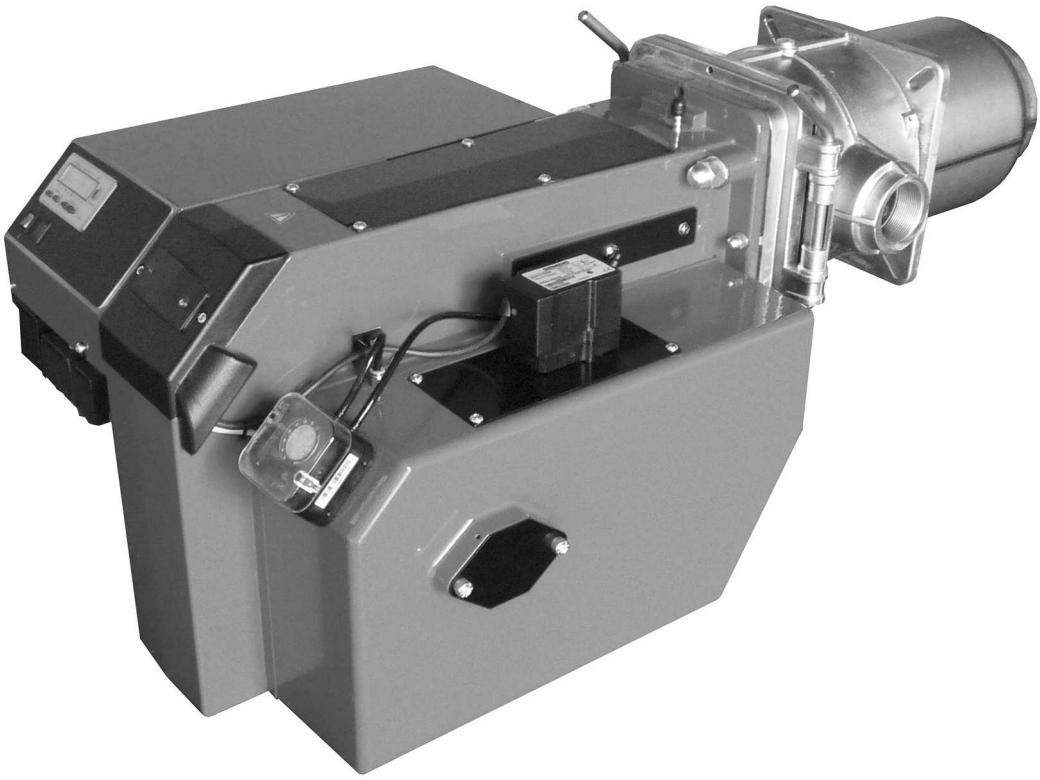
GIERSCH

Technical Information • Installation Instructions

MG20-ZM-L-LN

Gas

Issued in April 2024
Subject to tech. modifications
to improve the product!



CE

GB

Contents

1 General information

Installation of a gas-fired heating system must be performed in accordance with the applicable regulations and guidelines. It is therefore the duty of the installer to be fully familiar with all regulations. Installation, start-up and maintenance must be performed with utmost care.

The burner must not be operated in rooms with high levels of air humidity (laundry rooms), dust or corrosive vapours. The boiler room must be ventilated accordingly with ventilation air.

Giersch MG Series gas burners are suitable for combustion of natural gas in accordance with DIN EN 437 and are in compliance with the DIN EN 676 European standard.

2 Checking scope of supply and electrical ratings

Before installing the gas burner, please check the scope of delivery.

Scope of delivery:
burner housing, gas jacket with burner pipe, mounting kit, documentation and gas train.

Gas installation and commissioning are subject to the applicable national regulations, e.g. in Germany the Technical Regulations of the DVGW (DVGW-TR-GI).

The following must be observed for Switzerland: SVGW Gas Provisions G1, G3: Gas installation EKAS Form.
1942: Liquefied gas regulation, Part 2 Regulations of cantonal authorities (e. g. fire department regulations).

The gas pipe must be designed to conform to the flow rate and the available gas flow pressure and routed with the lowest pressure loss over the shortest distance to the burner.

The loss of gas pressure via the gas train and the burner as well as the resistance on the fuel gas side of the heat generator must be less than the connection flow pressure.

Caution !
Observe sequence and through-flow direction of valves and fittings.

3 Maintenance and customer service

The complete system should be checked once a year for proper functioning and leak tightness by an authorised representative of the manufacturer or by another expert.

Only qualified personnel may open only for maintenance, not during on-going operation. Prior to opening/swinging out, de-energise the burner and let it cool down. After completion of work, close the burner again.

Wear protective clothing|/hearing protection when working in the boiler house

We accept no liability for consequential damage in cases of incorrect installation or repair, the fitting of non-genuine parts or where the equipment has been used for purposes for which it was not intended.

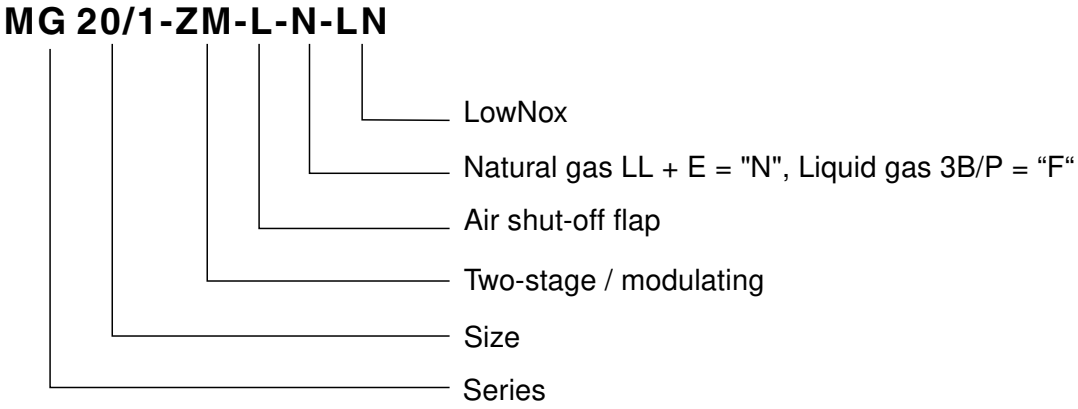
4 Operating instructions

The operating instructions together with this technical information leaflet must be displayed in a clearly visible position in the boiler room. The address of the nearest customer service centre must be displayed on the back of the operating instructions.

5 Instruction of operating personnel

Failures are often caused by operator error. The operating personnel must be properly instructed in how the burner works. In the event of recurring faults, Customer Service should be notified.

6 Key for code designation

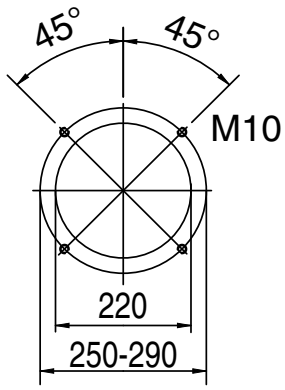


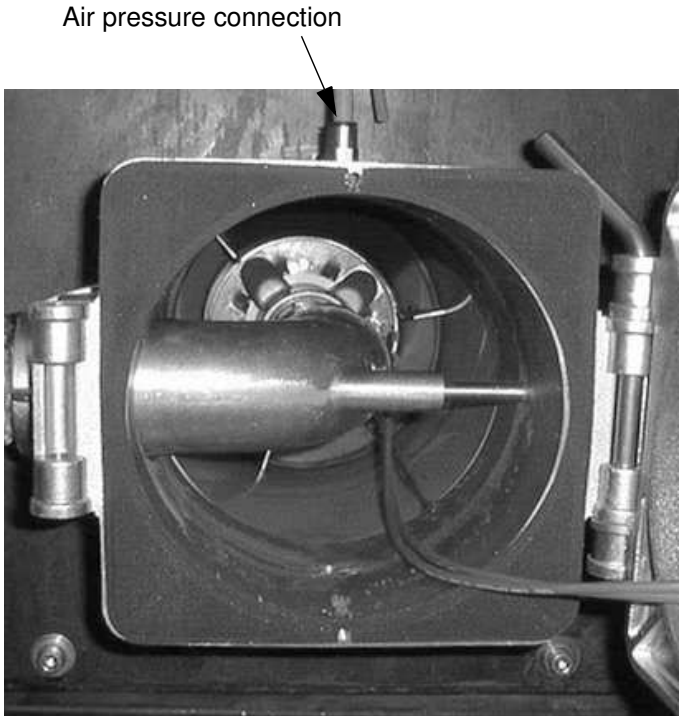
7 Technical specifications

	Burner type	
Technical specifications	**MG20/1-ZM-L-LN**	**MG20/2-ZM-L-LN**
Burner output in kW	224 - 860	247 - 1350
Gas type	Natural gas LL + E= "N", liquid gas 3B/P = "F"	
Mode of operation	Progressive two-stage or modulating	
Voltage	3 / PE ~50 Hz 400 V / T16 A	
Max. power consumption at start / during operation	6.5 A max./ 3.6 A eff.	8.0 A max./ 4.6 A eff.
Electric motor power (at 2800rpm) in kW	1.1	2.2
Flame control	Ionisation	
Burner management system	LMV27	
Weight in kg	56	58
Noise emission in db(A)	≤ 78	≤ 78
Gas burner class	3	
NOx limit	≤ 80 mg/kWh	

8 Boiler connection dimensions

Dimensions in mm

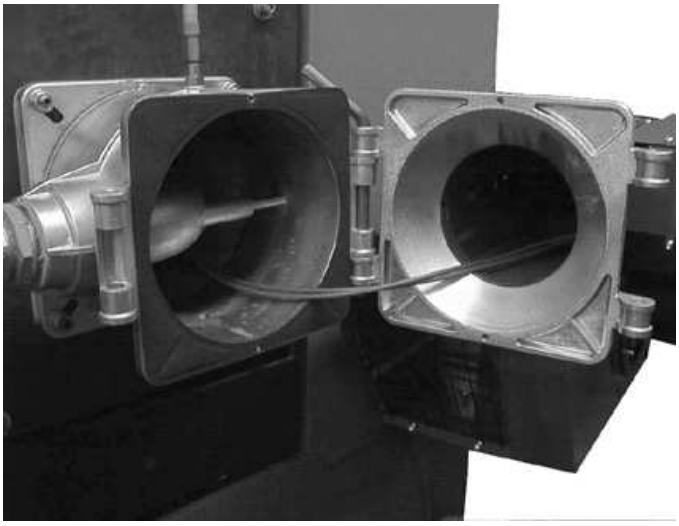




9 Mounting the gas jacket on the boiler

The boiler connection plate must be prepared according to the dimensions specified for the boiler connection dimensions. You can use the gas-jacket gasket as a template.
Screw the gas jacket to the boiler using the four M10 fastening screws with washers and a size Allen key. The air pressure switch for the gas train must be at the top.

