



Operating instructions
Fuel-oil burners 23-43

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Overview

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Guarantee, safety instructions Principal regulations

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See technical data Nr 4200 1023 3600

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Guarantee

Installation and start-up must be carried out in accordance with good practice by a qualified specialist. All applicable regulations and the instructions that follow must be complied with. The manufacturer will decline all responsibility in the event of failure to comply fully and in every respect with any of the relevant requirements. See also:

- guarantee certificate enclosed with burner,
- general terms of sale.

Safety

The burner is designed for installation on a generator connected to correctly functioning exhaust flues.

It should be used in an area where there is an adequate supply of combustion air and where polluted products can be properly evacuated.

Flue size and design must be appropriate to the fuel in compliance with the current regulations and standards.

The control and safety unit and the cut-outs used require a power supply of 230 VAC $\pm 10\%$ 50Hz $\pm 1\%$ with an **earthed neutral wire**.

It must be possible to isolate the burner from the network by means of a multipole switch complying with the current standards.

Maintenance staff should always act with extreme caution and in particular avoid direct contact with electrical circuits and with parts not fitted with heat insulation.

Avoid splashing water on the electrical components of the burner.

In the event of flood, fire, fuel leak or abnormal operation (suspicious smell, or noise, etc.) switch off the burner, turn off the power and fuel supplies and call in a qualified specialist.

It is essential that all furnaces and accessories, waste gas ducts and connection pipes are serviced, cleaned and swept once a year and before burner start-up. See the applicable regulations in force.

Principal regulations “FR”

Residential buildings:

- Order of 2 August 1977 and subsequent amending and supplementary orders: Technical and safety rules applicable to gas- and liquefied hydrocarbon-fired installations located within residential buildings and their outbuildings.
 - Standard DTU P 45-204: Gas installations (previously DTU 61-1 - Gas installations - April 1982 plus subsequent additions).
 - Standard DTU 65.4: Technical requirements for boiler-rooms.
 - Standard NF C15-100 - Low-voltage electrical installations + Rules.
 - Departmental health regulations.
- Establishments open to the public:
- Fire safety and panic control regulations in establishments open to the public:

General requirements:

- GZ clauses (Gas fuel and liquefied hydrocarbon installations);
- CH clauses (Heating, ventilation, refrigeration, air-conditioning and steam and domestic hot water production);

Requirements particular to each type of establishment open to the public.

Outside “FR”

Refer to local regulations.

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Overview

Burner description Packaging

Description of burner

VL 04.540 DP, monobloc fuel-oil burners is forced-draught burners. They use fuel-oil with a viscosity of between 1.6 and 6 mm²/s at 20°C (cSt) and a heating capacity (H_i) of 11.86 kWh/kg. They operate in 3 progressive stages. The VL 04.540 DP is a 2 nozzles burner, with 2 pressures setting on the pump.

They can be used on generators conforming to EN standard 303.1. They are available in two fixed combustion head lengths (KN - KL). The MPA 22 control and safety unit is designed for intermittent service (limited to twenty-four hours of continual operation).

Packaging

The burner is delivered on a pallet in two packages weighing 46kg.

Burner body with:

- integrated electric board,
- document pouch containing:
 - operating instructions,

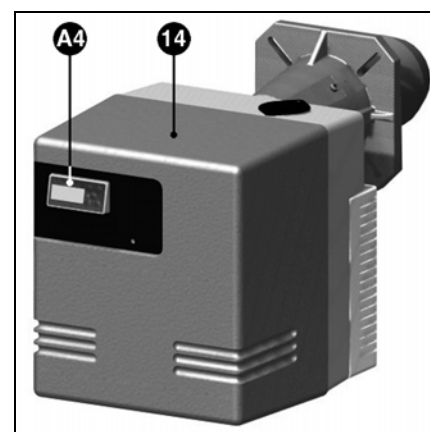
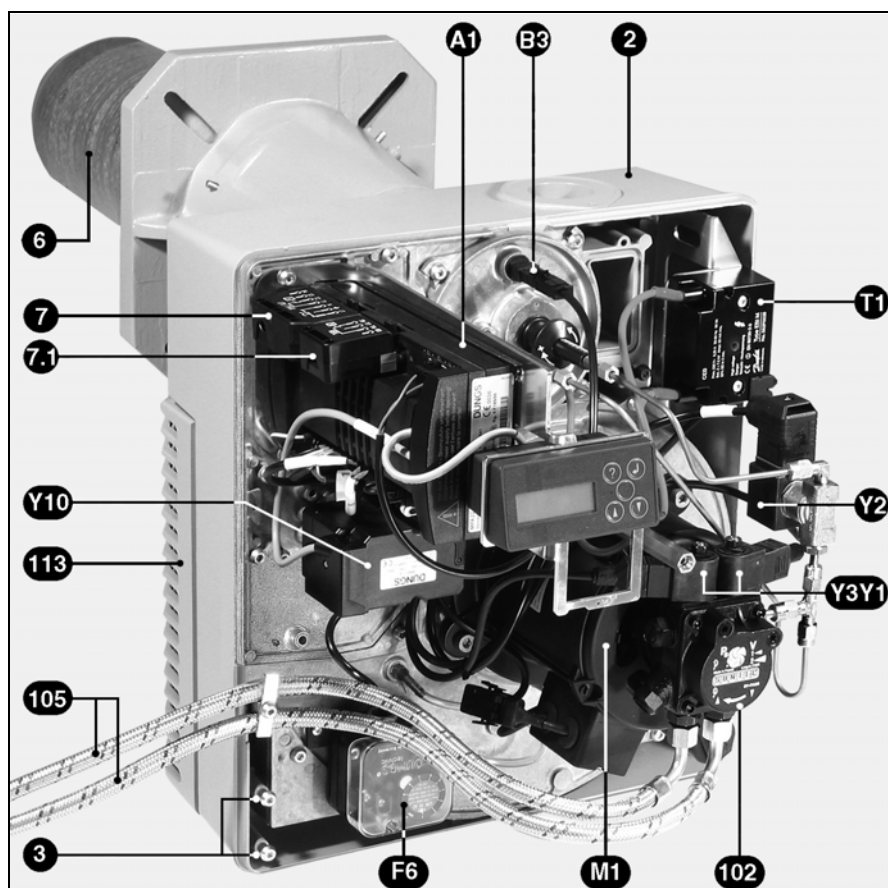
- wiring and hydraulics diagrams,
- boiler-room plate,
- guarantee certificate.

hydraulic connection:

- two 1.15m long flexible lines with mounted connectors,
- two pump linking tubes, nozzle line.

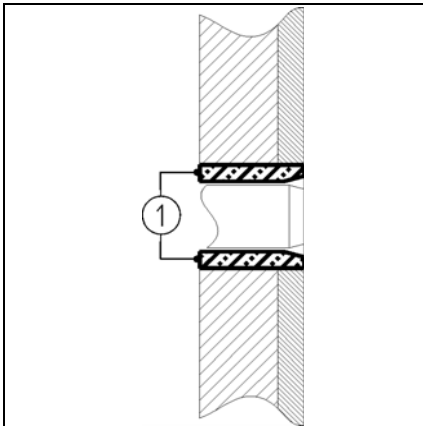
Combustion head with:

- seal for front of burner, bag of nuts and bolts.



