CR00249 178 051 35-7 2021-02-01

Installation- and maintenance instruction

BFG 1

Translation of the original instructions.

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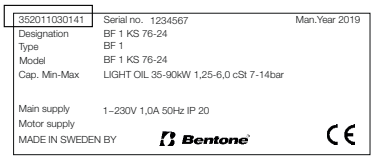

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Table of contents

1. General Information

This Installation and Maintenance manual:

- is to be regarded as part of the burner and must always be kept near the installation site.
- is intended for use by authorised personnel.
- must be read prior to installation.
- must be observed by all who work with the burner and associated system components.
- work with the burner may only be carried out by certified installers/ personnel.

Enertech AB is not liable for any typographical errors and reserves the right to make design changes without prior notice.

Safety instructions

- The burner may only be used for its intended purpose in accordance with the product's technical data.
- The burner may only be installed and operated by authorised personnel.
- The product is packaged to prevent damage from occurring during handling. Handle the product with care. Lifting equipment must be used to lift larger packages.
- The products must be transported/stored on a level surface in a dry environment, max. 80% relative humidity, no condensation. Temperature -20 to +60 °C.
- Check that the burner is compatible with the boiler's output range.
- All components must be installed without being bent, twisted or subjected to mechanical or thermal forces which can affect the components.
- The burner must be installed so that it complies with local regulations for fire safety, electrical safety, and fuel distribution.
- The gas outlet from the pressure regulator shall be configured in accordance with applicable regulations and lead to a safe area.
- Make sure when installing the equipment that there is enough space to service the burner.
- Permitted temperature during operation -10 to +60 °C. Max 80% relative humidity, no condensation.
- The installer must ensure that the room has adequate air supply.
- The room must comply with local regulations pertaining to its intended use.
- The installation site must be free of chemicals.
- Burner pipes, fan wheels and air dampers may contain sharp edges.
- The surface temperature of the burner's components can exceed 60 °C.
- Caution: The burner has moving parts, and there is risk of crushing injuries.

- The electrical installation must be professionally carried out in accordance with applicable high voltage regulations, as per Enertech's recommendations.
- Before servicing, shut off the fuel supply and turn off the power to the burner.
- Seal inspections must be performed during installation and servicing to prevent gas leakage.
- Care should be taken by the installer to ensure that no electrical cables or fuel lines are crushed or otherwise damaged during installation or servicing.
- If the boiler is equipped with an access hatch, this must be equipped with a hatch opening switch connected to the burner's safety system.
- When in operation, the burner's noise level can exceed 85 dBA. Use hearing protection.
- The burner must not be put into operation without proper safety and protection devices.
- A Class BE fire extinguisher is recommended.
- It is forbidden to alter thedesign or use accessories which have not been approved by Enertech in writing.
- Prior to operation, the following points must be checked:
- fitting and installation work has been completed and approved
- electrical installation has been correctly performed
- flue gas ducts and combustion air ducts are not blocked
- all actuators and control and safety devices are in working order and correctly set

Actions to take if you smell gas

Turn off the equipment and the boiler. Open windows and doors. Prevent open flames or sparking, e.g. do not turn lights on or off, do not use any electrical appliances, do not use mobile phones. Open windows and doors. Close the gas ball valve. Warn residents; do not use doorbells. Evacuate the building. Notify the installer or gas supplier once the building has been evacuated.

Burner servicing schedule

Servicing must be carried out once a year or after 3 000 hours of operation.

Burner	1 year	3 000 hrs
Inspection of electrical installation	1 year	3 000 hrs
Leakage check	1 year	3 000 hrs
Filter	1 year replacement at Δp>10 mbar	3 000 hrs replacement at Δp>10 mbar
Electrodes	Replacement/Cleaning 1 year	Replacement/Cleaning 3 000 hrs
Brake disc	Replacement/Cleaning 1 year	Replacement/Cleaning 3 000 hrs
Motor	1 year	3 000 hrs
Fan wheel	1 Year Replacement when cleaning needed/imbalance	3 000 hrs Replacement when cleaning needed/imbalance

Component replacement intervals

Control system	10 years	250 000 starts
Valve control system	10 years	250 000 starts
Pressure switch	10 years	250 000 starts
Ignition system with flame guard	10 years	250 000 starts
UV flame sensor	10 000 hrs	N/A
Gas pressure regulators	15 years	N/A
Gas valve without seal testing	10 years	250 000 starts
Gas valve with seal testing	Replacement upon fault detection	N/A
Gas pressure switch	10 years	250 000 starts
Safety blow-off system	10 years	N/A
Damper motor	N/A	500 000 starts
Contactor	10 years	500 000 starts

The burner and its components must be recycled according to applicable regulations.

Delivery check

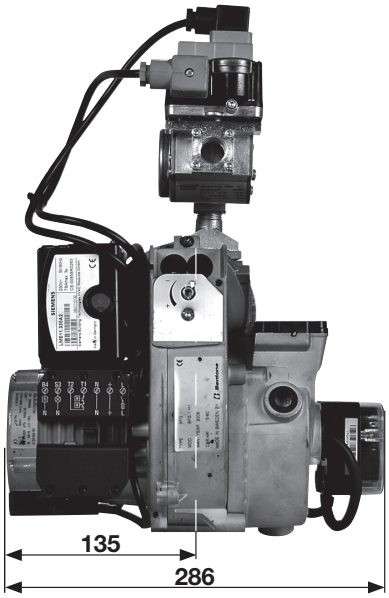
- Make sure everything is delivered and the goods have not been damaged during transit.
- If something is wrong with a delivery, report it to the supplier.
- Transport damage must be reported to the shipping company.

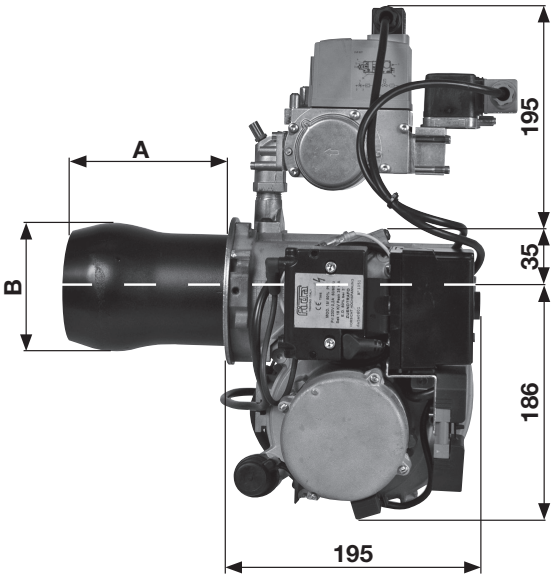
2. Technical data BFG 1

2.1 Burners are intended for use at:

- Hot water boilers in intermittent operation.

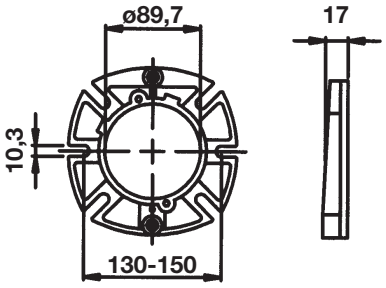
2.2 Dimensions



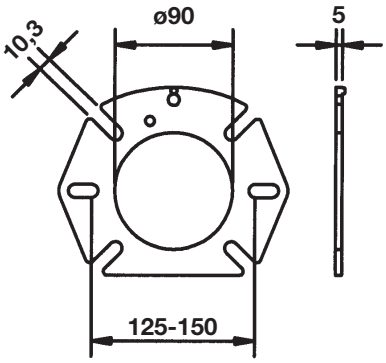


The above-mentioned measurements are maximum measurements. They can vary, depending on which components are used.

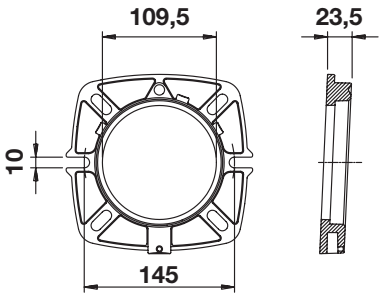
Flange 1
BFG 1 H1 and BFG1 H2



Flange 2
BFG 1 H1 and BFG1 H2



Flange 3
BFG 1 H3



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2.3 Capacity range BFG 1 H1, BFG 1 H2 and BFG 1 H3

Capacity	Gas quantity at min. power Nm^3/h [1)]	Gas quantity at max. power Nm^3/h [1)]
BFG 1 H1 15 - 60 kW		
G 20	1,59	6,35
G 25	1,86	7,44
G 30	0,47	1,86
G 31	0,61	2,45
BFG 1 H2 15 - 65 kW		
G 20	1,59	6,88
G 25	1,86	8,06
G 30	0,47	2,02
G 31	0,61	2,66
BFG 1 H3 25 - 100 kW		
G 20	2,65	10,58
G 25	3,10	12,41
G 30	0,75	3,10
G 31	1,02	4,09

MB-Block	Max. connection pressure mbar	Min connection pressure mbar
GB-LD 055	65	See data plate
MBC 65	200	
MBC 120	360	
MB 403	200	
MB 405	360	
MB 407	360	

Lower heat value Hu at normal state 15°C and 1013.25 mbar EN676				
Grade of gas		kWh/Nm^3	MJ/Nm^3	$kcal/Nm^3$
Natural gas	G20	9.5	34.02	8126
Natural gas	G25	8.2	29.25	6986
Butane	G30	32.5	116.09	27728
Propane	G31	24.6	88.00	21019

Gas quantity and capacity vary according to grade of gas and connection pressure.

2.3.1 Gas categories, approved gases

Only dry gas is permitted for use

Gerätekategorien Appliance categories	Versorgungsdrücke Supply pressure	Bestimmungsländer Countries of destination
$II_{2R/3R}$	20 mBar	AT, BE, BG, CH, CZ, CY, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR
$II_{2H38/P}$	20 mBar	AT, CH, CY, DK, FI, LT, RO, SE, SK
II_{2H3P}	20 mBar	GB, IE
$II_{2L38/P}$	20 mBar	NL, RO
$II_{2E38/P}$	20 mBar	PL
$II_{2E(R)B}$	20 mBar	BE
I_{3P}	20 mBar	BE

2.3.2 Electric Specification EN 60335-2-102

Burner correspond to IP20

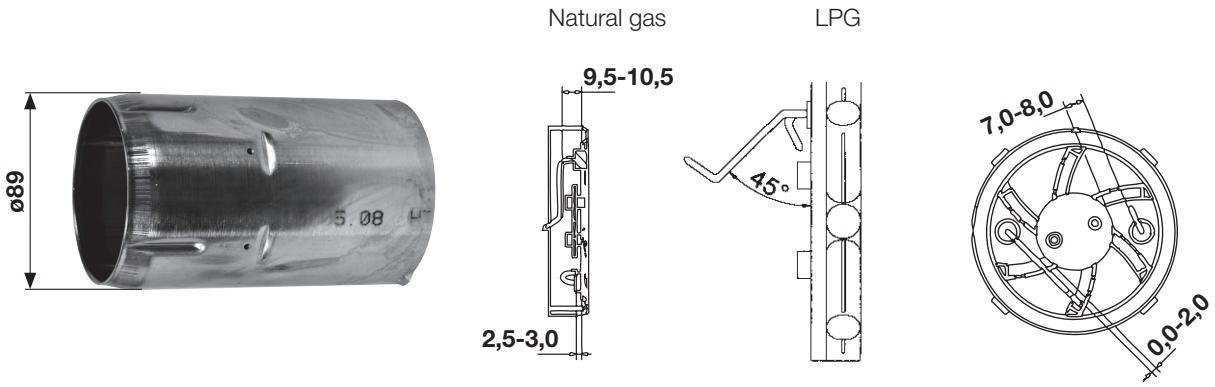
Type	BFG 1
Motor	110W, 0,9A, 230V, 50Hz, 2700Rpm
The recommended main fuse motor	6,3A
Control power	1~230V 1,0A
Sound	79 dBA ± 0,5 dBA

Measurements according to EN 3746: 2010

Alt.1 The sound level of the burner can be reduced by equipping the burner with silencer. Installation must be done so it does not prevent air supply to the burner.

Alt.2 The burner's noise level can be reduced by connecting the burner's air intake to the air duct that opens into an appropriate location. Installation must be done so it does not prevent air supply to the burner.