10 Mounting the burner housing on the gas jacket (service position)



Position the burner housing in the gas-jacket hinge and secure it with a rod. The burner is now in the service position.

Attach the ignition and ionisation cable to the ignition and ionisation electrodes.

Carefully swing the burner closed.
Do not pinch electrical cables.

Insert the second mounting rod into the hinge. Tighten the screw at the top to secure the burner in position.

11 Gas burner with gas train

Installation of the gas train	
Installation position	only in horizontal line, not tilted.
Minimum distance to masonry	20 mm

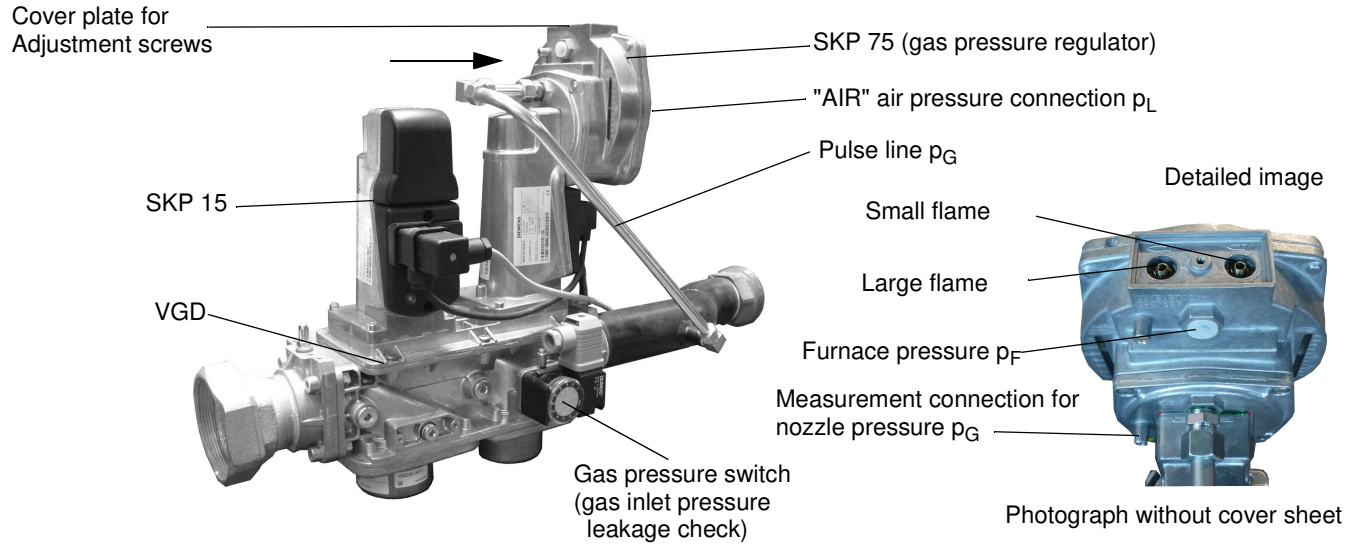
The nipple for the compressed air connection P_L must be screwed in at the top of the gas jacket (see 9. Mounting the gas jacket at the boiler).

Connect the blue hose at the "AIR" connection of the gas train and at the air pressure connection at the gas jacket. The blue hose serves as a control line for the gas train and must be routed in a loose loop without kinking.

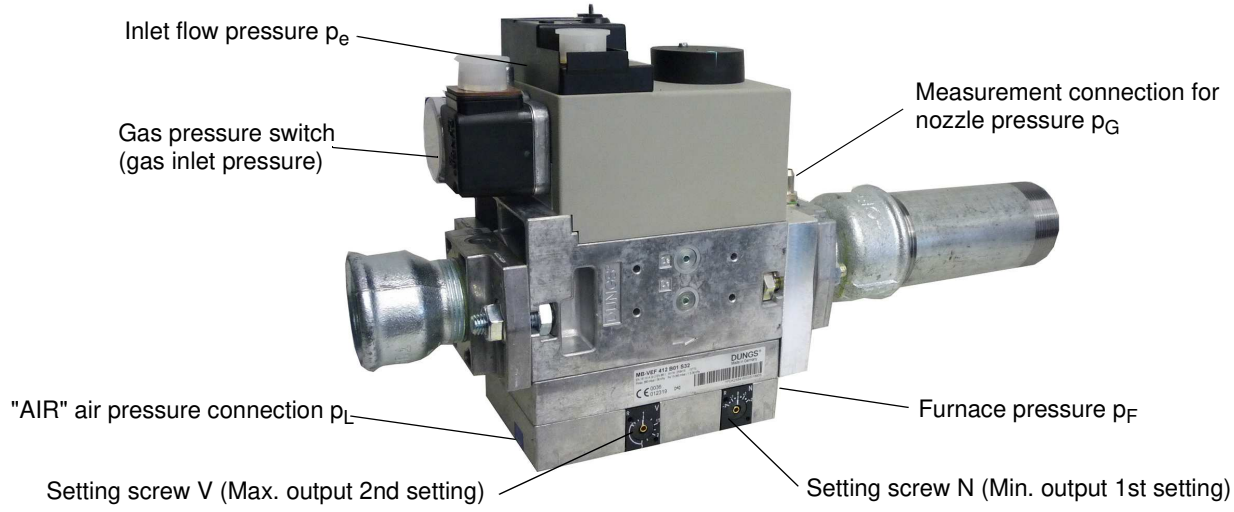
Burner start:

If the burner does not go into operation, turn adjusting screw **N** or small flame slightly in the direction "**+**" and repeat start.

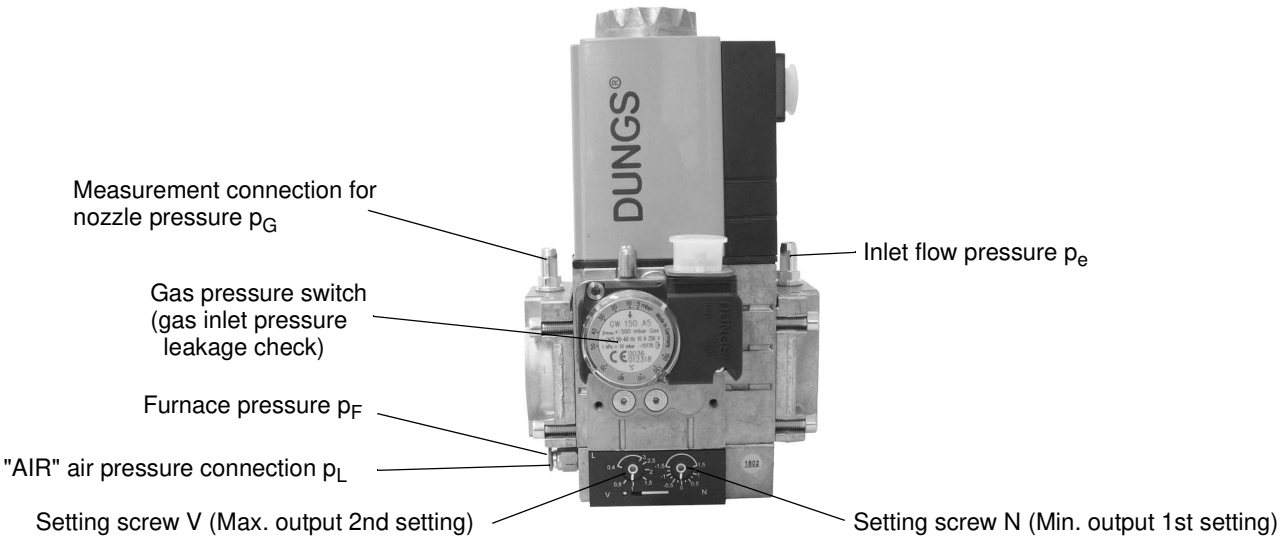
KEV 1 ½", KEV2", KEV DN65 (VGD20.40, VGD20.50, VGD40.65 all SKP15/75).