- | | |
|------------|--------------------------------|
| A1 | Control and safety unit MPA 22 |
| A4 | Display |
| B3 | Cell |
| F6 | Air pressure switch |
| M1 | Motor |
| T1 | Ignition transformer |
| Y1, Y2, Y3 | Solenoid valves |
| Y10 | Servomotor |
| 2 | Housing |
| 3 | Plate hook-up device |
| 6 | Blast tube |
| 7, 7.1 | Boiler electrical connection |
| 14 | Cover |
| 102 | Fuel pump |
| 105 | Flexible |
| 113 | Air box |

Assembly

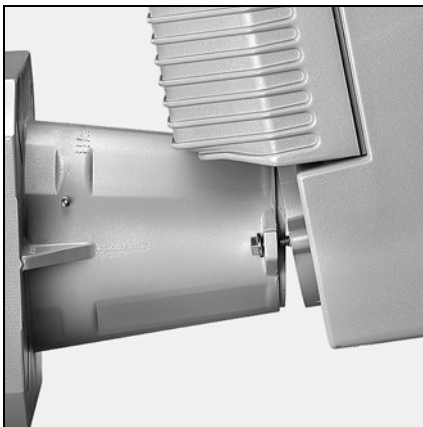


Boiler face

- Prepare face according to the enclosed space requirement diagram. If required, insert a counter face plate (option).
- Fill in space 1 with recommended heat-resistant material or material supplied by the boiler manufacturer.
- Check subsequently for leaks.

Combustion head

- Withdraw the combustion components.
- Position the combustion head with the vertical slots.
- Mount and fix combustion head with its seal on front of burner.



Burner body

The burner body is put in place **with the spiral facing downwards** or upwards (see space required).

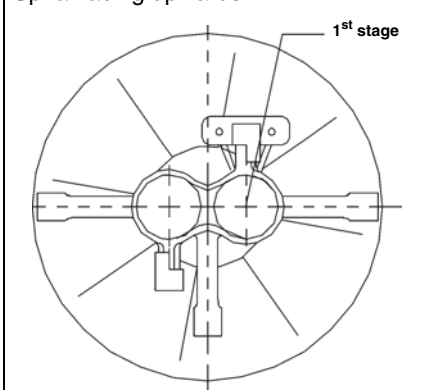
- On the body, loosen the two screws to the maximum extent.
- Tilt the body forward and engage the two screws into the crosspiece slots.
- Keep the body leaning against the crosspiece and tighten the two screws.

If the burner's body was assembled with the volute at the bottom, please refer to the "Burner inversion" section.

No other assembly positions are authorised.

- Insert the combustion components (unit nozzle line) into the head.
- Hook up the flexible pipes connecting the pump and the installation.
- Make sure you respect the direction of flow firstly in relation to the suction or booster ▲, and secondly in relation to return ▼.

Spiral facing upwards



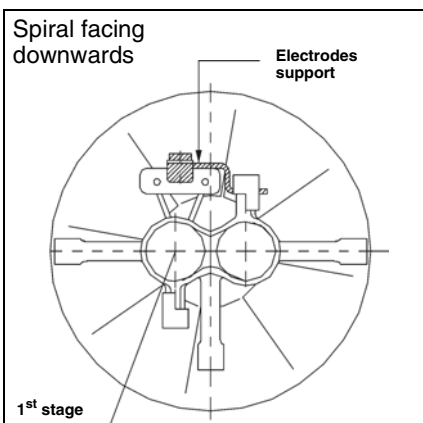
Burner inversion

The electrodes must be placed in the top vertical position.

If the burner's body was assembled with the volute at the bottom, carry out the following procedure:

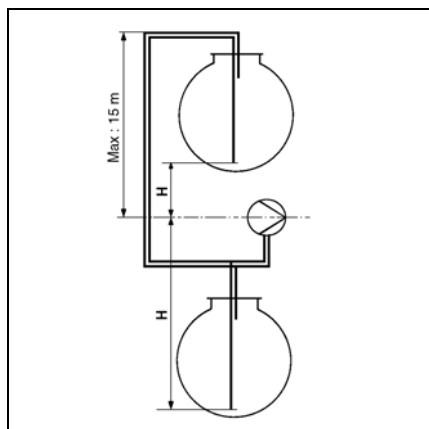
- Take out the combustion components (3 screws).
- Remove the electrodes block.
- Remove the electrodes support and place it in high position.
- Fit the electrodes block back onto the support, opposite the stage-one nozzle (see the diagram).
- Fit the combustion components back in (unit nozzle line).

Spiral facing downwards



Start-up

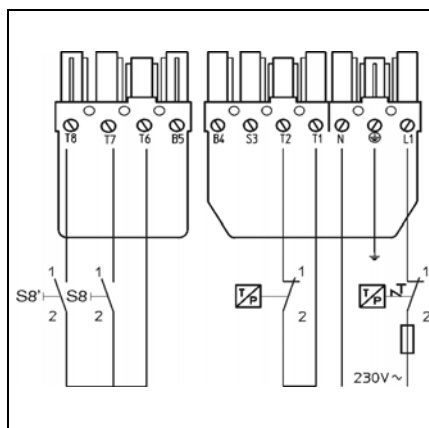
Fuel-oil / power supply connections Pre-start-up checks / Checking for leaks



Altitude correction	
Pump in suction (H +) or loading (H -) mode	
Altitude (m)	Nominal H (m)
0-500	0
501-800	0,5
801-1300	1,0
1301-1800	1,5
1801-2200	2,0

e.g.: altitude 1100 m. Nominal H = 1 m. Actual H 2 m.
Corrected H in suction mode 2 + 1 = 3m
Corrected H in pressure mode 2 - 1 = 1m
Select pipe Ø from table in accordance with length required between tank and pump. If corrected H in suction mode is above 4 m, include transfer pump (max. pressure 2 bar)

corrected H (m)	L (m) of double-tube installation		
	VL 04.540 DP		
	Ø (mm)		
	10/12	12/14	14/16
4,0	51	83	83
3,0	45	83	83
2,0	38	82	83
1,0	32	69	83
+0,5	29	62	83
0	26	56	83
-0,5	22	49	83
-1,0	19	42	80
-2,0	13	29	55
-3,0	6	16	31
-4,0	0	2	6



Fuel-oil connection

Enclosed diagrams provide required pipe diameters.

There are two following possibilities:

- Direct suction:
According to length L and suction or load height H and chance mishaps ; These lengths include the presence of a quarter-turn hand-operated valve, a check valve and four elbows.
Maximum negative pressure 0.4bar.

- Transfer loop:
According to the type of facility, booster pump characteristics will have to meet several criteria, notably:
- hourly flow,
- fluid flow speed,
- maximum boosting pressure.
Preference should be given to this type of installation, in order to obtain long spray pump life.

In both cases, it is compulsory to fit a 120µm filter and quarter-turn hand-operated valve on the suction or booster (not supplied).