2.4 Model BFG 1 H1



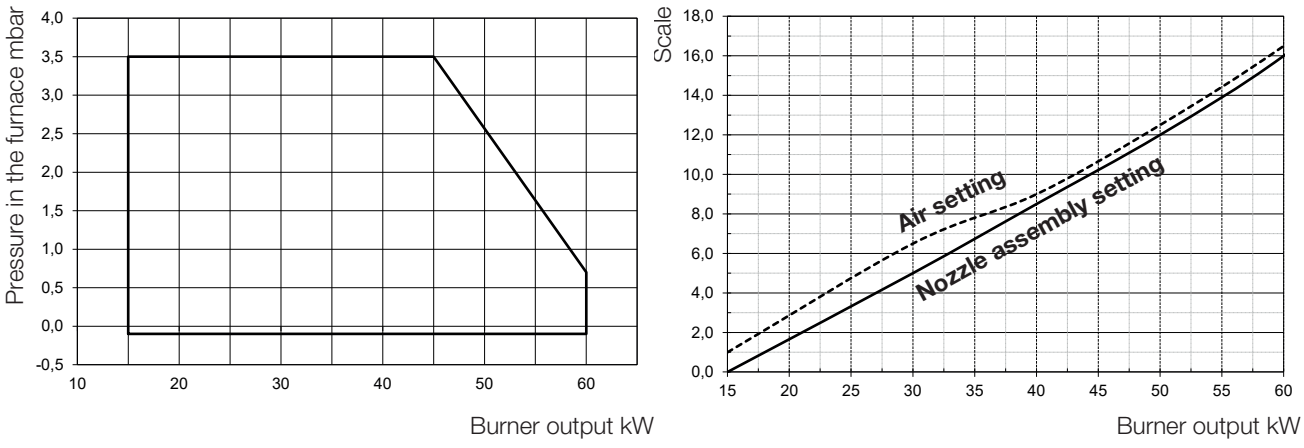
Blast tube length mm	Blast tube Dimension A mm	Flange Dimension B ø
108	79	90
140	111	90

The above-mentioned measurements are maximum measurements. They can vary, depending on which components are used.

2.4.1 Burner output/Basic settings

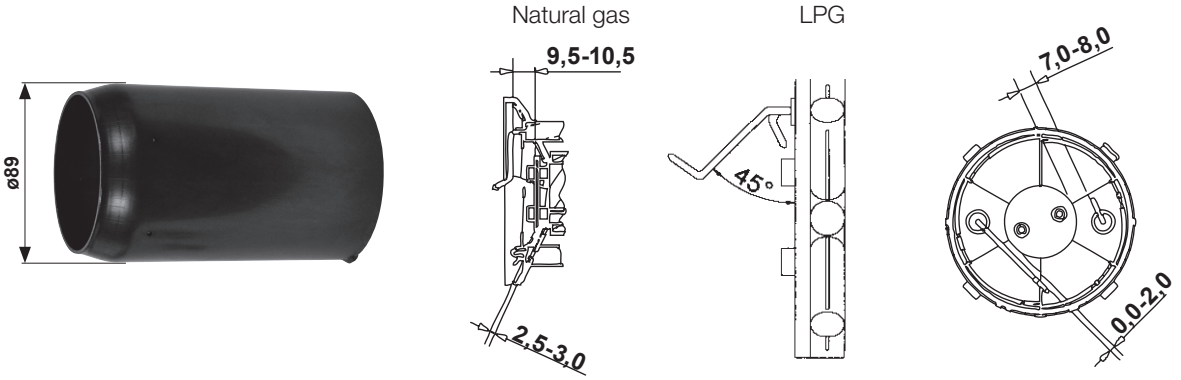
15 - 60 kW

! Do not exceed working field.



! Scale value valid at 0 mbar in furnace pressure.

2.5 Model BFG 1 H2



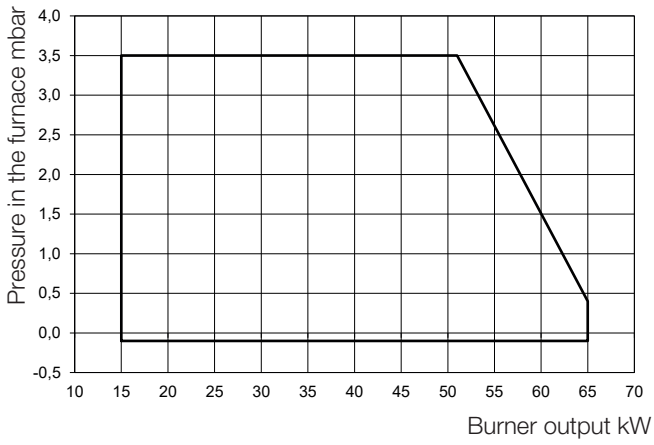
Blast tube length mm	Blast tube Dimension A mm	Flange Dimension B ø
115	86	90
147	118	90

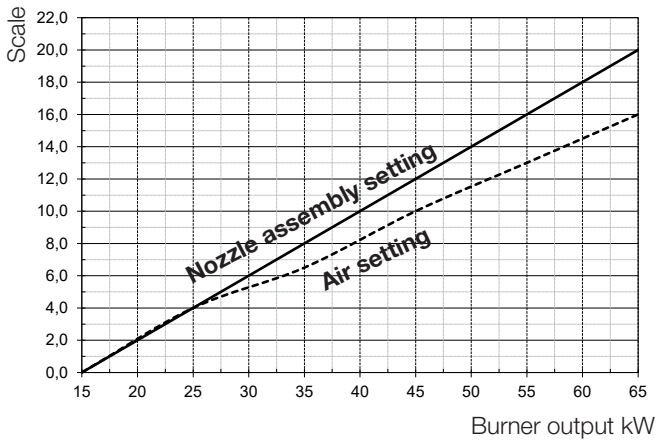
The above-mentioned measurements are maximum measurements. They can vary, depending on which components are used.

2.5.1 Burner output/Basic settings

15 - 65 kW

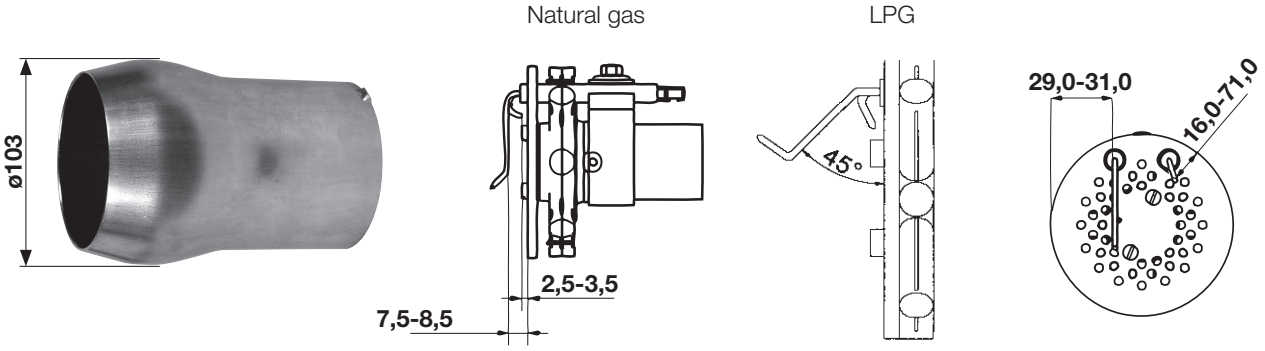
! Do not exceed working field.





! Scale value valid at 0 mbar in furnace pressure.

2.6 Model BFG 1 H3



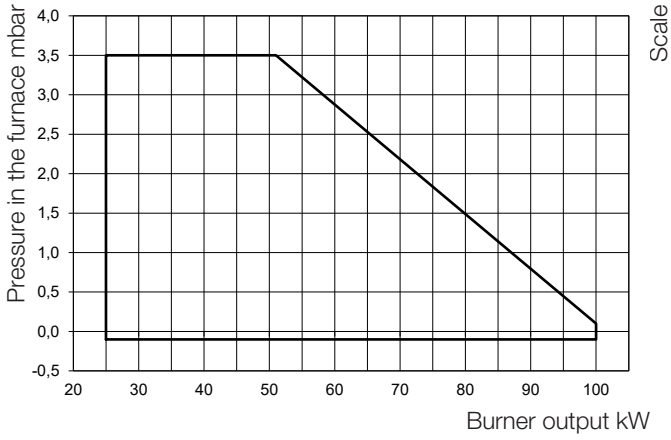
Blast tube length mm	Blast tube Dimension A mm	Flange Dimension B ø
145	120	110
245	220	110

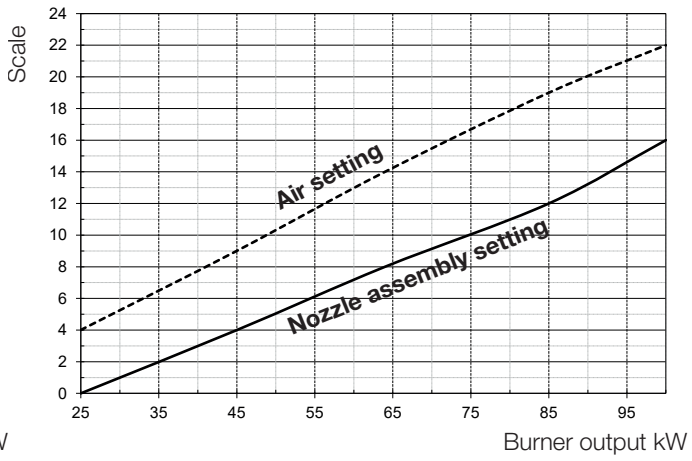
The above-mentioned measurements are maximum measurements. They can vary, depending on which components are used.

2.6.1 Burner output/Basic settings

25 - 100 kW

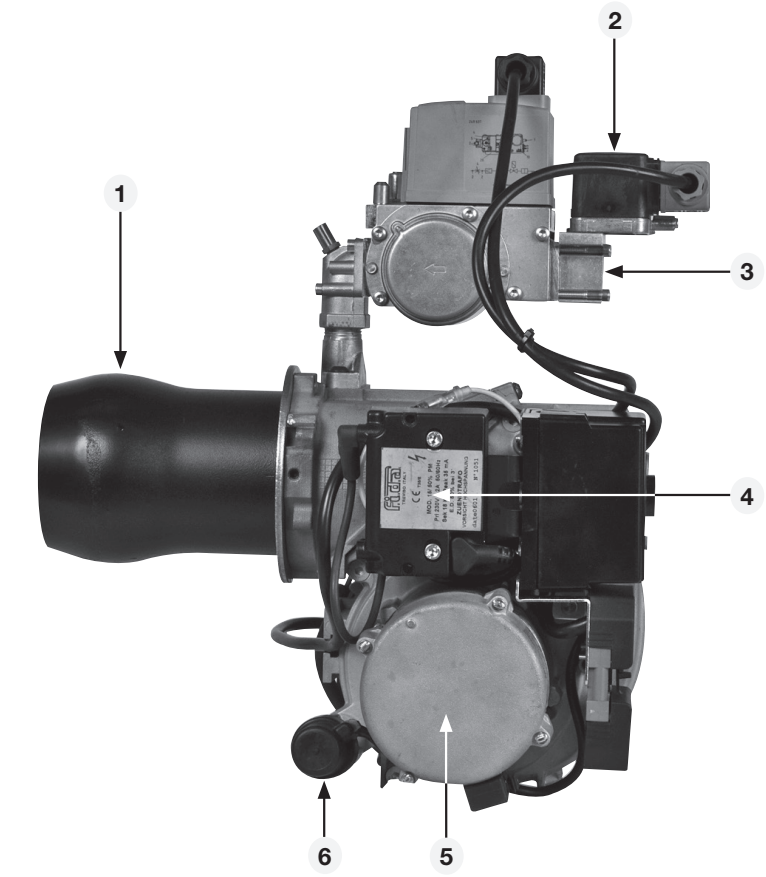
! Do not exceed working field.

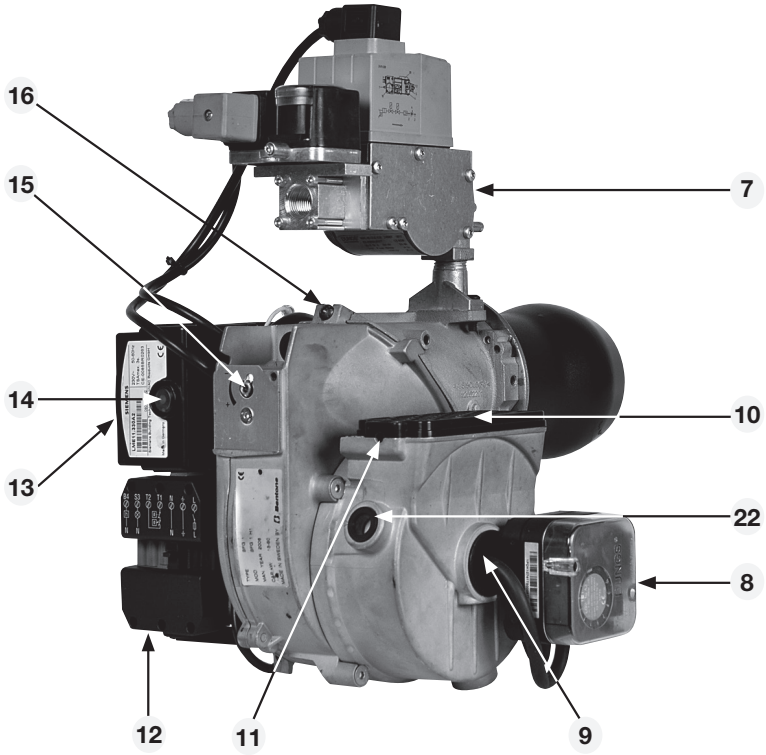




! Scale value valid at 0 mbar in furnace pressure.