KEV412 1 ½"(MB-VEF 412)



KEV 300 1" (MBC-300-VEF)



Large flame / "V" setting	Exhaust gas analysis values	
Change in "+" direction if:	CO_2 too low	O_2 too high
Change in "-" direction if:	CO_2 too high	O_2 too low

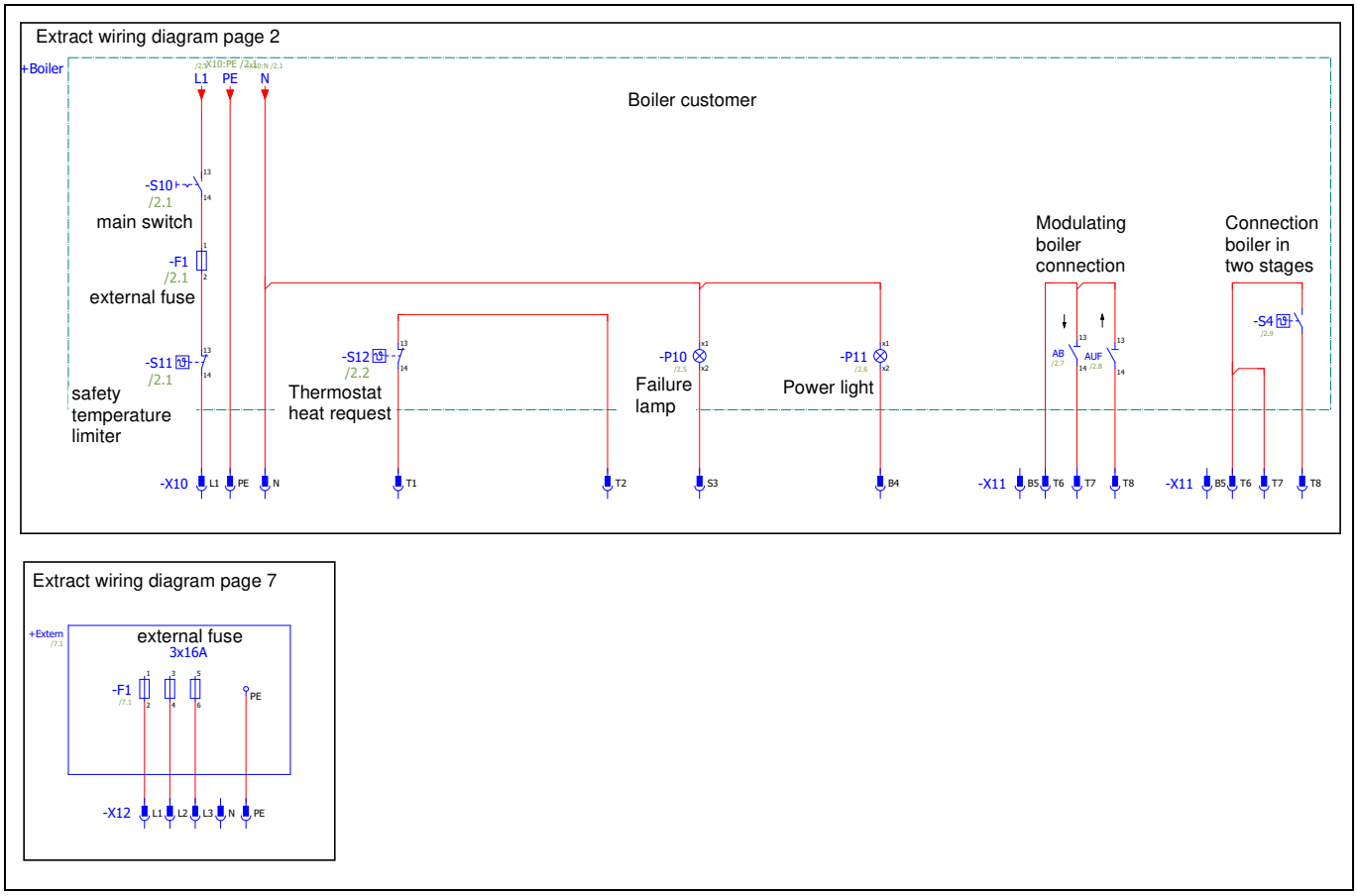
Small flame /"N" setting	Exhaust gas analysis values	
Change in "+" direction if:	CO_2 too low	O_2 too high
Change in "-" direction if:	CO_2 too high	O_2 too low

Caution !
Difference between baffle plate pressure p_L - furnace pressure p_F must be at least 0.3 mbar.

12 Terminal diagram - connector pin assignments

If the male connector has already been wired: check the connections according to the connection diagram!

The electrical connection of the burner must be made in the male connector included according to the connection diagram, taking account of the local regulations.
The supply cable must be fused with max. 10 A fast blow or 6.3 A slow blow and must be routed using flexible cable.

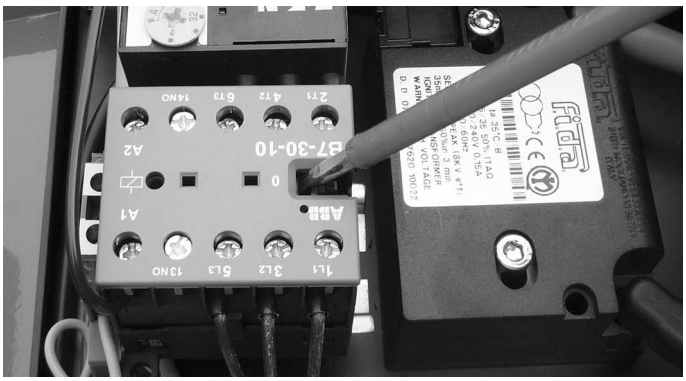


13 Electrical connection

De-energise the burner when carrying out connection work and removing electrical parts!

The burner must be connected to the electricity supply in accordance with the wiring diagram. This work must be performed by trained, qualified electricians. The supply cable to the burner must be of the flexible type.

To access the firing unit, the cover must be brought to the service position. To do this, remove the securing screws (1) and fold the cover down to the left.

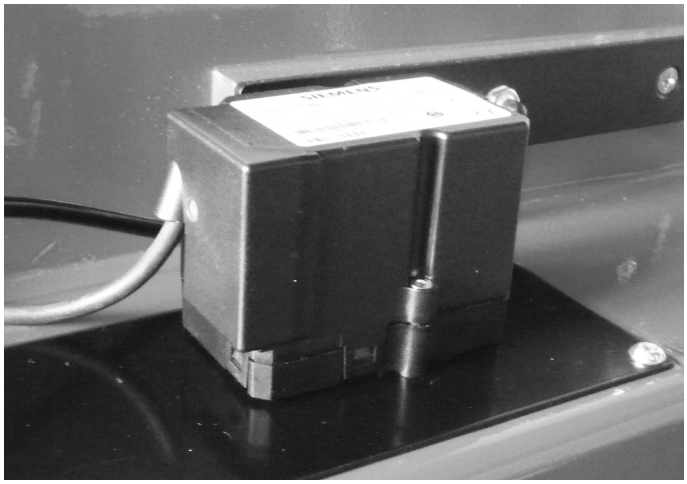


After wiring has been completed, check the direction of rotation of the burner motor by actuating the motor contactor with an insulated screwdriver.
The direction of rotation is correct when the fan wheel turns towards the boiler (also see arrow on the motor flange).

IMPORTANT !

The motor protection relay is set at the factory. The set value should not be modified.

14 Air flap positioning motor



The air flap positioning motor is designed for air flap adjustment on progressive two-stage burners or modulating burners. The motor is activated electronically via the microprocessor-controlled control box.

Do not open the air flap actuator while it is under voltage. The internal optics would be destroyed. No warranty if the seal is broken!

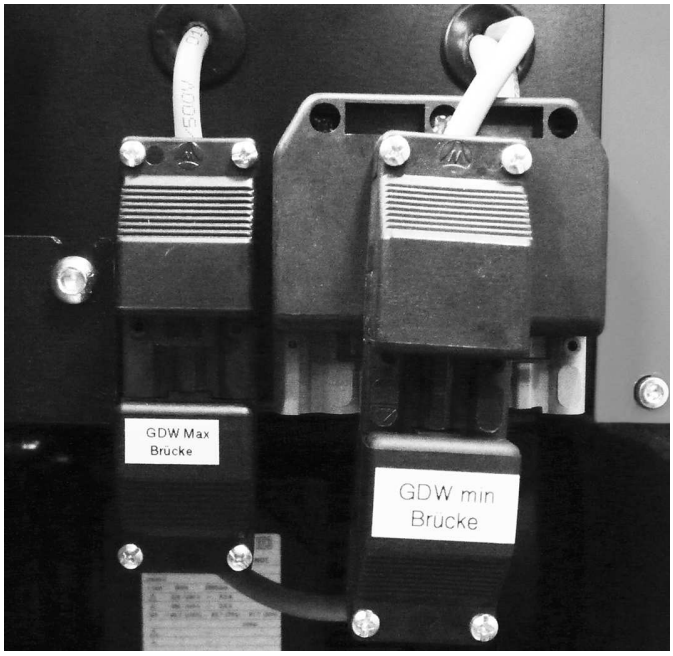
15 Air pressure monitor

The air pressure switch is a differential pressure switch and monitors the air pressure at the forced-air burner.

The air pressure switch is pre-set at the factory.

16 Gas pressure monitor

16.1 Gas pressure switch min.



The **gas pressure switch MIN** at the gas fitting serves to monitor the gas inlet pressure. If the minimum gas inlet pressure is not reached (factory setting), the burner is switched off. The burner automatically starts again when the minimum pressure is exceeded. The gas pressure monitor as **density control DK** generally serves to check the valves and must be set to 50% of the static gas inlet pressure.

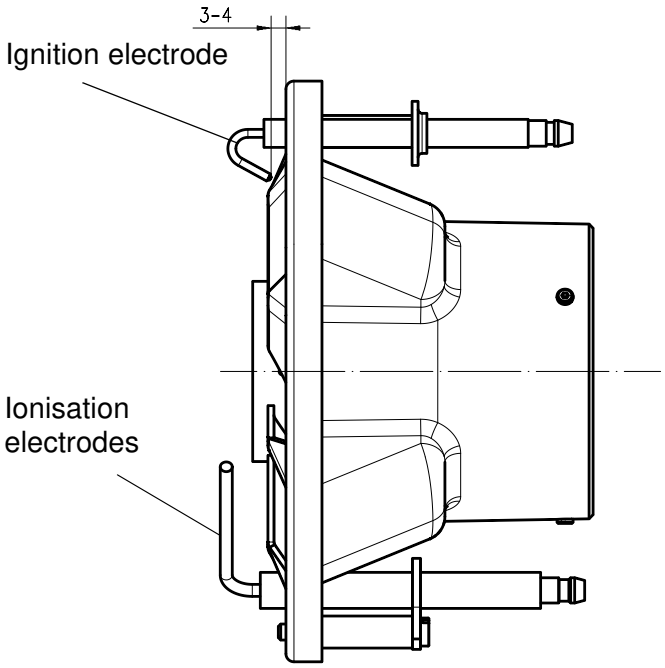
The monitoring of the gas inlet pressure and the tightness control are either carried out only with the gas pressure monitor DK **(the jumper GDW MIN must not be removed)** or with the gas pressure switch MIN and the gas pressure switch DK **(the GDW MIN jumper has to be replaced with the connection of the gas pressure switch MIN)**.

