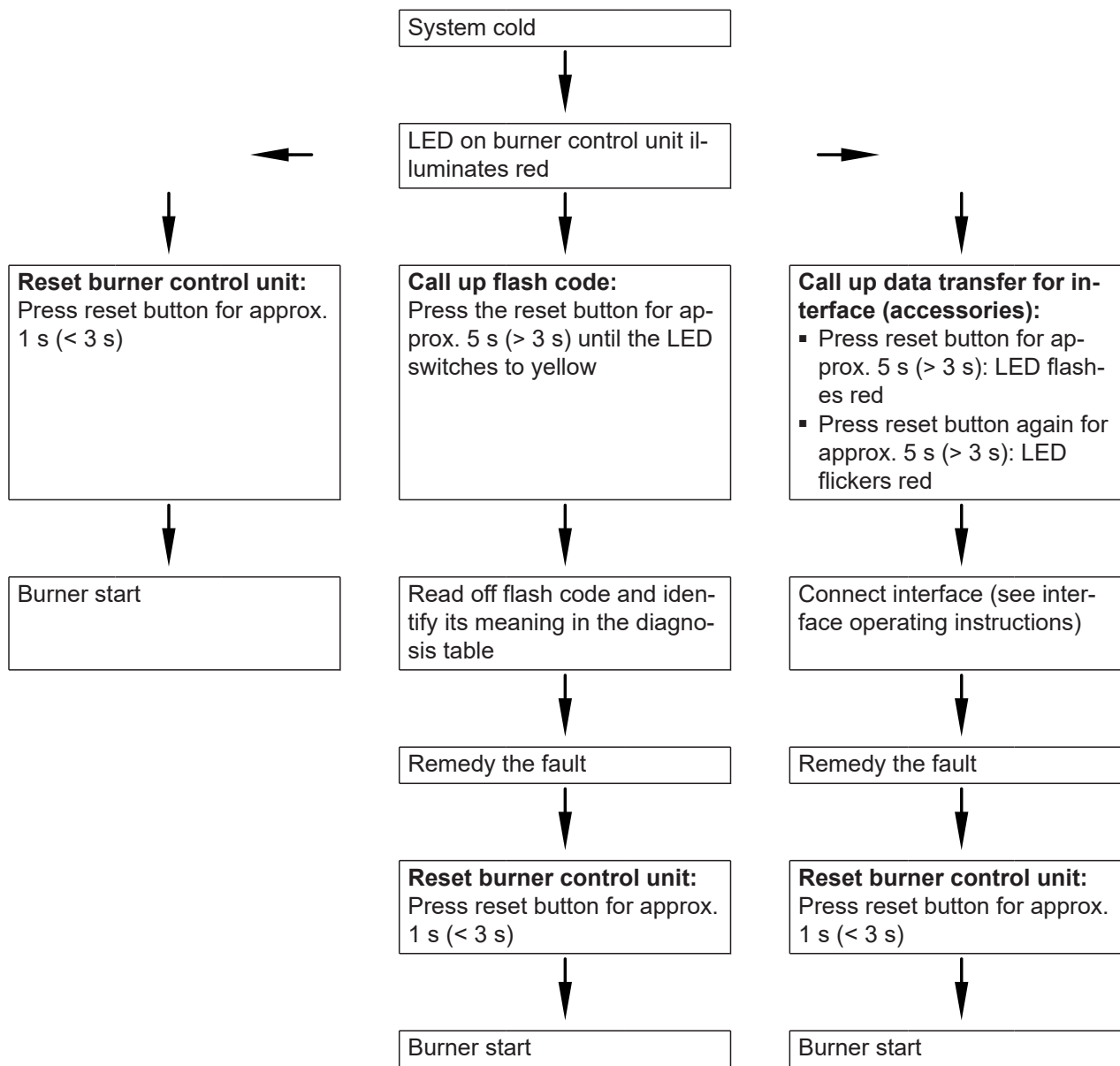


Fig. 24

1. Press reset button (A) for approx. 5 s (>3 s) until the signal lamp shines yellow.
2. A flash code is then shown.
The number of flashes in a sequence indicates the type of fault. For an explanation, see the table in chapter "Fault indication with flash code".
3. To reset the burner and exit the fault display, press the reset button for approx. 1 s (<3 s).

