SIEMENS

LME39…

Gas burner controls

Basic Documentation

The LME39… and this Basic Documentation are intended for use by OEMs which integrate the burner controls in their products.

CC1P7106en
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Building Technologies Division

Supplementary documentation

ASN	Title	Documentation no.	Type of document
LME…	Burner control	CC1Q7101	Range overview
LME39…	Burner control	CC1N7106	Data Sheet

Contents

1 Safety notes

1.1 Warning notes

To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

Do not to open, interfere with or modify the unit!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not disconnected, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals. If this is not observed, there is a risk of electric shock
- Press the lockout reset button/operation button of the LME39... or the AGK20... lockout reset button extension only manually (applying a force of no more than 10 N) without using any tools or pointed objects. If this is not observed, there is a risk of loss of safety functions and a risk of electric shock
- Fall or shock can adversely affect the safety functions. Such units must not be put into operation, even if they do not exhibit any damage. If this is not observed, there is a risk of loss of safety functions and a risk of electric shock
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring and the parameterization are in an orderly state and make the safety checks as described in *Commissioning notes*. If this is not observed, there is a risk of loss of safety functions and a risk of electric shock
- The data line for the AZL2… or other accessories, such as the OCI410 (plugs into the BCI), must be connected or disconnected only when the burner control is dead (all-polar disconnection), since the BCI does not ensure safe separation from mains voltage. If this is not observed, there is a risk of electric shock

1.2 Engineering notes

- When used in connection with actuators, there is no position feedback signal from the actuator to the burner control
- When used in connection with actuators, the requirements of applicable standards and regulations must be observed
- The running times of the actuators must match the burner control's program. An additional safety check of the burner together with the actuators is required
- If the communication interface (jack RJ11) is not used, protection against electric shock hazard must be provided (jack must be covered up)

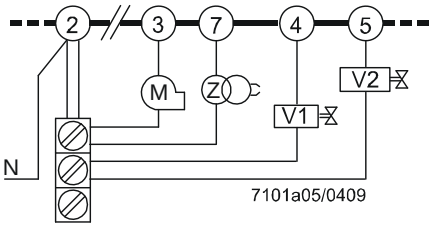
1.3 Mounting notes

- Ensure that the relevant national safety regulations are complied with

1.4 Installation notes

- Always run the high voltage ignition cables separate from the unit and other cables while observing the greatest possible distance
- Do not mix up live and neutral conductors
- Install switches, fuses and earthing, in compliance with local regulations
- The connection diagrams show the burner controls with earthed neutral conductor. In networks with nonearthed neutral conductor and ionization current supervision, terminal 2 must be connected to the earth conductor via an RC unit (product no. ARC 4 668 9066 0). It must be made certain that local regulations are complied with (e.g. protection against electric shock hazard) since AC 120 V (50/60 Hz) or AC 230 V (50/60 Hz) mains voltage produces peak leakage currents of 2.7 mA
- Make certain that the maximum permissible current rating of the connection terminals will not be exceeded
- Do not feed external mains voltage to the control outputs of the unit. When testing the devices controlled by the burner control (fuel valves, etc.), the burner control must not be connected
- Check the connecting lines of the air pressure switch for short-circuits (air pressure switch between terminals 2 and 6). If this is not observed, there is a risk of loss of safety functions
- To prevent mixup of different types of burner controls, the LME39... must always be used in connection with grey plug-in bases AGK11.6. Make absolutely certain that the live conductor for the control thermostat or pressurestat is tapped after the gas pressure switch and the safety limit thermostat to be connected to terminal 11 (refer to Connection diagram)
- For safety reasons, feed the neutral conductor to terminal 2. Connect the burner components (fan, ignition transformer and fuel valves) to the neutral distributor as shown below in the figure. The connection between neutral conductor and terminal 2 is prewired in the base

Example



Legend

V...	Fuel valve
M	Fan motor
Z	Ignition transformer

Figure 1: Correct wiring of neutral conductors!

Recommendation**:**

Note!
In extremely EMC-stressed environments, burners without fan motor or burners equipped with fan control via auxiliary contactor should use an AGK25 to produce a burden on terminal 3. If not observed, the burner is not reliably started up

1.5 Connection BCI via integrated jack RJ11

- If the BCI (jack RJ11) is not used, protection against electric shock hazard must be provided (jack must be covered up)
- The AGV50... signal cable for the AZL2… or other accessories, for example BC interface OCI410 (plugs into the jack RJ11), must be connected or disconnected only when the burner control is dead (all-polar disconnection), since the BCI does not ensure safe separation from mains voltage
- The display and operating unit AZL2... is designed for direct connection to the integrated jack RJ11 at LME39...
- Since the BCI has no safe separation from mains voltage, the signal cable AGV50..., must conform to certain specifications. Siemens has specified the signal cable AGV50... for use under the burner hood (cable supplied by Hütter; refer to Technical data). When using signal cable of other manufacture, Siemens' requirement will not necessarily be met
- Do not lay the signal cable AGV50... from the LME39… to the AZL2… together with other cables (especially high-voltage ignition cable)
- Service operation with a longer signal cable from LME39… to AZL2…, or from LME39… to OCI410:
  If a longer signal cable is required for service work for example (short-time, <24 hours), note that above usage under the burner hood no longer applies and, for this reason, the signal cable can be subjected to increased mechanical stress. In that case, extra cable sheathing is required (e.g. heat shrink tubing)
- Both the signal cable AGV50... and the AZL2… must be shipped and stored so that no damage due to dust and water can occur when used in the plant later on
- To ensure protection against electric shock hazard, make certain that, prior to switching on power, the signal cable AGV50... is correctly connected to the AZL2…
- The AZL2… must be used in a dry and clean environment

Connection display and operating unit AZL2...

- Connect the AZL2... with the interface at your LME39..., follow the example design below

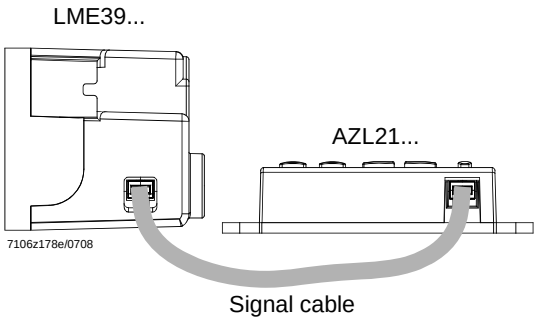


Figure 2: Connection display and operating unit AZL2

Connection BC interface OCI410

Connect the BC interface OCI410 without other extension with the USB interface at your PC, follow the example design below.

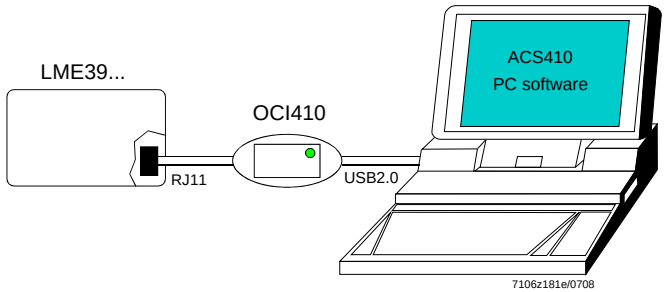


Figure 3: Connection BC interface OCI410

Connection interface OCI400...

- Put the interface OCI400... in the connector at lockout reset button of LME39... Interface diagnostics works only if the AGK20... lockout reset button extension is not fitted
- Connect the interface OCI400... without other extension to the interface at your PC, follow the example design below

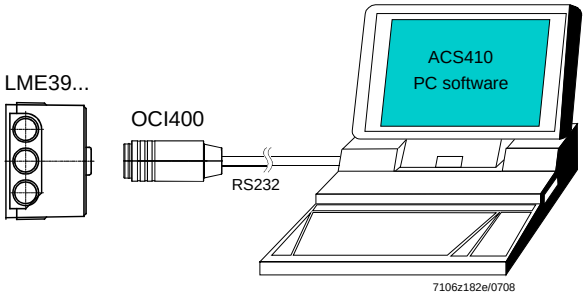


Figure 4: Connection interface OCI400...

1.6 Electrical connection of flame detectors

It is important to achieve practically disturbance- and loss-free signal transmission:

- Never run detector cables together with other cables
  – Line capacitance reduces the magnitude of the flame signal
  – Use a separate cable
- Observe the permissible length of the detector cables (refer to Technical data)
- The ionization probe and the ignition electrode are not protected against electric shock hazard
- Locate the ignition electrode and the ionization probe such that the ignition spark cannot arc over to the ionization probe (risk of electrical overloads) and that it cannot adversely affect the supervision of ionization
- Insulation resistance
  – Must be a minimum of 50 MΩ between ionization probe and ground
  – Soiled detector holders reduce the insulation resistance, thus supporting creepage currents
- Earth the burner in compliance with the relevant regulations; earthing the boiler alone does not suffice

1.7 Commissioning notes

When commissioning the plant for the first time or when doing maintenance work, make the following safety checks:

	Safety check to be carried out	**Expected response** Delivery state (factory setting):
a)	Burner startup with previously interrupted line to the flame detector	Lockout at the end of safety time → Max. 3 repetitions (can be parameterized)
b)	Burner operation with simulated loss of flame. For that purpose, cut off the fuel supply	Lockout → Max. 3 repetitions (can be parameterized)
c)	Burner operation with simulated air pressure failure (not with atmospheric burners)	Immediate lockout

Table 1: Safety checks

After installation and commissioning, of a plant, the parameterized values and settings must be **documented** by the person/heating engineer responsible for the plant. These data can be printed out with the help of the PC software ACS410, for example, or must be written down. The documentation must be checked by the expert and then kept in a safe place.

Warning!
On the OEM access level of the LME39…, it is possible to make parameter settings that differ from application standards. When setting the parameters, it must be made certain that the application will run safely in accordance with legal requirements. If this is not observed, there is a risk of loss of safety functions.

Prior to commissioning, the following points must be checked:

- The correct time parameter settings, especially the settings of the safety and prepurge times
- The correct functioning of the flame detector in the event of loss of flame during operation (including the response time); with extraneous light during the prepurge time and when there is no establishment of flame at the end of the safety time.
- Air pressure
- Safety loop (e.g. safety limit thermostat)
- Minimum gas pressure (gas pressure switch)

1.8 Standards and certificates

Applied directives:

- Low-voltage directive 2014/35/EC
- Directive for gas-fired appliances 2009/142/EC
- Directive for pressure devices 97/23/EC and 2014/68/EC (2016-07-16)
- Electromagnetic compatibility EMC (immunity) *) 2014/30/EC

*) The compliance with EMC emission requirements must be checked after the burner control is installed in equipment

Compliance with the regulations of the applied directives is verified by the adherence to the following standards / regulations:

- Automatic burner control systems for burners and appliances burning gaseous or liquid fuels DIN EN 298
- Safety and control devices for gas burners and gas burning appliances DIN EN 13611
- Automatic electrical controls for household and similar use Part 2-5: Particular requirements for automatic electrical burner control systems DIN EN 60730-2-5

The relevant valid edition of the standards can be found in the declaration of conformity!

Note on **DIN EN 60335-2-102**
Household and similar electrical appliances - Safety - Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections. The electrical connections of the LME and the AGK11 comply with the requirements of EN 60335-2-102.

EAC Conformity mark (Eurasian Conformity mark)

ISO 9001:2008
ISO 14001:2004
OHSAS 18001:2007

China RoHS
Hazardous substances table:
http://www.siemens.com/download?A6V10883536

1.9 Life cycle

Burner controls has a designed lifetime* of 250,000 burner startup cycles which, under normal operating conditions in heating mode, correspond to approx. 10 years of usage (starting from the production date given on the type field).
This lifetime is based on the endurance tests specified in standard EN 298.
A summary of the conditions has been published by the European Control Manufacturers Association (Afecor) (www.afecor.org).

The designed lifetime is based on use of the burner controls according to the manufacturer's Data Sheet and Basic Documentation. After reaching the designed lifetime in terms of the number of burner startup cycles, or the respective time of usage, the burner control is to be replaced by authorized personnel.

* The designed lifetime is not the warranty time specified in the Terms of Delivery

1.10 Disposal notes

The unit contains electrical and electronic components and must not be disposed of together with domestic waste.
Local and currently valid legislation must be observed.

2 Makeup of system/description of functions

2.1 Use

LME39… are used for the startup and supervision of 1- or 2-stage gas or gas burners in intermittent operation. The flame is supervised by an ionization probe or flame detector QRA… with ancillary unit AGQ3.xA27 for gas forced draft burners

- Applications in accordance with EN 267: Gas burners for liquid fuels
- Type-tested and approved in accordance with DIN EN 298

2.2 Features

- Undervoltage detection
- Air pressure supervision with functional check of the air pressure switch during startup and operation
- Electrical remote lockout reset facility
- Multicolor indication of fault status and operational status messages
- Limitation of the number of repetitions
- Accurate control sequence thanks to digital signal handling
- Controlled intermittent operation after maximum 24 hours of continuous operation
- BCI

3 Basic unit

LME39…

- The housing is made of impact-proof, heat-resistant and flame-retarding plastic. It is of plug-in design and engages audibly in the base
- Burner controls LME39... and plug-in base AGK11.6 are silver-grey (RAL7001)
- The housing accommodates the
  – microcontroller for the program control and the control relays for load control
  – electronic flame signal amplifier (ionization)
  – lockout reset button with its integrated 3-color signal lamp for operational status and fault status messages and the socket for connecting the interface OCI400... adapter or the AGK20... lockout reset button extension
- All safety-related digital inputs and outputs of the system are monitored by means of a contact feedback network
- The display and operating unit AZL2… is designed for direct connection to the LME39…
- The LME39... is operated and parameterized via the AZL2... or with the help of the OCI410 / ACS410
- Burner capacity unlimited (thermal output on startup ≤120 kW)
- 3 repetitions in the event of loss of flame during operation (can be parameterized)
  ➔ Default setting: No repetition

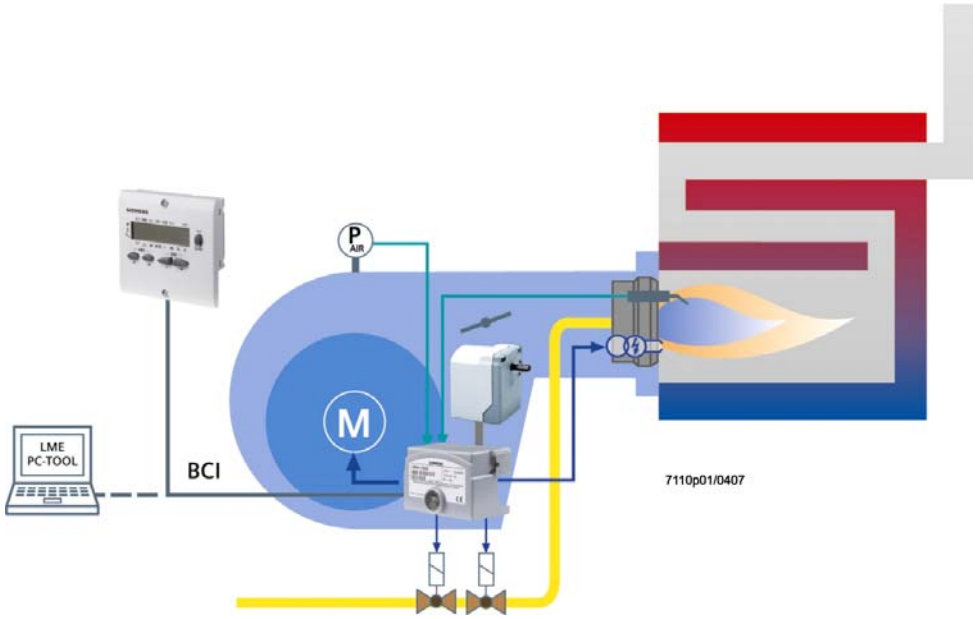


Figure 5: Example: Modulating gas burner

The diagram shows the full scope of functions of the LME39… system. The actual functions are to be determined based on the respective execution / configuration!