When using the gas cycle MB-VEF 412, the connection is made via the 7-pin connector and is only evaluated as DK MIN. The plug bridge must not be removed

Additional parameterization of the LMV is not required here.

16.2 Gas pressure monitor max.

Optionally a gas pressure switch max. can be incorporated.
The LMV and the wiring have been prepared such that only the jumper in the socket part (brown) at the burner needs to be removed. In addition, the male connector and the gas pressure switch max. must be wired in accordance with the circuit diagram. If the gas pressure switch max. has tripped, a fault is shown in the display (AZL).
First, the gas pressure switch max. must be unlocked; to do this the lid of the gas pressure switch max. must be unscrewed and the red button pressed.
Then, the fault in the display can be deleted (press the **i**/**reset** button for 3 sec.).



17 Set the electrodes

The electrodes are preset at the factory.

18 Flame monitor with ionisation control

If an AC current is applied between the burner and the ionisation rod, a DC current flows due to the rectifying effect of the flame. This ionisation current forms the flame signal and is amplified and passed to control box. A flame cannot be faked because the rectifying effect no longer works if there is a short-circuit between the sensor electrode and the burner.

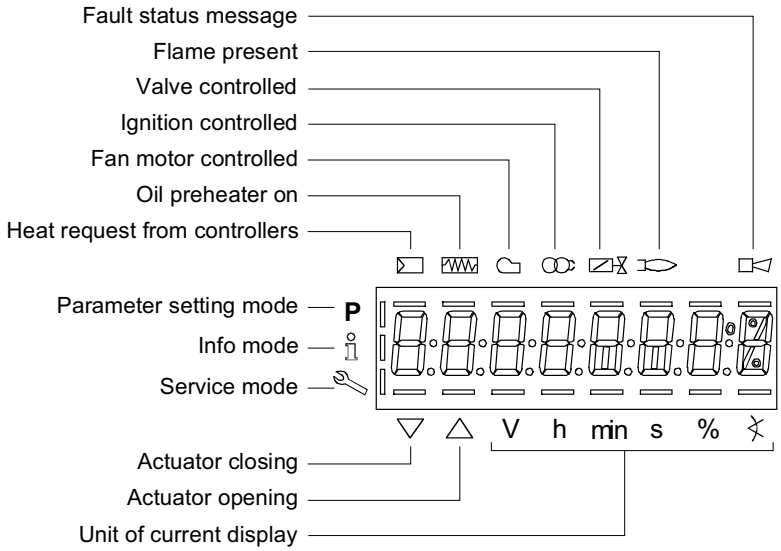
Measuring the ionisation current

The ionisation current must be measured during burner start-up and maintenance or after a fault indication in the control box. This done by disconnecting the plug in the ionisation cable and connecting it to the ionisation measuring cable.
The measurement must be carried out directly after post-ignition during the safety time!
The ionisation current must be at least
1.5 µA. Values below 1.5 µA will result in unreliable operation or a direct fault shut-down. In this case, the ionisation rod and the baffle plate must be cleaned. Bend ionisation rod if necessary. If the ionisation rod is defective, replace it. Possibly reverse the polarity of the ignition transformer on the primary side. Check the cable for moisture and dry it if necessary.

19 Adjustment of the mixer head

Set the position of the mixer head according to burner output in accordance with the table on page 25 ff.

20 Operating instructions and equipment description LMV



Button	Function
F	**F button** - To adjust the fuel drive (Hold down the **F button** and set the value with the **- or + button**)
A	A button - To adjust the air drive (Hold down the **A button** and set the value with the **- or + button**)
VSD F A	**F and A button** - To shift to parametrisation mode **P** (**F and A button** press simultaneously with **- or + button**) - To adjust the speed for frequency converter operation (FC) (**F and A button** press simultaneously with **- or + button**)
i/reset	**Information and enter button** - To navigate in information and service mode * Selection (flashing symbol) increment (press button < 1 s) * To switch to a lower menu level (press button < 1 ... 3 s) * To switch to a lower menu level (press button < 3 ... 8 s) * To switch the operating mode (press button > 8 s) - **Enter** in parametrisation mode - **Unlock** in case of fault - One menu level down
-	**- Button** - Reduce value - For navigating in curve setting, information and service mode
+	**+ Button** - Increase value - For navigating in curve setting, information and service mode
ESC - +	**- and + button: Escape function** (Press **- and + button** simultaneously) - Do not accept the value - One menu level higher

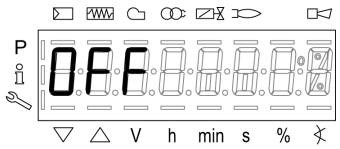
21 Start-up and calibration

Determine burner output according to table page 32 ff. P0 = start level, P1 = 1st step / min. Power, P9 = 2nd stage / max. Power.

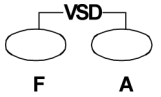
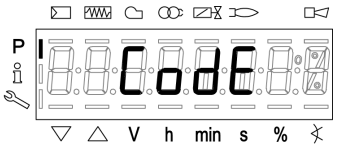
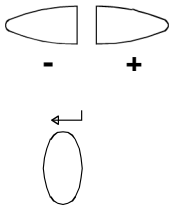
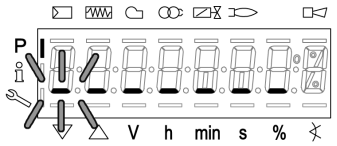
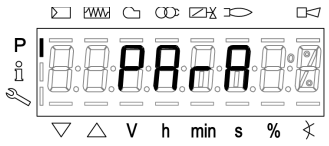
Normally P0 = P1. For condensing boilers, P0 must be set higher than P1. The setting depends on the boiler.

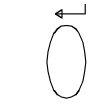
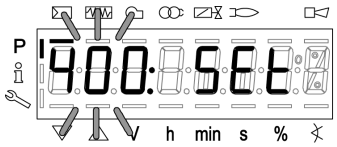
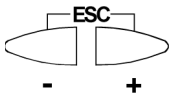
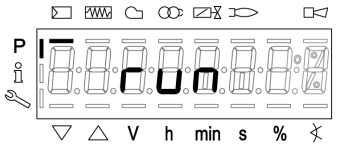
To enter the setting mode, the burner must be in standby mode.Standby means that the burner is supplied with power, gas pressure is built up and none Heat request is present (maintenance switch to position 0).

The combustion managers are configured in the factory and preset to low power.

Action button	Display	Description
		**OFF** means burner off and programmed. **OFF UPr** means burner off and non-programmed.

Enter password

Action button	Display	Description
		Press **F and A button** simultaneously. The display **CodE** appears
		After releasing the buttons, 7 bars appear and the first one flashes. Use the **- or + button** to select a number or letter. Confirm each value with **i/reset**.
		Confirm the password **1234** with **i/reset** after the last input.
		After correct input, the following appears for a max. of two seconds

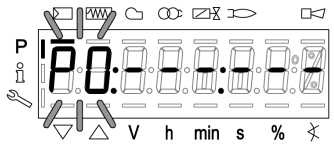
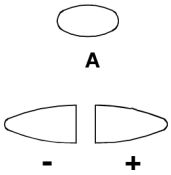
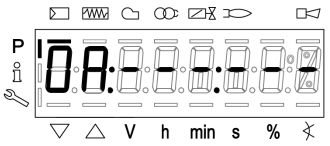
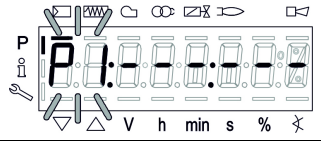
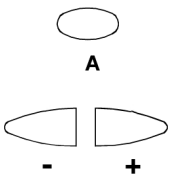
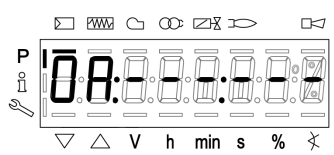
Action button	Display	Description
		Initial commissioning and compound setting
		If the burner control is programmed, run will be displayed. (Starter voltage for curve parameterization)

You have the option of pressing i/Reset directly to the warm setting (page 19)to continue.

Regulation without a flame

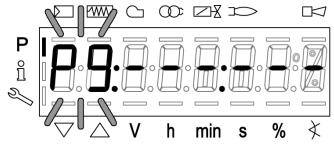
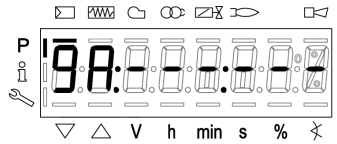
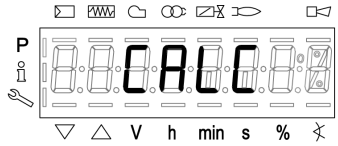
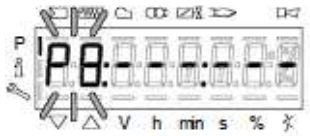
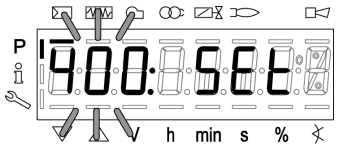
Cold-setting

Use the values from the settings table for the default setting.
When presetting, the maintenance switch should be in position **0**.

Action button	Display	Description
		Set the start position air flap.
		Hold down **key - A** and use the **- or + key** to set the value. Normally P0 = P1. For condensing boilers, P0 must be set higher than P1. The setting depends on the boiler.
		Move to the next curve point.
		Set curve point **P1**
		Hold down **key - A** and use the **- or + key** to set the value.