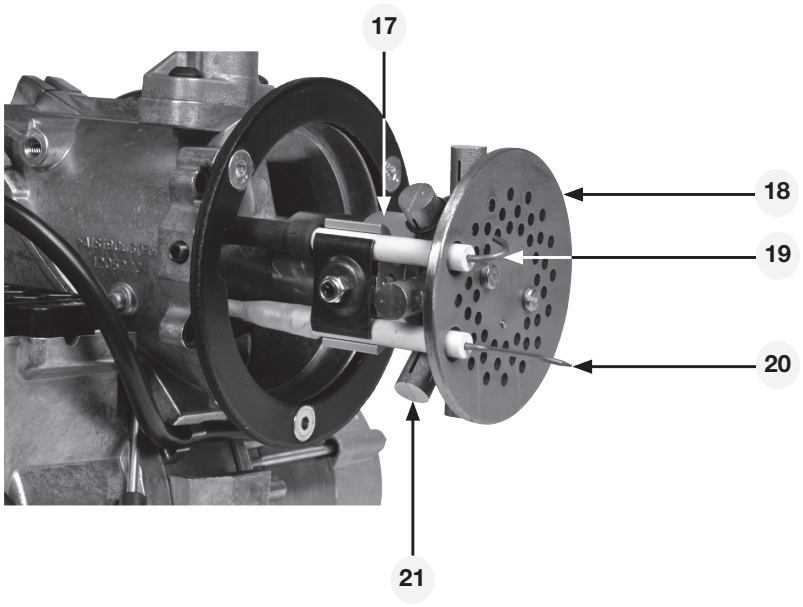
2.7 Description





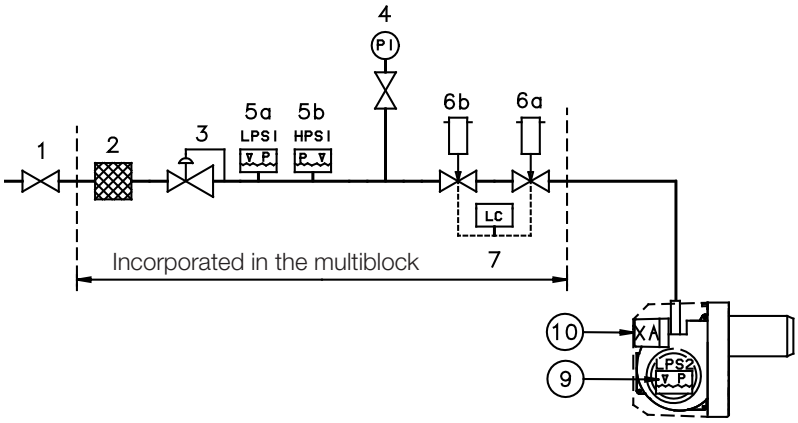
2.7.1 Components

1. Blast tube
2. Gas pressure switch
3. Connection multiblock
4. Ignition transformer
5. Motor
6. Capacitor
7. MultiBloc
8. Air pressure switch
9. Test point for the air pressure switch on the low-pressure side
10. Air intake
11. Air regulation
12. Electric connection
13. Gas burner control
14. Reset button
15. Nozzle assembly adjustment
16. Screw for division of burner in front and rear part
17. Nozzle assembly
18. Brake plate
19. Ignition electrode
20. Ionisation electrode
21. Nozzle
22. Air flow indicator (indicates the air setting)



3. Installation

3.1 Skeleton diagram



1. Ball valve
2. Filter
3. Pressure regulator
4. Outlet for gas pressure measuring
5a. Gas pressure switch, min.
5b. Gas pressure switch, max.
6a. Main valve
6b. Safety valve
7. [1)] Leakage control
9. Air pressure switch
10. Gas burner control

Pos. 5b: Components not required acc. to EN 676.

[1)] Required above 1200 kW acc. to EN 676.

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3.2 Delivery check

Check that all has been delivered and that the goods have not been damaged during transport. If that is not the case, please notify the delivery company. Transport damages should be reported to the forwarding agency.

3.3 Preparations for installation

Check that the measurements and capacity range of the burner are compatible with the boiler. The power ratings on the type plate refer to the min. and max. power of the burner.

3.4 Gas supply

For good operating safety, it is important that the gas supply system is installed correctly.
Consider the following:

1. Check that the burner is approved for the gas quality of the installation. If not, please contact the supplier.
2. Check that the gas components of the burner are approved for indicated gas pressure.
3. The gas supply system should be installed in accordance with current standards.
4. Pipe lines should be run so that service on boiler and burner is facilitated.
5. Pipe lines should be run so that eventual contaminants cannot come into contact with the gas components.

3.5 Electric connection

Before starting the electric installation, the main switch must be turned off.
If the boiler has a 7-pole and a 4-pole Eurostecker connector, these usually fit directly to the burner. If not, use the connectors included, (see connection under Electric equipment)

> **!** If an electric connection other than the one re commended by Enertech is used, a risk of damage and injury can arise.

3.6 Setting brake plate and air flow

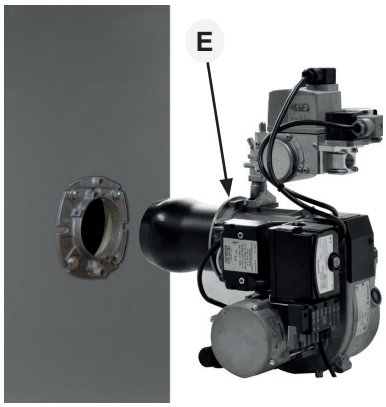
Before the placing into service, the burner should be initially set according to diagram, (see Basic settings). Note that it is only a basic setting which should be adjusted once the burner has been started.

3.7 Burner installation

3.7.1 Hole pattern

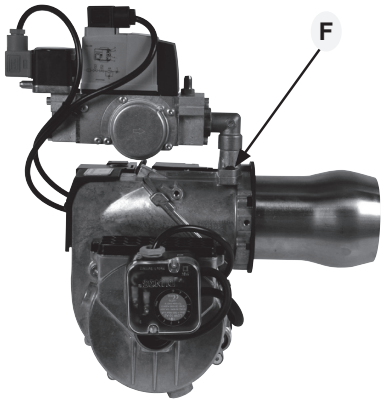
Check that the hole pattern on the boiler matches that of the flange, (see Technical data).

3.7.2 Burner installation



1. Install the flange with gasket on the boiler.
2. Insulate between the blast tube and the boiler door to minimize heat radiation.
3. Check the ignition electrode and ionisation electrode. (Refer to Technical data).
4. Install the burner on the boiler and lock into the flange (E).
5. Install the gas line on the burner. Check that the O-ring has not been damaged during installation, fasten with the screws (F).
6. Where support for the multiblock is included, this should be installed.

3.7.3 Gas connections

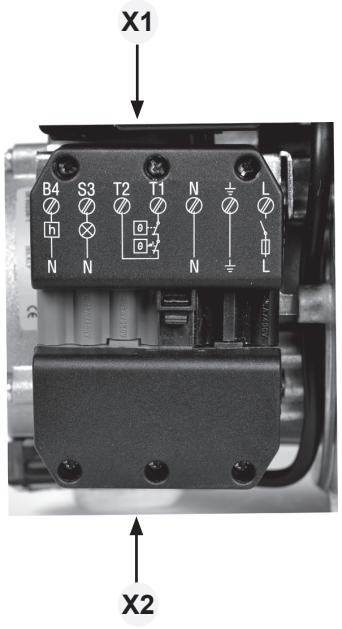


1. Check the gas pipe dimensions. (According to local regulations).
2. Connect the gas pipe to the gas flange of the multiblock.
3. A manual gas valve should be installed in the vicinity of the burner.
4. No mechanical stresses/forces should exist in the gas connection.
5. Check the sealing of the gas connections, including the multiblock and flanges.

NOTE!

If the gas connection is via a hose, the support for the multiblock that is supplied with the burner should be mounted (F). Install the support so that the underneath of the multiblock rests on it.

3.7.4 Electric connection



If the boiler does not have a pre-wired connector, connect in the included connector, X2 according to the wiring diagram.

1. Turn off the main switch.
2. Connect the Eurostecker X2 acc. to Alt. 1 - 3, (see Electric equipment).
3. Install the Eurostecker X2 on the burner.
4. Turn on the main switch.

3.8 Control measures

3.8.1 Gas quality

Check that the combustion head is intended for the gas quality to be used, (see Technical data).

3.8.2 Bleeding

Bleeding of the gas pipe can be achieved by removing the screw on the test nipple for the inlet pressure. Connect a plastic hose and lead out the gas into nature. When the bleeding in completed, **don't forget to install the screw in the test nipple again.**

3.8.3 Function test

The electric function test can be done as follows:

When connecting to the mains, check that the phase and zero are not switched. The gas tap should be closed. To prevent the gas pressure switch from blocking, it should be bridged temporarily.

After the main switch has been turned on and the max. and control thermostats have been set, the prepurging period lasts for 30-35 secs. After this, the pre-ignition is started (0.5-2.5 secs. depending on the design of the gas burner control). The ignition spark should then be able to operate faultlessly at the required quantity of air for combustion. The gas valve is energized and opens. After the end of the safety period (2-3 secs.), the gas burner control blocks.

The solenoid valve and motor become de-energized. Remove the bridge after completed testing.

Check that no safety functions are disconnected before placing the burner into service.

3.8.4 Leakage testing

When leakage testing the gas fittings with test points between the valves, the solenoid valve should be closed. A pressure gauge should be connected to the test nipple Pa. The test pressure in the fittings should be 1.5 x max inlet pressure or min. 150 mbar. If leakage is observed when measuring, localise the leaking site with soapy water or leak detection spray. After sealing, leak test the fittings again. After completed trimming, all joints, branching points and outlets on the gas line should be tested for leaks.

4. Basic Settings

4.1 Recommended excess air when using default setting

Grade of gas	Excess air flue gases		Max. % CO_2
	% O_2	% CO_2 Lambda 1.2	
Natural gas	3–5	≈10	11.9
Propane	3–5	≈11.5	13.9
Butane	3–5	≈11,5	14,1
Liquefied petroleum gas (LPG)	3–5	≈11	13,8

4.2 Determining the gas quantity for the system

The heat values indicated are normal values; the heat value varies according to the origin of the gas. For more exact information on values, contact the gas distributor.

Lower heat value HU at normal state 15°C and 1013.25 mbar EN676				
Grade of gas		kWh/Nm3	MJ/Nm3	kcal/Nm3
Natural gas	G20	9.5	34.02	8126
Natural gas	G25	8.2	29.25	6986
Butane	G30	32.5	116.09	27728
Propane	G31	24.6	88.00	21019

4.3 Example of how to calculate the gas quantity (natural gas G20):

V_0 =	Desired quantity of gas	[Nm^3/h]
Q =	Boiler output	[kW]
H_U =	Gas heat value	[kWh/Nm^3] or [MJ/Nm^3] or [kcal/Nm3]
η=	Boiler efficiency	[%]

Calculation example:

Q = 50 kW

H_U = Example A: 34020 MJ/Nm^3

Example B: 9.5 kWh/Nm^3

Example C: 8126 $kcal/Nm^3$

η = 90%

$$\text{Example A } V_{0A} = \frac{Q \cdot 3600}{H_u \cdot \eta} = \frac{50 \cdot 3600}{34020 \cdot 0.90} \approx 5.9\ Nm^3/h$$

$$\text{Example B } V_{0B} = \frac{Q}{H_u \cdot \eta} \approx \frac{50}{9.5 \cdot 0.90} \approx 5.8\ Nm^3/h$$

$$\text{Example C } V_{0C} = \frac{Q}{H_u \cdot 0{,}00116 \cdot \eta} = \frac{50}{8126 \cdot 0.00116 \cdot 0.90} \approx 5.9\ Nm^3/h$$

If the barometer reading (altitude), pressure and temperature of the gas deviate significantly from normal values, this must be taken into account as follows:

T =	Temperature of gas at the gas meter	[°C]
B =	Barometer reading	[mbar]
P =	Pressure of gas at the gas meter	[mbar]
f =	Factor calculated for multiplication with flow in Nm^3/h to arrive at actual flow in Nm^3/h.	
V =	Actual flow	[m^3/h]

$$f = \frac{273}{273+T} \cdot \frac{B+P}{1013.25}$$

Calculation example:

T = 15°C

B = 945 mbar

P = 15 mbar

$$f = \frac{273}{273+15} \cdot \frac{945+15}{1013.25} \approx 0.90\ Nm^3/h$$

This means that the quantity of gas read from the gas meter should actually be read off as 1.11 . the calculated flow in a normal state.

$$V = V_0 \cdot f$$

$$V_A = V_{0A} \cdot f = 5.9 \cdot 0.90 \approx 5.2\ m^3/h$$

$$V_B = V_{0B} \cdot f = 5.8 \cdot 0.90 \approx 5.2\ m^3/h$$

$$V_C = V_{0C} \cdot f = 5.9 \cdot 0.90 \approx 5.3\ m^3/h$$

4.4 Calculating the quantity of gas supplied

The quantity of gas supplied can be calculated if the system is equipped with a gas flow meter of some type. The procedure here is usually to measure how long it takes for the burner to consume a certain quantity of gas.