3.1 Time parameters

Parameterized times see *Type summary*.

Both the prepurge time and the safety times are safety-related and can be changed by the OEM with the help of the display and operating unit AZL2... or
PC software ACS410.

3.2 Indication and diagnostics

Multicolor indication of operational status and fault status messages via multicolor signal lamp in the lockout reset button

Forwarding of operational status messages, fault status messages and full service information via
- BCI communication via integrated jack RJ11 to display and operating unit AZL2... or via additional BC interface OCI410 to PC software ACS410
- UDS communication at interface diagnostic mode (UDS), with additional optical interface OCI400..., via integrated signal lamp at lockout reset button, between PC software ACS410 or to flue gas analysis unit of some manufacturers

3.2.1 Communication/parameterization

AZL2…

The display and operating unit AZL2... with LCD and menu-driven operation, facilitates enable a simple operation, parameterization and targeted diagnostics via menu-driven operation.
When making diagnostics, the display shows operating states, the type of error and the startup counter (IBZ). Passwords protect the different parameter levels of the burner/boiler manufacturer and heating engineer against unauthorized access. Simple settings that the plant operator can make on site require no password.

PC software ACS410

PC software ACS410 enabled a simple operation, comfortable readout of settings and operating states, the parameterization, trend recording and targeted diagnostic of LME39…
Therefore, the separate available BC interface OCI410 (for BCI communication with LME39… to the PC) has to be connected to the integrated jack RJ11.

4 Type summary (other types on request)

The product nos. given below applies to the LME39… without plug-in base and without flame detector. For ordering information on plug-in bases and other accessories, refer to Ordering.

Article no.	Type		Times in seconds												
			tw max. s	TSA max. s	tfz (P228) approx. s	t1 (P225) min. s	t1' (P256) min. s	t3 (P226) approx. s	t3n (P257) approx. s	t4 (P230) approx. s	t8 (P234) min. s	t10 (P224) approx. s	t11 (P259) min. s 1)	t12 (P260) min. s 1)	t22 (P231) max. s
BPZ:LME39.100C1	**LME39.100C1**	Requirement	2.5	3	0.3	30	---	3	2.5	10	0	180	30	30	---
BPZ:LME39.100C2	**LME39.100C2**	Requirement	2.5	3	0.3	30	---	3	2.5	10	0	180	30	30	---
	Setting range	Min.	---	0.3	0	0	---	1.2	0 + 0.3	1.2	0	0	0	0	---
		Max.	---	37.5 + 1.5 + 0.3	1.5	75	---	37.5	37.5 + 0.3	75	1237	179.5	75	75	---
		Increments (s)	---	0.147	0.147	0.294	---	0.147	0.147	0.294	4.851	4.851	0.294	0.294	---
		Factory setting	---	t3n + tfz	0.294	32.34	---	3.234	2.205 + 0.3	9.996	0	179.487	32.34	32.34	---
BPZ:LME39.400C1	**LME39.400C1**	Requirement	2.5	5	0.3	---	14.5	1.7	4.4	10	0	---	---	---	5
BPZ:LME39.400C2	**LME39.400C2**	Requirement	2.5	5	0.3	---	14.5	1.7	4.4	10	0	---	---	---	5
	Setting range	Min.	---	0.3	0	---	0	1.2	0	1	0	---	---	---	0
		Max.	---	37.5 + 1.5 + 0.3	1.5	---	75	37.5	37.5 + 0.3	75	1237	---	---	---	7.4
		Increments (s)	---	0.147	0.147	---	0.294	0.147	0.147	0.294	4.851	---	---	---	0.147
		Factory setting	---	t3n + tfz	0.294	---	15.582	1.911	4.116 + 0.3	9.996	0	---	---	---	4.557

Function parameter	Parameter number	Factory setting
Repetition limit value loss of flame and no flame at the end of safety time 0 = none 1 = none 2 = 1 x repetition 3 = 2 x repetition 4 = 3 x repetition	240	1

Note on parameterization:

Use the AZL2… or ACS410 to always set the exact value of the required time (multiples of increments of 0.147 seconds, 0.294 seconds or 4.851 seconds).
When parameterizing minimum or maximum times, the possibility of a ±7% tolerance must be taken into consideration.

For **min**imum values: The value to be parameterized must be at least 7% **greater**. For **max**imum values: The value to be parameterized must be at least 7% **smaller**.

Example:	Prepurge time shall be set to 30 seconds
Calculation:	30 seconds + 7% = 32.1 seconds
Value to be parameterized (parameter 225):	Must be equal to or **greater** than the calculated value (e.g. 32,34 seconds)
Example:	Safety time shall be set via the change of postignition time to 5 seconds
Special case here:	Safety time is set directly via the change of postignition time and flame detection time using the following formula: **TSA = t3n + tfz = P257 + 0.3 seconds + P228**
Calculation:	5 seconds - 7% = 4.65 seconds **t3n** = 4.65 seconds - 0.3 seconds - P228 **t3n** = 4.05 seconds (with tfz = 0.3 seconds)
Value to be parameterized (parameter 257):	Must be equal to or **smaller** than the calculated value (e.g. 3.969 seconds)

Legend

tfz	Flame detection time	t4	Interval between ignition OFF and release fuel valve 2
TSA	Safety time	t8	Postpurge time
tw	Waiting time	t10	Specified time for air pressure signal
t1	Prepurge time	t11	Programmed opening time for actuator
t1´	Purge time	t12	Programmed closing time for actuator
t3	Preignition time	t22	2nd safety time
t3n	Postignition time (parameter 257 + 0.3 seconds)		

1) Maximum running time available for actuator. The actuator's running time must be shorter, otherwise, the actuator will not reach the required position

5 Accessories (to be ordered separately)

5.1 Connection accessories for small burner controls

AGK11.6
Gray plug-in base for connecting the LME39 to the burner plant.
Refer to Data Sheet N7201

Cable holder **AGK66**
For plug-in base AGK11.
Refer to Data Sheet N7201

Cable holder **AGK65**
For plug-in base AGK11.
Refer to Data Sheet N7201

Cable strain relief elements **AGK67**
For plug-in base AGK11.
Refer to Data Sheet N7201.

5.2 Service tools

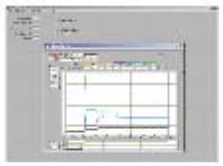
Optical Interface **OCI400**
- Optical interface between burner control and PC
- Facilitates viewing and recording setting parameters on site using the ACS410 software

Refer to Data Sheet N7614

BCI interface module **OCI410**
- BCI interface module between burner control and PC
- Facilitates viewing, processing, and recording setting parameters on site using the ACS410 software

Refer to Data Sheet N7616.

PC Software **ACS410**
For setting the parameters and for visualizing the burner controls.
Refer to Software Documentation J7352



5.3 Display and operating units

Display and operating unit **AZL21.00A9**
Detached unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI interface for LME39, degree of protection IP40.
Refer to Data Sheet N7542.

Display and operating unit **AZL23.00A9**
Detached unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI interface for LME39, degree of protection IP54.
Refer to Data Sheet N7542.

5.4 Flame detector

UV flame detector **QRA2**
Only in conjunction with ancillary unit AGQ3
Refer to Data Sheet N7712

UV flame detector **QRA10**
Only in conjunction with ancillary unit AGQ3
Refer to Data Sheet N7712

UV flame detector **QRA4**
Only in conjunction with ancillary unit AGQ3
Refer to Data Sheet N7711

Ionization probe
To be supplied by customer

5.5 Actuators

Actuator **SQN3**
Refer to Data Sheet N7808

Actuator **SQN7**
Refer to Data Sheet N7804

Actuator **SQN9**
Refer to Data Sheet N7806

5.6 Others

Valve proving system **LDU11** (only LME39.100)
Designed to check the tightness of shutoff valves in connection with gas burners and gas devices. In the event of inadmissible leakage, the system prevents the burner from starting up.
Refer to Data Sheet N7696

RC unit **ARC 4 668 9066 0**
For the supervision of ionization currents in networks with non-earthed neutral conductor

PTC resistor **AGK25**

- AC 230 V
- To burden terminal 3 (for burners without fan motor such as atmospheric gas burners)

Ancillary unit **AGQ3**
For UV supervision. Can be fitted under the plug-in base.
AGQ3.1A27: Cable length 500 mm
AGQ3.2A27: Cable length 300 mm

Reset button extension **AGK20**

Signal cable **AGV50.100**
For AZL2, with RJ45 connector, cable length 1 m, pack of 10.

6 Technical data

6.1 General unit data

Mains voltage - LME39.xxxx1 - LME39.xxxx2	 AC 120 V AC 230 V
Mains frequency	50...60 Hz
Power consumption	12 VA
External primary fuse (Si)	Max. T10H250V to IEC 60127-2 Recommendation: T6.3H250V to IEC 60127-2
Mounting position	Optional
Input current at terminal 12	Max. 5 A
Weight	Approx. 160 g
Safety class I (burner control with plug-in base)	In accordance with DIN EN 60730-1 For applications without safe separation. Protection against electric shock is achieved through double or reinforced insulation. Provision for the protective earth connection is made in the plug-in base AGK11.
Degree of protection	IP40 (to be ensured through mounting) (if RJ11 jack is not covered, only IP10)
Rated surge voltage category III (DIN EN 60664)	
• LME total unit	4 kV
• Creepage distances and air gaps	2.5 kV due to voltage limitation measures
Pollution degree	2 in accordance with DIN EN 60730-1
Software class	Class C in accordance with DIN EN 60730-2-5:2011 2-channel structure
Reaction time in the event of loss of flame	Max. 1 s
Perm. cable length terminal 1	Max. 1 m at a line capacitance of 100 pF/m, unshielded (max. 3 m at 15 pF/m)
Perm. cable length from QRA… to AGQ3.xA27 (lay separate cable)	Max. 20 m at 100 pF/m, unshielded
Perm. cable length terminals 8, 10 and 11	Max. 20 m at 100 pF/m, unshielded (lay separate cable)
Perm. cable lengths other terminals	Max. 3 m at 100 pF/m, unshielded
Perm. input voltage terminals 6 and 11	AC 120 V AC 230 V
Possible input current terminal 6	0.5 mA
Possible input current terminals 8 and 11	1 mA

Perm. terminal rating	At cosφ ≥0.6	At cosφ = 1
- Terminal 3	Max. 2.7 A (15 A for max. 0.5 s)	Max. 3 A
- Terminals 4, 5 and 7	Max. 1.7 A	Max. 2 A
- Terminal 9		
- LME39.100...	Max. 1 A	Max. 1 A
- LME39.400...	Max. 1,7 A	Max. 2 A
- Terminal 10	Max. 1 A	Max. 1 A

Table 2: Perm. terminal rating

6.2 Signal cable AGV50... display → BCI

Signal cable	Color white Unshielded Conductor 4 x 0.141 mm² with RJ11-plug
Cable length - AGV50.100	 1 m
Supplier	Reference: Hütter http://www.hkt-netzwerktechnik.at/index.htm Order number: on request
Location	Under the burner hood (extra measures required for compliance with SKII EN 60730-1)

6.3 Environmental conditions

Storage	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+70 °C
Humidity	<95% r.h.
Transport	DIN EN 60 721-3-2
Climatic conditions	Class 2K3
Mechanical conditions	Class 2M2
Temperature range	-20...+70 °C
Humidity	<95% r.h.
Operation	DIN EN 60 721-3-3
Climatic conditions	Class 3K3
Mechanical conditions	Class 3M3
Temperature range	-20...+60 °C
Humidity	<95% r.h.
Installation altitude	Max. 2,000 m above sea level

Attention!
Condensation, formation of ice and ingress of water are not permitted!
If this is not observed, there is a risk of loss of safety functions and a risk of electric shock.

AGK11...

Connectable conductor cross-sections	
• Terminals 1...12	Min. 0.5 mm² Max. 1.5 mm² Wire or stranded wire with ferrules
• Auxiliary terminals N, PE, 31, 32	Min. 0.5 mm² Max. 1.5 mm² Wire or stranded wire with ferrules (when connecting 2 wires or stranded wires per terminal, the same cross-sectional areas must be used for each terminal)

6.4 Flame supervision with ionization probe

	At mains voltage	
	UN = AC 120 V [1])	UN = AC 230 V [1])
Detector voltage between ionization probe and ground (AC voltmeter Ri ≥ 10 MΩ)	AC 50...120 V	AC 115...230 V
Switching threshold (limit values): Switching on (flame on) (DC ammeter Ri ≤5 kΩ) Switching off (flame off) (DC ammeter Ri ≤5 kΩ)	 ≥DC 1.5 µA ≤DC 0.5 µA	 ≥DC 1.5 µA ≤DC 0.5 µA
Detector current required for reliable operation	≥DC 3 µA	≥DC 3 µA
Switching threshold in the event of poor flame during operation (LED flashes green)	Approx. DC 5 µA	Approx. DC 5 µA
Short-circuit current between ionization probe and ground (AC ammeter Ri ≤5 kΩ)	AC 50...150 µA	AC 100...300 µA

Table 3: Data ionization probe

[1]) For applications outside the European Union, operation at mains voltage AC 120 V/AC 230 V ±10% is ensured

Flame supervision with ionization is accomplished by making use of the conductivity and rectifying effect of the flame.

The DC current that flows in the presence of a flame (ionization current) is largely proportional to the flame quality. This current is measured in the flame signal amplifier.

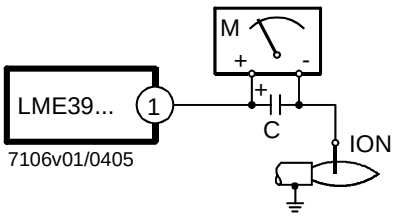
The amplifier is designed such that it only responds to the DC current component of the flame signal. This ensures that a short circuit between the ionization probe and ground cannot simulate a flame signal (since in that case AC current would flow).

Note!
The ignition (ignition spark) can have a negative effect on the ionization current formation during startup.

To minimize the impact
- the positioning of the ionization probe must be checked and optimized
- it may be beneficial to replace the electrical connections (phase / neutral) on the primary side of the ignition transformer

A short-circuit between ionization probe and ground initiates a non-alterable lockout.

6.4.1 Measuring circuit



Legend

C Electrolytic capacitor 100...470 µF; DC 10...25 V
ION Ionization probe
M Microammeter, Ri max. 5,000 Ω

Figure 6: Measuring circuit: Ionization probe

For detector currents, see *General unit data*.

6.5 Flame supervision with AGQ3.xA27 and flame detector QRA...

Only in connection with LME39.xxxx2 (AC 230 V)!