Important:

- Suction:
• Totally fill suction pipe between spray pump and tank down-pipe with fuel oil.
- Transfer loop:
• Fill, boost, drain and set pressure in circuit at **2bar** max. It is advisable to install a pressure switch to limit burner operation to boost pressure.
- Check for possible leaks.

Electrical connection

The electrical characteristics such as voltage, frequency, power, are mentioned on the identification plate.
Minimum conductor section: 1.5mm²
Delayed-action minimum protection device: 6.3A.

Refer to the wiring diagrams for the electrical connections (diagram enclosed with the burner and diagram screen printed on socket 7P and 4P.

Optional:

- External connection:
- of an alarm between S3 and N.
- of one (or more) hour meter between B4 and N to totals the operating hours, and between B5 and N to count the operating hours at nominal flow stage.

Burner start up simultaneously involves starting up installation by the fitter or his representative; only they can guarantee boiler house compliance with currently accepted practices and regulations in force.

The fitter must first be in possession of a "certificate of gas fuel conformity" issued either by the approved body or distributor and also have leak-tested and drained pipework upstream from the quarter-turn hand-operated valve. Also, the fuel-oil suction pipe must be filled completely, drained and pressurized, if booster is available.

Pre-start-up checks

- Check:
- nominal voltage and electrical frequency available and compare with those indicated on the rating plate,
- polarity between phase and neutral,
- connection of previously tested earth wire,
- absence of potential between neutral and earth,
- direction of rotation of motor,
- Turn off the power supply.
- Check absence of voltage.
- Close the fuel valve.
- Take note of the operating instructions provided by the boiler and regulator manufacturers.
- Check:
- that the boiler is filled with pressurized water,
- that the circulator(s) is/are working,
- that the valve(s) is/are open,
- that the combustion air supply and exhaust flue are operational and compatible with the heating capacity of the burner and the fuel,
- presence, calibration and setting of electrical protection devices,
- setting of boiler regulator circuit,
- fuel-oil level in tank,
- that the suction line is full,
- position of the flexible piping:
- suction and return,
- boost pressure of 2bar max.,
- position of hydraulic protection valves and preliminary filter.

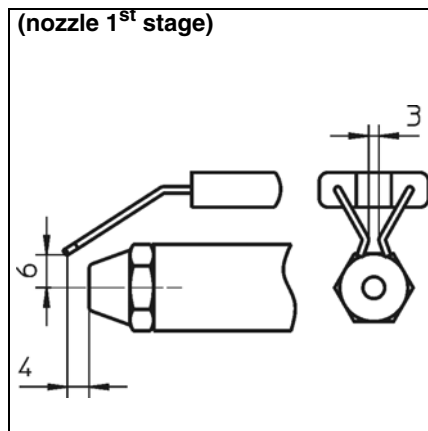
Checking for leaks

Fuel-oil

This operation is carried out at the time of firing when the burner is working.

Start-up

Checking and setting Combustion components and secondary air



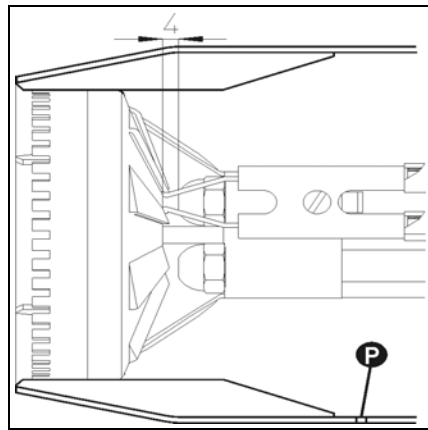
Checking and setting the combustion components

The nozzles are fitted on delivery.

- Withdraw cell from its seating.
- Disconnect the ignition cables from the transformer and the oil tubes.
- Unscrew (by two rotations) the three screws from the cover.
- Turn (bayonet system) to withdraw combustion components.
- Check the ignition electrode settings (see diagrams).
- Adjust and fit the nozzles in accordance with the boiler power.
- Reassemble.
- Check subsequently for leaks.

Should the end piece be taken off:

- Upon reassembly, check that fuel discharge hole **P** is in the **lower vertical position** during shut-down (see the diagrams opposite).



Secondary air

This is the flow of air admitted between the turbulator diameter and the blast tube.

The position of the turbulator (dimension **Y**) can be read from the scale graduated from 0 to 40mm.

Maximum secondary air is indicated by the 40 mark and minimum secondary air by 0.

It can be adjusted according to:

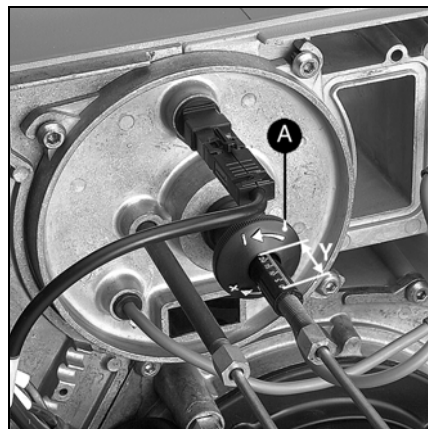
- ignition quality (shock, vibration, chatter, delay),
- combustion efficiency.

Setting

This is done without disassembling the burner (while in operation or when stopped), in accordance with the values table page 10.

If dimension **Y** is reduced, CO₂ increases, and conversely.