To measure:

t = Time for a certain quantity of gas consumed by the burner. [h]

M = Quantity of gas consumed. [m^3]

V = Actual gas flow [m^3/h]

$$V = \frac{M}{t}\ [m^3/h]$$

Calculation example:

t = 1 min 10 s

M = 100 dm^3 (litre)

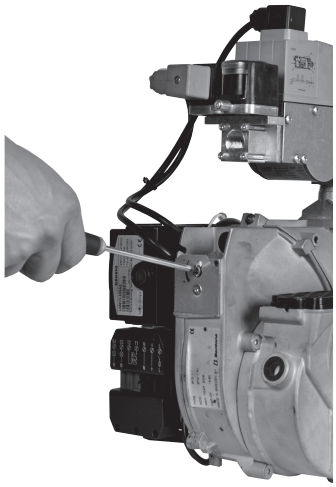
$$M = \frac{100}{1000} = 0.1\ m^3$$

$$t = \frac{1}{60} + \frac{10}{3600} = 0.0194\ h$$

$$V = \frac{M}{t} = \frac{0,1}{0.0194} \approx 5.1\ m^3/h$$

4.4.1 Nozzle assembly adjustment

The burner is equipped with a control which changes the position of the brake plate in the blast tube. This is used to set the correct pressure differential across the combustion device and thereby get a good combustion without pulsations. The setting to be used depends on the set effect and the overpressure in the boiler. (For basic setting, see Technical data).



Setting brake plate
H1 och H2

- Smaller gap: turn the screw to the left
- Larger gap: turn the screw to the right

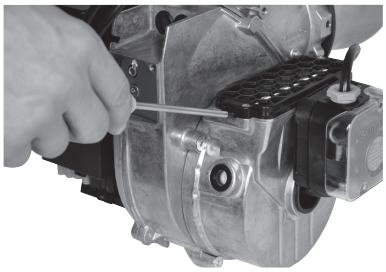
H3

- Smaller gap: turn the screw to the right
- Larger gap: turn the screw to the left

The setting of the brake plate position affects the air flow. Therefore, the air must always be readjusted with the air regulation device of the burner.

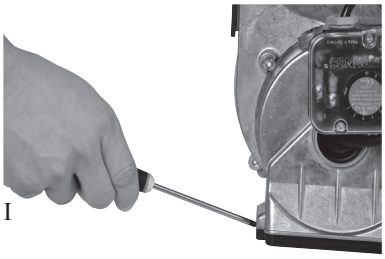
4.4.2 Air intake adjustment

The air setting is very important to get good combustion with neither too much nor too little air. The air flow for combustion is adjusted by turning the air adjusting screw with an Allen key. How open the air control should be is determined by the fired-in effect and overpressure in the boiler, as well as other settings on the burner such as the position of the brake plate.
(For basic setting, see Technical data).

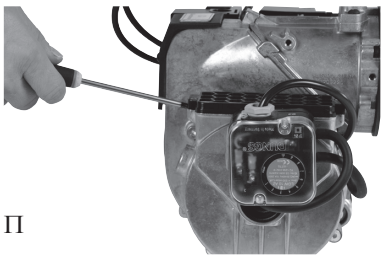


4.4.3 Air quantity setting procedure

The setting of the air control depends on how the screw, with which the air adjustment is done, is installed. If the air intake is pointing downwards as in Fig. I, a clockwise turn gives a decrease in the air flow and a counter-clockwise turn an increase in the air flow.
If the air intake is pointing upwards as in Fig. Π, a clockwise adjustment increases the air flow and a counter-clockwise adjustment decreases it.



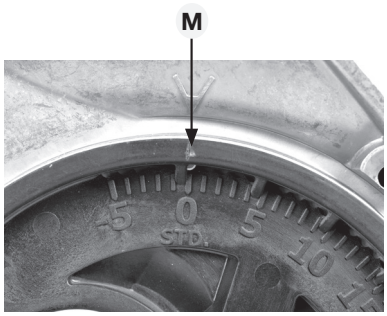
I



Π

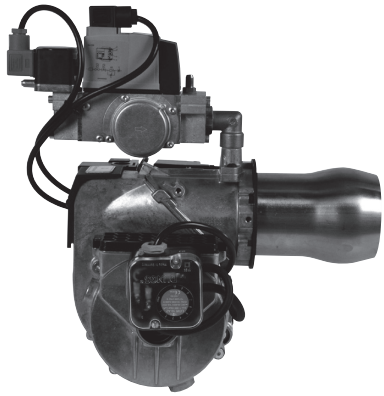
4.4.4 Inlet cone, air control

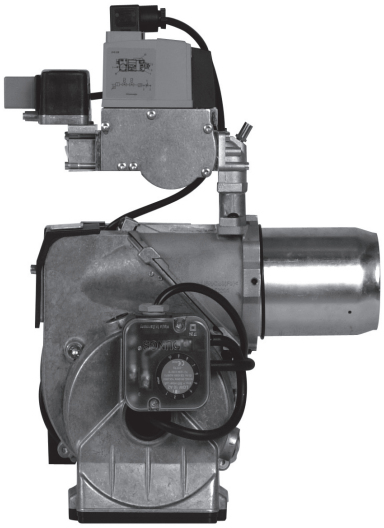
The air flow is also affected by the position of the intake cone. This rarely needs adjustment, however, and should be maintained in the standard position ”STD” for good operation and starts. (A cast-in arrow on the fan housing indicates the position of the inlet cone. In addition to the scale on the inlet cone casting, there is also a mark (M) indicating the factory setting.)



4.4.5 Rotation of air intake

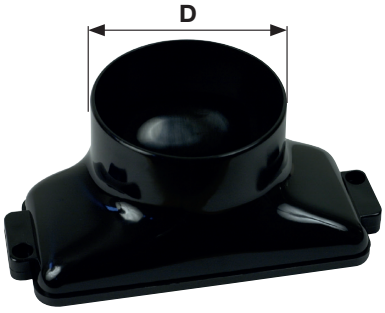
The air intake can be rotated in order to fit the burner into different environments. The intake can be rotated into various positions, not just the ones shown to the left.
To rotate the air intake, loosen the three screws securing the air intake and the two screws fastening the air pressure switch. Then rotate the air intake to the desired position and tighten the screws.
The air intake position does somewhat affect the air flow through the burner. The position giving the largest flow is with the air intake downwards.





4.4.6 Air duct

A hose connection via a air duct is available in three different dimensions, 48, 68 and 78 mm outer diameter ”D”. The air duct is installed on the air intake at the place where the grid is installed in the standard design.



5. Burner service

5.1 Service

Service should be performed after approx. 3000 working hours, but no less than once a year.

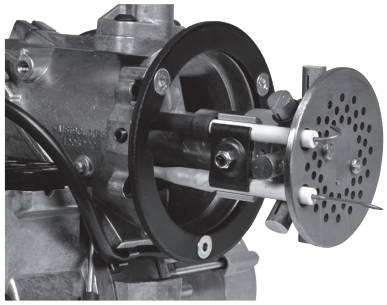
Only authorized personnel should perform the service.

Before any kind of service is performed, switch off the current with the line breaker and turn off the gas supply.

Be careful: certain parts exposed after the separation of the burner can be warmer than 60°C.

Be careful not to pinch or damage any electric cables or gas pipes during installation or service.

5.1.1 Combustion device service



1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Remove the gas pipe after ensuring that the gas is turned off.
3. Remove the burner from the burner flange. Pull out the burner. Disconnect the blast tube and remove it.
4. If necessary, clean the brake plate and nozzle.
5. Check the ignition electrode and ionisation electrode. Replace if necessary. (Refer to Technical data for setting of electrodes)
6. Install on the blast tube and fasten the burner on the burner flange.
7. Install the gas pipe.
8. Check the gas pipe for leakage.
9. Install the Eurostecker; switch on the main current and open the gas flow.
10. Start the burner and check the combustion.

! When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

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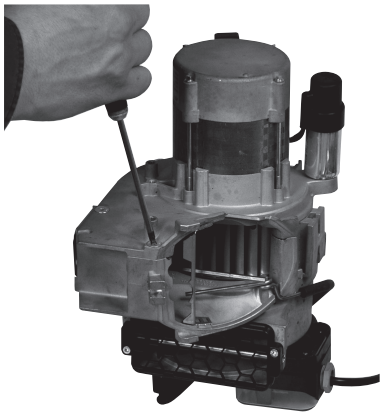
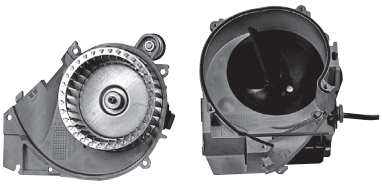
5.1.2 Fan motor replacement



1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Disconnect the electric bracket to the motor.
5. Loosen the screw holding the electrical bracket.
6. Remove the cable conduit for the ignition electrode and ionisation electrode.
7. Loosen the screws (H) holding the motor flange, 5 pcs.
8. Lift off the motor.
9. Disconnect and remove the fan wheel.

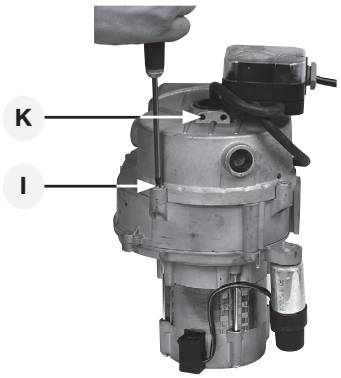


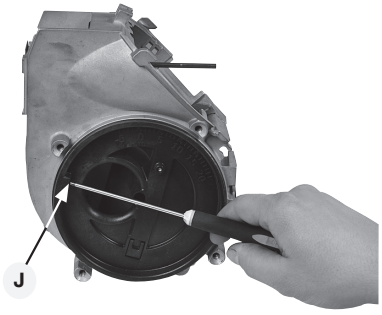
10. Install the fan wheel on the new motor and tighten the locking screw. The fan wheel should be installed in the bottom position against the motor shaft.
11. Fit in the motor flange against the fan housing.
12. Assemble the motor flange and the fan housing. Tighten the screws alternatively and not one at a time.
13. Place the cable conduit and the hose for the air pressure switch in position.
14. Install the screws in the electrical bracket.
15. Connect the motor cable. Connect the ignition electrode and ionisation electrode.
16. Assemble the fan housing and the front piece.
17. Install the Eurostecker; switch on the main current and open the gas flow.
18. Start the burner and check the combustion.

! When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

5.1.3 Air intake and inlet cone service

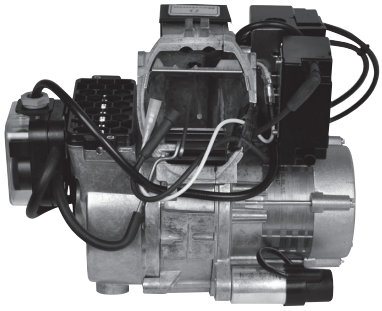
1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Loosen the screws (K) holding the air switch, 2 pcs. Remove the air switch.
5. Loosen the screws (I) holding the air intake, 3 pcs.
6. Remove the air intake.
7. Loosen the screw (J) holding the inlet cone and note the inlet cone position.
8. Remove the inlet cone from the fan housing.
9. Check the function and appearance of the different components in the air regulation. Clean and replace the components as needed.
10. Assemble the burner. Be careful when installing the inlet cone - install it in the same position as it was before being removed.
11. Fit the O-ring in the groove between the fan housing and inlet cone. Ensure that it is properly located in the groove and is not damaged when the air intake is fitted.
12. Install the Eurostecker; switch on the main current and open the gas flow.
13. Start the burner and check the combustion*.





5.1.4 Fan wheel check

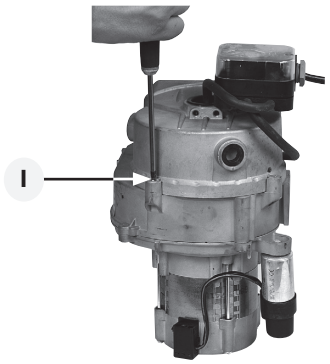
1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Visually check the fan wheel. Carefully rotate the fan wheel with your fingers or a tool.
5. If possible, carefully clean the fan wheel if it is not heavily soiled.
6. If thorough cleaning is deemed necessary, proceed to Fan wheel service. If cleaning is not necessary, assemble the burner.
7. Install the Eurostecker, switch on the main current and open the gas flow.
8. Start the burner and check the combustion.