Mains voltage	AC 230 V +10%/-15%
Mains frequency	50...60 Hz ±6%
Perm. cable length from QRA... to AGQ3.xA27 (lay separate cable)	Max. 20 m, unshielded
Perm. cable length from AGQ3.xA27 to LME39.xxxx2	Max. 2 m, unshielded
Weight of AGQ3.xA27	Approx. 140 g
Mounting position	Optional
Degree of protection	IP40, to be ensured through mounting
Power consumption	4.5 VA

	At mains voltage UN	
	AC 220 V	AC 240 V
Detector voltage at QRA... (with no load)		
Terminal 3 off (refer to program sequence)	DC 400 V	DC 400 V
Terminal 3 on (refer to program sequence)	DC 300 V	DC 300 V
Detector voltage Load by DC measuring instrument Ri >10 MΩ		
Terminal 3 off (refer to program sequence)	DC 380 V	DC 380 V
Terminal 3 on (refer to program sequence)	DC 280 V	DC 280 V
DC current detector signals with flame detector QRA...	**Min. required**	**Max. possible**
Measurement at the flame detector QRA…	200 µA	500 µA

Table 4: Data QRA...

Ancillary unit AGQ3.xA27

The correct functioning of aged UV cells can be checked with a UV test by applying a higher voltage to the UV cell after controlled shutdown until terminal 3 carries voltage.

Connection diagram

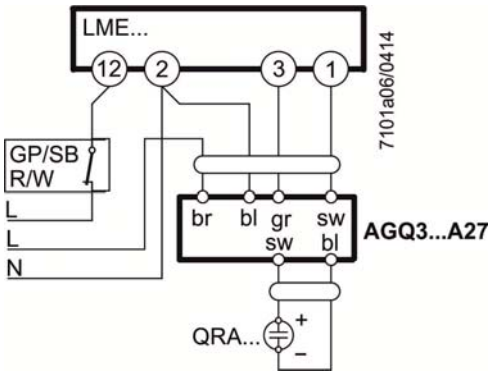


Figure 7: Connection diagram AGQ3.xA27

Measuring circuit for measuring the UV flame current

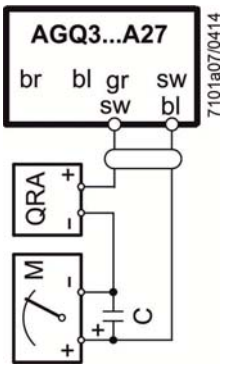


Figure 8: Measurement made at the flame detector QRA…

Legend

C	Electrolytic capacitor 100...470 µF; DC 10...25 V	bl	Blue
M	Microammeter Ri max. 5,000 Ω	br	Brown
QRA...	Flame detector	gr	Grey
GP	Pressure switch		(old: rt = red)
SB	Safety limit thermostat	sw	Black
R	Control thermostat or pressurestat		
W	Limit thermostat or pressure switch		

7 Functions

7.1 Preconditions for burner startup

- Burner control must be reset
- All contacts in the line are closed, request for heat
- No undervoltage
- Air pressure switch or CPI must be in its no-load position, or DBR2 is connected
- Fuel valve 1 is connected
- Fan motor or AGK25 is connected
- Flame detector is darkened and there is no extraneous light

7.2 Undervoltage

- Safety shutdown from the operating position takes place should mains voltage drop below about AC 75 V (at UN = AC 120 V)
- Restart is initiated when mains voltage exceeds about AC 95 V (at UN = AC 120 V)
- Safety shutdown from the operating position takes place should mains voltage drop below about AC 165 V (at UN = AC 230 V)
- Restart is initiated when mains voltage exceeds about AC 175 V (at UN = AC 230 V)

7.3 Controlled intermittent operation

After no more than 24 hours of continuous operation, the burner control initiates automatic controlled shutdown followed by a restart.

7.4 Control sequence in the event of fault

If lockout occurs, the outputs for the fuel valves, the burner motor and the ignition equipment immediately deactivated (<1 second).

Cause	Response
Mains failure	Safety shutdown, followed by restart on restoration of mains voltage
Voltage below undervoltage threshold	Safety shutdown
Voltage above undervoltage threshold	Restart
Extraneous light during prepurge time	Lockout, blink code 4
Extraneous light during waiting time	Prevention of startup, lockout after approx. 30 seconds at the latest, blink code 4
No flame at the end of safety time	**Factory setting:** Lockout at the end of safety time, blink code 2 **Can be parameterized:** Max. 3 repetitions, followed by lockout at the end of safety time, blink code 2
Loss of flame during operation	**Factory setting:** Lockout, blink code 7 **Can be parameterized:** Max. 3 repetitions, followed by lockout, blink code 7
Air pressure switch welded in working position	Prevention of startup, lockout after approx. 65 seconds at the latest, blink code 5
Air pressure switch welded in no-load position - Failure during valve proving (only in connection with LDU11...)	Lockout approx. 180 seconds at the end of specified time blink code 3 Note! Time may be extended by the actuator's running time (t11), depending on the application.
No air pressure signal after completion specified time	Lockout, blink code 3
CPI contact is open during waiting time	Prevention of startup, lockout after approx. 60 seconds at the latest, blink code 14

Table 5: Lockout

In the event of lockout, the LME39… remains locked and the red fault signal lamp lights up. The burner control can immediately be reset. This state is also maintained in the event of mains failure.

7.5 Resetting the burner control

When lockout occurs, the burner control can immediately be reset. Keep the lockout reset button depressed for about 1 second (<3 seconds). The LME39… can only be reset when all contacts in the line are closed and when there is no undervoltage.

The burner control can also be reset via display and operation unit AZL2... or PC software ACS410.

7.6 Limitation of repetitions (can be parameterized)

If no flame is established at the end of safety time, or if the flame is lost during operation, a maximum of 3 repetitions per controlled startup can be performed via control thermostat/pressurestat, or else lockout will be initiated. Counting of repetitions is restarted each time a controlled startup via control thermostat/pressurestat takes place.

Factory setting: No repetition

Note!
In the event of repetition due to loss of flame during operation, a flame signal must be available at the end of the safety time; if not, the unit will go to lockout.

8 PC software ACS410

8.1 Duty of PC software

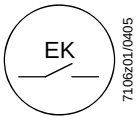
The PC software is a component of the LME39… system and serves primarily as an operator module for the following basic tasks:

- Visualization of system state with the following data:
  - Parameters
  - Process data
- Configuration and parameterization of the basic unit (individual parameters)
- Reset

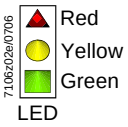
For operating and commissioning instructions, refer to Installation and Operating Instructions J7352.

9 Operation, indication, diagnostics

9.1 Operation



Lockout reset button is the key operating element for resetting the burner control and for activating/deactivating the diagnostics functions.



The multicolor signal lamp in the lockout reset button is the key indicating element for visual diagnostics and interface diagnostics.

Both (lockout reset button/signal lamp) are located under the transparent cover of the lockout reset button.

There are 3 diagnostics choices:

1. Visual diagnostics: Operational status indication or diagnostics of the cause of fault
2. Interface diagnostics: With the help of the interface OCI400... and the PC software ACS410 or flue gas analyzers of different makes.
3. On the display of the AZL2… or BC interface OCI410 and PC software ACS410

Visual diagnostics:
In normal operation, the different operating states are indicated in the form of color codes according to the color code table given below.

9.2 Operational status indication

During startup, operation indication takes place according to the following table:

Color code table for multicolor signal lamp (LED)		
Status	**Color code**	**Color**
Waiting time, other waiting states	○.....	OFF
Prepurging, air pressure switch waiting phase, postpurging	●.....	Yellow
Ignition phase, ignition controlled	○●○●○●○●○●○	Flashing yellow
Operation, flame o.k.	■.....	Green
Operation, flame not o.k.	○■○■○■○■○■○	Flashing green
Extraneous light on burner startup	■▲■▲■▲■▲■▲■	Green-red
Undervoltage	●▲●▲●▲●▲●▲●▲	Yellow-red
Fault, alarm	▲.....	Red
Error code output (refer to Error code table)	○▲○▲○▲○▲○▲○	Flashing red
Interface diagnostics	▲▲▲▲▲▲▲▲▲▲▲▲	Red flicker light

Table 6: Error code table

Legend

..... Steady on
○ OFF
▲ Red
● Yellow
■ Green

9.3 Diagnostics of cause of fault

After lockout, the red signal lamp is steady on. In that condition, visual diagnostics of the cause of fault according to the error code table can be activated by pressing the lockout reset button for more than 3 seconds. Pressing the lockout reset button again for at least 3 seconds activates interface diagnostics. Interface diagnostics works only if the AGK20... lockout reset button extension is not fitted. If, by accident, interface diagnostics has been activated, in which case the slightly red light of the signal lamp flickers, it can be deactivated by pressing again the lockout reset button for at least 3 seconds. The moment of switching over is indicated by a yellow light pulse.

The following sequence activates the diagnostics of the cause of fault:

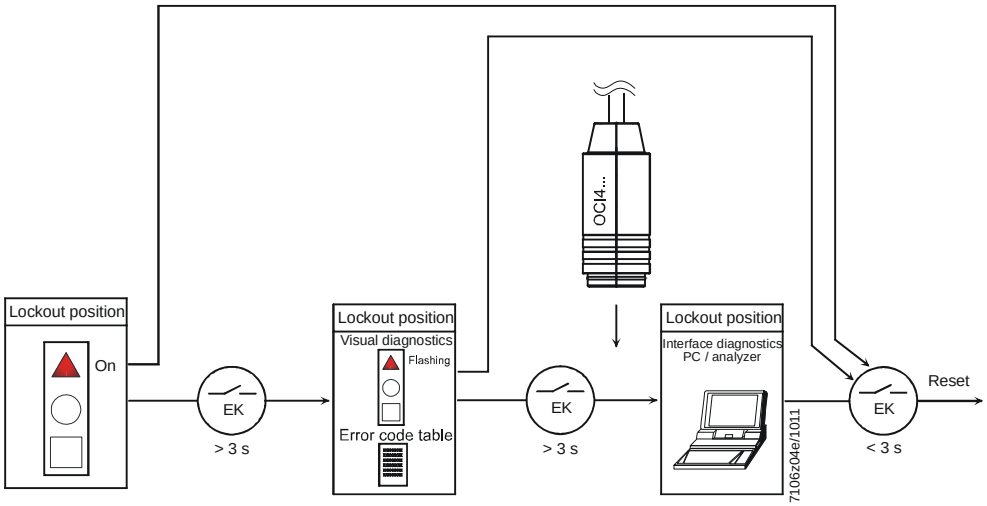


Figure 9: Diagnostics of cause of fault

Error code table

Red blink code of signal lamp (LED)	Alarm at terminal 10	Possible cause
2 blinks	ON	No establishment of flame at the end of safety time - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
3 x blinks	ON	Air pressure switch faulty - Loss of air pressure signal after specified time - Air pressure switch welded in no-load position - Failure during valve proving (only in connection with LDU11...)
4 blinks	ON	Extraneous light on burner startup
5 blinks	ON	Air pressure switch time supervision - Air pressure switch welded in working position
6 blinks	ON	Free
7 blinks	ON	Too many losses of flame during operation (limitation of repetitions) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
8 x blinks	ON	Free
9 blinks	ON	Free
10 blinks	OFF	Wiring error or internal error, output contacts, other fault
14 blinks	ON	CPI contact not closed

Table 7: Error code table

During the time the cause of fault is diagnosed, the control outputs are dead.

- Burner remains shut down
- External fault indication remains deactivated
- Fault status signal (alarm) at terminal 10, according to the error code table

The diagnostics of the cause of fault is quit and the burner switched on again by resetting the burner control. Press the lockout reset button for about 1 second (<3 seconds).

Note!
When using coiled igniters, flame detection may be improved by increasing parameter 228 (tfz). To prevent an extended safety time (TSA, parameter 227) in that case, the postignition time (t3n, parameter 257) must be reduced to the same extent.

Warning!
If the set safety time (TSA) is too long, the safety functions will become ineffective. Compliance with the relevant standards must be ensured!