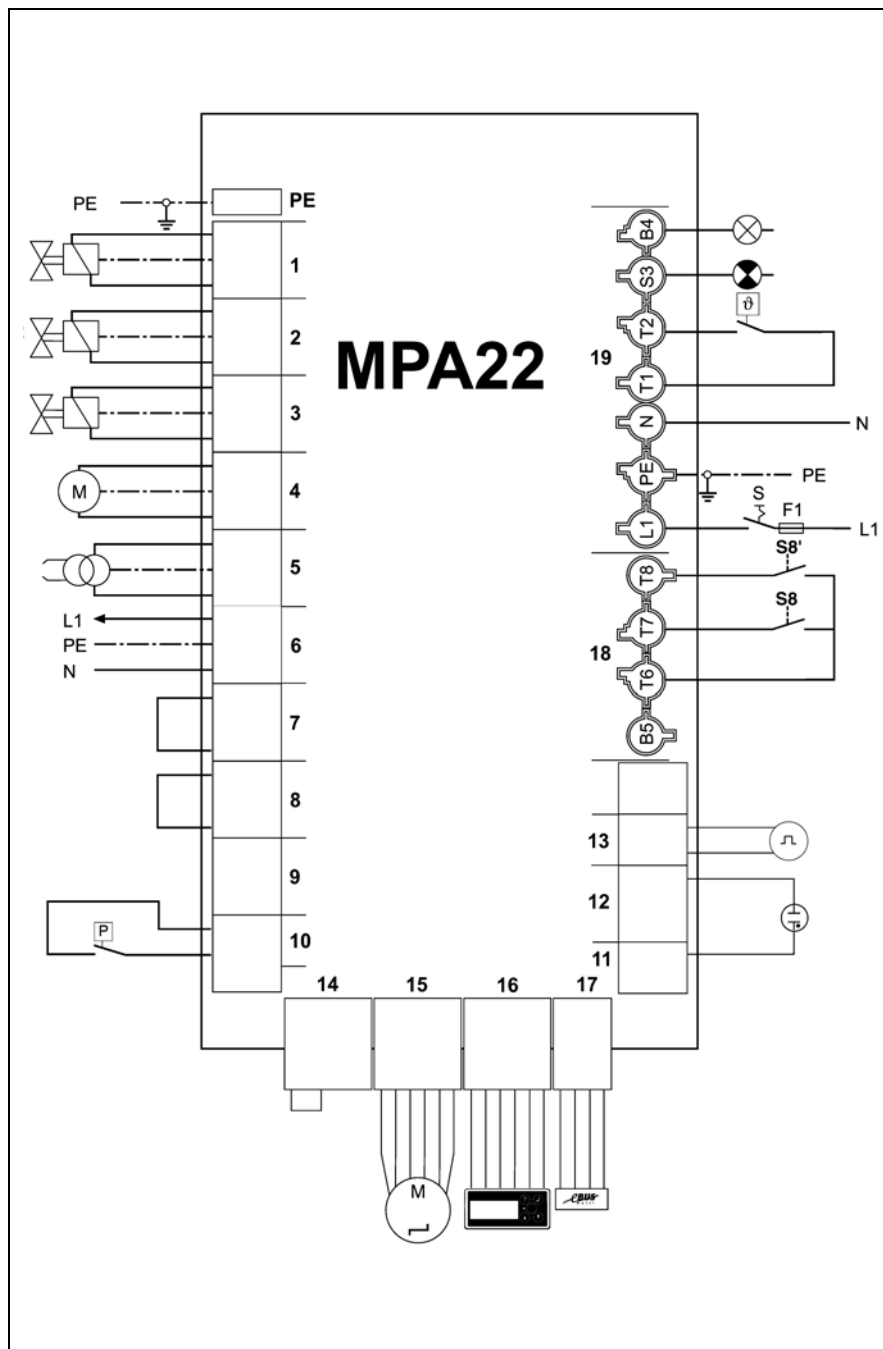
- Turn button **A** in the direction desired.



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Start-up Control unit MPA22

Description of operation



Parallel to its control unit and fuel safety functions, the MPA control unit also provides power modulation for the burner by controlling the air flap via an electronic connection.

During commissioning, the setting points are set by the values measured in combustion analysis.

In this way, optimum combustion is ensured over the entire burner power curve.

A separate burner ignition load can be defined using the P0 setting point.

The limit values of the regulation range are set using the setting points "P1" and "P9". In addition, other optional functions can be activated such as, for example, postventilation or waiting time.

The control unit is controlled by a display.

Note:

For further information, see the enclosed electrical circuit diagram.

- | | | | |
|----|-----------------------------|----|--|
| 1 | 1 st stage valve | 13 | Pulse meter * |
| 2 | 2 nd stage valve | 15 | Y10 air servomotor |
| 3 | 3 rd stage valve | 16 | Display A connection |
| 4 | Burner motor M1 | 17 | e-Bus connection * |
| 5 | T1 ignition transformer | 18 | Power regulator connection 4p. |
| 6 | 230V-50Hz output | 19 | Boiler connection panel connection 7p. |
| 10 | F6 air pressure switch | | |
| 11 | MZ 770 cell | * | Option |

Start-up Control unit MPA22

Display



Display

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- Accessing information mode ($t < 5$ s).
- Accessing language mode ($t > 5$ s).
- Return to programme level above.



- Activating a function.
- Confirming a value.



- Moving the cursor anti-clockwise.
- Increasing the marked value.



- Moving the cursor clockwise.
- Reducing the marked value.



- Resetting the unit.



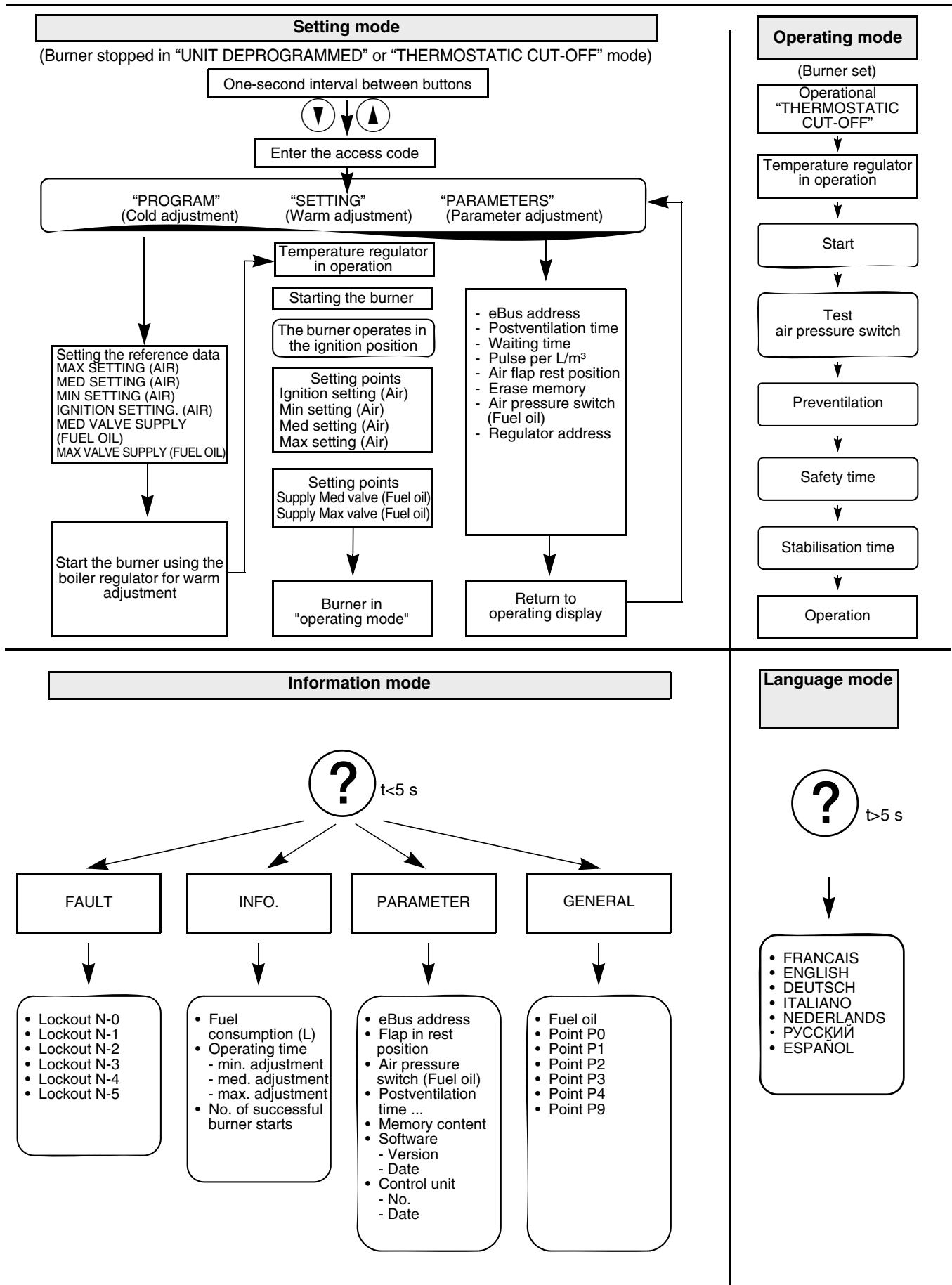
- Red light diode (flashes in the event of a fault).