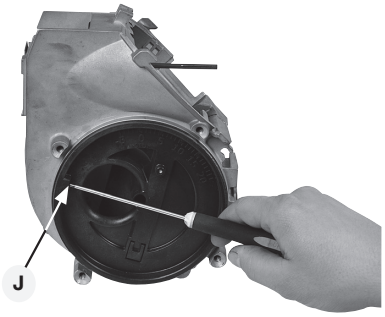


! When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

5.1.5 Fan wheel service

1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Loosen the screws (I) holding the air intake, 3 pcs.
5. Remove the air intake.
6. Loosen the screw (J) holding the inlet cone and note the inlet cone position.
7. Remove the inlet cone from the fan housing.
8. Clean the fan wheel. If necessary, disconnect and remove the fan wheel for more thorough cleaning of the fan and fan housing.
9. Install the fan wheel and tighten the screw. The fan wheel should be installed in the bottom position against the motor shaft.
10. Assemble the burner. Be careful when installing the inlet cone – install it in the same position as it was before being removed.
11. Fit the O-ring in the groove between the fan housing and inlet cone. Ensure that it is properly located in the groove and is not damaged when the air intake is fitted.
12. Install the Eurostecker; switch on the main current and open the gas flow.
13. Start the burner and check the combustion.





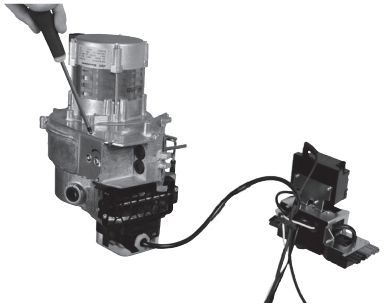
When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

5.1.6 Electrical package

Check that the screw holding the electrical bracket is tightened so that good earth connection between the package and the burner body is obtained.

Use only electric components recommended by Enertech.

5.1.6.1 Complete electrical package replacement



1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Disconnect the electric contact to the motor and the multiblock.
5. Open the air pressure switch and disconnect the cables. Note how the air pressure switch is connected.
6. Loosen the screw holding the electrical bracket.
7. Disconnect the ignition electrode and ionisation electrode cables from the electrical package.
8. Attach the new electrical package.
9. Connect the ignition electrode and ionisation electrode in the new electrical package.
10. Install the screws in the electrical bracket.
11. Connect the cables to the air pressure switch and install the cover. Ensure correct connection.
12. Connect the motor cable and multiblock.
13. Assemble the fan housing and front piece.
14. Install the Eurostecker; switch on the main current and open the gas flow.
15. Start the burner and check the combustion.

! When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

5.1.6.2 Single electrical package component replacement

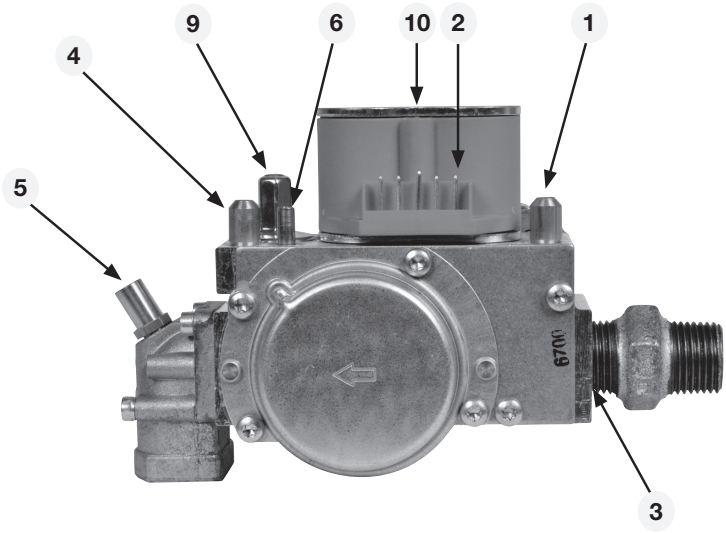
1. Switch off the main current, disconnect the Eurostecker from the burner and turn off the gas.
2. Loosen the screw assembling the front piece of the burner and the fan housing, but not more than that the fan housing can be removed from the front piece. Disconnect the cables to the multiblock.
3. Remove the fan housing from the front piece and pull it backwards until the cables to the ignition electrode and ionisation electrode can be loosened.
4. Remove the gas burner control.
5. Remove the cable of components to be replaced. Disconnect the cable in the terminal board.
6. Insert the new cable.
7. Check that all wires enter the terminal board and that they are securely fastened.
8. Switch on the gas burner control.
9. Assemble the fan housing and front piece.
10. Install the Eurostecker; switch on the main current and open the gas flow.
11. Start the burner and check the combustion.

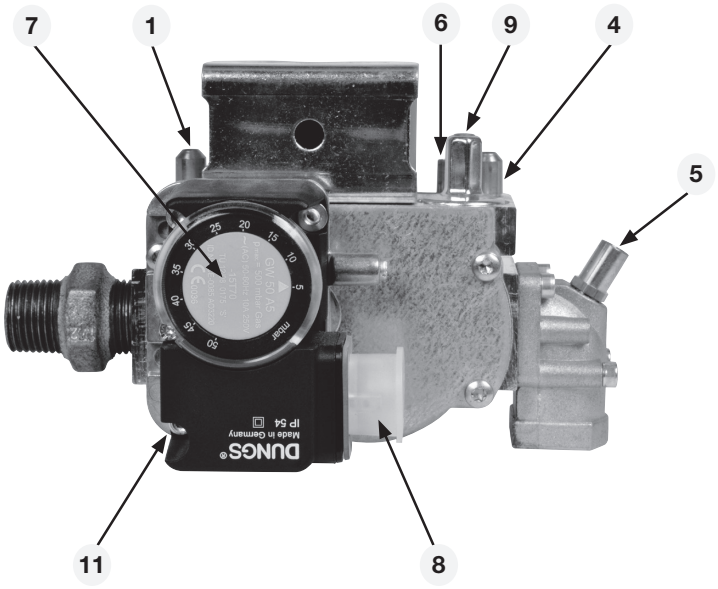
When the ignigtion transformer, air switch, gas switch and gas burner control contained in the electrical package are being replaced, no work needs to be done in the socket.

! When servicing/replacing components which affect the combustion, gas side leakage analysis and check should be performed on the system.

6. MultiBloc

6.1 GB-LD055 D01...





All gasline components shall be assembled and mounted without bending, torque and other mechanical or thermal stress.

Components

1. Test nipple for inlet pressure
2. Coil + electric connector
3. Gas filter (non replaceable)
4. Test nipple for regulator pressure
5. Test nipple for nozzle pressure
6. Quantity setting via gas throttle
7. Gas pressure switch, min.
8. Electric connector, gas pressure switch
9. Setting of pressure regulator
10. Screw for coil 4 mm Allen key
11. Screw, gas pressure switch

172 525 29

6.1.1 Setting MultiBloc, GB-LD055 D01...

- Connect a pressure gauge to the test nipples:
  (1) Inlet pressure
  (4) Regulator pressure
  (5) Nozzle pressure
- Ensure the presence of air-free gas at the ball valve.
- Start the burner.

6.1.1.1 Setting the gas flow

- The gas flow can be changed with a 2 mm Allen key on the adjustment screw (6).
- Greater gas flow, turn counter-clockwise (+).
- Lesser gas flow, turn clockwise (-).

Note!
When the gas flow is changed, a new check of the combustion must be performed. Use a flue-gas instrument for this check.

6.1.1.2 Setting the pressure regulator

A higher outlet pressure from the regulator can be required if, for instance, the quantity setting is max. open and the factory setting 10 mbar is not sufficient.

- The regulator pressure can be changed with a 2 mm Allen key on the adjustment screw (9).
- Adjustment clockwise gives higher pressure.
- Adjustment counter-clockwise gives lower pressure.

6.1.1.3 Coil replacement

- Loosen screw (10).
- Remove the coil (2).
- Install a new coil.
- Attach the coil with screw (10).

6.1.1.4 Replacement of gas pressure switch (GW...A5)

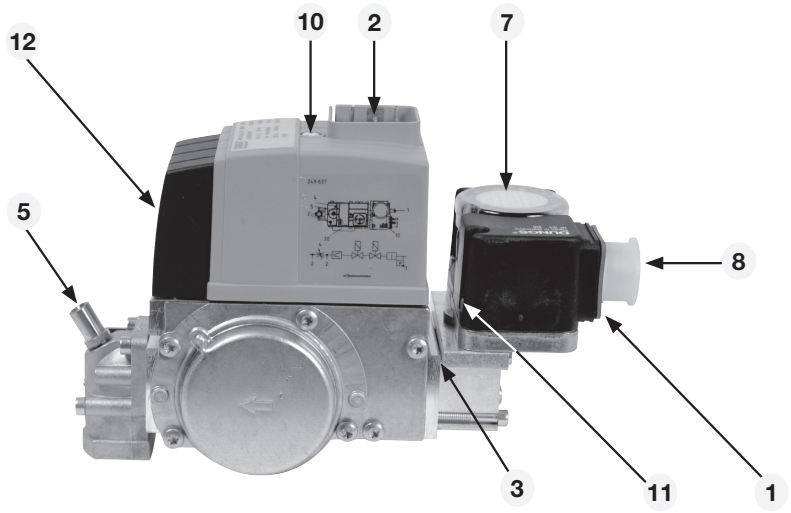
- Loosen the two screws (11).
- Carefully remove the gas pressure switch.
- Install a new gas pressure switch.
- Attach the gas pressure switch with the two screws (11).

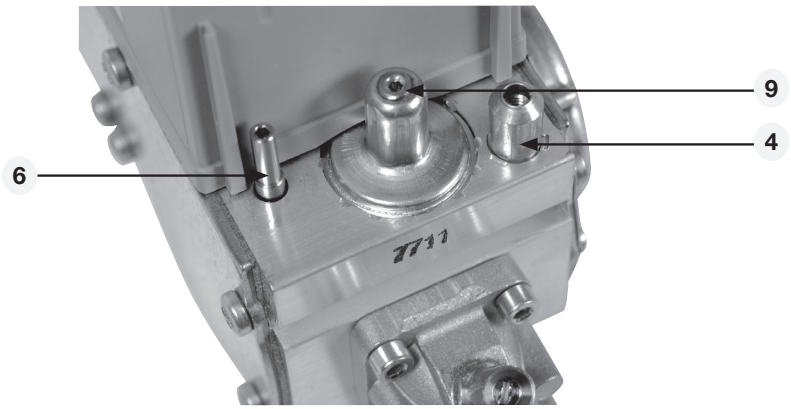
6.1.1.5 Important

When replacing gas pressure switches, inspecting filters via the gas connection, etc., ensure that the O-rings and gaskets are positioned correctly and that leak testing is performed after each operation. Also check the function of the gas pressure switch and set it.

! After completion of the jobs on the gas components, perform leakage control and function control.

6.2 MBC-65-DLE-S20





All gasline components shall be assembled and mounted without bending, torque and other mechanical or thermal stress.

Components

1. Test nipple for inlet pressure
2. Electric connector coil
3. Gas filter (non replaceable)
4. Test nipple for regulator pressure
5. Test nipple for nozzle pressure
6. Quantity setting via gas throttle
7. Gas pressure switch, min.
8. Electric connector, gas pressure switch
9. Setting of pressure regulator
10. Screws for coil
11. Screw, gas pressure switch
12. Cover adjustment control

6.2.1 Setting MultiBloc, MBC-65-DLE-S20

- Connect a pressure gauge to the test nipples
  (1) Inlet pressure
  (4) Regulator pressure
  (5) Nozzle pressure
- Ensure the presence of air-free gas at the ball valve.
- Start the burner.

6.2.1.1 Setting gas flow

- The gas flow can be changed with the help of a 2 mm Allen key on the adjustment screw (6).
- Greater gas flow, turn counter-clockwise (+).
- Lesser gas flow, turn clockwise (-).

NOTE!
When the gas flow is changed, a new check of the combustion must be performed. Use a flue-gas instrument for this check.

6.2.1.2 Setting pressure regulator

A higher outlet pressure from the regulator can be required if, for instance, the quantity setting is max. open and the factory setting is not sufficient.

- The regulator pressure can be changed with a 2 mm Allen key on the adjustment screw (9).
- Adjustment clockwise gives higher pressure.
- Adjustment counter-clockwise gives lower pressure.

6.2.1.3 Replacement of coil

- Loosen screw (10).
- Remove the cover.
- Remove the circuit board.
- Disconnect the solenoid valve from the valve with a hexagonal screw.
- Install and fasten the new coil.
- Install and fasten the circuit board and cover.