10 Inputs and outputs/internal connection diagram/program sequence of LME39.100...

10.1 Program sequence

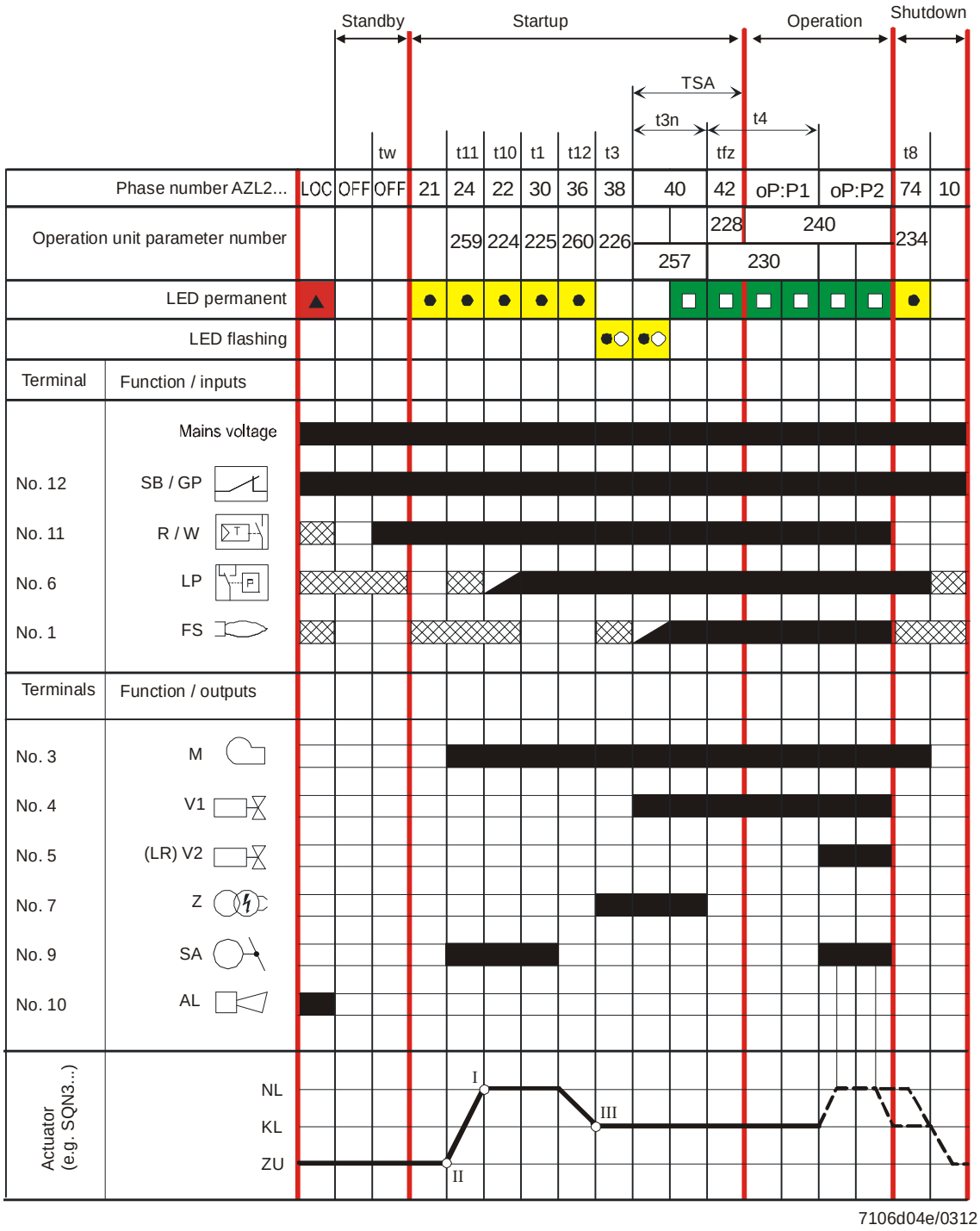


Figure 10: Program sequence

10.2 Inputs and outputs/internal connection diagram

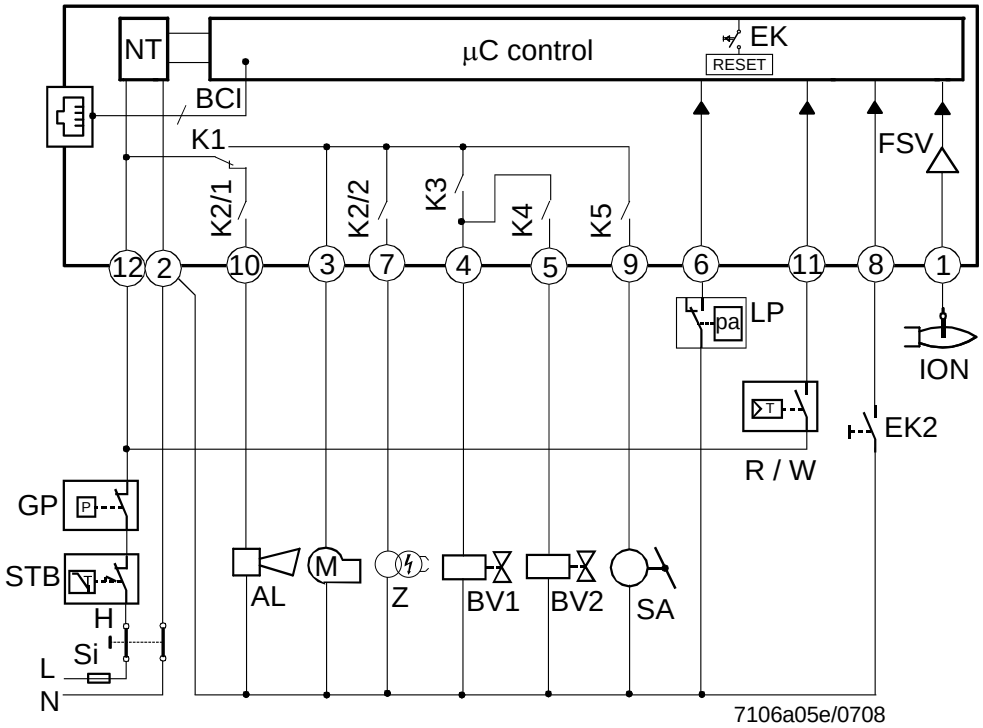


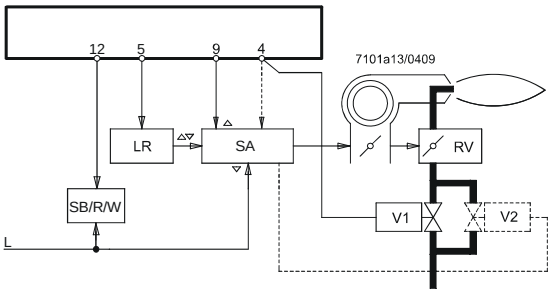
Figure 11: Internal diagram

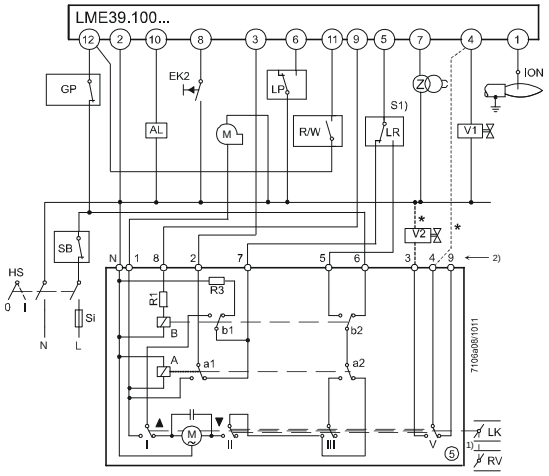
10.3 Application examples

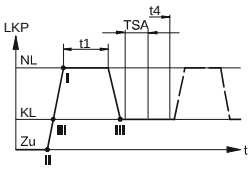
Attention!
The connection diagrams shown are merely examples which must be adapted in the individual case depending on the application!

Control of actuators of 2-stage or 2-stage modulating burners.
Controlled prepurging with high-fire air volume.

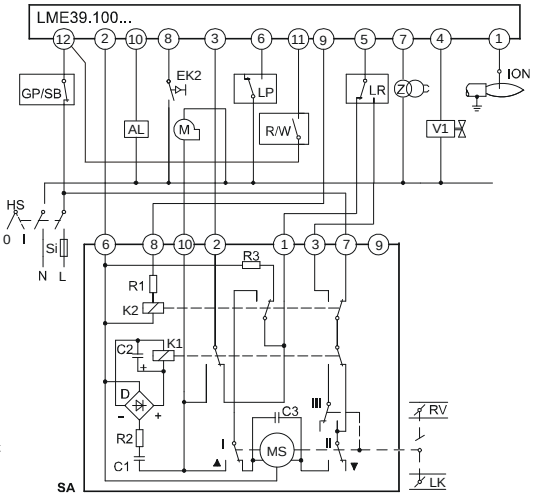
For information about actuators:
SQN3... see Data Sheet N7808
SQN7... see Data Sheet N7804
SQN9... see Data Sheet N7806





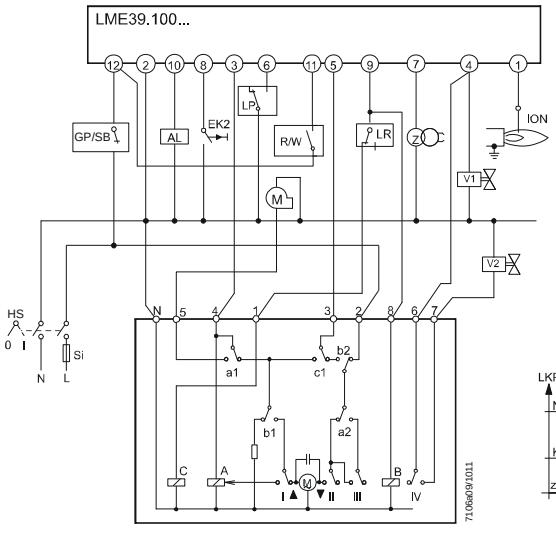


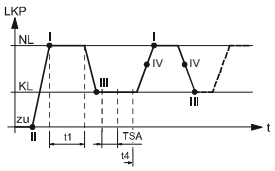
SQN3...151... or SQN3...251...



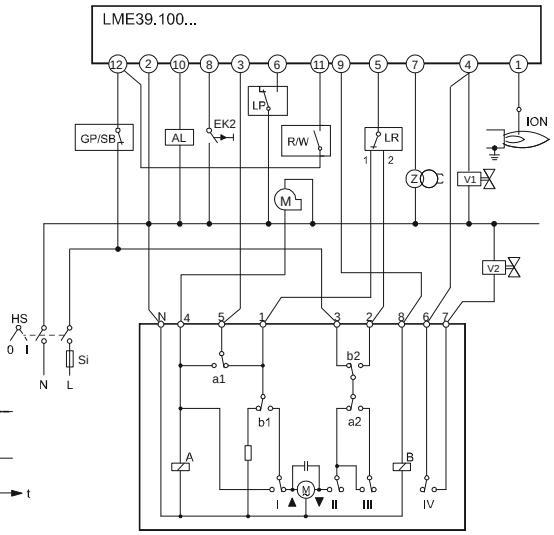
SQN90.220.../2-stage modulating control

*** Note:**
With 2-stage modulating burners (with gas regulation damper), fuel valve 2 and the dotted connection between terminals (*) are not required.





SQN7...454/2-stage control
1 wire control



SQN7...424/2-stage control
2 wire control

Figure 12: Application examples LME39.100...

10.4 Application LME39.100... with LDU11...

- Before startup of burner
- In the case of plants without vent pipe to atmosphere

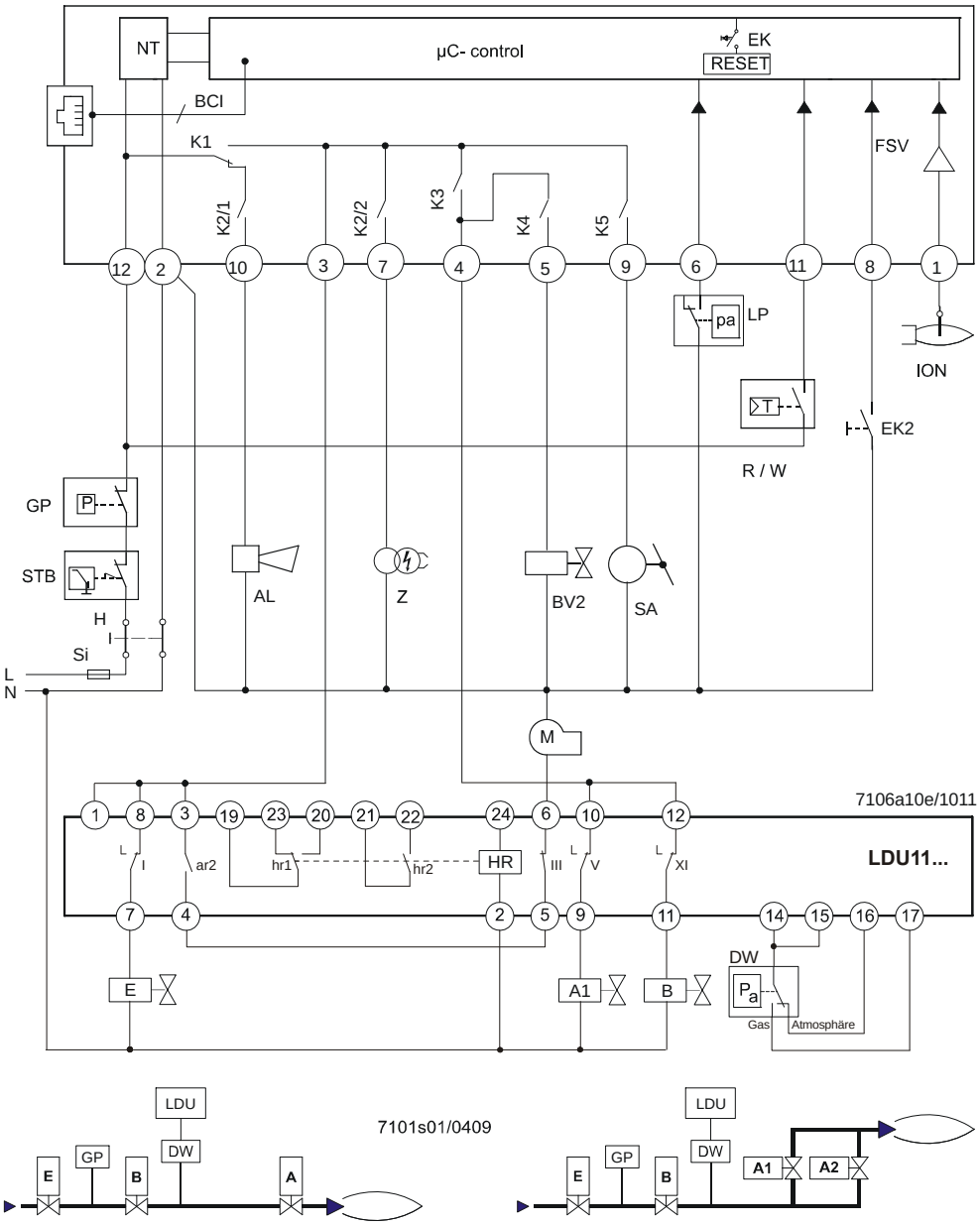


Figure 13: Application examples with LDU11...

- Valve proving is started each time the system is switched on, with connection of terminal 3, after controller ON or after lockout
- If the LDU11... initiates lockout, valve proving can take up to 160 seconds. Therefore, the maximum permissible response time of the air pressure switch is 180 seconds
- With the LDU11…, faults during valve proving lead to lockout and, with the LME39.100..., to lockout due to air pressure switch timeout (blink code 3)

☞

- Note!
  A faulty air pressure switch (air pressure switch does not closing) leads to lockout (blink code 3) on completion of the pressure switch response time of 180 seconds and can be distinguished from lockout due to faulty valve proving only because the LDU11... did not go to lockout
- The fan motor must be connected to terminal 6 of the LDU11... since release takes place via the air pressure switch upon successful valve proving