LED colour	Operating condition
Yellow, constant	Oil preheater active, oil preheat time t_w
Yellow, flashing	Ignition phase pre-purge, ignition activated
Green, constant	Operation, flame stable
Green, flashing	Operation, flame unstable
Yellow-red, flashing alternately	Undervoltage (<165 V)
Red, constant	Fault, burner locked out
Red, flashing	Fault code indication (for an explanation, see chapter "Fault indication with flash code")
Green-red alternately	External light before burner start
Red, flickering	Interface diagnosis For diagnosis with interface adaptor (accessories)

Burner fault flowchart



Diagnosis

Fault indication with flash code

Fault	Red flash code	Cause of fault	Measure
Burner does not start (with fault indication), signal lamp lights up.	10 x	Electrical connection faulty, wires "L 1" and "N" interchanged or burner control unit faulty.	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 (see chapter "Connection and wiring diagram").
Burner does not start (with fault indication).	2 x	Motor faulty	Replace motor.
	2 x	Coupling between motor and oil pump faulty	Replace coupling.
	2 x	Oil pump seized up or sluggish.	Clean oil pump or replace it.
	2 x	Air pressure switch has tripped	Check flue gas path for blockages/contamination and clean. Reset air pressure switch.
	8 x	Oil preheater faulty	Replace oil preheater.
Burner starts, but no flame is formed.	2 x	Ignition electrodes incorrectly adjusted	Adjust correctly (see chapter "Checking and adjusting the mixer 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	Air pressure switch has tripped	Check flue gas path for blockages/contamination and clean. Reset air pressure switch.
	2 x	Pump does not supply oil.	Mount pressure gauge and vacuum gauge at the pump and check build-up of pressure (see following paragraph).

Troubleshooting

Diagnosis (cont.)

Fault	Red flash code	Cause of fault	Measure
Pump does not supply oil.	2 x	Tank empty	Fill up with fuel oil.
	2 x	Shut-off valves closed at filter or in oil line	Open valves.
	2 x	Filter blocked	Clean filters (fuel oil 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 fittings. Check oil lines and connections for leaks and tighten if required.
	2 x	Oil flow and return hoses interchanged.	Correct the connections in line with the marking on the pump.
	2 x	Vacuum in suction line too high (above 0.3 bar)	Check sizing of oil line cross-section. Replace filter. Check external fuel oil valve.
	2 x	Air pressure switch has tripped	Check flue gas path for blockages/contamination and clean. Reset air pressure switch.
	2 x	External anti-lift valve is faulty. (Vacuum at the pump > 0.45 bar)	Check external anti-lift valve; replace if necessary.
Fan motor faulty	2 x	Fan motor occasionally does not start, due to faulty auxiliary winding or capacitor.	Replace the motor or capacitor.
Burner starts, but no oil is injected.	2 x	Solenoid valve coil is faulty.	Replace solenoid valve coil.
	2 x	Oil pump is faulty.	Replace oil pump.
	2 x	Air pressure switch has tripped	Check flue gas path for blockages/contamination and clean. Reset air pressure switch. Check air pressure switch and replace if necessary. See page 14
	2 x	Nozzle is blocked.	Replace nozzle.
External light during the pre-purge phase	4 x	Oil pump solenoid valve fails to close.	Replace oil pump.
	4 x	Ignition electrodes incorrectly adjusted or worn	Check ignition electrodes; replace if necessary.
	4 x	Mixer assembly/oil preheater in incorrect position	Position oil preheater or mixer assembly correctly
Burner starts and flame builds, but burner enters fault state after safety time expires.	2 x	Burner control unit faulty	Replace burner control unit.
	2 x	Carbon deposits on flame tube or mixing assembly	Clean flame tube and mixing assembly.

Diagnosis (cont.)