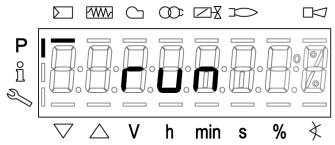
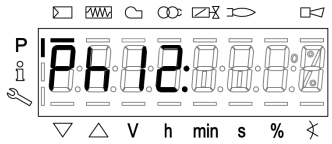
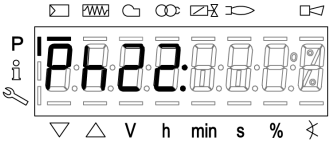
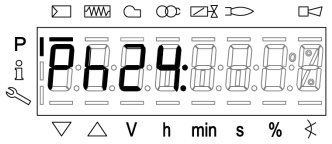
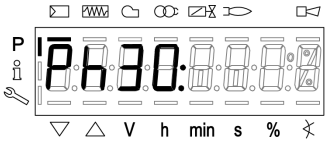
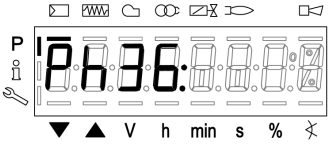
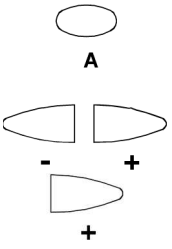
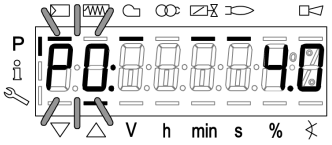
Action button	Display	Description
+		**Press +** to confirm all the curve points until the curve point P9 is reached.

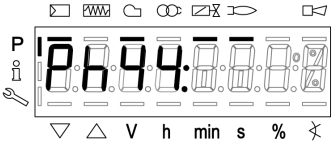
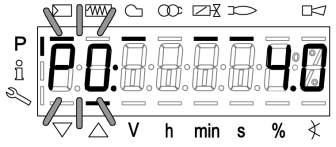
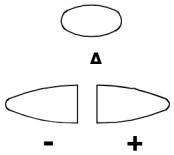
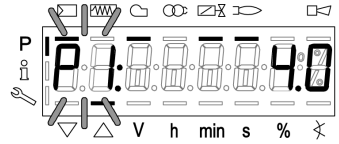
High load preset

Action button	Display	Description
		Set the high load air flap.
A - +		Hold down **button A** and set the value with the **- or + button**.
-		The **- key** is longer than 3 sec. hold down to trigger the calculation **(CALC)**. The points p8 to P1 are automatically calculated and set to a straight line.
ESC - +		Pressing the **ESC key** returns to the parameter level.
i/reset		Pressing **i/Reset key**

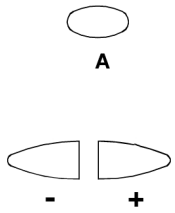
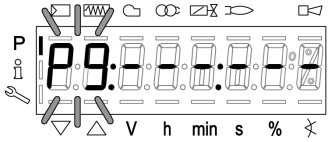
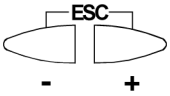
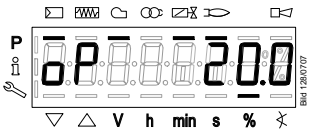
Hot setting, adjustment with flame

Start identifier for curve programming

Action button	Display	Description
 **i/reset**		It will show **run gas.** Press the **i** / **reset key** to start the burner
		Burner start with pre-ventilation.
Maintenance switch 0/1		Heat request **ON** Burner starts with the pre-purge
		Blower start-up and safety valve ON
		Run in pre-ventilation position
		Pre-ventilation
If the leakage check is activated, Ph80, Ph81, Ph82 and Ph83 are displayed first.		
		Run in ignition position
 **+**		If the phase sequence stops at **Ph36, + press the key**
 **A** **- +** **+**		This display appears only if the LMV was originally unprogrammed. Otherwise, he jumps directly from Ph36 to Ph38. The **ignition position P0** can only be extinguished the symbols ▼ ▲ are corrected. Hold down **button A** and set the value with the **- or + button.** Press **+ key** to confirm.

Action button	Display	Description
		Ignition ON
		Valves ON
		Ignition OFF
		Flame in start position
		Skip **P0 with + key**
		Move to the next curve point, P1 low load
		Hold down **button A** and set the value for the low load with **the - or + button**.
		
		Use **+ button** to confirm all curve points up to curve point P9. In curve point **P9**, set the excess air for the high load at the gas ramp using the adjusting screw **"V" or "large flame"** . The CO_2 value should be 9-10% for natural gas.
		Use the **- button** to select curve point **P1**. In curve point **P1**, set the excess air for the low load at the gas ramp using the adjusting screw **"N" or "small flame"** . The CO2 value should be 9-10% for natural gas.
		Use the **+ button** to select curve point **P9** again. In curve point **P9**, check the excess air for the high load at the gas ramp and correct using the adjusting screw **"V" or "large flame"** .

Setting the output in high and low-load operation

Action button	Display	Description
		Check the high-load setting via the gas flow at the gas meter or compare the nozzle pressure with the values stated in the adjustment tables. Hold down **A button** and use the **- or + button** to set the output for curve point **P9**. The air surplus is not affected by this adjustment.
		Use the **- button** to select curve point P1. Check the low-load setting via the gas flow at the gas meter or compare the nozzle pressure with the values stated in the adjustment tables.
		Back to curve point **P9**
		After setting all curve points, the burner is ready for operation. Press the **ESC button briefly 3x** to save all curve points and access automatic mode
		OP 20 … 100 Burner output stage (automatic mode)

The warm setting of the burner is completed.

LMV phase display

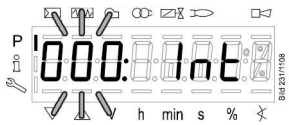
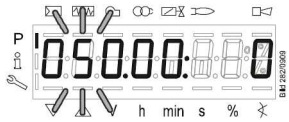
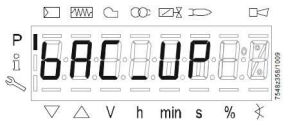
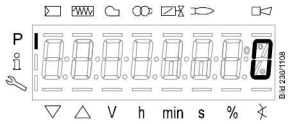
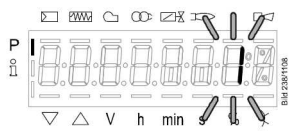
Display	Description
Ph00	Fault phase
Ph01	Safety phase
Ph10	Go home
Ph12	Standby (stationary)
Ph22	Blower start-up time (blower motor = ON, safety valve = ON)
Ph24	Run in pre-air position
Ph30	Pre-air time
Ph36	Run in ignition position
Ph38	Pre-ignition phase
Ph39	Leakage check filling time (test pressure switch min for installation between fuel valve 1 and fuel valve 2)
Ph40	First safety time (ignition transformer ON)
Ph42	First safety time (ignition transformer OFF)
Ph44	Interval 1
Ph50	Second safety time
Ph52	Interval 2
Ph60	Operation 1 (stationary)
Ph62	Maximum time small-load setting (operation 2, preparation decommissioning, run in small-load setting)
Ph70	After-burn time
Ph72	Run in post-ventilation position
PH74	Post-ventilation time (no external leak test)
Ph78	Post-ventilation time (abort when power controller ON)
Ph80	Leakage check idle time
Ph81	Leakage check test time atmospheric pressure, atmosphere test
Ph82	Leakage check filling test, filling
Ph83	Leakage check test time gas pressure, pressure test
Ph90	Gas shortage waiting time

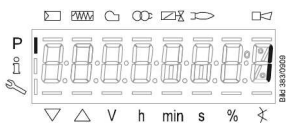
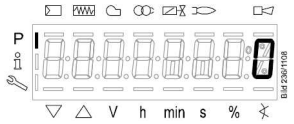
22 Backup and Restore

With the help of the AZL2, settings of the LMV can be saved (backup) and restored to the LMV at a later time.

Caution!
We recommend to perform a backup after a parameter change!

Backup

Action button	Display	Description
		Parameter **000**: flashes. Display: Parameter 000: flashing, display **Int** not
 **i/reset**		
 **+**		Press **+ key** to select parameter **050**. Display: Parameter 050. flashing, index 00: and value 0 not
 **i/reset**		
		With **i** / **reset** select parameter **bAC_UP**. Display: Parameter bAC_UP
 **i/reset**		
		Press **i** / **reset** to select the backup operation. Display: Value = 0
 **+**		With the **+ key,** the value in change mode is shifted one position to the left. Display: Value 1 flashes **Note** To detect display errors, the value is displayed offset to the left

Action button	Display	Description
i/reset		With **i** / **reset** activate the backup process. Display: 1 appears
ca. 5 seconds		After approx. 5 seconds (depending on the duration of the program), the display shows 0 and signals the end of the backup process. Display: 0

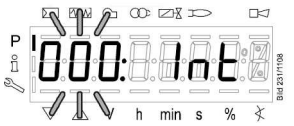
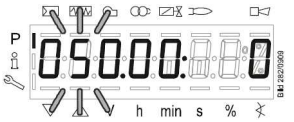
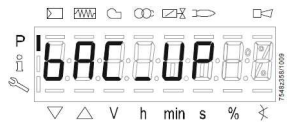
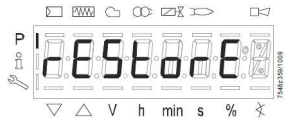
Note!

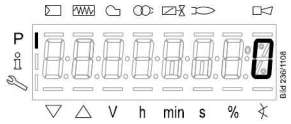
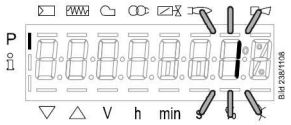
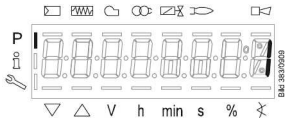
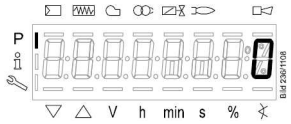
If an error occurs during the backup, a negative value is displayed. For error diagnostics, the cause of the error can be read from the diagnostic code of error message 137 (see error code list).

Restore a backup record (Restore)

To restore a backup data set, the parameter must be set to the value 1.