Current values and operating statuses are displayed via the display and operating unit. By pressing certain buttons, the information, operating and language modes may be accessed in addition to the adjustment mode.

Overview

Control unit MPA22

Programme structure



Start-up

Burner setting data

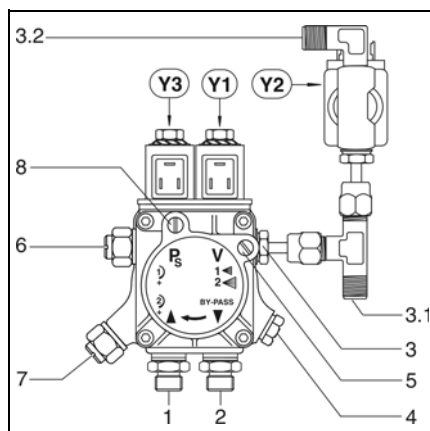
Model	Burner power			Nozzles 45°B Gph	Fuel oil flow			Pump pressure			Dimension Y mm	Air flap opening					
	Mini kW	Medi. kW	Maxi kW		Mini kg/h	Medi. kg/h	Maxi kg/h	Mini bar	Medi. bar	Maxi bar		Flap positi. ignition P0 (°)	Flap positi. mini P1 (°)	Valve positi. Medi. P2 (°)	Flap positi. medi. P3 (°)	Valve positi. maxi P4 (°)	Flap positi. maxi P9 (°)
VL 04.540 DP	166	230	310	3,75 + 2,00	14	20	26	11	11	18	15	14,5	16	22	28	40	45
	225	350	450	5,00 + 2,50	19	30	36	12	12	20	20	22	25	30	40	50	55
	166	320	500	3,75 + 3,75	14	27	38	11	11	22	30	14,5	16	22	35	45	60
	200	410	540	4,50 + 4,50	18	36	47	11	11	22	40	19	23	30	40	50	60

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The above setting data are **basic adjustments**. The factory setting data are framed in bold. Under normal circumstances, the setting will enable the burner to operate. In any event, carefully check the setting values. Corrections may be necessary depending on the characteristics of your installation.

Start-up

Description and settings of the fuel oil pump Firing Setting and checking the safety devices



Key

- | | | |
|---|---|---------|
| 1 | Suction | M16x1.5 |
| 2 | Return | M16x1.5 |
| and access to the bypass screw (4mm hex. screw) remove for one pipe operation. In this case, seal return 2. | | |
| 3 | Nozzle line outlet | |
| 3.1 | Pressure exit 1 | M8x1 |
| 3.2 | Pressure exit 2 | M8x1 |
| 4 | pressure connector (for pressure gauge) | G1/8 |
| 5 | Pressure release or boost pressure (for vacuum gauge or pressure gauge) | G1/8 |
| 6 | Pressure setting 1 st and 2 nd stage | |
| 7 | Pressure setting 3 rd stage | |
| 8 | Special pressure tap Ps | |
-  Does not give the spray pressure. Do not use it.

Principle of functioning

When powered down, the two solenoid valves integrated into the pump are closed.

Setting the fuel-oil pressure

On delivery, the pump is set at :

- 1st and 2nd stage: 10 bars
- 3rd stage: 20 bars

To increase the pressure:

- Turn screw 6 or 7 clockwise.

The maximum negative pressure is 0,4bar in case of direct suction from tank.

On boost, maximum pressure is 2 bar.

- Check subsequently for leaks.

Firing



Warning:

The burner can be fired only if all the conditions enumerated in the previous chapters have been met.

- Mount a pressure gauge and a vacuum gauge on the pump.
- Open the fuel valves.
- Close the thermostatic circuit.
- Disconnect the four-pole plug (controller thermostat).
- Unlock the control and safety unit.
- In mode "virgin box", to reach the adjustment mode (see page 9).

The burner develops on the way lighting.

Assess the firing quality.

- Change to the "Min setting" point (1st stage) and adjust the combustion if necessary.
- Check the combustion (CO₂ and blackening index).
- Read and adjust the pump pressure to reach the required rated capacity: screw 6.
- Stop for 8s and change to the "medium setting" point (2nd stage).
- Check the combustion (CO₂ and blackening index).
- Adjust the air flow on the display.
- Change to the "Max setting" point (3rd stage).
- Read and adjust the pump pressure to reach the required rated capacity (screw 7).
- Optimize the firing quality, the switching to another fire stage and the combustion results by modifying dimension Y.
- Make button A rotate toward **arrow** -: the CO₂ index decreases and vice versa. Modifying dimension Y may involve the adjustment of the air flow stage.
- Check the combustion :
 - CO₂ index above 12%,
 - blackening index lower than 1.

Comply with the smoke temperature value recommended by the boiler manufacturer to obtain the required effective output.

- Stop the burner.
- Disconnect the four-pole plug.
- Restart the burner at "Min setting" (1st stage).
- Check the combustion (CO₂ and blackening index).

Do not act upon the pump pressure and dimension Y settings any longer.

- Adjust the air flow on the display.
- Stop the burner.
- Connect the four-pole plug.
- Restart the burner.

Assess its operation on firing, while switching to another fire stage or when increasing or reducing the power.

- Check the safety devices.

Setting and checking the safety devices

Cell

- Test the cell by simulating disappearance of the flame and a parasite flame.
- Replace housings.
- Check:
 - absence of leaks between flange and front of burner,
 - opening of regulator (limiter and safety) circuit.
- Check combustion under actual operating conditions (doors closed, housing in place, etc.) and absence of leaks in the different systems.
- Note the results on the appropriate documents and communicate them to the dealer.
- Put into automatic operation.
- Distribute the information required to operate the boiler.
- Place the boiler-room plate where it can easily be seen.

Start-up

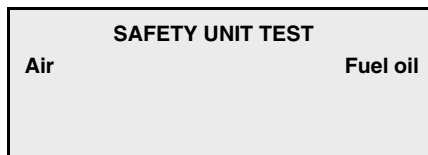
Inspection before commissioning Autotest of control unit

Inspection before commissioning

Before starting the burner, carry out the following checks and/or inspections:

- The operating instructions of the heat generator manufacturer.
- Adjusting the following devices:
 - temperature regulator,
 - pressure regulator,
 - limiter,
 - safety pressure switch.
- Opening the chimney and supplying sufficient cold air.

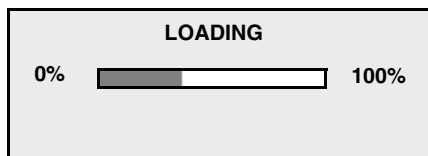
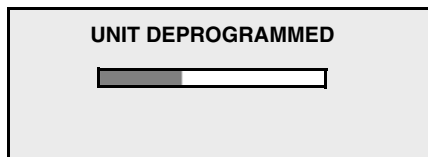
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Self-testing of the unit

Switch on the burner. The ignition control unit runs a self-test. If the control unit has not yet been programmed, the display will then show "UNIT DEPROGRAMMED"

Self-testing of unit and of air and gas stepper motors.