Fault	Red flash code	Cause of fault	Measure
Flame tears off during operation. Green LED on ignition unit flashes. (The burner is locked out after 3 unsuccessful re-ignition attempts.)	7 x	Ignition electrode worn down	Replace ignition electrode.
	7 x	Air in suction line	Seal line and filter.
	7 x	Flue gas recirculation	Check the flue. Carry out annular gap test.
	7 x	Condensate backup	Check condensate drain.
	7 x	Nozzle faulty	Replace nozzle.
	7 x	Incorrect burner setting	Check the default settings in line with chapter "Standard values for burner adjustment".
	7 x	Mixer assembly contaminated	Clean mixer assembly.
	7 x	Flame tube damaged/deformed	Replace flame tube
Ignition switches on during operation	7 x	Mixer assembly contaminated	Clean mixer assembly.
	7 x	Nozzle contaminated or faulty	Replace nozzle.
	7 x	Condensate backup in flue gas heat exchanger	Clean trap and neutralising system.
	7 x	Heating surfaces of flue gas heat exchanger are contaminated. (Pressure drop on the hot gas side too high)	Clean the heating surfaces of the flue gas heat exchanger.

Faults without flash code indication

Fault	Cause of fault	Measure
Burner does not start (no fault indicator), signal lamp does not light up.	No power	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 mains isolator.
	High limit safety cut-out has responded.	Press the reset button on the boiler control unit.
Flame pulsates, tears off.	Fan pressure too high	Check the static burner pressure at the test connector on top of the fan housing (U-tube pressure gauge). Adjust the air damper and 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	Check the setting.
	Oil throughput too high	Set the oil pressure correctly (see chapter "Standard values for burner adjustment").
	Condensate backup in flue gas heat exchanger	Clean trap and neutralising system.
	On-site condensate drain blocked	Clean the condensate drain.
	Condensate lifting pump (if installed) faulty	Replace condensate lifting pump.
	Heating surfaces of boiler or flue gas heat exchanger dirty	Clean heating surfaces of boiler or flue gas heat exchanger.

Diagnosis (cont.)

Fault	Cause of fault	Measure
	In room sealed 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, remedy the leak in the flue system. Immediate remedy: Temporarily operate the burner in open flue mode.
	If other combustion equipment is connected to the same chimney, flue gas may also be drawn in.	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.
	Recirculation gap too large	Check/adjust recirculation gap.
Burner sooty; higher CO concentration in flue gas.	Insufficient or excessive air	Correct the settings. Check and clean impeller. Check ventilation in installation room.
	Insufficient chimney draught	Check chimney and flue gas routing.
	Pressure drop on the flue gas side too high	Check condensate drain. Check heat exchanger for contamination and clean if necessary
	Nozzle faulty	Replace the nozzle; fit the right nozzle (see chapter "Standard values for burner adjustment").
	Flue gas in the combustion air supply	Check the flue system for leaks.
	Insufficient combustion air supply	Check combustion air supply.
	In room sealed operation, flue gas is drawn in as well.	Check the flue system.
	Condensate backup in flue gas heat exchanger	Clean trap 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 connection. Retighten screws on the boiler door and on the flue outlet cover.
Flue gas temperature too high	Oil throughput too high	Match oil throughput to rated boiler heating output.
	Boiler and flue gas heat exchanger dirty	Clean boiler and flue gas heat exchanger; correct the burner settings.
	Air in flue gas heat exchanger	Vent flue gas heat exchanger.
	Insufficient circulation volume due to faulty heating circuit pump	Check the heating circuit pump; replace if necessary.
	Incorrect hydraulic connection; not all heating circuits are connected to the flue gas heat exchanger.	Connect the return of all heating circuits and the DHW cylinder to the flue gas heat exchanger.
Burner operates, constantly flickering red light on burner control unit.	No fault, interface diagnosis	Press reset button for > 3 s until the light shines yellow.

Component overview

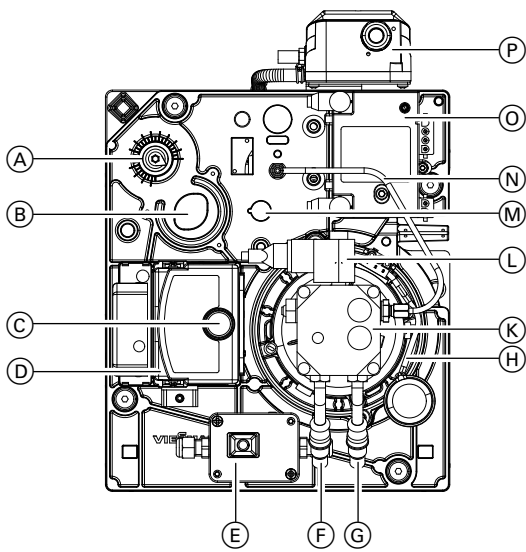


Fig. 25

- | | |
|---------------------------------|-------------------------|
| (A) Air regulating valve | (H) Fan motor |
| (B) Timer | (K) Oil pump |
| (C) Reset button with extension | (L) Solenoid valve |
| (D) Burner control unit | (M) Flame monitor |
| (E) Fitting assembly | (N) Oil line |
| (F) Return line | (O) HF ignition unit |
| (G) Suction line | (P) Air pressure switch |