6.2.1.4 Replacement of gas pressure switch (GW...A5)

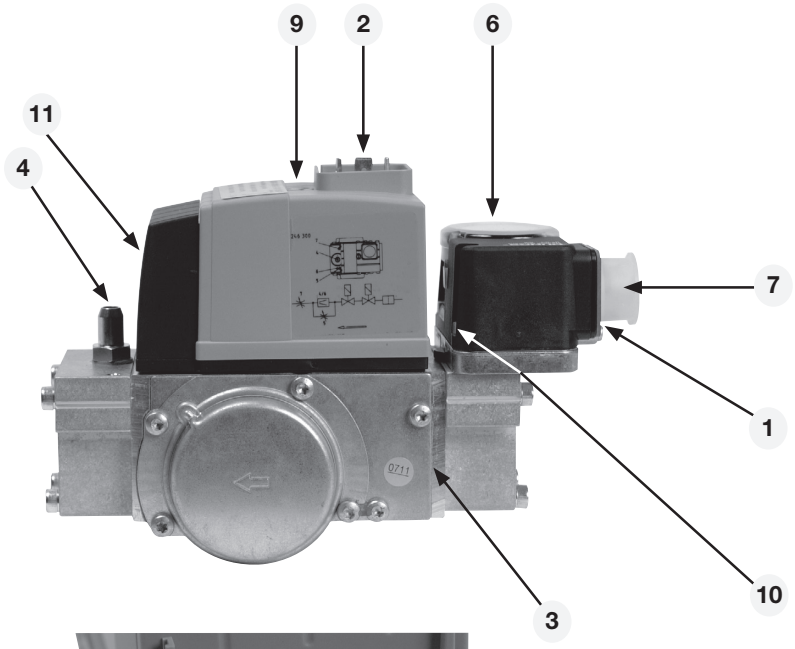
- Loosen the two screws (11).
- Carefully remove the gas pressure switch.
- Install a new gas pressure switch.
- Attach the gas pressure switch with the two screws (11).

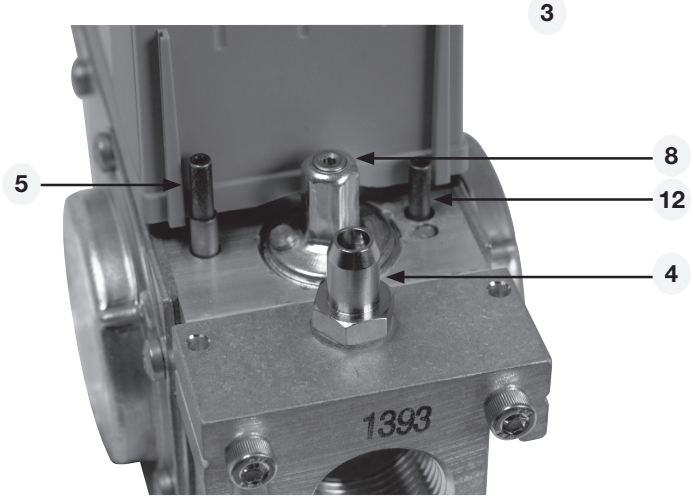
6.2.1.5 Important

When replacing gas pressure switches, inspecting filters via the gas connection, etc., ensure that the O-rings and gaskets are positioned correctly and that leak testing is performed after each operation. Also check the function of the gas pressure switch and set it.

! After completion of the jobs on the gas components, perform leakage control and function control.

6.3 MBC-120-DLE-S20





All gasline components shall be assembled and mounted without bending, torque and other mechanical or thermal stress.

Components

1. Test nipple for inlet pressure
2. Electric connector coil
3. Gas filter (non replaceable)
4. Test nipple for nozzle pressure
5. Quantity setting via gas throttle
6. Gas pressure switch, min.
7. Electric connector, gas pressure switch
8. Setting of pressure regulator
9. Screw for cover over coil
10. Screw, gas pressure switch
11. Cover adjustment control
12. Quantity setting of start gas via gas throttle

6.3.1 Setting MultiBloc, MBC-120-DLE-S20

- Connect a pressure gauge to the test nipples:
  (1) Inlet pressure.
  (4) Nozzle pressure.
- Ensure the presence of air-free gas at the ball valve.
- Start the burner.

6.3.1.1 Setting gas flow

- The gas flow can be changed with the help of a 2 mm Allen key on the adjustment screw (5).
- Greater gas flow, turn counter-clockwise (+).
- Lesser gas flow, turn clockwise (-).

NOTE!
After changing the gas flow, a new check of the combustion must be performed. Use a flue-gas instrument for this check.

6.3.1.2 Setting pressure regulator

A higher outlet pressure from the regulator can be required if, for instance, the quantity setting is max. open and the factory setting is not sufficient.

- The regulator pressure can be changed with a 2 mm Allen key on the adjustment screw (8).
- Adjustment clockwise gives higher pressure.
- Adjustment counter-clockwise gives lower pressure.

6.3.1.3 Setting start gas flow

The MultiBloc is set with the slow opening at start.
The start gas flow can be changed with a 2 mm Allen key on the adjustment screw (12).

- For quicker opening, turn counter-clockwise (+).
- For slower opening, turn clockwise (-).

It is important that the regulator pressure be higher than the start gas pressure. This is checked by turning.

- The adjustment screw (12) counter-clockwise two turns during operation.

The nozzle pressure (4) must not increase. If the nozzle pressure has increased, the adjustment screw (12) should be turned clockwise until the nozzle pressure no longer is affected. Then turn another two turns clockwise to achieve a stable nozzle pressure.

! After completion of the jobs on the gas components, perform leakage control and function control.

6.3.1.4 Replacement of coil

- Loosen screw (9).
- Remove the cover.
- Remove the circuit board.
- Loosen the hexagonal screw which holds the solenoid coil and the valve together.
- Install and fasten the new coil.
- Install and fasten the circuit board and cover.

6.3.1.5 Replacement of gas pressure switch (GW...A5)

- Loosen the two screws (10).
- Carefully remove the gas pressure switch.
- Install a new gas pressure switch.
- Attach the gas pressure switch with the two screws (10).

6.3.1.6 Important

When replacing gas pressure switches, inspecting filters via the gas connection, etc., ensure that the O-rings and gaskets are positioned correctly and that leak testing is performed after each operation. Also check the function of the gas pressure switch and set it.

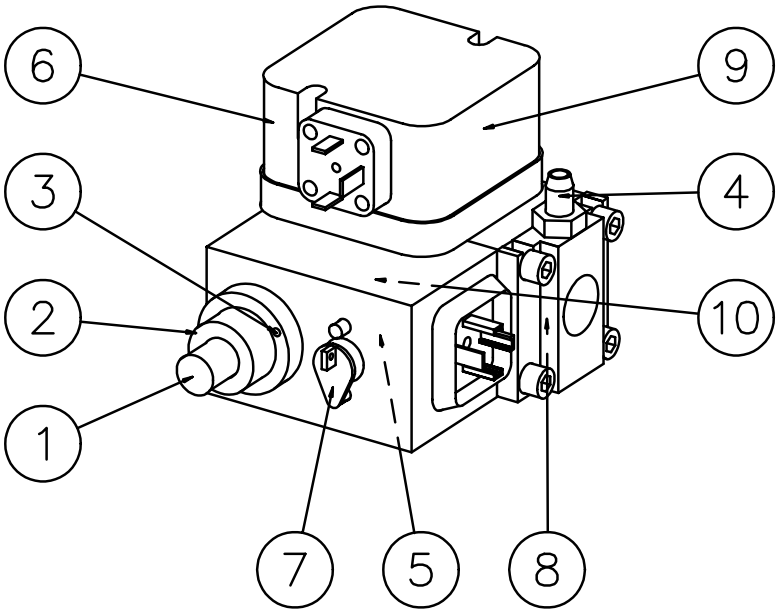
! After completion of the jobs on the gas components, perform leakage control and function control.

6.4 MultiBloc MB-DLE 403

Max. inlet pressure:

- MB-DLE 403: 200 mbar
  Adjustable governor pressure: 4-50 mbar.

Solenoid valve:
Slow opening valves with adjustable start load and max. flow.



All gasline components shall be assembled and mounted without bending, torque and outher mechanical or thermal stress.

1. Protective cover start load adjustment
2. Hydralic damping
3. Fixing screw
4. Test nipple (inlet pressure)
5. Test nipple (pressure after go-vernor)
6. Test nipple (pressure in inner assembly)
7. Governor
8. Filter
9. Gas pressure switch
10. Solenoid valve

172 515 45-2

Flow adjustment

Loosen the fixing screw (a), turn the hydraulic device (b):

- to the right = the gas flow is reduced
- to the left = the gas flow is increased

Do not forget to tighten the fixing screw.

The flow adjustment can also be made by means of the governor. Adjust the outlet pressure to a value giving the desired gas flow on the fully open valve. At small capacities (gas flows) it is also necessary to adjust as above.

Adjustment of start gas flow

Remove the protective cover (c).

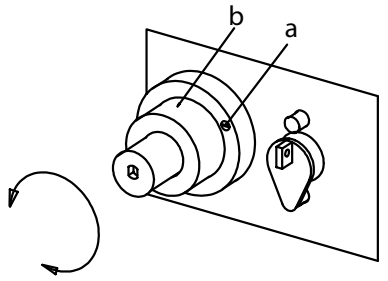
Turn the adjustment knob (d) (use the protective cover as a tool) to the desired start gas flow.

- Turn to the right = start gas flow is reduced
- Turn to the left = start gas flow is increased

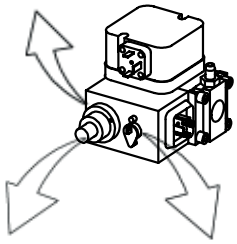
Adjustment of governor

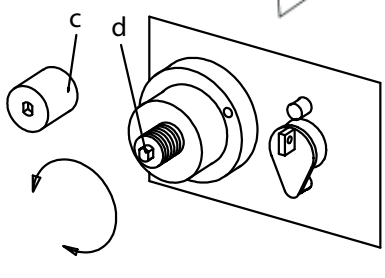
Adjust outlet pressure from governor by means of a screw. Min. and max. outlet pressures corresponds to appr. 60 turns of the spring. It is not possible to change pressure springs in order to change the outlet pressure.

- Turn to the right = outlet pressure is increased
- Turn to the left = outlet pressure is reduced

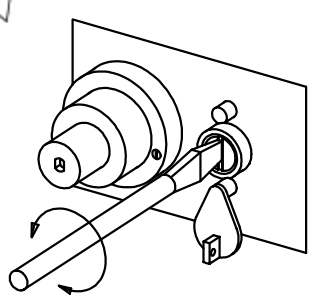


Flow adjustment





Adjustment of start gas flow



Adjustment of governor

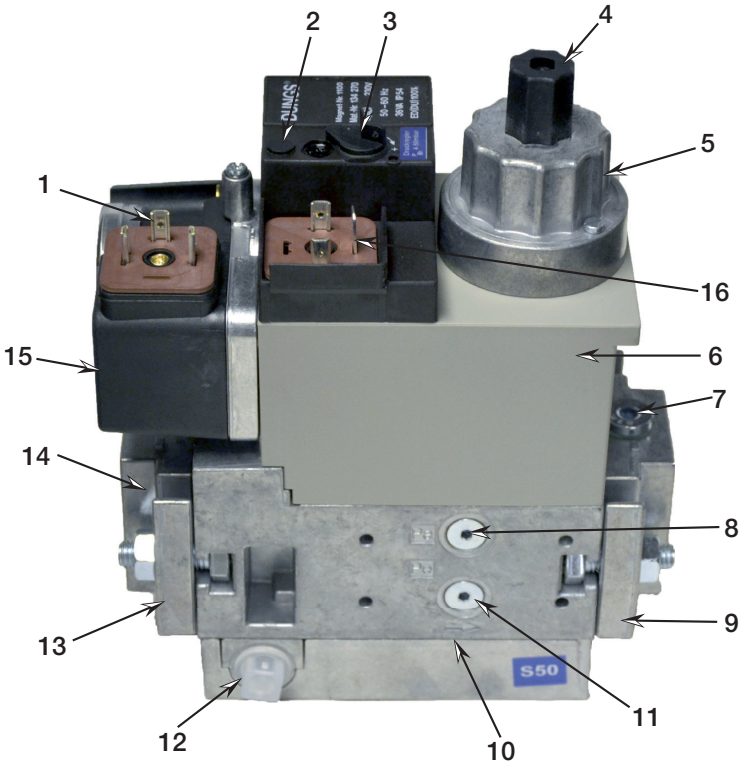
6.5 MultiBloc MB-DLE BO1, 405 - 420

Max. inlet pressure: 360 mbar.

Adjustable governor pressure:

- 405 - 412 S50 = 4 - 50 mbar
- 415 - 420 S20 = 4 - 20 mbar
- 415 - 420 S50 = 20 - 50 mbar

Solenoid valve:
Slow opening valves with adjustable start load and max. flow.



All gasline components shall be assembled and mounted without bending, torque and other mechanical or thermal stress.

1. Electrical connection for pressure switch (DIN EN 175 301-803 connector)
2. Operation display V1, V2 (optional)
3. Lead seal eye, Gouvernor adjustment
4. Setting cap
5. Hydraulic brake / setting plate
6. Solenoid
7. Test point connection G 1/8 possible
8. Test point connection G 1/8 downstream of valve 1, possible on both sides
9. Output flange
10. Gas flow direction
11. Test point connection G 1/8 upstream of V1, possible on both sides
12. Vent nozzle, regulator
13. Filter (below flange)
14. Input flange
15. Pressure switch
16. Electrical connection for valves (DIN EN 175 301-803 connector)

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Flow adjustment

Loosen the fixing screw (a), turn the hydraulic device (b):

- to the right = the gas flow is reduced
- to the left = the gas flow is increased

Do not forget to tighten the fixing screw.