Restore

Action button	Display	Description
		Parameter **000**: flashes. Display: Parameter 000: flashes, **Int** does not.
i/reset		
+		Press **+ key** to select parameter **050**. Display: Parameter 050. flashing, index 00: and value 0 not
i/reset		
		With **i** / **reset** select parameter **bAC_UP.** Display: Parameter bAC_UP
+		Press **+ key** to select the parameter **rESTorE.** Display: **rESTorE**

Action button	Display	Description
 **i/reset**		
		Press **i** / **reset** to select the restore operation. Display: value 0
 **+**		With the **+ key**, the value in change mode is shifted one position to the left. Display: Value 1 flashes **Note** To detect display errors, the value is displayed offset to the left.
 **i/reset**		With **i** / **reset** activate the backup process. Display: 1 appears
ca. 8 seconds		After approx. 8 seconds (depending on the duration of the program), the display shows 0 and signals the end of the backup process. Display: 0

Note:

- Before restoring the backup data on the LMV, the latter compares the burner identification and product no. (ASN) with the burner identification and product no. (ASN) of the backup data set. If the data accord, they are restored. If not, the restore process is aborted. In case of abortion, or if an error occurs during the restore process, the display shows a negative value. For error diagnostics, the cause of the error can be determined from the diagnostic code of error message 137 (see Error code list). When the restore process is successfully completed, value 0 appears on the display. The LMV is supplied with undefined burner identification. In that case, the restore process from the AZL2 is possible without having to enter the burner identification in the LMV.
- Information Err C: 136 D: 1 (restore started) is displayed for a short moment

Caution
On completion of the restore process, the sequence of functions and the parameter settings must be checked.

23 Service level

The service level is used to display information about errors including the error history and information about the LMV.

Note!

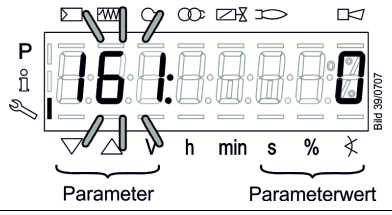
When on the service level, you can press **- or+** to display the next or the previous parameter.

Instead of pressing **+ key** yozu can also press **i/reset** for <1 sec..

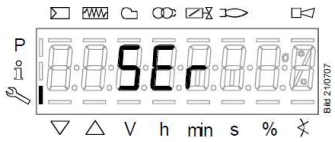
Note!

Press **ESC-Taste** or **i/reset** for > 3 s to return to the normal display.

Note! No change of values on the service level.

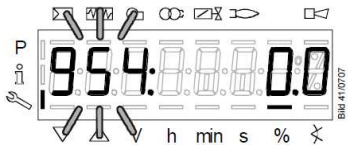
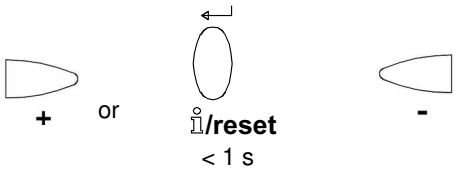
	If characters ._._ are displayed by the parameter, the value may consist of more than 5 digits. Press **i/reset** for >1 s and <3 s to display the value. Press **i/reset for** >3 s or **ESC** to return to the selection of the parameter number (parameter number flashes).

Display of the service level

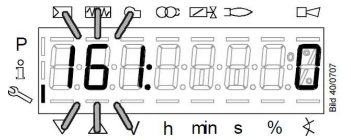
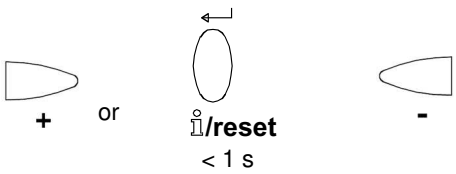
Action button	Display	Description
		Press **i/reset** for >3 s until **SEr** appears When releasing you are on the service level.

Nr.	Parameter
Service level	
954	Intensity of flame
960	Actual flow rate (fuel throughput in m³/h, l/h, ft³/h, gal/h)
121	Manual output Undefined = automatic operation
922	Incremental position of actuators Index 0 = fuel Index 1 = air
161	Number of faults
701 ● ● ● ● ●	Error history: 701-725.01.Code Error history: 701-725.02.Diagnostic code Error history: 701-725.03.Error class Error history: 701-725.04.Phase Error history: 701-725.05.Startup counter Error history: 701-725.06.Output Error history: 701-725.07.Fuel
725	Error history: Oldest error in the history

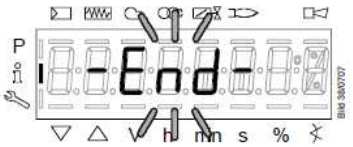
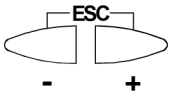
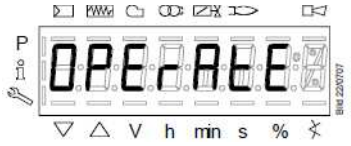
Intensity of flame

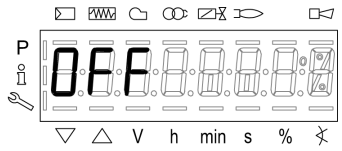
Action button	Display	Description
		The display shows **parameter 954**: flashing on the left. On the right, the flame's intensity is displayed as a percentage. Example: **954: 0.0**
To the next parameter		Back to the previous parameter

Numbers of fauls

Action button	Display	Description
		The display shows **parameter 161**: flashing on the left, the number of faults that occurred thus far on the right **0**. Example: Parameter **161: 0**
To the next parameter		Back to the previous parameter

End of service level

Action button	Display	Description
		When this display appears, you have reached the end of the service level. Display – **End** – appears flashing.
To the start of the service level		To the end of the service level
		Press **ESC** to return to the normal display. **OPErAtE** appears for a short moment.

Action button	Display	Description
		When this display appears, you are back on the normal display and you can change to the next level mode.

Note!

Press **ESC** or **i** / **reset** > 3 seconds to return to the normal display.

Error classes

The errors are divided into different error classes depending on the type of shutdown reaction. The current error displays all classes. Only the mistakes of the most important classes are included in the history.

Error classes	Priority	Description	History
0	highest	lock	●
1		Safety shutdown with software reset	●
2		undervoltage	
3		Safety shutdown: safety phase	●
4		Safety shutdown: Start prevention	
5		Safety features: Decommissioning	●
6	lowest	Message without switch-off reaction	

24 Error code list LMV

loc.C:	loc.d:	Description	Measure
		No communication between basic unit LMV27... and AZL2…	Check wiring for interruptions/loose contacts
2	1 - 4	No flame at the end of the safety time	
3	0 - 84	Compressed air fault	No compressed air
4	0 - 86	External light	
7	0 - 255	flame cut-off	
12	0	Fuel valve 1 leaking (fuel valve 2 for leakage check 9	For leakage check via X5-01 (gas pressure switch min) - Check whether valve on burner side is leaking - Check whether pressure switch for leakage check is closed when gas pressure is applied - Check wiring for short-circuit
	1	Fuel valve 2 leaking (fuel valve 1 for leakage check via X5-01)	For leakage check via X5-01 (gas pressure switch min) - Check whether valve on gas side is leaking - Check wiring for short-circuit
	2- 5	Leakage check not possible	Leakage check activated but no input assigned
	81	V1 leaking	Check whether valve on gas side is leaking Check the wiring for interruptions
	83	V2 leaking	Check whether the valve on the burner side is leaking Check whether the pressure switch for the leak test is closed when gas pressure is applied Check wiring for short-circuit
14	0	POC open	Check whether valve NC contact is closed
	1	POC closed	Check wiring Check whether valve NC contact opens when he valve is activated
	64	POC open start prevention	Check wiring for interruptions Check whether valve NC contact is closed
19	80	Combustion pressure, POC start prevention	Check whether the pressure switch is closed without combustion pressure being present Check wiring for short-circuit
20	0 - 1	Pressure switch min no minimum gas pressure/oil pressure	Check wiring for interruption
21	0- 64	Pressure switch max/POC	Check wiring for interruption. POC: Check whether valve NC contact is closed
22 OFF S	0 - 87	Safety chain	
23	0 - 2	Gas pressure switch min (Pmin)	Check wiring for interruption (X5-01)
50 - 67	#	Internal error	
70	26 - 26	Error group	Set all curve points for gas and air actuators, and for the FC
71	0 - 3	Special position undefined	Parametrise actuators
75-84		Internal fault group	
85	0	Error group fuel drive	Referencing of fuel drive not possible. Unable to reach reference point. 1. Check whether the drives have been exchanged 2. Check whether the drive is blocked or overloaded

loc.C:	loc.d:	Description	Measure
85	1	Error group air drive	Referencing of fuel drive not successful. Unable to reach reference point. 1. Check whether the drives have been exchanged 2. Check whether the drive is blocked or overloaded
86	0 - 1	Error group fuel drive	Unable to achieve the target position within the required tolerance. -> Check whether the drive is blocked or overloaded. A line break was detected at the drive connections. -> Check wiring (voltage X54 between Pin 5 or 6 and Pin 2 >0.5 V).
87	0 - 4	Error air drive	Unable to achieve the target position within the required tolerance. -> Check whether the drive is blocked or overloaded. A line break was detected at the drive connections. -> Check wiring (voltage X53 between Pin 5 or 6 and Pin 2 >0.5 V).
90 - 92	#	Internal fault group	
93	3	Short-circuit of probe	Short-circuit at QRB... 1. Check wiring 2. Flame probe possible defective
95	3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	External supply NOC	Check wiring
96	3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	Relay welded	Measure the contacts: 1. Device at voltage: Blower output must be de-energised 2. Deactivated voltage: Disconnect blower. There must be no ohmic connection between blower output and N. If one of the two tests fails, replace the unit, since the contacts are definitely welded and safety can no longer be guaranteed.
97	0	Safety relay welded or external voltage at safety contact	Measure the contacts: 1. Device at voltage: Blower output must be de-energised 2. Deactivated voltage: Disconnect blower. There must be no ohmic connection between blower output and N. If one of the two tests fails, replace the unit, since the contacts are definitely welded and safety can no longer be guaranteed.
98	2 Safety valve 3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	Replay does not pick up	Unlock; if it recurs, replace the unit
99 - 250	#	Internal error	

25 Calculation principles for gas burner adjustment

The values given in the tables are setting values for start-up.
The necessary system adjustment must be newly determined in each case.