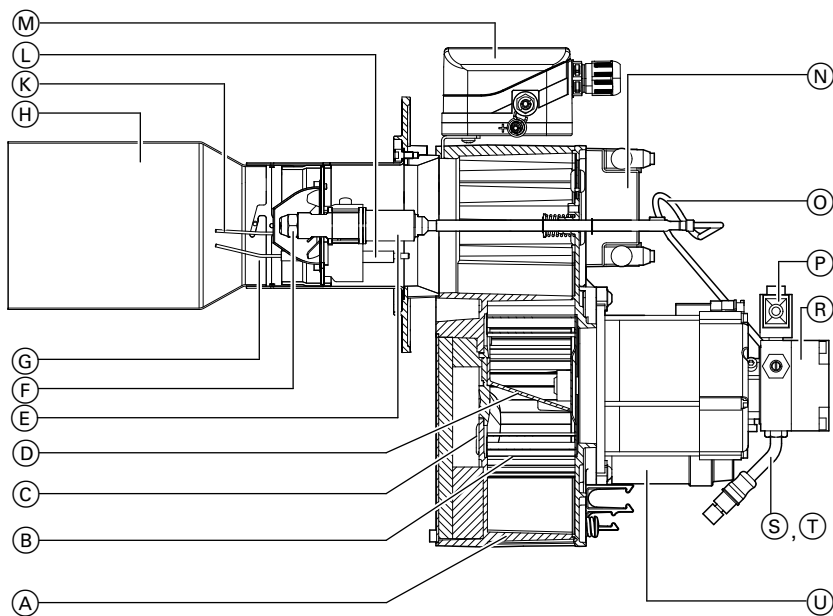


Fig. 26

- | | |
|----------------------------------------------|-------------------------|
| (A) Burner casing | (L) Ignition cable |
| (B) Impeller | (M) Air pressure switch |
| (C) Inlet air aperture | (N) HF ignition unit |
| (D) Air routing | (O) Oil line |
| (E) Blast tube connection with oil preheater | (P) Solenoid valve |
| (F) Oil burner nozzle | (R) Oil pump |
| (G) Mixer assembly | (S) Return line |
| (H) Flame tube | (T) Suction line |
| (K) Ignition electrodes | (U) Fan motor |