The flow adjustment can also be made by means of the governor. Adjust the outlet pressure to a value giving the desired gas flow on the fully open valve. At small capacities (gas flows) it is also necessary to adjust as above.

Adjustment of governor

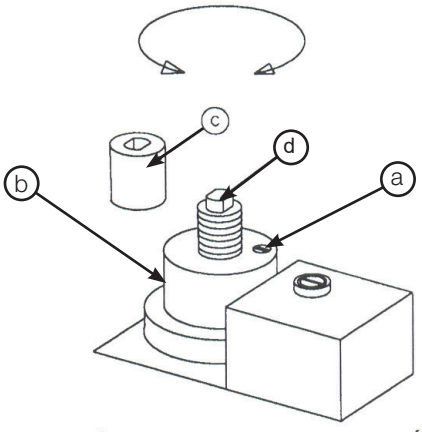
Adjust outlet pressure from governor by means of a screw . Min. and max. outlet pressures corresponds to appr. 60 turns of the spring. It is not possible to change pressure springs in order to change the outlet pressure.

- Turn to the right = the outlet pressure is increased
- Turn to the left = the outlet pressure is reduced

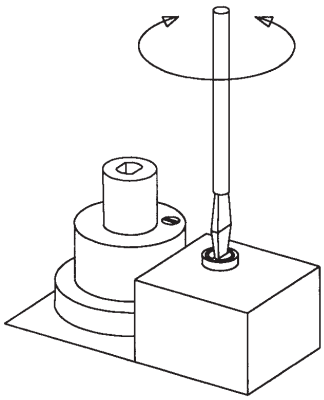
Adjustment of start gas flow

Remove the protective cover (c).
Turn the adjustment knob (d) (use the protective cover as a tool) to the desired start gas flow.

- Turn to the right = the start gas flow is reduced
- Turn to the left = the start gas flow is increased



Adjustment of start gas flow

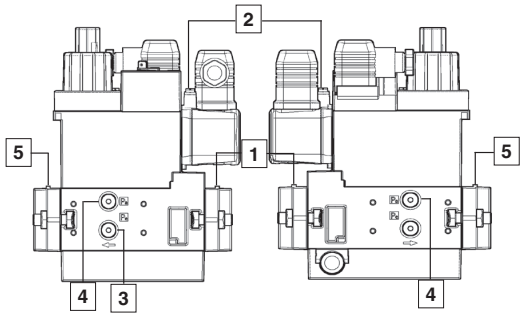


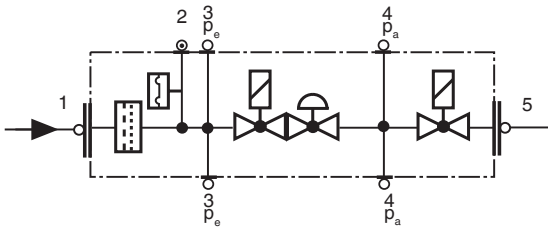
Adjustment of governor

Pressure taps

1, 3, 4, 5 Screwed sealing plug G 1/8

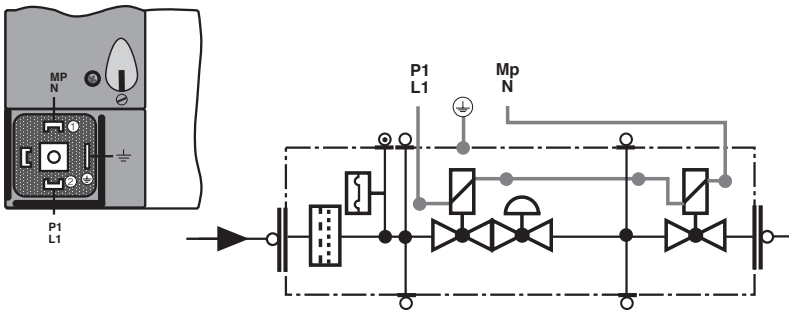
2 Measuring nozzles





Electrical connection

S 20/S 50



7. General instructions

7.1 Flame monitoring and ionisation current check

The burner is monitored according to the ionisation principle. The ionisation current should be checked at initial starting and at each service visit.

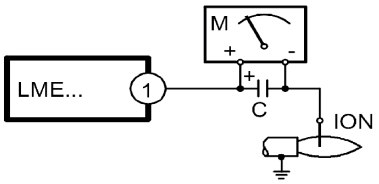
The reason for low ionisation current can be leakage current, poor connection to earth, fouling or incorrectly placed ionisation electrode in the combustion head. Sometimes incorrect gas-air mixture can also be the cause of poor ionisation current.

The ionisation current is measured with a microamperemeter (µA DC) which is connected in series with the ionisation electrode and gas burner control.

Connect the µA-meter as in (see Fig. 6.1.1) Min. required ionisation current for different gas control units is indicated in the table below. In reality, this current must be significantly higher, preferable more than 15 µA. The connection of the µA instrument is facilitated by the fact that all gas burners are equipped with a detachable ionisation cable.

Gas burner control	Connection to the board in gas burner control	Min. required ionisation current	Normal ionisation current
LME	1	5 µA	8 - 25 µA

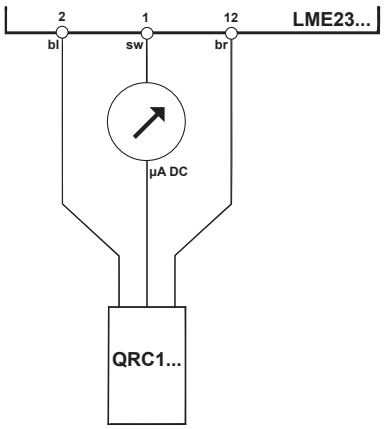
7.1.1 Flame monitoring ionisation



7.1.2 UV –detector (QRC)

Should not be exposed to temperatures higher than 60 °C. The current passing through the UV-detector, when it is lighted, should be at least 70 µA. The current can be measured with a moving coil instrument. A check is necessary only if a malfunction is suspected.

7.1.3 Flame monitoring UV-detector (QRC)



172 525 30-2

7.2 Setting the air pressure switch

The air pressure switch should block the burner if the air quantity supplied for combustion is insufficient. The air pressure switch must be set so that, if there is a defective air supply at the burner's max. or min. capacity, it reacts before the monitored pressure falls so much that it results in poor combustion.

Setting range approx:		
LGW 10	1-10	mbar
LGW 50	2,5-50	mbar

1. Remove the protective cover, screw (Y).

> **!** Be careful when adjusting the air pressure switch; it contains a live component.

2. Start the burner.
3. Carefully turn the scale on the air pressure switch clockwise until the air pressure switch stops the burner.
4. Try to find the pressure at which the burner stops for both the minimum and maximum input power by turning the scale. Make a note of the values and then set the air pressure switch on the basis of the highest pressure noted at which the burner stopped.
5. The air pressure switch should be set to a pressure approx. 10–15% lower than the highest noted pressure at which the burner stopped.
6. After setting the air pressure switch, perform repeated starts and run through the burner's set output range several times. This is to ensure the reliable function of the burner. If breakdowns or interruptions occur, the air pressure switch is probably set to a too narrow position.
7. Fit the protective cover, screw (Y).

7.3 Setting the min. gas pressure switch

The min. gas pressure switch should react to a burner connection pressure that is too low and in such cases prevent the burner from starting. If the connection pressure to the burner is too low during operation, the min. gas pressure switch should stop the burner. The burner can start again once the connection pressure has risen above the pressure set for the min. gas pressure switch.

1. Remove the protective cover, screw (Y).
2. Open the pressure outlet (X) and connect a manometer to measure the connection pressure.
3. Start the burner.
4. Measure and make a note of the connection pressure to the burner during normal operation at the highest input power.
5. Based on the desired connection pressure set, determine the connection pressure at which the gas pressure switch should stop the burner. Set the connection pressure at which the burner is stopped at a level where the burner is stopped before poor combustion occurs.
6. Set the min. gas pressure switch to this value by turning the scale.
7. Check the setting by carefully closing the ball valve while measuring the connection pressure.
8. When the min. gas pressure switch stops the burner, the value measured should then approximately correspond to the setting on the min. gas pressure switch. The tolerance on the scale for the min. gas pressure switch is approx. ±15%.
9. Open the ball valve.
10. Remove the pressure gauge and close the pressure outlet (X).

> **!** Check the gas tightness.

11. Fit the protective cover, screw (Y).

7.4 Handing over of the installation

- Perform repeated start tries to check that the settings work.
- Close the ball valve during operation to check that the gas pressure switch breaks at set value.
- Remove the hoses for the air pressure switch to check that the burner goes into blocking.
- Check the gas installation for leaks.
- Check that all protective covers and test nipples are installed and tightened.
- Fill out required test protocols.
- Instruct operating staff in the care and maintenance of the system and how to react in case of breakdown.
- Review and service should be performed by authorized personnel only.

8. Electrical equipment

8.1 Safety system

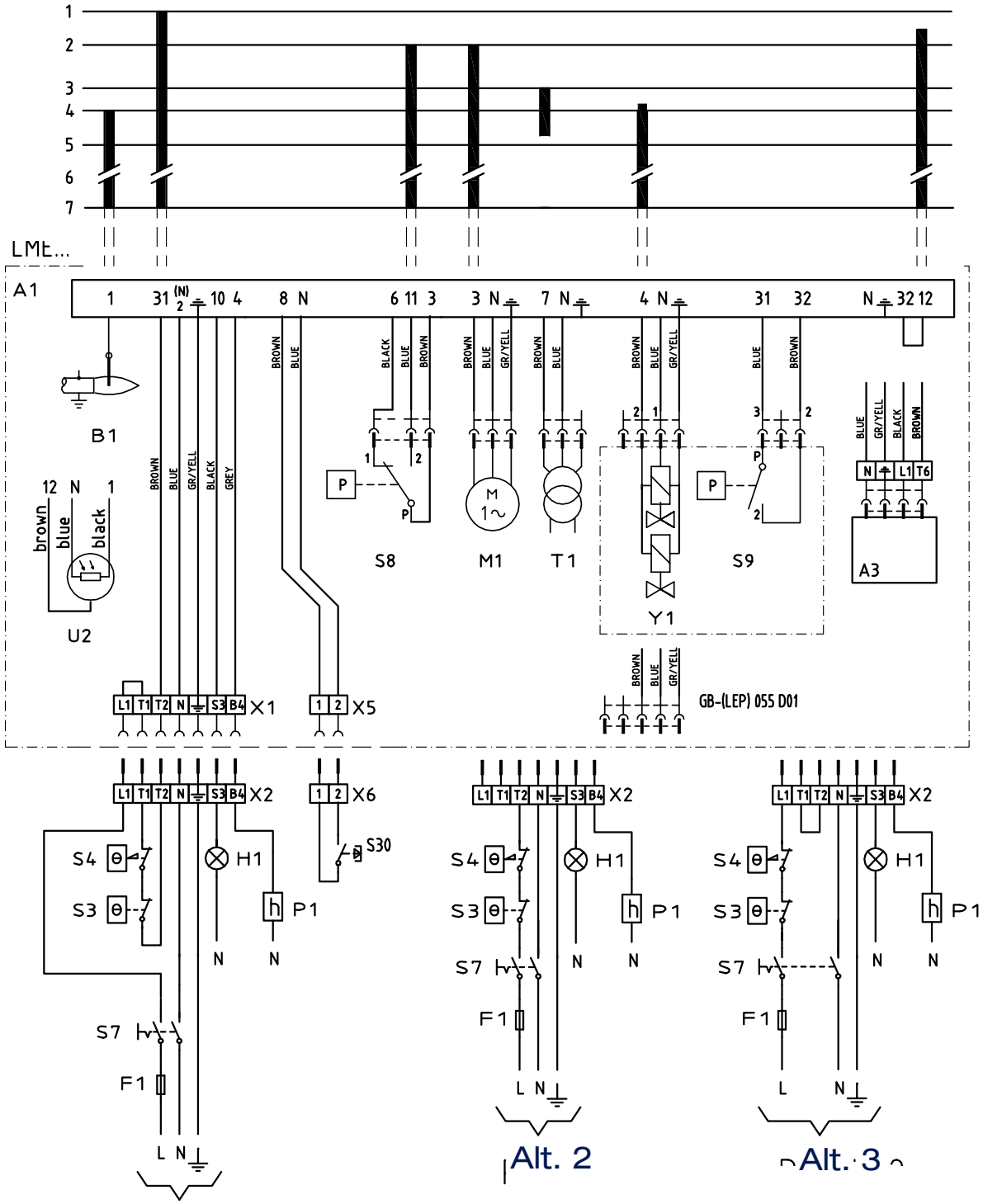
Safety systems must be installed in accordance with current regulations for the facility. This can differ between different systems in which the burner is installed, see the rules and regulations that apply.

The cables of the safety system must be separated so that the outgoing signal is not placed in the same cable as the incoming signal. These signals must be laid in two different cables.

The safety system such as safety switches for doors, doors, water level, pressure, temperature and other safety devices must be installed in the safety circuit according to the rules for the system.