General:
The calorific value ($H_{i,n}$) of fuel gases is generally specified for the normal state (0°C, 1013 mbar).

Natural gas type E	$H_{i,n}$ = 10.4 kWh/m^3
Natural gas type LL	$H_{i,n}$ = 9.3 kWh/m^3

Gas counters measure the volume of gas in the operational state.

Gas flow determination:
To allow the heat generator load to be adjusted correctly, the gas flow rate must be determined in advance.

Example:

Height above sea level	230 m
Atmospheric pressure B (acc. to Tab.)	989 mbar
Gas pressure P_G at gas meter	20 mbar
Gas temperature ϑ_G	16°C
Boiler output Q_n	220 kW
Efficiency η_K (assumed)	92%
Calorific value $H_{i,n}$	10.4 kWh/m^3

Gas flow in standard state (V_n)

$$V_n = \frac{Q_n}{\eta_k \times H_{i,n}} = \frac{220kW}{0,92 \times 10,4 \frac{kWh}{m^3}} = 23 \frac{m^3}{h}$$

Gas flow in operating state (V_B)

$$V_B = \frac{V_n}{f} = \frac{23 \frac{m^3}{h}}{0,94} = 24 \frac{m^3}{h}$$

Conversion factor (f)

$$f = \frac{B + P_G}{1013} \times \frac{273}{273 + \vartheta_G}$$

Annual average air pressure

Average geodetic altitude of the supply region above sea level [m]	from		1	51	101	151	201	251	301	351	401	451	501	551	601	651	701
	to	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Annual average of air pressure	(mbar)	1016	1013	1007	1001	995	989	983	977	971	965	959	953	947	942	936	930

Legend:

Q_n =	boiler output [kW]
η_K =	efficiency [%]
$H_{i,n}$ =	lower standard calorific value [kWh/m^3]
f =	conversion factor
B =	atmospheric pressure [mbar]
p_G =	gas pressure at gas meter [mbar]
ϑ_G =	gas temperature at gas meter [°C]

The values given in the tables are only setting values for start-up. The necessary system adjustment must be newly determined in the case of deviating data such as boiler output, calorific value and altitude.

A correction is required in any case.

The maximal burner output can only be achieved in mixing head position 0. Due to the variable mixing head position, the operating behaviour of the burner can be optimised for different heat generators.

						MG20/1-ZM-L-LN								MG20/2-ZM-L-LN			
						Natural gas LL Hi,n = 9.3 [kWh/m³]				Natural gas E $H_{i,n}$ = 10.4 [kWh/m³]				LPG $H_{i,n}$ = 25.89 [kWh/m³]			
Burner output [kW]		Boiler output η= 92% [kW]	Air flap position [°]		Burner heat pos. [mm]	Gas nozzle pressure [mbar]		Gas flow rate [m³/h]		Gas nozzle pressure [mbar]		Gas flow rate [m³/h]		Gas nozzle pressure [mbar]		Gas flow rate [m³/h]	
Stage 2	Stage 1		Stage2	Stage1		Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1
450	224	419	26.0	9	**22**	7.3	2.1	49.9	24.8	5.7	1.6	44.6	22.2	7.4	2.0	17.4	8.7
520	260	484	33.0	12	**22**	9.6	2.7	57.6	28.8	7.5	2.1	51.5	25.8	9.5	2.7	20.1	10.0
600	300	558	40.0	14	**22**	12.0	3.5	66.5	33.3	9.4	2.7	59.5	29.7	12.1	3.6	23.2	11.6
740	370	688	90.0	19	**22**	14.7	5.0	82.0	41.0	11.5	3.9	73.4	36.7	17.4	5.2	28.6	14.3
560	280	521	30.5	13	**10**	7.9	2.7	62.1	31.0	6.2	2.1	55.5	27.8	9.4	2.9	21.6	10.8
640	320	595	36.0	17	**10**	10.3	3.5	70.9	35.5	8.1	2.7	63.4	31.7	11.8	3.6	24.7	12.4
760	380	707	51.0	21	**10**	14.5	4.8	84.2	42.1	11.3	3.8	75.3	37.7	16.0	4.8	29.4	14.7
813	410	756	90.0	22.5	**10**	16.2	5.2	90.1	45.4	12.7	4.1	80.6	40.6	18.0	5.5	31.4	15.8
600	300	558	30.0	10	**0**	9.1	2.8	66.5	33.3	7.1	2.2	59.5	29.7	9.0	2.9	23.2	11.6
680	340	632	34.0	13	**0**	11.2	3.5	75.4	37.7	8.8	2.7	67.4	33.7	11.3	3.5	26.3	13.1
780	390	725	44.0	17	**0**	14.3	4.3	86.5	43.2	11.2	3.4	77.3	38.7	14.5	4.3	30.1	15.1
860	430	800	90.0	20	**0**	17.4	5.0	95.3	47.7	13.6	3.9	85.2	42.6	17.4	5.1	33.2	16.6

						MG20/2-ZM-L-LN								MG20/2-ZM-L-LN			
						Natural gas LL Hi,n = 9.3 [kWh/m³]				Natural gas E $H_{i,n}$ = 10.4 [kWh/m³]				LPG $H_{i,n}$ = 25.89 [kWh/m³]			
Burner output [kW]		Boiler output η= 93% [kW]	Air flap position [°]		Mixer head position [mm]	Gas nozzle pressure [mbar]		Gas flow rate [m³/h]		Gas nozzle pressure [mbar]		Gas flow rate [m³/h]		Gas nozzle pressure [mbar]		Gas flow rate [m³/h]	
Stage 2	Stage 1		2nd stage P 9	1st stage P 1		Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1
440	220	405	22	9	**22**	4.9	1.3	48.8	24.6	3.8	1.0	43.6	22.0	4.3	1.6	17.0	8.5
600	300	552	30	13	**22**	6.9	2.5	66.5	33.3	5.4	2.0	59.5	29.7	7.5	2.4	23.2	11.6
800	400	736	40	20	**22**	12.8	4.2	88.7	44.3	10.0	3.3	79.3	39.7	12.8	3.7	30.9	15.4
1000	500	920	90	25	**22**	19.6	5.2	110.9	55.4	15.3	4.1	99.1	49.6	19.5	5.4	38.6	19.3
500	250	460	25	9	**10**	5.0	1.2	55.4	27.5	3.9	0.9	49.6	24.6	4.5	1.5	19.3	9.7
660	330	607	32	17	**10**	7.0	3.0	73.2	36.6	5.5	2.3	65.4	32.7	7.4	2.2	25.5	12.7
860	430	791	41	22	**10**	13.0	4.2	95.3	47.7	10.2	3.3	85.2	42.6	12.3	3.4	33.2	16.6
1080	540	994	90	27	**10**	20.3	5.3	119.7	59.9	15.9	4.1	107.1	53.5	19.2	5.1	41.7	20.9
600	300	552	21	10	**0**	5.1	1.4	66.5	33.3	4.0	1.1	59.5	29.7	4.9	1.5	23.2	11.6
800	400	736	26	14	**0**	8.6	2.4	88.7	44.3	6.7	1.9	79.3	39.7	8.6	2.4	30.9	15.4
1100	550	1012	43	19	**0**	16.0	4.9	121.9	61.0	12.5	3.8	109.0	54.5	16.2	4.2	42.5	21.2
1350	680	1242	90	24	**0**	24.6	6.3	149.7	75.4	19.2	4.9	133.8	67.4	24.5	6.2	52.1	26.1