11 Inputs and outputs/internal connection diagram/program sequence of LME39.400...

11.1 Program sequence

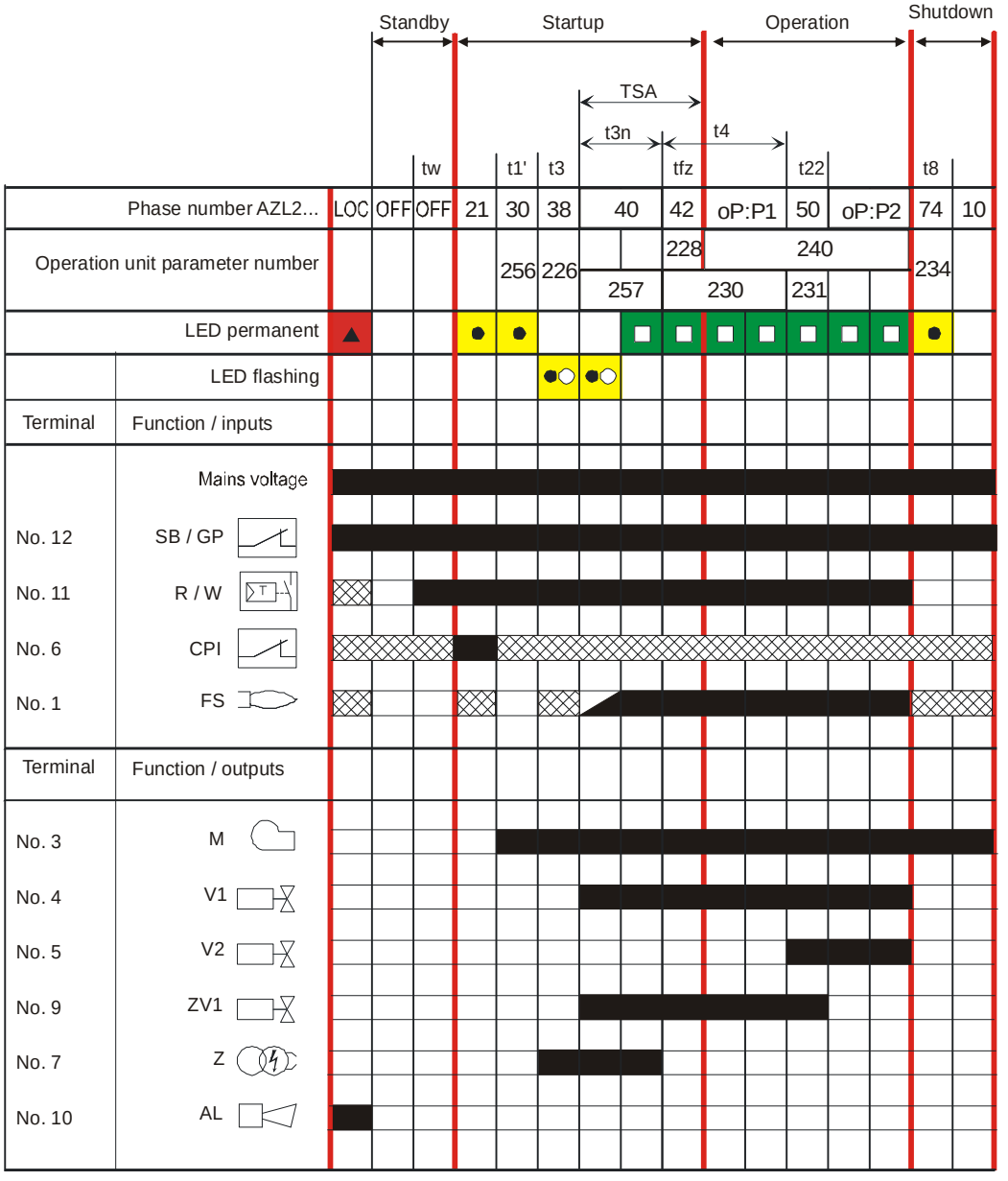


Figure 14: Program sequence

11.2 Inputs and outputs/internal connection diagram

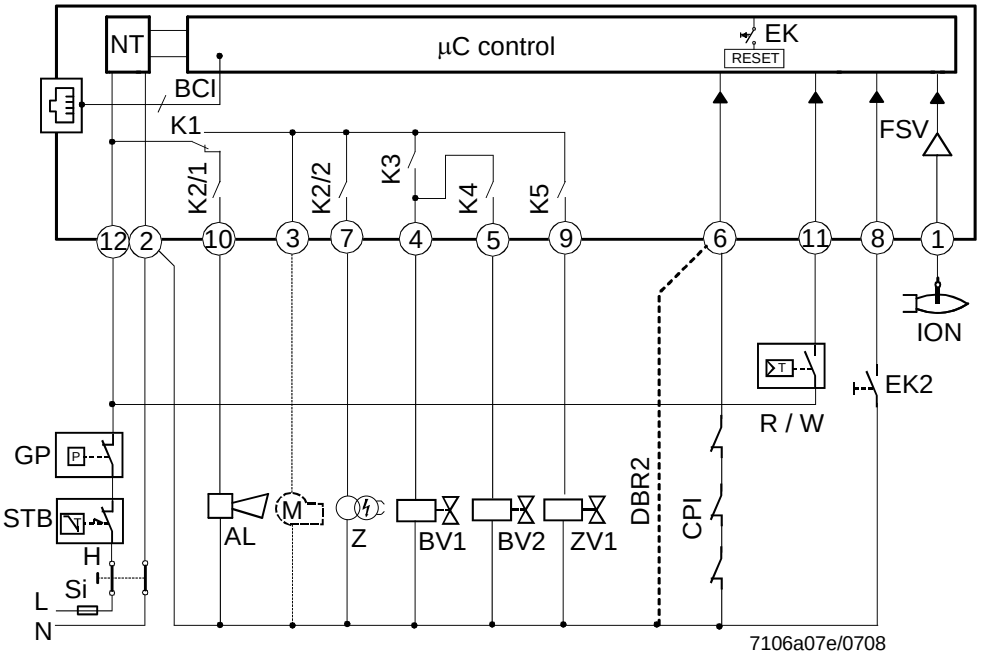


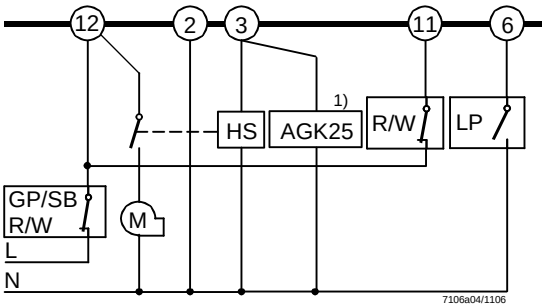
Figure 15: Internal diagram

11.3 Application example

Warning!
The connection diagram shown is merely an example which must be adapted in the individual case depending on the application!

Recommendation**:**

Note!
In extremely EMC-stressed environments, burners without fan motor or burners equipped with fan control via auxiliary contactor should use an AGK25 to produce a burden on terminal 3. If not observed, the burner is not reliably started up



[1]) AGK25 is required only if an auxiliary relay with a coil resistance of ≥50 kΩ is used

Figure 16: Only for burners with fan control via auxiliary contactor with air pressure switch

12 Legend

I, II, III	Cams actuator
t1	Prepurge time
t1´	Purge time
t3	Preignition time
t3n	Postignition time (P257+0.3 seconds)
t4	Interval between ignition OFF and release of fuel valve 2
t8	Postpurge time
t10	Specified time for air pressure signal
t11	Programmed opening time for actuator
t12	Programmed closing time for actuator
t22	2nd safety time
tfz	Flame detection time
TSA	Safety time (t3n + tfz)
tw	Waiting time
A, A1, A2	Gas valves controlled to evacuate the test space with valve proving
AGK25…	PTC resistor
AL	Error message (alarm)
B	Gas valve controlled to fill the test space with valve proving
BCI	Communication interface
BV...	Fuel valve
CPI	Closed Position Indicator
DBR2	Wire link
DW	Pressure switch-valve proving
E	Safety shut-off valve, dead closed (optional)
EK	Lockout reset button (internal)
EK2	Remote lockout reset button
FS	Flame signal
FSV	Flame signal amplifier
GP	Gas pressure switch
H	Main switch
HS	Auxiliary contactor, relay
ION	Ionization probe
K1...	Internal relay
KL	Low-fire
LK	Air damper
LKP	Position of air damper
LP	Air pressure switch
LR	Load controller
M	Fan motor
MS	Synchronous motor
NL	High-fire
NT	Power supply unit
QRA…	Flame detector
R	Control thermostat/pressurestat
RV	Gas regulation damper
SA	Actuator SQN...
SB	Safety limiter
Si	External fuse
STB	Safety limit thermostat
t	Time
V...	Fuel valve
W	Limit thermostat/pressure switch
Z	Ignition transformer
ZV	Extra valve

■	Input signal/output signal 1 (ON)
□	Input signal/output signal 0 (OFF)
▨	Input permissible signal 1 (ON) or 0 (OFF)

13 Dimensions

13.1 LME39...

Dimensions in mm

Plug-in base AGK11.6

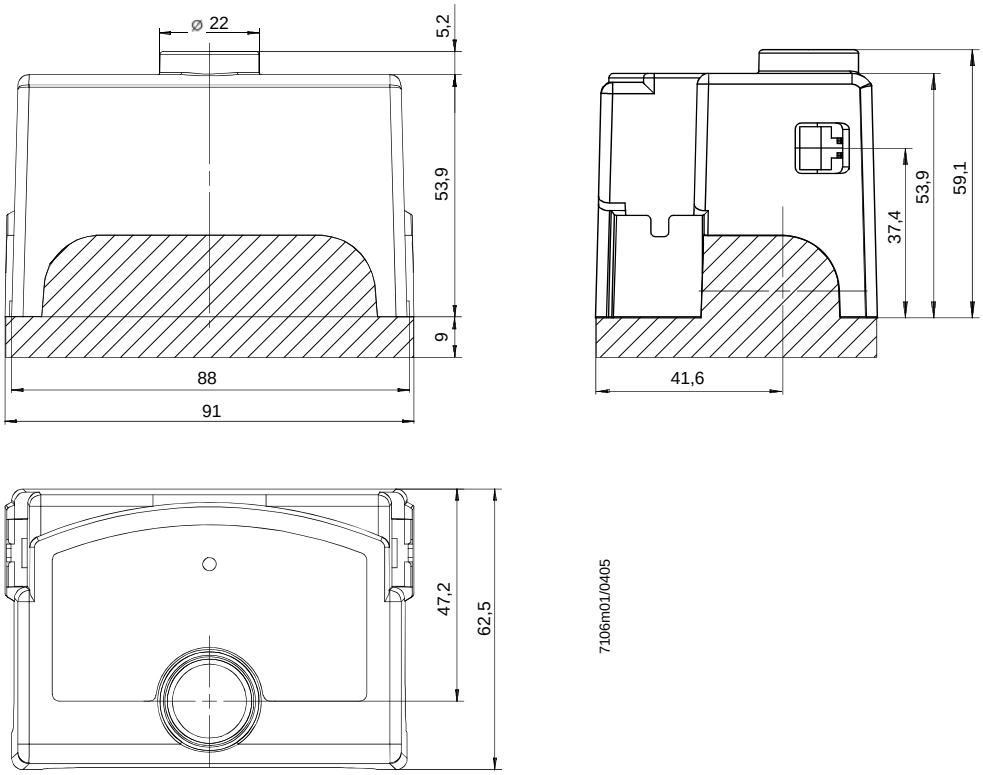


Figure 17: Dimensions LME39...

13.2 LME39... with lockout reset button extension AGK20...

Dimensions in mm

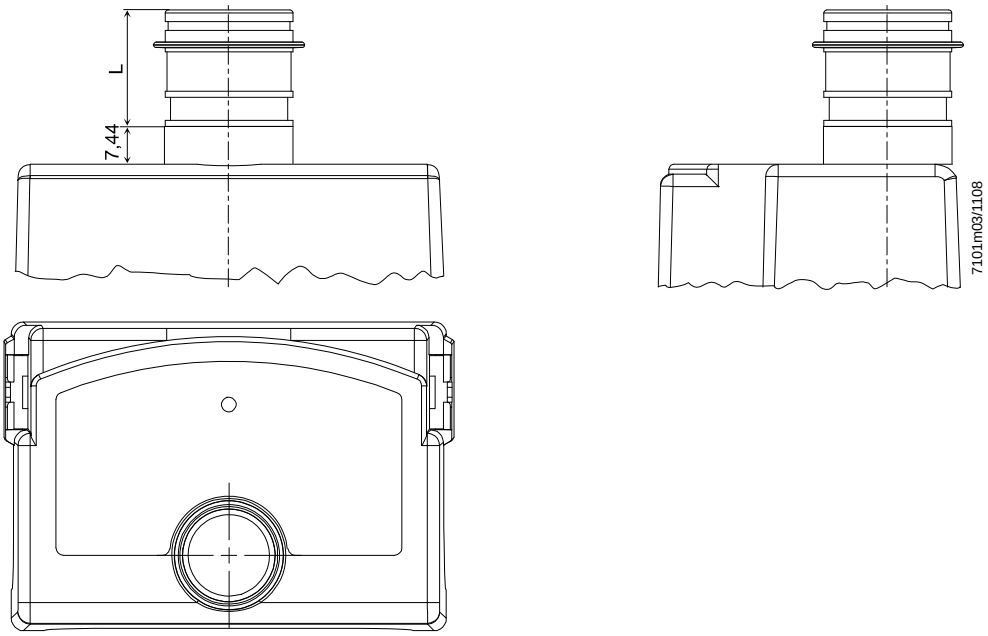


Figure 18: Dimensions LME39... with AGK20...

Designation	Length (L) in mm
AGK20.19	19
AGK20.43	43
AGK20.55	55

Table 8: Dimensions table AGK20...

13.3 Ancillary unit AGQ3.xA27

Dimensions in mm

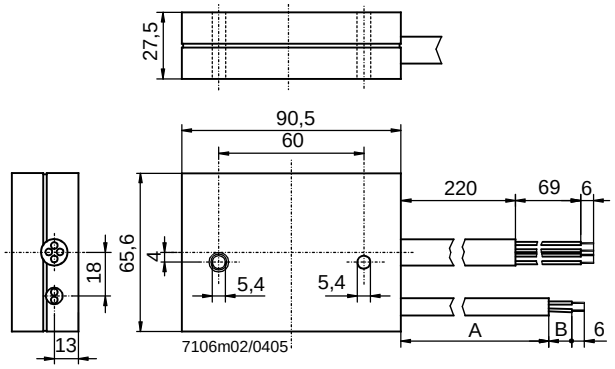


Figure 19: Dimensions AGQ3.xA27

Product no.	Dimensions	
	A	B
AGQ3.1A27	500	19
AGQ3.2A27	300	34

Table 9: Dimensions table AGQ3.xA27

14 Operation via the AZL2…

14.1 Description of the unit/display and buttons

Function and operation of unit versions AZL21… and AZL23… are identical.

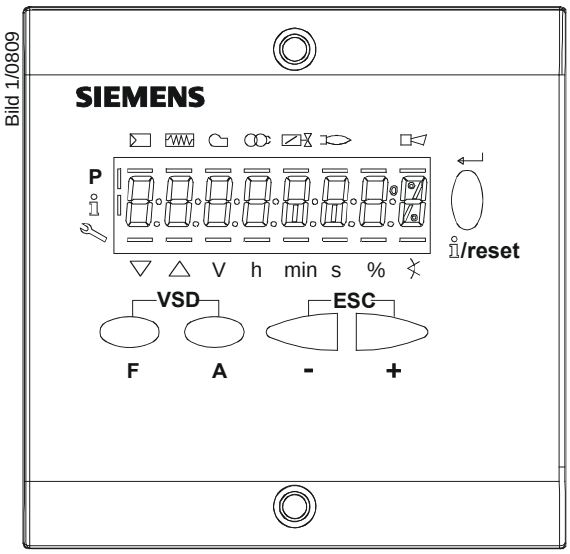


Figure 20: Description of the unit/display and buttons

Button	Function
VSD F A	**Buttons A and F: Parameterized function** - For switching to parameter setting mode **P** (press F and A simultaneously)
/reset	**Info and Enter button** - For navigation in info and service mode * For selection (symbol flashing) (press button for <1 second) * For changing to a lower menu level (press button for 1…3 seconds) * For changing to a higher menu level (press button for 3…8 seconds) * For changing to the normal display (press button for >8 seconds) - **Enter** in parameter setting mode - **Reset** in the event of fault - One menu level down
-	**- button** - For decreasing the value
+	**+ button** - One menu level down - For increasing the value
ESC - +	**+ and - button: Escape function** (press - and + simultaneously) - No adoption of value - One menu level up

14.2 Meaning of symbols on the display

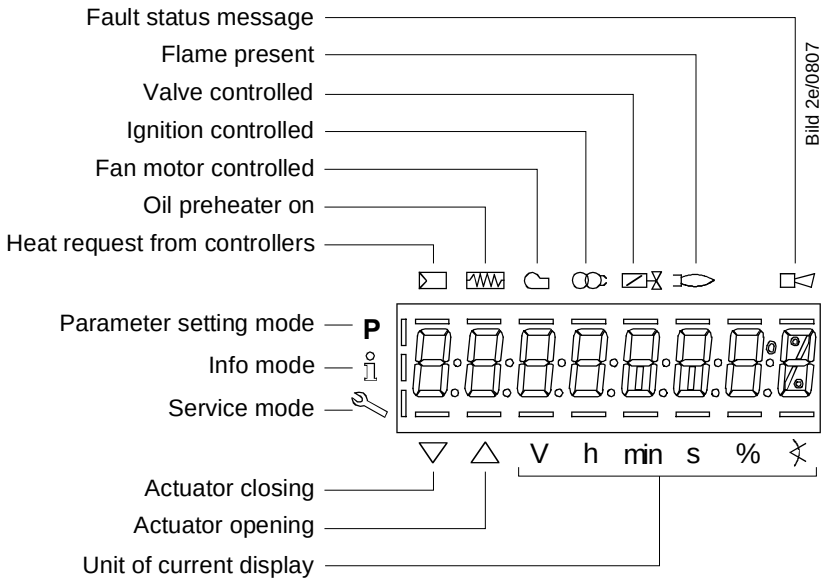
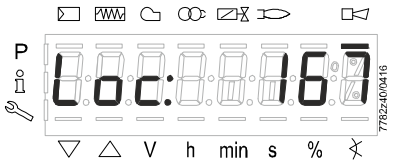


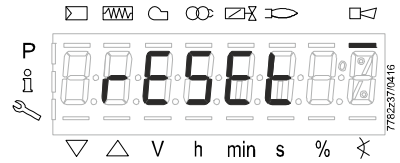
Figure 21: Meaning of display

14.3 Special functions

14.3.1 Manual lockout

i/reset plus any other button		Press i/reset **together** with **any other button**. The basic unit switches instantly to the lockout position, no matter what the operating position. The display shows the fault status message. Example: Error code **167** (Refer to chapter *Error code list*)

The reset must be carried out as follows:

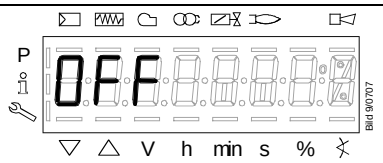
i/reset 1 s		When the i/reset button is pressed for 1 second, **rESEt** appears on the display. When the button is released, the basic unit is reset.