Connection and wiring diagram

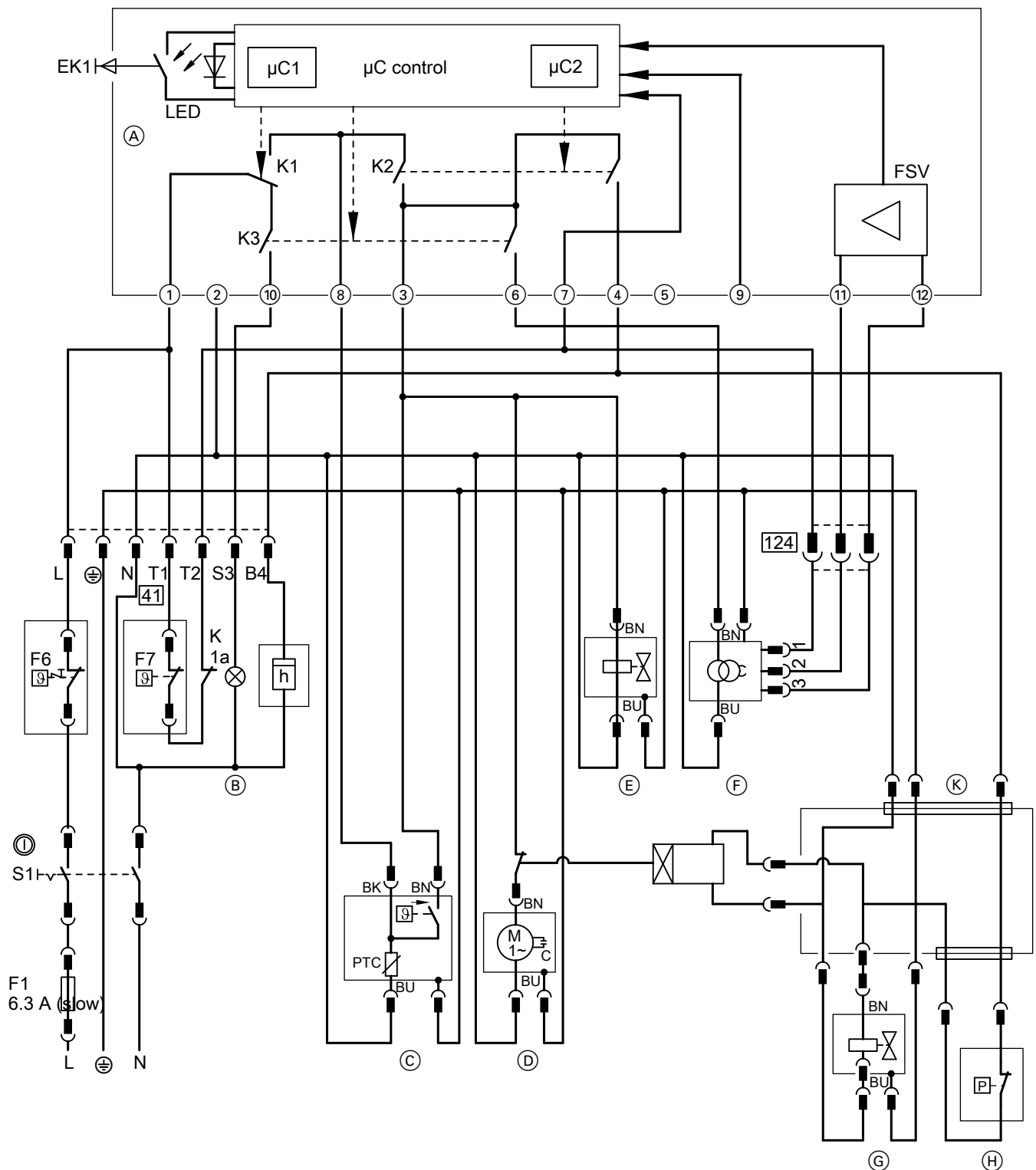


Fig. 27

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-K3 Relay contacts
- K1a Control unit relay contact
- ① - ⑫ Screwless terminals at the burner control unit
- (A) Burner control unit (see chapter "Program sequence during commissioning")
- (B) Fault indicator on the control unit
- (C) Oil preheater
- (D) Burner motor

Connection and wiring diagram (cont.)

- Ⓔ Solenoid valve for external connection via separate adaptor
- Ⓕ HF ignition unit with flame monitor
- Ⓖ Solenoid valve on the oil pump
- Ⓗ Air pressure switch
- Ⓚ Controller box

Colour coding to DIN IEC 60757

BK	Black
BN	Brown
BU	Blue

Commissioning/service reports

Commissioning/service reports

Settings and test values			Commissioning	Maintenance/service
Oil pressure	actual	<i>bar</i>		
	set	<i>bar</i>		
Vacuum	actual	<i>bar</i>		
	after maintenance	<i>bar</i>		
Soot value	actual			
	after maintenance			
Carbon dioxide content CO ₂	actual	<i>% by vol.</i>		
	set	<i>% by vol.</i>		
Carbon monoxide con- tent CO	actual	<i>ppm</i>		
	set	<i>ppm</i>		
Oxygen content O ₂	actual	<i>% by vol.</i>		
	set	<i>% by vol.</i>		
Flue gas temperature (gross)	actual	<i>°C</i>		
	set	<i>°C</i>		
Flue gas loss	actual	<i>%</i>		
	set	<i>%</i>		
Draught	actual	<i>hPa</i>		
	set	<i>hPa</i>		
Distance between noz- zles (external)	actual	<i>mm</i>		
	set	<i>mm</i>		
Air damper setting	actual			
	set			