The displays loads the values held in the burner control unit.



The control unit has not yet been programmed.

Start-up

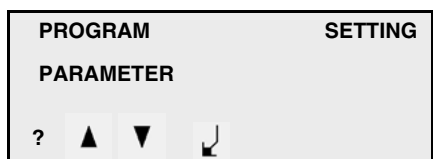
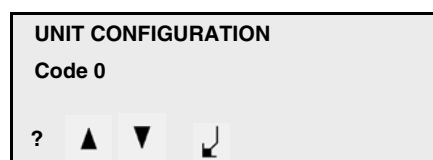
Access to the adjustment Menu "PARAMETER" Programming of supplementary functions

Access to the setting mode is only possible when the burner is stopped (display: "UNIT DEPROGRAMMED" or "THERMOSTATIC CUT-OFF".) For this purpose, reduce the temperature at the boiler controller or remove bridge plug 7. To activate the setting mode, it is also possible to enter an access code.

Precautions:

The setting mode is activated via the access code and the burner setting must only be adjusted by a technician adequately qualified and authorised to handle the MPA 22. The access code is located on an information plate affixed to the MPA22 safety unit.

During the setting procedure, a time-out of 30 minutes will be activated if no buttons are pressed. This time may be reset by pressing the keypad. After this time has expired, the boiler stops so that it cannot run until the setting procedure is completed. In setting mode, all safety functions are activated. Flame failure, air pressure switch failure or a fault in the stepper motor control will lead to a fault or safety disconnection.



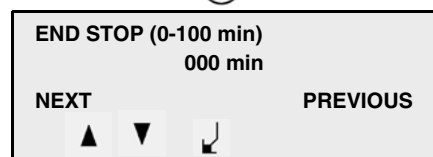
Access to the setting mode:

- Press and hold button  and after 0.5 seconds, press button .
- Enter the access code numbers with buttons  or .
- Confirm each number with .
- If a number is entered incorrectly, button  allows you to return to the level above.

After entering the correct code, three menus will appear for selection.

- ❶ "PARAMETER": for programming of additional functions.
- ❷ "PROGRAM": for pre-setting the burner during initial start up
- ❸ "SETTINGS": for partial programming, for example after thermostatic cut-off during adjustment or during subsequent correction of the adjustment values.

❶



❶ "PARAMETER"

The "PARAMETER" menu item is accessed via the setting mode. It allows the various additional functions and function parameters to be set.

- E-bus address: 03H: Standard address (factory setting). This parameter is required to establish communication with a PC.
Other addresses are possible: F3H, 73H, 33H, 13H.
Access to the next parameter: Confirm "NEXT" with button .

- This parameter enables a postventilation time to be set.
Setting range: 0 s. (= no postventilation) up to 240 s.

- This parameter enables a waiting time between a standard disconnection and a new burner start to be set.
Setting range: 0 min. (= no waiting time) up to 100 min.

- This parameter indicates the number of pulses that the gas counter sends to the control unit for 1 m³ of gas consumed.
Setting range: 1 (1 pulse = 1m³) to 255 (255 pulse = 1m³).

Start-up

Adjustment mode

Menu “PARAMETER”

Programming of supplementary functions

⏴

AIR FLAP SHUTDOWN POSITION
00.0°

NEXT PREVIOUS

▲ ▼ ↩

- This parameter enables the air flap stop to be set. This parameter (in degrees) may be required with postventilation.
Standard setting **00.0°**

⏴

CLEAR FAULT MEMORY

NEXT PREVIOUS

▲ ▼ ↩

- With this function, error messages which have accumulated in the error log may be cleared (display indication: “EMPTY”). The next new error is written as no. 0 in the error log.

⏴

AIR PRESSURE SWITCH (FUEL OIL)
Y

NEXT PREVIOUS

▲ ▼ ↩

- This function is used to activate or deactivate the "AIR PRESSURE SWITCH" function Y: yes, N: no.

⏴

CONTROLLER ADDRESS
10H

NEXT PREVIOUS

▲ ▼ ↩

- "CONTROLLER ADDRESS" (factory setting at 10H).
Other addresses are possible: F7H, F0H, 77H, 70H, 37H, 30H, 17H.

⏴

BURNER ACCESS

██████████

WRITE PARAMETERS

██████████

UNIT DEPROGRAMMED

- After confirming with “NEXT” in the “CONTROLLER ADDRESS” menu, the newly set parameters are saved in the safety unit. The safety unit then switches back to “THERMOSTATIC CUT-OFF”.

OR “THERMOSTATIC CUT-OFF”

en

Start-up

Adjustment mode Menu "PARAMETER" Presetting the burner

②

MAX. POWER SETTING	
AIR: .. ' .	FUEL OIL:
NEXT	
?	▲ ▼ ↵

MEDIUM SETTING	
AIR: .. ' .	FUEL OIL:
NEXT	
?	▲ ▼ ↵

MINIMUM SETTING	
AIR: .. ' .	FUEL OIL:
NEXT	
?	▲ ▼ ↵

IGNITION SETTINGS	
AIR: .. ' .	FUEL OIL:
NEXT	
?	▲ ▼ ↵

MEDIUM VALVE SUPPLY	
AIR:	FUEL: .. ' .
NEXT	
?	▲ ▼ ↵

MAX VALVE SUPPLY	
AIR:	FUEL: .. ' .
NEXT	
?	▲ ▼ ↵



READY TO BEGIN COMBUSTION SETTINGS ?	
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② "PROGRAM"

In the "PROGRAM" menu, points P9/P3/P1/P0/P2/P4 can be preset in accordance with the adjustment table (page 10) for the required burner output. The control unit then switches to the "SETTING" menu.

- Access to the setting mode.
- Select "PROGRAM" via ▼ or ▲.
- Confirm with ↵.

Adjusting the air value.

- Place the cursor in the air position, using ▼ or ▲.
- Activate via ↵ (the cursor flashes).
- Set the new value using ▼ or ▲.
- Confirm with ↵.

Changes between setting points P9/P3/P1/P0/P2/P4.

- Place the cursor on "NEXT" or "PREVIOUS" using ▼ or ▲.
- Confirm with ↵.

Direct access to this menu is possible via setting mode, by selecting "SETTINGS" ③.

Adjustment mode
Menu “PARAMETER” : setting the burner

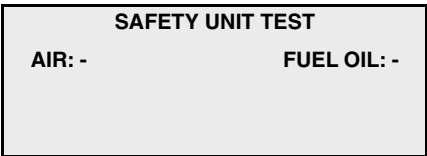
③ "SETTING"

"SETTING" the burner

In the "SETTING" menu, the air flap can be set precisely for the 5 reference setpoints P0 to P9, according to the combustion gas analysis. The limit points are then used: the low ctrl and high ctrl points are used to determine the definitive operating range of the burner.

N.B.: If a standard disconnection takes place during the setting procedure, immediately select the “SETTINGS” menu, after activating the setting mode. This ensures that those values already set will be saved.