172 525 31

8.2 Wiring diagram



8.2.1 List of components

A1	Gas burner control
A3	Valve, leak tester, Dungs VPS504 (optional)
A7	RC circuit
B1	Ionisation electrode
U2	UV-sond QRC (LME23...)
F1	Fuse
H1	Lamp, operation
M1	Burner motor
P1	Timer total operating time
S3	Control thermostat
S4	Temperature limiter
S7	Main switch
S8	Air pressure switch
S9	Gas pressure switch
S30	External reset
T1	Ignition Transformer
Y1	Solenoid valve
X3	Plug-in contact, burner
X4	Plug-in contact, boiler
X17	Plug-in contact, burner external reset (optional)
X18	Plug-in contact, boiler external reset (optional)

8.2.2 Function LME...

1.	**Operating switch ON-Thermostat ON-Gas pressure switch ON** A check that the air pressure switch **does not** indicate fan pressure is carried out.
2.	**Burner motor starts** A check that the air pressure switch indicates sufficient fan pressure is carried out.
3.	**The ignition spark is created**
4.	**The gas solenoid valve is open** The gas is ignited. The ionisation electrode now indicates a flame.
5.	**The safety time expires** The ignition spark ceases. The safety period ceases. If the spark is missing or it disappears after this time limit, the gas burner control is blocked.
6.	**Operating position**
7.	**Stop** The operation of the burner can now be stopped with the control switch or thermostat.
	If the gas burner control is blocked Red light in the gas burner control is lit. The burner is restarted by pushing the reset button.

8.3 Control program at faults; fault mode indicator LME ....

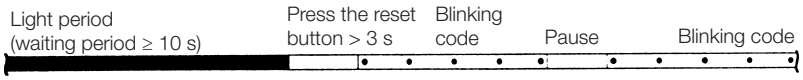
8.3.1 Colour codes

Table colour codes for multi-coloured signal light (LED)		
Status	Colour codes	Colours
Waiting period «tw», other waiting periods	○.....	Off
Ignition phase, ignition controlled	•○ •○ •○ •○ •○ •	Blinking yellow
Normal operation	□.....	Green
Operation, poor flame signal	□○□○□○□○□○	Blinking green
Illegal flame signal during start-up	□▲□▲□▲□▲□▲	Green-Red
Undervoltage	●▲●▲●▲●▲●▲	Yellow-Red
Fault, alarm	▲.....	Red
Blinking code for fault codes	▲○ ▲○ ▲○ ▲○	Blinking red
Interface diagnostics	▲▲▲▲▲▲▲▲	Red flicking

.....	Continuous
○	Off
▲	Red
●	Yellow
□	Green

8.3.1.1 Diagnosing alarm causes

After alarm disconnection, the red alarm signal light is lit continuously. The diagnosing of the alarm cause can be read according to the following sequence:



8.3.1.2 Limiting of starting repetitions

LME 11... has a function with start repetition if the flame is not created at start or disappears during operation.. LME 11... allows max. three repetitions during continuous starting cycle.

8.3.1.3 Alarm code table

Red blinking code on signal lamp (LED)	Possible causes
Blinking 2 x ..	No flame creation at End of “TSA” - defective or fouled flame monitoring - defective or fouled fuel valves - poor burner setting - defective firing device
Blinking 3 x ...	“LP” defective - No air pressure switch signal after “t10” - “LP” is welded in open position
Blinking 4 x	Illegal flame signal during start-up
Blinking 5 x	Time out “LP” - “LP” is welded in open position
Blinking 6 x	Free
Blinking 7 x	Too many flame disappearances during operation - poor burner setting - defective or fouled fuel valves - defective or fouled flame monitoring
Blinking 8 x	Free
Blinking 9 x	Free
Blinking 10 x	Connection fault or internal fault, outgoing contacts or other faults
Blinking 14 x	CPI contact not closed

During the diagnosing of the alarm cause, the control outputs are voltage-free.

- The burner is disconnected.
- Exception, alarm signal «AL» at board 10.
- Reconnection of the burner happens after resetting only.
- Press the reset button 0.5...3 s.

8.3.1.4 Interface diagnostics

To change to interface mode, press and hold the reset button longer than 3 s. To go back to the normal position, press and hold the reset button longer than 3 s. If the gas burner control is in the alarm position, it is reset by pressing the reset button 0.5...3 s.

9. Troubleshooting

Gas Burner

Conditions favourable to disruption-free operation of the system can only be guaranteed through the interaction between three factors – electricity, gas flow and combustion air. A change in any of these factors may cause disruptions.

It has been shown that a large proportion of disruptions can be attributed to relatively small things. Therefore, before requesting servicing, you should ascertain the following:

1. Are the system's gas taps open?
2. Are the fuses intact and is the power on?
3. Are control devices (room thermostat, boiler thermostat, etc.) correctly set?
4. Is gas pressure to the burner sufficient?
5. Are the burner controls on standby and not locked?
6. Is air supply to the burner adequate?

Cause of fault	Action
Burner does not start:	
No gas.	Make sure all gas taps are open.
No power.	Check the fuse, thermostat and electrical connections.
Burner motor does not start.	Motor protection has tripped. Motor faulty.
Burner control faulty.	Replace.
Burner motor running, no ignition spark at the end of pre-aeration:	
No power in the terminals.	Check the connector. Replace faulty burner controls.
Ignition electrodes in contact with each other or earth.	Adjust.
Ignition electrode porcelain damaged.	Replace the electrodes.
Poor connection to cable connectors.	Adjust connection.
Ignition cables damaged.	Replace.
Transformer damaged, no power to secondary winding.	Replace the transformer.
Ignition cable and ionisation cable swapped around.	Reconnect.
No flame propagation:	
Gas solenoid valve faulty.	Replace.
Gas solenoid valve does not open despite having power.	Replace solenoid valve terminals, or entire valve.
No power to solenoid valve.	Check the connection.
No electrical connection through air pressure gauge.	Check the air pressure gauge's settings and functions.
Ignition load incorrectly set.	Increase/decrease gas supply Reduce airflow.
Burner control faulty	Replace
Air pressure gauge incorrectly set or faulty	Check the settings and reset, or replace
No acknowledgement signal due to incorrect adjustment or misalignment of the control motor cams.	Check the settings and realign.

Cause of fault	Action
Burner trips after safety time limit despite flame propagation:	
No ionisation current or UV cell incorrectly positioned.	Adjust ionisation electrode and UV cell Check cables and connectors.
Burner control monitor faulty.	Replace burner control.
Voltage lower than 185 V.	Contact an electrician.
Ignition electrodes disrupting ionisation current.	Adjust ignition electrodes. Re-polarise the transformer.
Poor earth connection.	Ensure adequate earth connection.
Phase and neutral swapped around.	Check wiring diagram and change accordingly.
Burner trips during pre-aeration:	
Air sensor faulty or incorrectly set.	Increase/decrease air setting. Reduce air volume.
Ignition load incorrectly set.	Increase/decrease gas supply Reduce airflow.
Gas pressure too low.	Increase pressure. If necessary, contact gas supplier.
Pulsations at start-up:	
Ignition electrodes incorrectly set.	Adjust .
Gas pressure too high.	Check and adjust using pressure gauge and pressure control valve.
Flue gas side blocked.	Check the chimney flue.
Burner pulsates during operation:	
Burner incorrectly set.	Adjust.
Burner dirty.	Clean the burner.
Incorrect chimney.	Check and modify dimensions if necessary.
Burner functioning properly but with occasional blockage:	
Ionisation current too low.	Check. Must be at least 6 µA, but should ideally lie between 8 and 20 µA.
UV cell incorrectly positioned.	Adjust.
Voltage drop at certain times.	Must not drop below 15% of rated voltage. Contact an electrician if necessary.
Incorrectly set or faulty air sensor.	Check the settings and reset, or replace.
Ignition electrode overload.	Replace.
Burner control ambient temperature too high.	Insulate for heat, Max. 60 °C.
Ignition spark too weak.	Check the transformer.
Poor combustion:	
Poor draught conditions.	Check the chimney.
Flue gas temperature too high.	Boiler overloaded Decrease the gas volume, sweep the chimney if necessary.
CO_2 content too low.	Choke the air supply. Check the boiler for any leakages. Choke the draught if too high.

Cause of fault	Action
CO content too high:	
Surplus air when using natural gas and liquefied petroleum (propane, butane).	Choke the air supply.
Poor air supply.	Open the air supply. Check flue gas damper.
Holes in gas nozzle clogged.	Clean.
Poor fresh air intake.	Check and increase.
Flame at incorrect angle due to combustion head out of position.	Check the combustion head and readjust.
Condensation build up in boiler and chimney:	
Flue gas temperature too low or gas volume too low.	Raise the flue gas temperature by increasing gas volume Insulate the chimney.

EU Declaration of conformity

CE

Bentone Gas Burners

Certificate No.	Type	Certificate No.	Type
CE-0123CT1269	BFG 1	CE-0123CT1326	BG 550
CE-0123CT1270	STG 120	CE-0123CT1337	BG 600
CE-0123CT1281	STG 146	CE-0123CT1348	BG 650
CE-0123CT1292	BG 300	CE-0123CT1359	BG 700
CE-0123CT1304	BG 400	CE-0123CT1360	BG 800
CE-0123CT1315	BG 450	CE-0123CT1371	BG 950

This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration described above is in conformity with:

Gas Appliance Regulation 2016/426/EU

Machinery Directive 2006/42/EC

EMC 2014/30/EU

Restriction of the use of certain hazardous substances (RoHS) Directive 2011/65/EU

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

EN 676+A2:2008	Excluded Annex J/K. Automatic forced draught burners for gaseous fuels

Additional information can be downloaded at:

www.bentone.com

Enertech AB
Box 309
S-341 26 LJUNGBY

Ljungby, January 26th 2021

Helene Richmond

Managing Director

Enertech AB

10. General instructions for gasburners

10.3.1 Installation

1. Follow standards and instructions applicable to the installation of gas burners.
2. Ensure that the electric installation is made in accordance with existing regulations.
3. Check that the fresh air intake of the boiler room is sufficiently dimensioned.
4. Check by studying the data plate that the efficiency of the burner is adapted to the boiler output.
5. Check that the burner is adapted to the gas quality in question.
6. Check that the input pressure of the gas is correct.
7. Check that the dampers of the boiler are open.
8. Check that there is water in the system.
9. Check that thermostats etc. are correctly adjusted.
10. Read the instructions and follow the directions given for the burner as to starting-up and service.

10.3.2 Maintenance

General instructions

1. Keep the boiler room clean.
2. Ensure that the fresh air intake of the boiler room is not restricted.
3. Switch off the current and shut off the gas supply if the burner must be withdrawn from the boile.r
4. Do not use the boiler for burning paper and waste if there is no special arrangement (fire room) for this.

Normal operation

1. Ensure that the air supply to the burner is not obstructed by dust and dirt.
2. Have the installer make a yearly overhaul of the installation so that safety is not jeopardized.
3. Have the installer at the yearly overhaul also adjust the burner to ensure optimal combustion economy.
4. Check periodically that there is water in the system (fill up if necessary) and that thermostats etc. are normally adjusted.
5. Ensure that there is no water or dampness in contact with the burner.

10.3.3 If the burner has stopped

1. Press the reset button of the relay.
2. Check that the max. thermostat has not cut out.
3. Check other thermostats for example room ther mostat, if any.
4. Check that the gas pressure to the burner is sufficient.
5. Check that the electric fuses have not blown.
6. Make a new attempt to start the burner and check the counter of the gas meter to find out whether the solenoid valve opens.
7. If the burner does not start in spite of repeated starting attempts call the installer.

10.3.4 Shut-Off

1. Switch off the current with the main switch.
2. Shut-off the gas supply with the shut-off cock on the burner.

10.3.5 Warning

1. Never keep your face in front of the fire room door when starting up the burner.
2. Do not use naked flame when inspecting the fire room.

Authorized installer::

Address: ---

Telephone: ---

Bentone®

Service- and inspection card

Installation	Boiler	
Name:	Type:	Efficiency kW:
Address:	Burner	
	Type:	Efficiency kW:
Installed by:	Date:	

Date		Governor		CO_2	CO	Fluegas temp	Ionisation current	Pressure		Efficiency
	Nm^3 gas/h							Fire room	Chimney	
Measu-rement		Before	After	%	%	°C	µ A	mbar	mbar	%
	Small Flame									
	Large Flame									
	Measures									

Date		Governor		CO_2	CO	Fluegas temp	Ionisation current	Pressure		Efficiency
	Nm^3 gas/h							Fire room	Chimney	
Measu-rement		Before	After	%	%	°C	µ A	mbar	mbar	%
	Small Flame									
	Large Flame									
	Measures									

Date		Governor		CO_2	CO	Fluegas temp	Ionisation current	Pressure		Efficiency
	Nm^3 gas/h							Fire room	Chimney	
Measu-rement		Before	After	%	%	°C	µ A	mbar	mbar	%
	Small Flame									
	Large Flame									
	Measures									

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