Specification

Rated boiler heating output	kW	40	50
Burner type		VHG II-1	VHG II-2
DIN registration no.		5G999/08S	
Voltage	V	230	
Frequency	Hz	50	
Power consumption	W	340	
Includes 4 ignition processes per hour			
Motor speed	rpm	2800	
Version		Single-stage	
Oil pump rate	l/h	45	
Connections	R (female thread)	$\frac{3}{8}$	
Suction and return line on the supplied oil hoses			

Standard values for burner adjustment

Standard values for burner adjustment

Notes on burner adjustment for room sealed 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 balanced flue or coaxial flue gas/ventilation air systems

For burner adjustment, 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 adjustments are made, the outside air temperature is not +15 °C, we recommend changing the CO₂ value by adjusting the air flow rate (for adjustment procedure, see chapter "Adjusting the air flow rate"; 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.

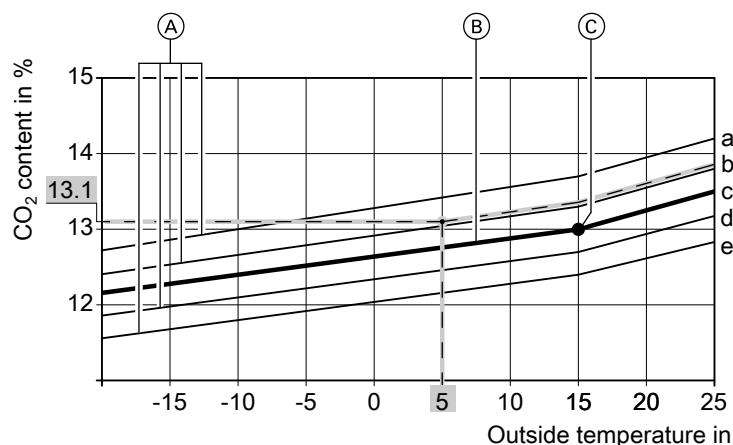


Fig. 28

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

Assumptions relevant to 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 (cont.)

Air pressure 925 mbar

Result: Adjust CO₂ content to 13.1 %**Standard values**

Rated heating output	kW	40	50
Oil burner nozzle			
Make: Danfoss ^{*2}	Type	80°S-LE	
	Gph	0.75	1.00
Oil pressure approx. ^{*3}	bar	17.0-20.0	16.0-19.0
Oil throughput	kg/h	3.5	4.6
	l/h	4.1	5.4
Air damper setting		8.0	12.0
Inlet air aperture setting		7.5	
Static burner pressure ^{*4}	mbar	13	12
Blast tube connection setting	mm	3	6

^{*2} The requirements for the ecolabel were only verified with the nozzles specified.

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

^{*4} To check the burner adjustment.

Information on fuel oil

Fuel oil quality

The Vitoflame oil burner is approved for the combustion of all commercially available fuel oils EL according to DIN 51603-1. Also for fuel oil DIN 51603-6 EL A Bio 10 (low sulphur with mixtures of up to 10 % bio-components).

A condensate neutralising system is not required (according to Code of Practice ATV-DVWK-A 251 [Germany]) when using low sulphur fuel according to DIN 51603.

Fuel oil additives

Fuel oil additives are substances that can be added providing they offer the following characteristics:

- Improvement of stability during fuel storage.
- Improvement of the thermal stability of the fuel.
- Reduction of odour development during tank filling.



Please note

Fuel oil additives can create residues and impair the safe operation of your heating system. The use of fuel oil additives that leave residues is not permitted.

Combustion improvers

Combustion improvers are additives for optimising fuel oil combustion.

Viessmann oil burners do not require combustion improvers, as these burners operate with clean and efficient combustion.



Please note

Combustion improvers can create residues and impair the safe operation of your heating system. The use of combustion improvers that leave residues is not permitted.

Biofuels

Biofuels are made from vegetable oil, e.g. sunflower or rape seed oil.

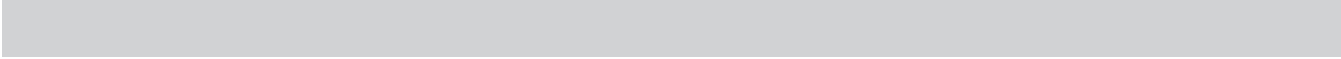


Please note

Biofuels can lead to damage to Viessmann oil burners. Their use is not acceptable.

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6221229 Subject to technical modifications.