15 Operation

15.1 Normal display

Normal display is the standard display in normal operation, representing the highest menu level. From the normal display, you can change to the info, service or parameter level.

15.1.1 Display in standby mode



Unit is in standby mode.

15.1.2 Display during startup/shutdown

15.1.2.1. Display of program phases

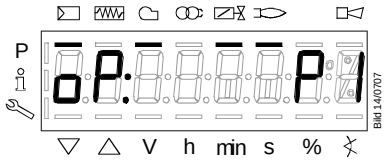
The unit is in **Ph**ase **30**. The controller calls for heat. The bar below the ▭ symbol appears. The individual program phases and controlled components are displayed in accordance with the program sequence.

15.1.2.2. List of phase displays

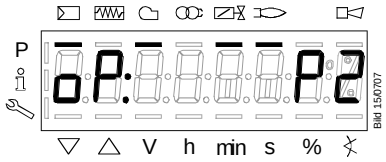
Phase	Function
Ph1	Undervoltage
Ph2	Fault without lockout
Ph4	Extraneous light on burner startup
Ph10	Home run
OFF	Standby
Ph21	Air pressure switch check, CPI check
Ph22	Fan ramp up time (fan motor = ON, safety valve = ON) specified time air pressure signal
Ph24	Actuator traveling to the prepurge position
Ph30	Prepurge time
Ph36	Actuator traveling to the ignition position
Ph38	Preignition time
Ph40	1st safety time (ignition transformer ON)
Ph42	1st safety time (ignition transformer OFF), flame detection time
Ph50	2nd safety time
Ph74	Postpurge time
oP: P1	Operation stage 1 (fuel valve 1 ON)
oP: P2	Operation stage 2 (fuel valve 1/fuel valve 2 ON)

Table 10: List of phase

15.1.3 Display of operating position



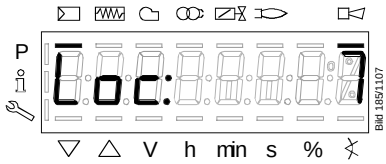
Display **oP: P1** stands for stage 1.
The display following **oP** is unit-specific.



Display **oP: P2** stands for stage 2.
The display following **oP** is unit-specific.

15.1.4 Fault status messages, display of errors and info

15.1.4.1. Display of errors (faults) with lockout



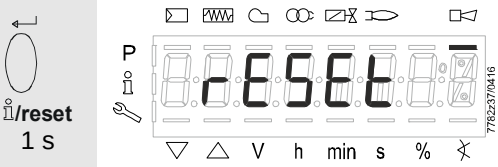
The display shows **Loc:**. The bar under the fault status message ⚑ appears.

The unit is in the lockout position.

The current error code is displayed (refer to Blink code table).

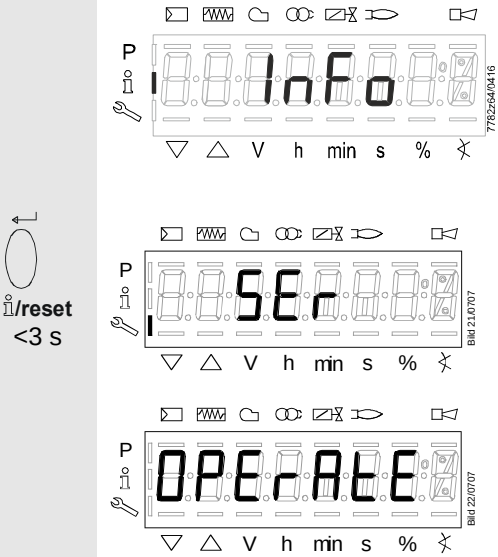
Example: Error code **7**

15.1.4.2. Reset



When pressing i/reset for 1 second, **rESEt** appears on the display.

When the button is released, the basic unit will be reset.



When pressing i/reset for >3 seconds, the display shows **InFo**, **SEr** and then **OPErAtE**.

When the button is released, the basic unit will be reset.

Note!
For meaning of the error and diagnostic codes, refer to the error list in section *Error history*.
When an error has been acknowledged, it can still be read out from the error history.

16 Menu-driven operation
16.1 Assignment of levels

The various levels can be accessed via different button combinations. The parameter level can only be accessed by entering a password.

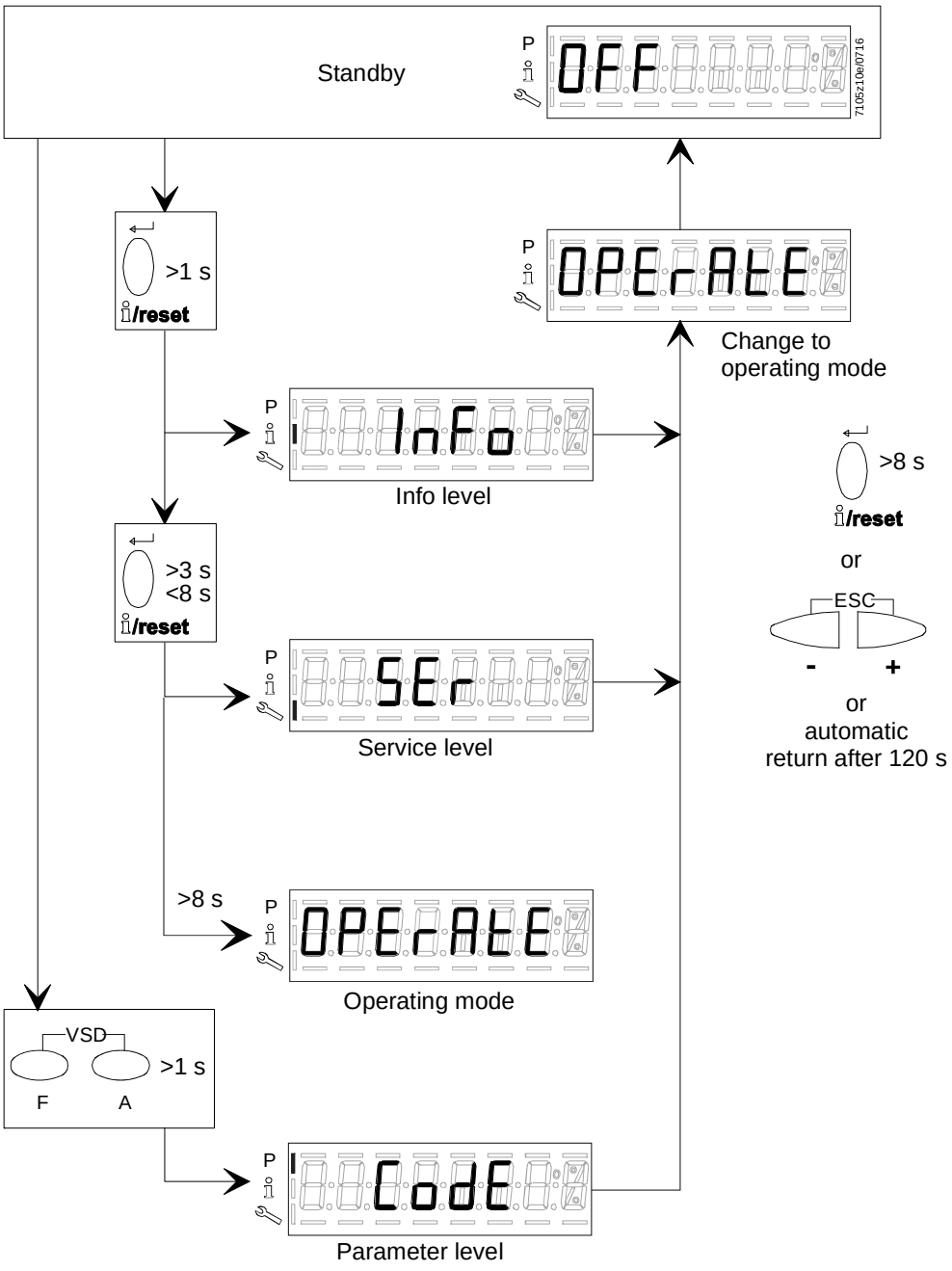
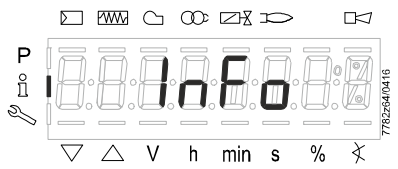


Figure 22: Assignment of levels

17 Info level

17.1 Display of info level

ℹ/reset 1…3 s		Press ℹ/reset until **InFo** appears. When releasing ℹ/reset, you are on the info level.

The info level displays information about the basic unit and operation in general.

Note!

On the info level, you can press - or + to display the next or the previous parameter.

In place of the + button, you can also press ℹ/reset for <1 second.

Note!

You can press ESC - + or ℹ/reset for >8 seconds to return to the normal display.

Note!

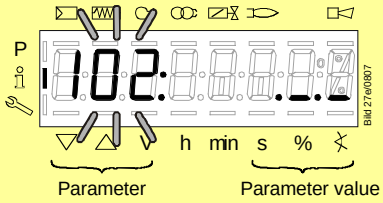


Figure 23: Info level

No change of value on the info level.

If the display shows ▬.▬ together with the parameter, the value may consist of more than 5 digits.

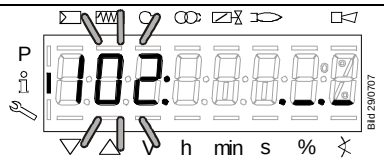
When pressing ℹ/reset for >1 second and <3 seconds, the value will be displayed.

By pressing ℹ/reset for >3 seconds or ESC - + , you return to the selection of the parameter number (parameter number flashes).

17.2 Display of info values

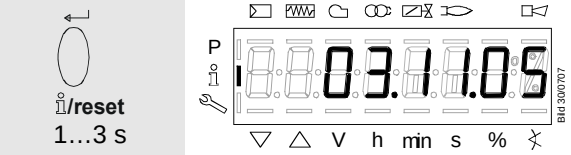
17.2.1 Identification date

The identification date described below corresponds to the creation date for the program sequence and cannot be changed by the user.



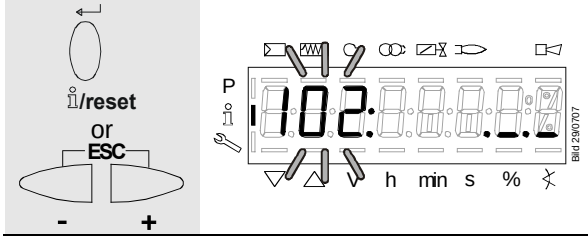
On the left, parameter **102:** is displayed flashing.
On the right, **._._** is displayed.

Example: **102: ._._**



Pressing the i/reset button (1…3 seconds) and releasing it when **._._** flashes displays the identification date (creation date of the program sequence), **DD.MM.YY**.

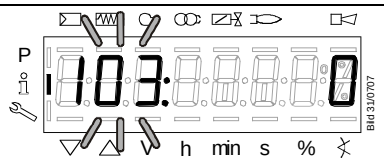
Example: Identification date **03.11.05**



Press i/reset or ESC - + to return to the display of parameters.

To the next parameter +

17.2.2 Identification number



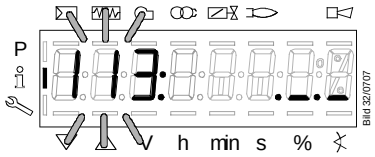
On the left, parameter **103:** is displayed flashing.
On the right, identification number **0** appears.

Example: **103: 0**

To the next parameter + or i/reset for <1 s

- Back to the previous parameter

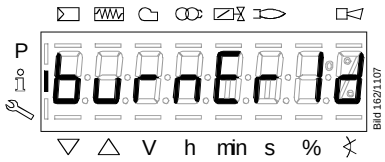
17.2.3 Identification of burner



On the left, parameter **113:** is displayed flashing.
On the right, **._._** appears.

Example: **113: ._._**

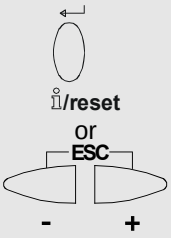
i/reset
1…3 s

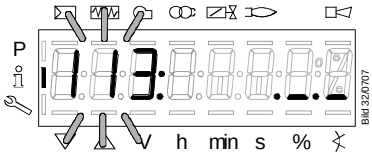


Pressing the i/reset button (1…3 seconds) and releasing it when **._._** flashes displays the burner ID.

Default setting: **burnEr Id**

Note!
The burner ID can only be changed with the help of the PC software ACS410 and only on parameter level.

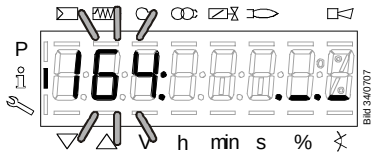
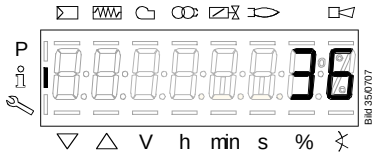
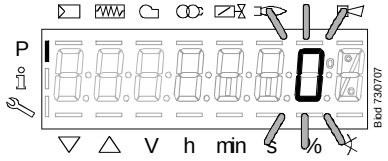
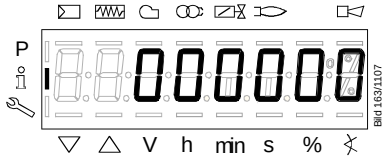
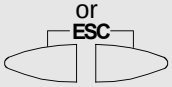
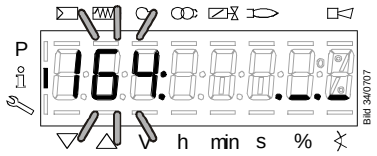
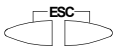




Press i/reset or - + ESC to return to the display of parameters.

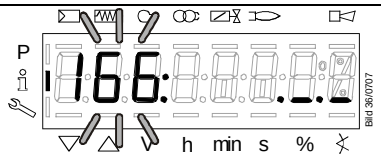
To the next parameter	+	-	Back to the previous parameter

17.2.4 Number of startups resettable

		On the left, parameter **164:** is displayed flashing. On the right, characters **._._** appear. Example: Parameter **164: ._._**
 **i/reset** 1…3 s		 Pressing the **i/reset** button (1…3 seconds) and releasing it when **._._** flashes displays the number of startups (can be reset). Example: **000036**
 **i/reset** 3…8 s		 Press **i/reset** for 3…8 seconds to go to the range that can be changed. Digit **0** flashes.
 **i/reset**		 By pressing **i/reset**, the number of startups is reset to **0**. Display: **000000**
 **i/reset** or 		 Press **i/reset** or  to show parameter **164** flashing again.

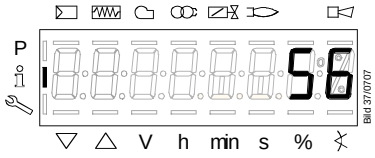
To the next parameter		 Back to the previous parameter

17.2.5 Total number of startups



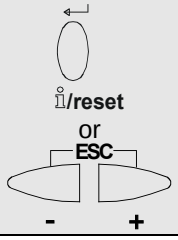
On the left, parameter **166:** is displayed flashing.
On the right, characters **._._** appear.

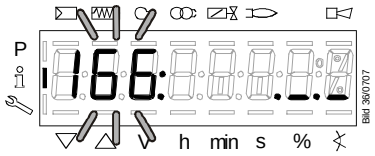
Example: Parameter **166: ._._**



Pressing the /reset button (1…3 seconds) and releasing it when **._._** flashes displays the total number of startups.

Example: **000056**

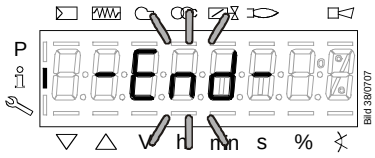




Press /reset or ESC - + to go back to the display of parameters.

To the next parameter	+	-	Back to the previous parameter

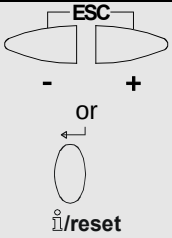
17.2.6 End of info level

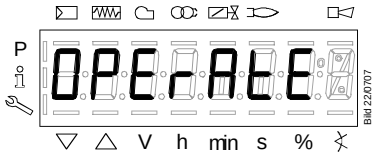


When this display appears, you have reached the end of the info level.

The display shows **– End –** flashing.

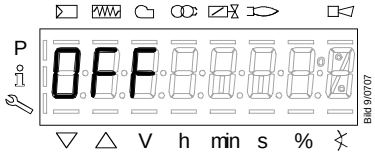
To the first parameter on the info level	+	-	To the final parameter on the info level





Press ESC - + or the /reset button (>8 seconds) to return to operating mode

The display shows **OPErAtE**.



When this display appears, you are back to standby and you can change to the next level mode.

Press /reset to switch between the service and the parameter level.

18 Service level

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

Note!

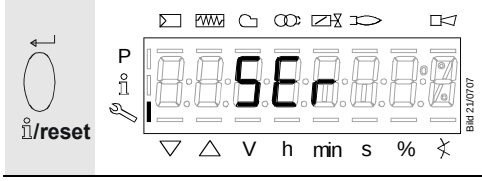
When on the service level, you can press - or + to display the next or the previous parameter.

Instead of pressing +, you can also press i/reset for <1 second.

Note!

Press ESC - + or i/reset for >8 seconds to return to the normal display.

18.1 Display of the service level



Press i/reset for >3 seconds until **SEr** appears.

When releasing i/reset, you are on the service level.

18.2 Display of service values

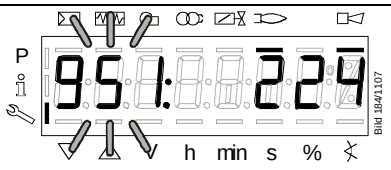
18.2.1 Error history

Refer to section *Parameter with index, with or without direct display/Example of parameter 701: Error history*.

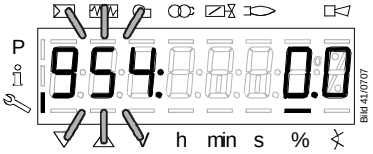
Note!
Can be deleted for service (refer to chapter *Parameter list*)!

Refer to chapter *Error code list*!

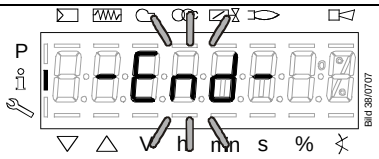
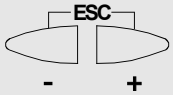
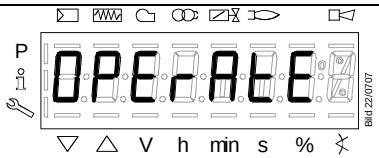
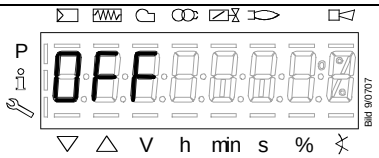
18.2.2 Mains voltage

		Parameter **951:** appears flashing. Mains voltage is displayed on the right. Example: **951: 224**
To the next parameter	+	- Back to the previous parameter

18.2.3 Intensity of flame

		The display shows parameter **954:** flashing. On the right, the intensity of the flame is displayed as a microamperes (µA). Example: **954: 0.0**
End of service level **– End –**	+	- Back to the previous parameter

18.2.4 End of service level

		When this display appears, you have reached the end of the service level. The display shows **– End –** flashing.
To the start of the service level	+	- To the end of the service level
		Press  to return to operating mode. The display shows **OPErAtE**.
		When this display appears, you are back to standby and you can change to the next level mode.

19 Parameter level

The parameters stored in the basic unit can be displayed or changed on the parameter level. The change to the parameter level requires entry of a password.
Siemens supplies the burner control LME39… with the factory settings according to *Type summary*.

The OEM can change the Siemens default settings to meet its own requirements.

With the LME39…, the burner control's characteristics are determined primarily through parameterization. Every time the unit is recommissioned, the parameter settings must be checked. The LME39… must never be transferred from one plant to another without matching the parameters to the new plant.

Caution!
Parameters and settings may only be changed by **qualified staff**.
If parameters are changed, responsibility for the new parameter settings is assumed by the person who – in accordance with the access rights – has made parameter changes on the respective access level.
After parameterization, the OEM must check to ensure that safe burner operation will be warranted.
The OEM which made the settings is always responsible for the parameters, their settings and compliance of the respective application with the relevant national and international standards and safety regulations, such as EN 676, EN 267, EN 1643, EN 746-2 etc. If this is not observed, there is a risk of loss of safety functions.
Siemens AG, its suppliers and other Group Companies of Siemens AG do not assume responsibility for special or indirect damage, consequential damage, other damage, or damage resulting from wrong parameterization.

Warning!
If the factory settings are changed, all changes made must be documented and checked by the OEM.

The OEM is obliged to mark the unit accordingly and to include at least the list of device parameters and settings in the burner's documentation.

Siemens also recommends attaching an additional mark on the LME39… in the form of an adhesive label. As specified in EN 298, the label should be easy to read and wipe proof.

The label with a maximum size of 70 x 45 mm can be attached to the upper part of the housing.

Example of label:

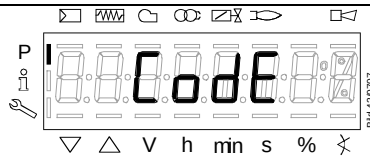
OEM logo
Product no./part no.: 1234567890ABCD
Caution! OEM settings:
Parameter no.

225 = 30 s (t1)	226 = 2 s (t3)
230 = 10 s (t4)	234 = 0 s (t8)
240 = 1 (repetition)	
257 = 2 s (t3n)	TSA = t3n + 0.7 s
259 = 30 s (t11)	
260 = 30 s (t12)	

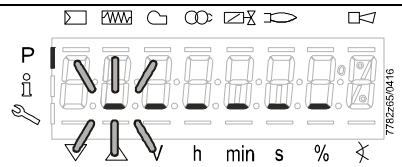
19.1 Entering the password

Note!
The **OEM** password must consist of **5** characters,
that for the **heating engineer** of **4** characters.

VSD
F A
>1 s

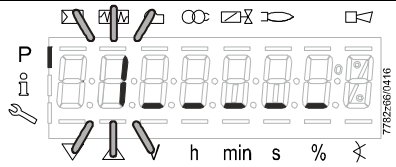


Press button combination VSD F A to display **CodE**.



When releasing the buttons, 6 bars appear the first of which flashes.

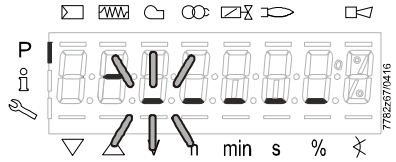
\- or +



Press - or + to select a numeral or letter.

ℹ/reset

\- or +



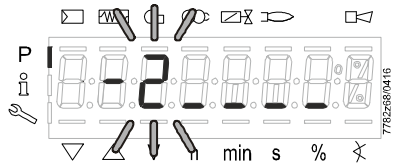
Press ℹ/reset to confirm the entry.

The value entered changes to a minus sign (**–**).

The next bar starts flashing.

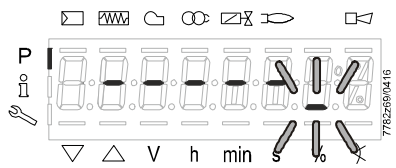
ℹ/reset

\- or +



Press - or + to select a numeral or letter.

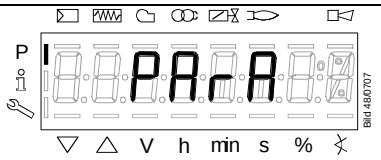
ℹ/reset



After entry of the last character, the password must be confirmed by pressing ℹ/reset.

Press ℹ/reset again to finish entry of the password.

Example: Password consisting of 4 characters.



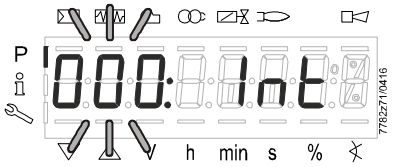
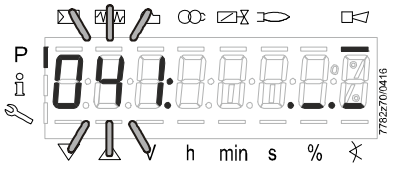
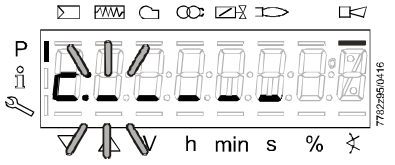
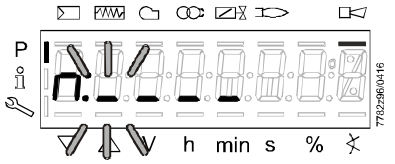
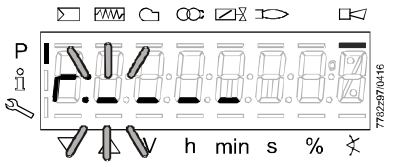
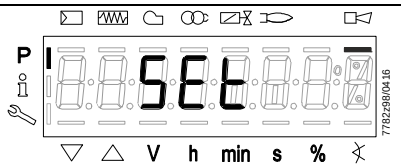
As a confirmation of correct entry, **PArA** appears for a maximum of 2 seconds.

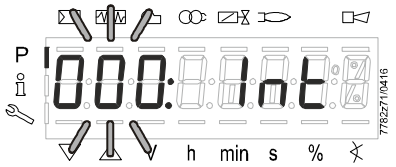
Note!
For the entry of passwords or burner IDs, the following numerals and letters can be used:

1	= 1	A	= A	L	= L
2	= 2	b	= b	n	= n
3	= 3	C	= C	o	= o
4	= 4	d	= d	P	= P
5	= 5	E	= E	r	= r
6	= 6	F	= F	S	= S
7	= 7	G	= G	t	= t
8	= 8	H	= H	u	= u
9	= 9	I	= I	Y	= Y
0	= 0	J	= J		

19.2 Changing the heating engineer's password

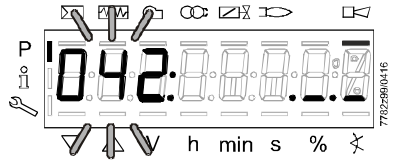
Note!
For the OEM to change the heating engineer's password, **c:** requires entry of the OEM password!

VSD F A >1 s		Press button combination VSD F A to display **000: Int**. Pressing the i/reset button takes you to parameter **041** heating engineer's password.
i/reset		Parameter **041:** flashes. Press i/reset to go to level **c:** for password changes.
i/reset		Letter **c:** for **c**onfirmation appears flashing. Proceed as described in section *Entering the password* and enter the former password. After entry of the last character, the password must be confirmed by pressing i/reset.
i/reset		Letter **n:** for **n**ew appears flashing. Proceed as described in section *Entering the password* and enter the new password (4 characters). After entry of the last character, the password must be confirmed by pressing i/reset.
i/reset		Letter **r:** for **r**epeat appears flashing. Proceed as described in section *Entering the password* and repeat entry of the new password. After entry of the last character, the password must be confirmed by pressing i/reset.
		**SEt** confirms that the new password has been saved. You will then be taken automatically to the next menu display **000: Int**.

		Pressing the ⎍/reset button takes you to parameter **041** heating engineer's password.

Continue in the parameter level to the next parameter group **100:**	 **+**	 **-** End of the parameter level **–End-**

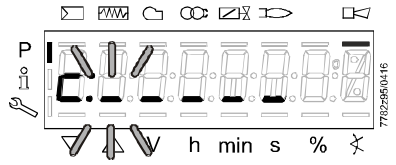
19.3 Changing the OEM's password



Parameter **042:** flashes.

Press ℹ/reset to go to level **c:** for password changes.

ℹ/reset

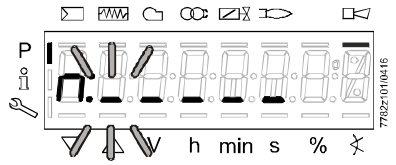


Letter **c:** for **c**onfirmation appears flashing.

Proceed as described in section *Entering the password* and enter the former password.

After entry of the last character, the password must be confirmed by pressing ℹ/reset.

ℹ/reset

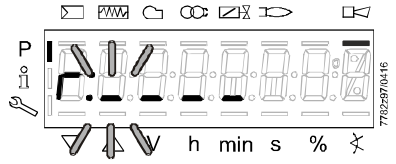


Letter **n:** for **n**ew appears flashing.

Proceed as described in section *Entering the password* and enter the new password (5 characters).

After entry of the last character, the password must be confirmed by pressing ℹ/reset.

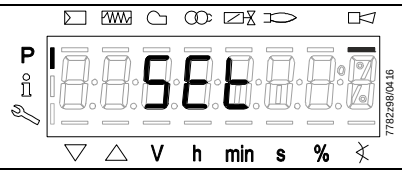
ℹ/reset



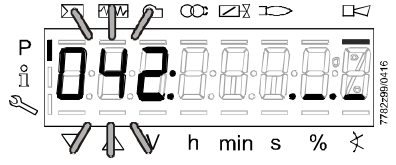
Letter **r:** for **r**epeat appears flashing.

Proceed as described in section *Entering the password* and repeat entry of the new password.

After entry of the last character, the password must be confirmed by pressing ℹ/reset.



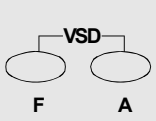
SEt confirms that the new password has been saved.

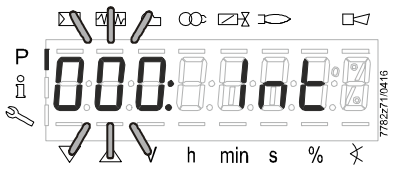


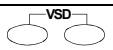
Parameter **042:** flashes again.

20 Operating variants of the parameters

The parameters stored in the burner control LME39… can be displayed and changed on the parameter level.

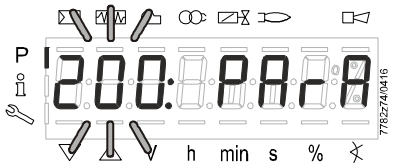




Press button combination 

to display **000: Int**.

With + , select the parameter group **100: PArA**.

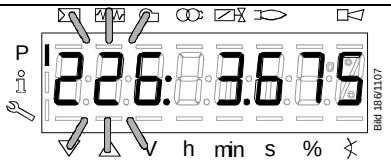


With + , select the parameter group **100: PArA**.

Pressing the  /reset button takes you to parameter **182:** Flame sensitivity.

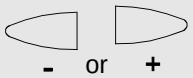
20.1 Parameters without index, with direct display

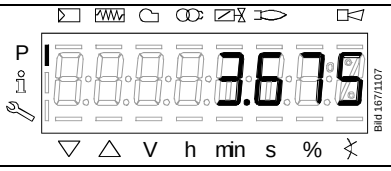
20.1.1 Example of parameter 226 (preignition time) on the parameter level



Press + to select preignition time.

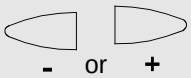
Display: Parameter **226:** flashes, value **3.675** does not.

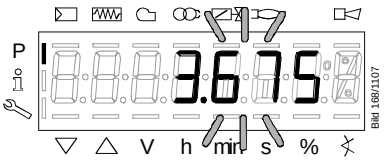




Press - or + to go to editing mode.

Display: **3.675**

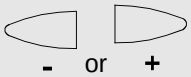


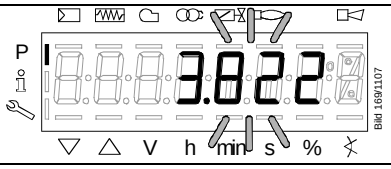


Press - or + to shift the former preignition time to change mode one place to the left.

Display: Preignition time **3.675** flashes.

Note!
To detect display errors, the value appears one place shifted to the left.



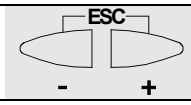


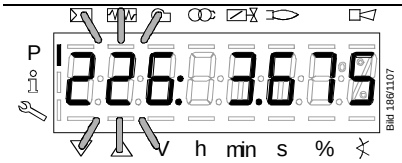
Press - or + to select the required preignition time.

Display: Preignition time **3.822** flashes

Alternative 1:

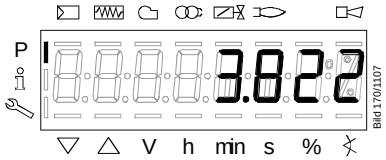
Discard the change!

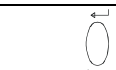




Alternative 2:

Adopt the value!



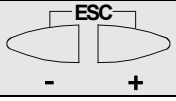


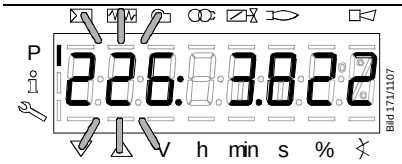
Press /reset to return to editing mode.

The value set will be adopted.

Note:
To detect display errors, the value appears one place shifted to the right.

Display: Value **3.822**



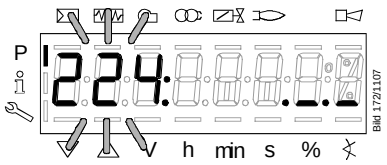
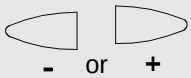
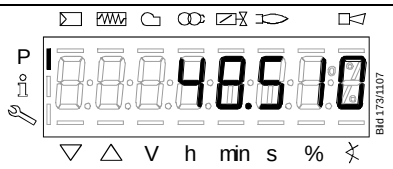
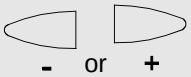
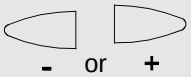
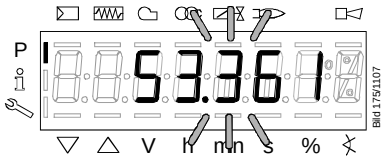


To the next parameter

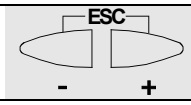
Back to the previous parameter

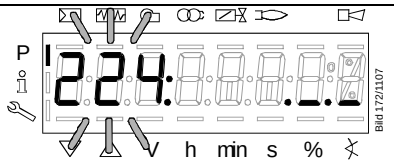
20.2 Parameters without index, with no direct display

20.2.1 Example of parameter 224 (max. time until air pressure on) on the parameter level

		Press + to select specified time for air pressure signal air pressure switch. Display: Parameter **224:** flashes, characters ·–·– do not.
		
		Press - or + to go to editing mode. Display: **48.510**
		Press - or + to shift the former specified time to change mode one place to the left. Display: Specified time **48.510** flashes. Note! To detect display errors, the value appears one place shifted to the left.
		Press - or + to set the specified time. Display: Specified time **53.361** flashes.

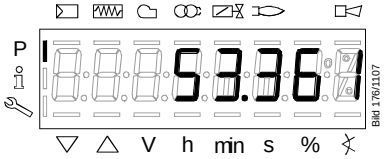
Alternative 1:

Discard the change!	



Alternative 2:

Adopt the change!	

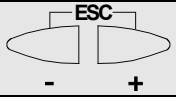


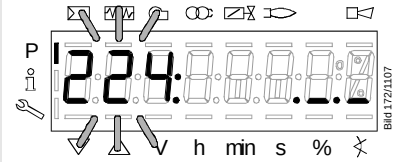
Press /reset to return to editing mode.

The value set will be adopted.

Note:
To detect display errors, the value is shown again, but shifted one place to the right.

Display: Value **53.361**





Press 

to return to the parameter level.

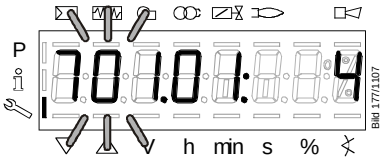
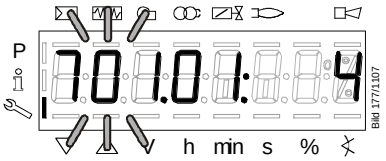
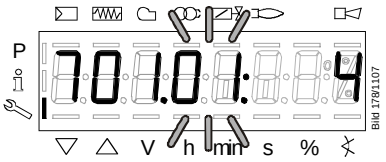
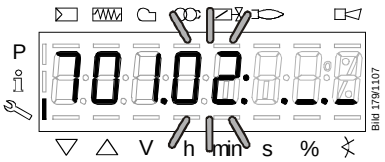
Display: Parameter **224:** flashes, characters ·–·– do not.

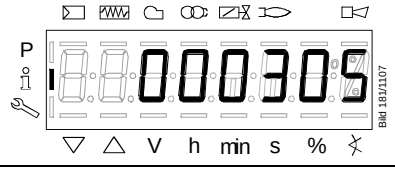
To the next parameter		 Back to the previous parameter

20.3 Parameters with index, with or without direct display

20.3.1 Example of parameter 701 (actual error) on the service level

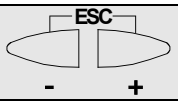
Refer to chapter *Error code list*!

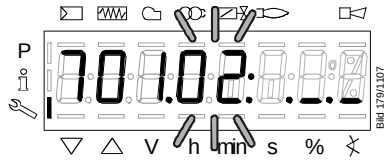
+		Press + to select parameter **701**. Display: Parameter **701.** flashes, index **01:** and error code **4** do not.
		On the left, the current error **701.** appears flashing, index **01:** does not flash. On the right, error code **4** is displayed. Example: Parameter **701.**, index **01:**, error code **4**
	i/reset 1…3 s	
		Press i/reset for 1…3 seconds to show index **01:** for the error code flashing. Display: Parameter **701.** does not flash, index **01:** flashes, error code **4** does not flash.
To the next index	+	
+		Press + to select the index. .01 = error code .02 = diagnostic code Example: Parameter **701.**, index **02:**, diagnostic code **_._**
	i/reset 1…3 s	

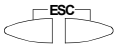


Press i/reset to go to the display mode.

Display: Value **000305**





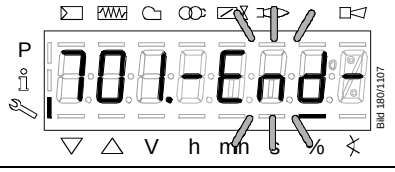
Press 

to return to the index.

Display: Parameter **701.** does not flash, index **02:** flashes, characters **·–·–** do not flash.

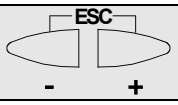
To the next index 

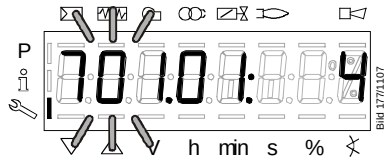
Back to the previous index

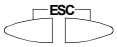


When this display appears, you have reached the end of the index level within parameter **701.**.

Display **– End –** appears flashing.





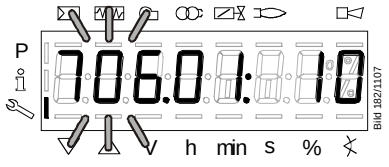
Press 

to return to the parameter level.

Display: Parameter **701.** flashes, index **01:** and diagnostic code **4** do not.

To the next older error 

▪
▪
▪



Parameters cover the period back to the last error since deletion of the history (max. to parameter **706.**)

Example:
Parameter **706.**, index **01:**, error code **10**

To the next parameter 

Back to the previous parameter

21 Error code list

Error code	Clear-text	Potential cause
Loc: 2	No flame at the end of safety time	No establishment of flame at the end of safety time - Defective or soiled fuel valves - Defective or soiled flame detector - Poor adjustment of burner, no fuel - Defective ignition equipment
Loc: 3	Air pressure failure (air pressure switch has welded in the no-load position, drop-out after specified time) (air pressure switch flame-on response time)	Error air pressure switch - Air pressure failure on completion of specified time - Air pressure switch has welded in the no-load position
Loc: 4	Extraneous light	Extraneous light on burner startup
Loc: 5	Air pressure failure, air pressure switch has welded in the operating position	Air pressure switch time supervision - Air pressure switch has welded in the operating position
Loc: 7	Loss of flame	Loss of flame during operation too frequent (limitation of repetitions) - Defective or soiled fuel valves - Defective or soiled flame detector - Poor adjustment of burner
Loc: 10	Errors that cannot be assigned (application) Internal error	Wiring error or internal error, output contacts, other errors, manual locking
Loc: 14	CPI error	CPI contact not closed

Table 11: Error code list

Note!
When using coiled igniters, flame detection may be improved by increasing parameter 228 (tfz). To prevent an extended safety time (TSA, parameter 227) in that case, the postignition time (t3n, parameter 257) must be reduced to the same extent.

Warning!
If the set safety time (TSA) is too long, the safety functions will become ineffective. Compliance with the relevant standards must be ensured!

22 Parameter list

22.1 LME39.100...

Parameter number	Parameter	Edit	Value range Min.	Value range Max.	Increment	Default setting	Password level reading from level	Password level writing from level
000	**Internal parameters**							
41	Heating engineer's password (4 characters)	Edit	xxxx	xxxx	1	---	---	OEM
42	OEM's password (5 characters)	Edit	xxxxx	xxxxx	1	---	---	OEM
100	**General**							
102	Identification date	Read only	---	---	---	---	Info	---
103	Identification number	Read only	0	9999	1	0	Info	---
113	Burner identification	AZL2: Readable ACS410: Selectable	0	99999999	1	burnEr Id	Info	OEM via ACS410
164	Number of startups	Resettable	0	999999	1	0	Info	Info
166	Total number of startups	Read only	0	999999	1	0	Info	---
200	**Burner control**							
224	Max. time until air pressure on	Edit	0 s	179.487 s	4.851 s	179.487 s	SO	OEM
225	Prepurge time	Edit	0 s	74.97 s	0.294 s	32.34 s	SO	OEM
226	Preignition time	Edit	1.176 s	37.485 s	0.147 s	3.234 s	SO	OEM
228	Flame detection time	Edit	0 s	1.47 s	0.147 s	0.294 s	SO	OEM
230	Interval: Ignition OFF until fuel valve 2 (BV2) release	Edit	1.176 s	74.97 s	0.294 s	9.996 s	SO	OEM
234	Postpurge time	Edit	0 s	1237.005 s	4.851 s	0 s	SO	OEM
240	Repetition limit value loss of flame and no flame at the end of safety time 0 = none 1 = none 2 = 1 x repetition 3 = 2 x repetition 4 = 3 x repetition	Edit	0	4	1	1	SO	OEM
257	Postignition time	Edit	0 s	37.485 s	0.147 s	2.205 s	SO	OEM
259	Programmed actuator opening time	Edit	0 s	74.97 s	0.294 s	32.34 s	SO	OEM
260	Programmed actuator closing time	Edit	0 s	74.97 s	0.294 s	32.34 s	SO	OEM

Parameter number	Parameter	Edit	Value range Min.	Value range Max.	Increment	Default setting	Password level reading from level	Password level writing from level
700	**Error history**							
701	Current error: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
702	Error history former 1: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
703	Error history former 2: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
704	Error history former 3: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
705	Error history former 4: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
706	Error history former 5: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
900	**Process data**							
951	Mains voltage	Read only	0 V	LME39.100x1: AC 155 V LME39.100x2: AC 290 V	1 V	---	Service	---
954	Flame intensity	Read only	0 µA	45 µA	0.1 µA	---	Service	---

22.2 LME39.400...

Parameter number	Parameter	Edit	Value range Min.	Value range Max.	Increment	Default setting	Password level reading from level	Password level writing from level
000	**Internal parameters**							
41	Heating engineer's password (4 characters)	Edit	xxxx	xxxx	---	---	---	OEM
42	OEM's password (5 characters)	Edit	xxxxx	xxxxx	---	---	---	OEM
100	**General**							
102	Identification date	Read only	---	---	---	---	Info	---
103	Identification number	Read only	0	9999	1	0	Info	---
113	Burner identification	AZL2: Readable ACS410: Selectable	0	99999999	1	burnEr Id	Info	OEM via ACS410
164	Number of startups	Resettable	0	999999	1	0	Info	Info
166	Total number of startups	Read only	0	999999	1	0	Info	---
200	**Burner control**							
226	Preignition time	Edit	1.176 s	37.485 s	0.147 s	1.911 s	SO	OEM
228	Flame detection time	Edit	0 s	1.47 s	0.147 s	0.294 s	SO	OEM
230	Interval: Ignition OFF until fuel valve 2 (BV2) release	Edit	1.176 s	74.97 s	0.294 s	9.996 s	SO	OEM
231	2nd safety time	Edit	0 s	7.35 s	0.147 s	4.557 s	SO	OEM
234	Postpurge time	Edit	0 s	1237.005 s	4.851 s	0 s	SO	OEM
240	Repetition limit value loss of flame and no flame at the end of safety time 0 = none 1 = none 2 = 1 x repetition 3 = 2 x repetition 4 = 3 x repetition	Edit	0	4	1	1	SO	OEM
256	Purge time	Edit	0 s	74.97 s	0.294 s	15.582 s	SO	OEM
257	Postignition time	Edit	0 s	37.485 s	0.147 s	4.116 s	SO	OEM

Parameter number	Parameter	Edit	Value range Min.	Value range Max.	Increment	Default setting	Password level reading from level	Password level writing from level
700	**Error history**							
701	Current error: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
702	Error history former 1: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
703	Error history former 2: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
704	Error history former 3: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
705	Error history former 4: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
706	Error history former 5: 01: Error code 02: Startup counter reading	Read only	 2 0	 15 999999	 1 1	---	Service	---
900	**Process data**							
951	Mains voltage	Read only	0 V	LME39.400x1: AC 155 V LME39.400x2: AC 290 V	1 V	---	Service	---
954	Flame intensity	Read only	0 µA	45 µA	0.1 µA	---	Service	---

Table 12: Parameter list

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22.3 Table overview

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