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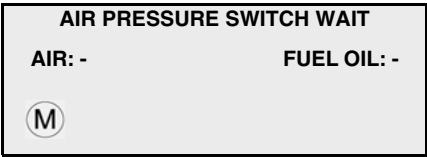


- To start the burner, insert bridge plug 7 and make sure that there is a heating request from the boiler regulator.

The burner starts with the following functional sequence:



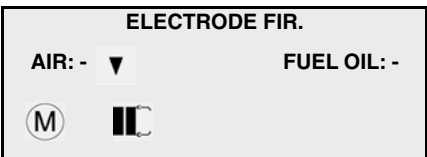
- Air valve is forced open for preventilation. Air:.....▲



- Fan motor on.....(M)
- Testing the air pressure switch



- 20 second preventilation. the remaining time is displayed.
- Pre-ignition:.....■



- Air valve stepper motor switches to ignition position. Air:▼



- Valves on.■
- 3-second safety delay. Once the safety delay is over, the ignition transformer supply is cut off.
- Flame signal available■

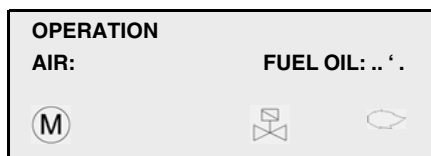
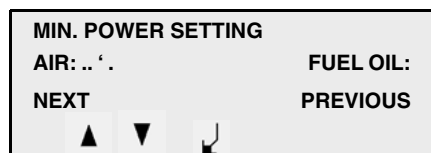
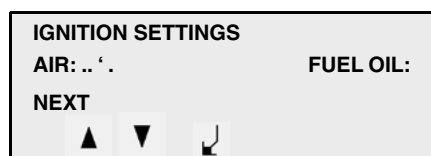


- During the stabilisation time, the burner remains in the ignition position.

Start-up

Adjustment mode

Menu "PARAMETER" : setting the burner



The burner remains waiting for the ignition power, setting point **P0**.

- Check the fuel oil pressure (factory-set to 10 bar). In the event of subsequent modifications, all setting values must be corrected. For this reason, fine setting of the burner from point P9 must be carried out, if necessary. At each setting point, check the combustion values and if necessary, change the gas throttle position or the air valve position. Proceed as follows:

- Select the air position using or .
- Activate via (the cursor flashes).
- Change the value via or .
- Confirm with .

Accessing the next setting point by selecting "NEXT" and confirming using button .

▲ N.B.:

The values for each setting point are not saved until the next setting point is accessed.

- Enter the setting values in the log (page 22).
- Carry out the individual setting points up to **Point 9** (max. power setting).
- Check the fuel flow at max. setting and, if necessary, increase or decrease the values for the fuel or the air (see page 11).
- Once all the setting points **P0** to **P9** have been optimally set, confirm "NEXT" at setting point **P9**, using .

- By confirming with "NEXT", the setting procedure is complete and the burner switches to operating mode.

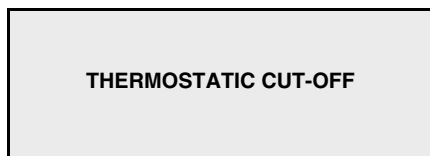
- The burner switches to the lower operating point and waits for a heating request. The burner regulates within the preselected power band, according to the signals from the regulation thermostat.

Setting the air pressure switch

- When the burner is operating at min. setting, determine the blower pressure.
- Set the air pressure switch to approximately 15% below the determined pressure.

Commissioning

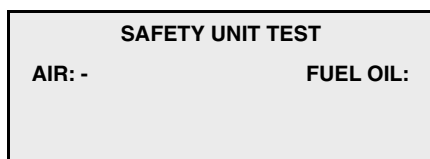
Operating mode



The burner is ready for operation

- The boiler thermostat requests heat.

Burner start flowchart:



The burner starts with the following functional sequence:



- Air valve is forced open for preventilation. Air:..... ▲

- Fan motor on..... (M)



- 20 second preventilation. : the remaining time is displayed..... ▲



- The air throttle switches to the ignition position. Air: ▼

- Ignition on (M)



- Valves on.
- 3-second safety delay.

- Flame formation.....



Once the safety delay is over, the ignition transformer supply is cut off.

- During the stabilisation time, the burner remains in the ignition position.



The burner is operational and set according to the pre-set output range with the display

Air only shows ▲ or ▼
Fuel oil only shows — or = or ≡

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Start-up

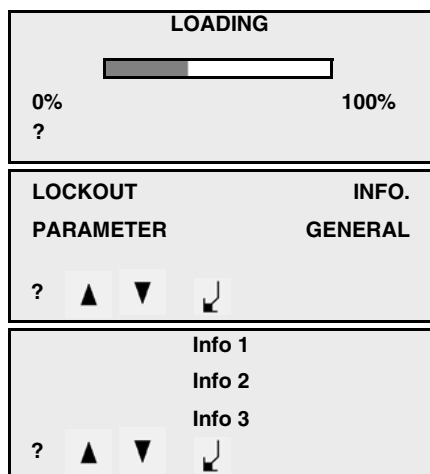
Information mode Language mode

Comment:

Information mode can be activated using

button  during burner operation and burner idle time.

Pressing the  button again exits information mode.



• Press button  for under 5 seconds.

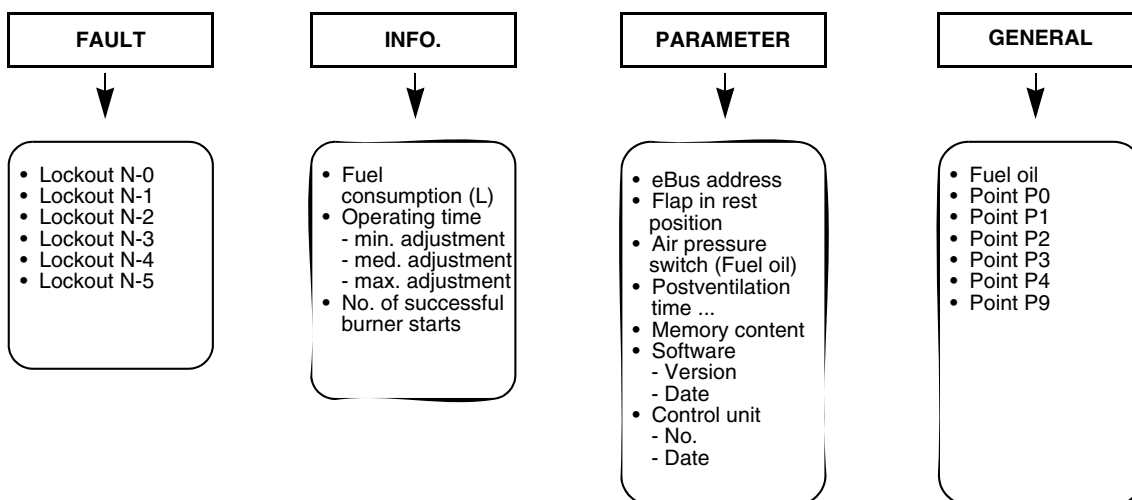
• Select the desired menu with  or .