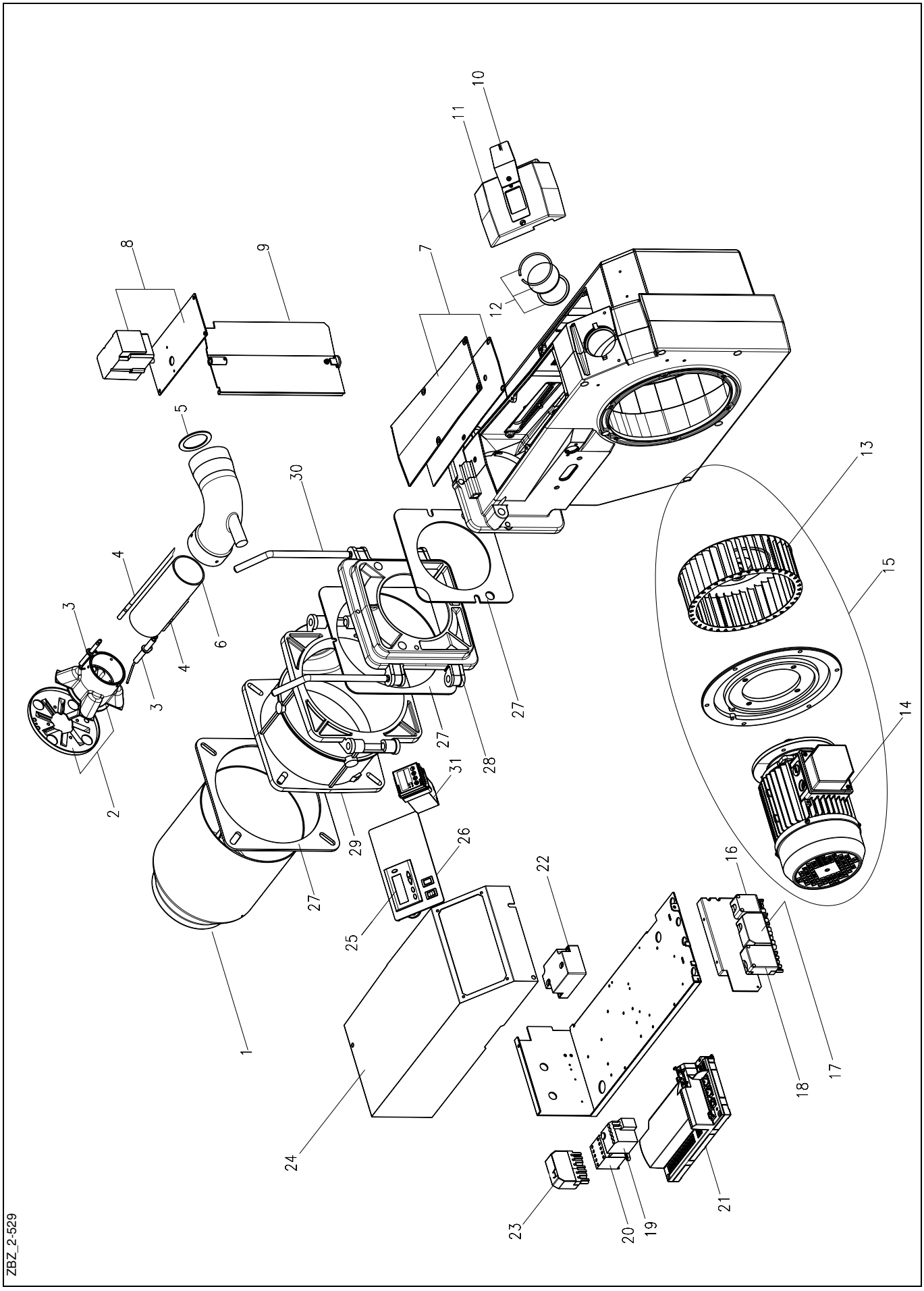
27 Adjustments log

Please enter the measured values into the Adjustments log.

Boiler type	Gas fitting

Measured values		min.	max.	Date
P0 (start point)				
P1 (min load)				
P9 (max load)				
Flue gas temperature	°C			
Carbon dioxide (CO_2 level)	%			
O_2 content	%			
CO level	%			
Flue	mbar			
Nozzle pressure	mbar			
Boiler pressure	mbar			
Room temperature	°C			
Gas type				
Setting value **V** at the fitting				
Setting value **N** at the fitting				

28 Exploded view drawing / spare parts list



Position	Designation	VE	Art. no.
1	Burner tube MG20/1-LN, 271 mm long	1	47-90-24880
1	Burner tube MG20/1-LN, 371 mm long (100 mm extended)	1	47-90-25260
1	Burner tube MG20/1-LN, 471 mm long (200 mm extended)	1	47-90-25261
1	Burner tube MG20/2-LN, 271 mm long	1	47-90-24878
1	Burner tube MG20/2-LN, 371 mm long (100 mm extended)	1	47-90-25258
1	Burner tube MG20/2-LN, 471 mm long (200 mm extended)	1	47-90-25559
2	Mixer head assembly with electrodes MG20-N-LN	1	47-90-28854
2	Mixer head assembly with electrodes MG20-F-LN	1	47-90-28858
3	Ignition and ionisation electrodes set	1	47-90-28857
4	Ignition and ionisation electrodes set	1	47-90-28880
4	Ignition and ionisation cable set, 100 mm extended	1	47-90-28881
4	Ignition and ionisation cable set, 200 mm extended	1	47-90-28882
5	Seal for gas nozzle MG20-LN	5	47-50-25500
6	Gas nozzle tube MG20	1	47-90-25037
6	Gas nozzle tube MG20, 100 mm extended	1	47-90-25037-01
6	Gas nozzle tube MG20, 200 mm extended	1	47-90-25037-02
7	Cover MG20 with seal	1	47-90-10698
8	Positioning drive SQM33	1	47-90-29097
9	Air flap MG20	1	47-90-27030
10	Sight glass cover	5	47-50-12106
11	Hood MG20	1	47-90-24857
12	Inspection glass with seal	5	36-50-11544
13	Fan wheel ∅218 x 80 for MG20/1	1	36-90-11540-01
13	Fan wheel ∅224 x 82 for MG20/2	1	47-90-24847
14	Motor 1.1 kW 400 V / 50 Hz	1	47-90-29347
14	Motor 2.2 kW 400 V / 50 Hz	1	47-90-29691
15	Motor 1.1 kW cpl. with fan wheel	1	47-90-29240
15	Motor 2.2 kW cpl. with fan wheel	1	47-90-29692
16	4-pin receptacle, green	1	37-90-20774
17	7-pin receptacle, black/brown	1	37-90-20731
18	5-pin receptacle, black	1	37-90-20748
19	Thermal over-current relay 2.4 - 4,0 A for MG20/1	1	47-90-25172
19	Thermal over-current relay 4.0 - 6.0 A for MG20/2	1	47-90-25173
20	Small motor contactor B7-30-10	1	47-90-25171
21	Burner management system LMV 27.100A2	1	47-90-29079-02
22	Ignition transformer	1	47-90-24469
23	7-pin receptacle, green	1	37-10-10831
24	Electronic unit hood MG20	1	47-90-24852
25	Display and operating unit AZL 21.00A9	1	47-90-29098
26	Cover MG20-ZM	1	47-90-29089
27	Gasket set	1	47-90-26722
28	Gas jacket MG20 Part 2	1	44-90-30242
29	Gas jacket MG20 Part 1	1	44-90-30245
30	Mounting rod MG20	2	46-50-21085
-	Inlet nozzle	1	36-90-11541
-	Protective grid	1	47-90-10696
-	Bridges male connector 3-pol. brown gas max.	1	47-90-27382
-	Bridges male connector 3-pol. black gas min	1	47-90-27399
-	Female part 3-pol. brown	1	47-90-27203
-	Female part 3-pol. black	1	37-90-20739
-	Combustion chamber pressure measuring tube for KEV (CG and MBC)	1	47-90-30200
-	Combustion chamber pressure measuring tube for KEV2 (SKP)	1	47-90-30202

29 Declaration of Conformity for Gas Burners

GIERSCH
Wärme für die Zukunft.
Giersch GmbH | Adjutantenkamp 18 | 58675 Hemer
0 23 72/965-0 0 23 72/6 1240 info@giersch.de www.giersch.de

Declaration of Conformity for Gas Burners

We, Giersch GmbH, Adjutantenkamp 18 in D-58675 Hemer declare under our responsibility that

gas burner type **MG20/ …**

is conform with the regulations of these directives

MD2006/42/EG
EMC2014/30/EG
GAD 2016/426/EG
LVD2014/35/EU
MCP2015/2193/EU
RoHS 2011/65/EU
DIN EN 676

and is marked with:

CE

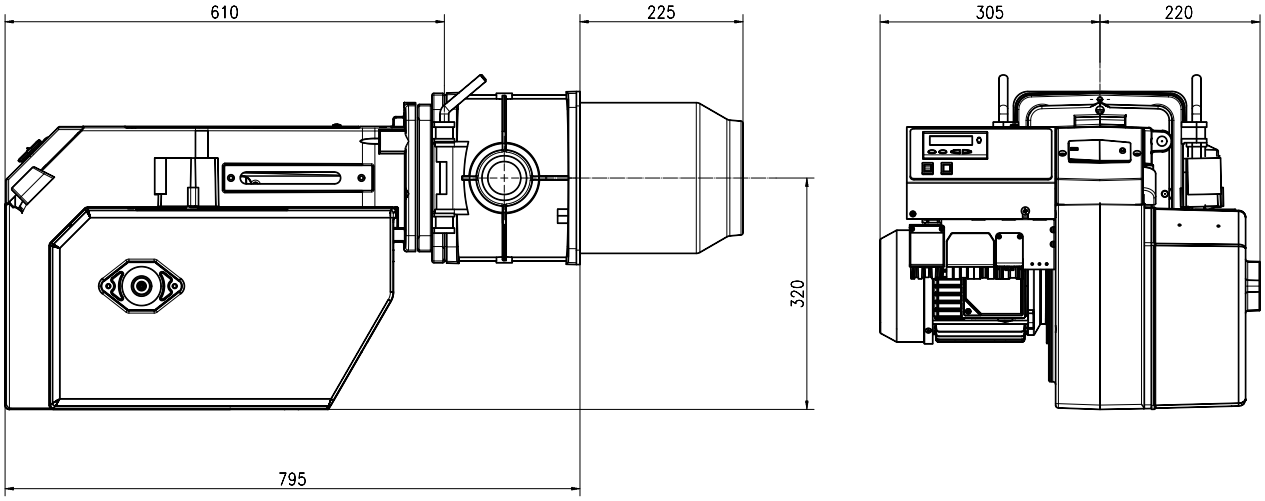
CE-0085

Hemer, 12.01.2024

Dr. Josef Becker
Managing Director

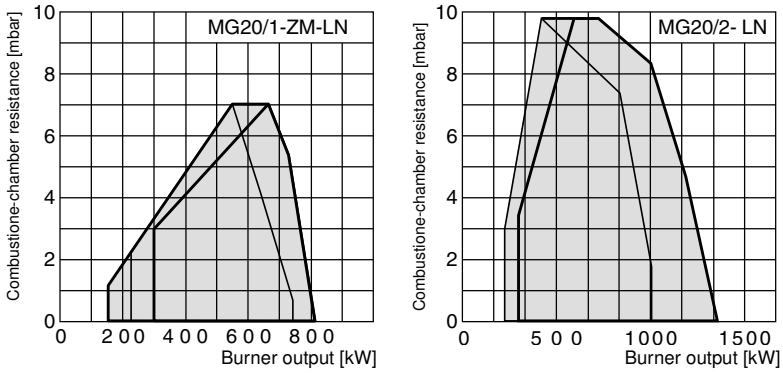
30 Dimensions

(all dimensions are given in mm)



Burner tube extension 100 mm and 200 mm

31 Working ranges



Working ranges acc. to DIN EN 676. The working ranges are referred to 15°C and 1013 mbar.

Giersch GmbH • Brenner und Heizsysteme
Adjutantenkamp 18 • D-58675 Hemer • Telephone 02372/965-0 • Telefax 02372/61240
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