• Confirm the menu selected with .

• The display indicates the three most recent items of information on the screen.

• To see more information, scroll using  or .

• Return to the next highest level with .



Language mode can be activated using button  both while the burner is operating and when it is stopped.

• Press button  for longer than 5 seconds.

• Select the desired language using  or .

• Scroll using  or  (7 language options).

• Confirm the language selected using . This will close language mode.



Important

The burner should be serviced at least once a year by a trained specialist.

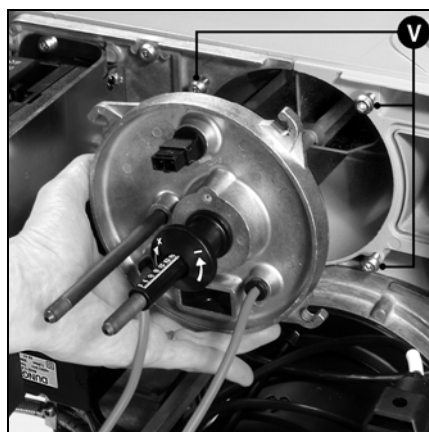
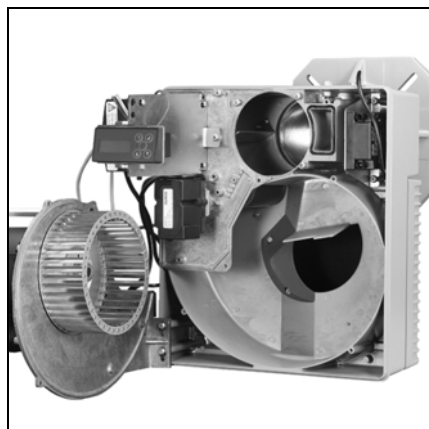
- Turn off power supply at isolator switch.
- Check absence of voltage.
- Close fuel input.
- Check for leaks;

Do not use: pressurized liquids or chlorinated products.

The setting values are indicated in the paragraph: “**Start-up**”.

Use only original spare parts.

- Remove the burner housing.



Checking the combustion components

- Take out the cell and wipe it with a clean, dry rag.
- Disconnect the ignition cables from the transformer and the oil tubes.
- Unscrew the screws **V** on the cover and turn (bayonet system) to release the combustion components.
- Disconnect the electrode cables.
- Withdraw and clean the turbulator.
- Disassemble and change the nozzles if necessary.
- Clean or, if necessary, change the electrodes.
- Check their settings.
- If necessary, remove any dust from the parts that are accessible from the cover.
- Reassemble by performing the same actions as during disassembly but in reverse order.

Changing blast tube

Perform the following :
1 either open burner body and boiler door,

- Undo the three blast tube screws.
- Change blast tube.



Upon reassembly, check that the fuel discharge hole is in the **lower vertical position** during shut-down.

- If required, fill space between the quarl and the new blast tube with refractory material.
- Check for leaks.

2 or remove the burner :

- Detach and withdraw the body of the burner while taking care not to disturb the electric wires.
- Remove the fixation head.
- Undo the three blast tube screws, then proceed as described in 1.

Cleaning the air supply system

- Disconnect the motor.
- Unscrew completely the five motor panel screws, starting at the bottom.
- Disengage the panel and hook up the motor/panel assembly onto the device fitted for this purpose.
- Clean the air circuit and the turbine.
- Clean the air supply system and the turbine.
- Re-assemble.

Cleaning the photoconductive cell

- Clean with clean, dry rag.
- Re-fit.

Clean the pre-filter upstream from the extraction hose (where applicable).

Cleaning the fuel-oil pump filter

The filter is located in the pump. It must be cleaned each time the burner is serviced.

- Place a container under the pump to catch the fuel oil.
- Remove screws and cover.
- Withdraw filter and clean or replace it.
- Re-fit filter and cover with a new gasket fuel-oil.
- Screw down firmly.
- Open manual fuel valve.
- Check pressure and absence of leaks.

Motor-driven pump unit

- Check:
 - atomization pressure,
 - absence of leaks in systems,
 - coupling between pump and motor,
 - state of flexible hoses.

Fuel-oil valves

The valves do not require any special maintenance.

The valves must not be repaired. Defective valves must be replaced by a qualified specialist, who will then carry out new checks for leaks, correct running and combustion.

Checking connections

On the connection box, the fan motor and the servomotor.

Cleaning the housing

- Clean housing with water and detergent.
- Replace.

Remarks

After each intervention:

- Check combustion under actual operating conditions (doors closed, housing in place, etc.) and absence of leaks in the different systems.
- Carry out the safety checks.
- Note the results in the appropriate documents.

Troubleshooting

Eliminating defects

Causes and elimination of defects

When a failure occurs, check the prior normal operation conditions:

1. Is the electrical supply available?
2. Is there any fuel oil?
3. Are all the regulating and safety devices adjusted correctly - such as the boiler thermostat, the protective device against lack of water, the end-of-stroke switches, etc.?

In case of a burner failure, a lighted warning lamp will flash on the display. The cause of the failure is also shown and a failure code is emitted.

Fault	Cause	Corrective action
Nothing shown on display	Mains voltage off Defective external fuse Display-control unit connection broken Defective display MPA 22 defective	Check Check / change Check / reestablish the connection Change Change
"Safety chain" display	No reaction signal at terminal 7	Push in the bridging plug and/or check the pressure switch / limiter
The burner will not start	Control unit-motor connection broken Defective condenser Defective motor Incorrect control unit-servomotor reaction signal	Reestablish the connection Check / change Check / change Control unit / servomotors Check / change
The motor runs for a short time only	Air pressure switch does not engage Solenoid valve V1 does not open No fuel oil	Check / change the setting Check the compact ramp / change it Inform the fuel oil supplier
The burner will not start	Defective compact ramp Defective ignition transformer Ignition electrodes position / ignition cable Defective MPA 22 control unit MZ 770S cell	Change Change Check / change Check / change Check / change

Specific setting values for MPA22

Installation :
 Burner N° :

Boiler make :
 Boiler model :

			Measurement/Date:			
Parameters	Dim.	Range	M1/	M2/	M3/	M4/
eBus address						
Postventilation time	[s]	0-240				
Waiting time	[min]	0-100				
Pulses per L/m³		1-255				
Air flap rest position	[°]					
Clear memory contents		blank/				
Address regulation						
Software						
Product N°						

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Info.	Dim.
Fuel consumption	[m³]
Operating time	[Std]
No. of successful starts	

Measurement/Date:			
M1/	M2/	M3/	M4/

		Measurement				Measurement				
	Air	M1	M2	M3	M4	Fuel-oil	M1	M2	M3	M4
Value P0	[°]	14.6				[°]				
Value P1	[°]	15.5				[°]				
Value P2	[°]	22				[°]				
Value P3	[°]	31.5				[°]				
Value P4	[°]	45				[°]				
Value P9	[°]	60				[°]				
Min. CO ₂ /CO	[%]					[ppm]				
Max. CO ₂ /CO	[%]					[ppm]				

Observer M1:
 Observer M2:

Observer M3:
 Observer M4: