

# SIEMENS



## LMO39...

## Burner controls

## Basic Documentation

The LMO39... and this Basic Documentation are intended for use by OEMs which integrate the burner controls in their products.

## Supplementary documentation

ASN	Title	Document no.	Document type
LMO39...	Burner control	CC1P7154	Data Sheet
ACS410	PC software	J7352	Software Documentation
OCI400	Optical Interface	N7614	Data Sheet
OCI410	Optical Interface	N7616	Data Sheet
QRB1 / QRB3	Photo Resistive Flame Detectors	N7714	Data Sheet
QRB4	Yellow flame detector	N7720	Data Sheet
QRC1	Blue-flame Detectors	N7716	Data Sheet

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# 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 LMO39... 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

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

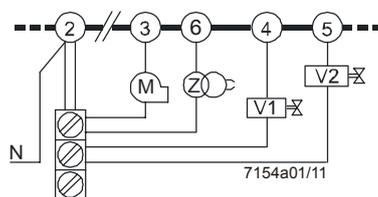
Ensure that the relevant national safety regulations are complied with.

## 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
- 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
- To prevent mixup of different types of burner controls, the LMO39... 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 pressure switch and the safety limit thermostat to be connected to terminal 7 (see 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!

## 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 signal cable AGV50... for the AZL2... or other accessories, for example BCI 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 LMO39...
- 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 (see 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 LMO39... to the AZL2... together with other cables (especially high-voltage ignition cable)
- Service operation with a longer signal cable from LMO39... to AZL2..., or from LMO39... 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 LMO39..., follow the example design below.

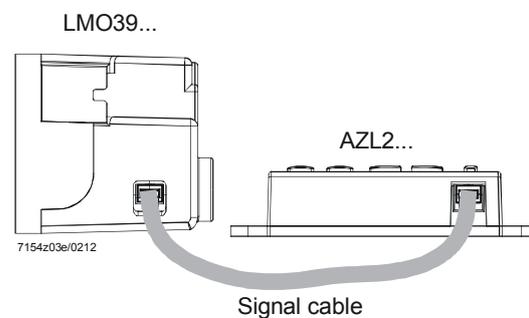


Figure 2: Connection display and operating unit AZL2...

### Connection BCI OCI410

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

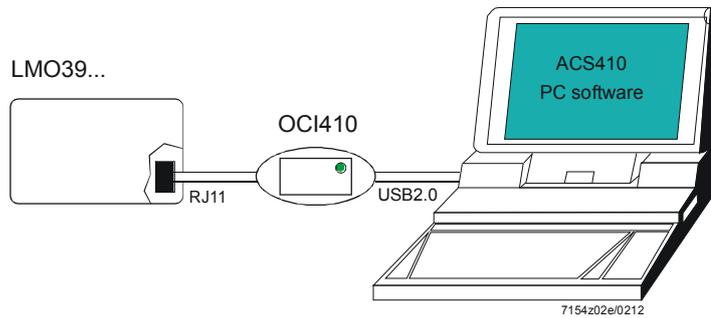


Figure 3: Connection BCI OCI410

### Connection interface OCI400...

- Put the interface OCI400... in the connector at lockout reset button of LMO39... 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

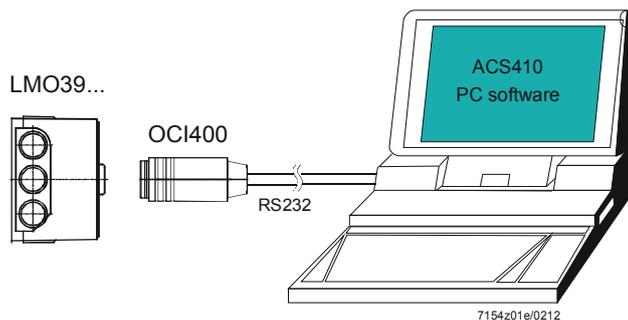


Figure 4: Connection interface OCI400...

## 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 (see Technical data)
- Insulation resistance
  - 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 <u>Delivery state (factory setting):</u>
a)	Burner startup with previously interrupted line to the flame detector	Non-alterable lockout at the end of the safety time (TSA)
b)	Burner operation with simulated loss of flame. For that purpose, cut off the fuel supply	Non-alterable lockout → Max. 3 repetitions (can be parameterized)
c)	Burner operation with flame detector exposed to extraneous light	Non-alterable lockout after approx. 30 seconds

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 LMO39..., 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.

Particular requirements in line with EN 298: 2012 must be taken into consideration for applications involving stationary air heaters (WLE).

Example: Maximum safety time (TSA) = 5 seconds

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

## 1.8 Standards and certificates



### Applied directives:

- Low-voltage directive 2014/35/EC
- Directive for pressure devices 2014/68/EC
- 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 burners and appliances burning gaseous and/or liquid fuels — General requirements 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 LMO39 and the AGK11 comply with the requirements of EN 60335-2-102.



EAC Conformity mark (Eurasian Conformity mark)



ISO 9001:2015  
ISO 14001:2015  
OHSAS 18001:2007



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



## 1.9 Life cycle

Burner controls have 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](http://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

LMO39... are used for the startup and supervision of 1- or 2-stage oil burners in intermittent operation.

Yellow-burning flames are supervised with photo resistive detectors QRB1 / QRB3 or yellow flame detector QRB4, blue-burning flames with blue flame detector QRC.

- 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
- Electrical remote lockout reset facility
- Multicolor indication of fault status and operational status messages
- Limitation of the number of repetitions
- Accurate and reproducible program sequence through digital signal handling
- Controlled intermittent operation after 24 hours of continuous operation
- BCI
- For use with stationary direct-fired air heaters
- Bridging contact for oil preheater
- Monitoring of time for oil preheater

### 3 Basic unit

LMO39...

- 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 LMO39... 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
  - 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 LMO39...
- The LMO39... is operated and parameterized via the AZL2... or with the help of the OCI410 / ACS410
- Burner capacity unlimited (thermal output on startup  $\leq 120$  kW)
- 3 repetitions in the event of loss of flame during operation (can be parameterized)
  - ➔ Default setting: Non-alterable lockout

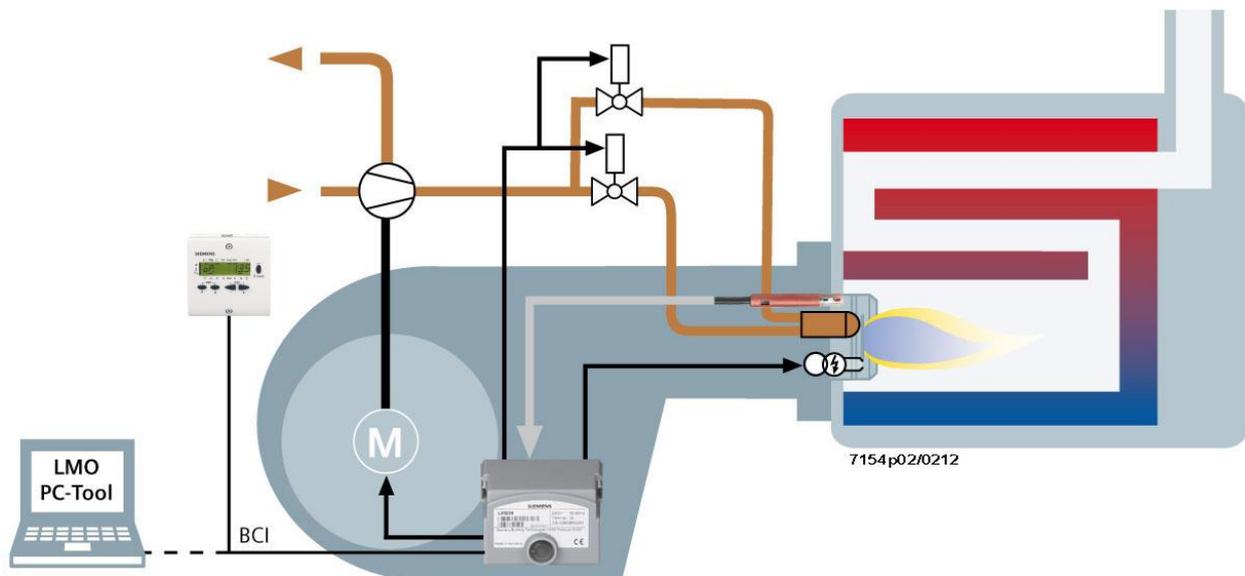


Figure 5: Example: 1-/2-stage oil burner

The diagram shows the full scope of functions of the LMO39... 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 BCI 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 LMO39...

Therefore, the separate available BCI OCI410 (for BCI communication with LMO39... 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 LMO39... burner control without plug-in base and without flame detector. For ordering information on plug-in bases and other accessories, see Ordering.

Article no.	Type		Times in seconds							
			tw max. s	TSA (P267) max. s	t1 (P265) min. s	t3 (P266) min. s	t3n (P295) approx. s	t4 (P270) approx. s	t8 (P274) min. s	tow (P296) approx. s
<b>BPZ:LMO39.100C1</b>	<b>LMO39.100C1</b>	Requirement	2.5	5	0	30	4,5	5	0	600
<b>BPZ:LMO39.100C2</b>	<b>LMO39.100C2</b>	Requirement	2.5	5	0	30	4,5	5	0	600
	Setting range	Min.	---	0	0	0 + 5.6	0	0	0	0
		Max.	---	14.994	1237	1237 + 5.6	14.994	1237	1237	1237
		Increment (s)	---	0.147	4.851	4.851	0.147	4.851	4.851	4.851
		Factory setting	---	4.557	0	29.106 + 5.6	4.410	4.851	0	596.673

Function parameter	Parameter number	Factory setting
Repetition limit value loss of flame or no flame at the end of safety time 0 = none 1 = none 2 = 1 x repetition 3 = 2 x repetition 4 = 3 x repetition	280	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  $\pm 7\%$  tolerance must be taken into consideration.

For **minimum** values: The value to be parameterized must be at least 7% **greater**. For **maximum** values: The value to be parameterized must be at least 7% **smaller**.



Example: Prepurge time shall be set to 30 seconds  
Special case here: The preignition time is made up of parameter 266 and a time of 5.6 seconds that cannot be parameterized.  
Calculation:  $30 \text{ seconds} + 7\% - 5.6 \text{ seconds} = 32,1 \text{ seconds} - 5.6 \text{ seconds} = 26.5 \text{ seconds}$   
Value to be parameterized (parameter 266): Must be equal to or **greater** than the calculated value (e.g. 29.106 seconds)

Example: Safety time shall be set to 5 seconds  
Calculation:  $5 \text{ seconds} - 7\% = 4.65 \text{ seconds}$   
Value to be parameterized (parameter 267): Must be equal to or **smaller** than the calculated value (e.g. 4.557 seconds)

Legend	TSA	Safety time	t3n	Postignition time
	tw	Waiting time	t4	Interval between flame ON and release fuel valve 2
	t1	Prepurge time	t8	Postpurge time
	t3	Preignition time		
	1)	Repetition (maximum number of startups per controlled start)		

## 5 Accessories

(To be ordered separately)

### 5.1 Connection accessories for small burner controls

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Plug-in base **AGK11.6**

Article no.: **BPZ:AGK11.6**

For connection of LMO39... to burner system, grey.  
Refer to Data Sheet N7201.



Cable holder **AGK66**

Article no.: **BPZ:AGK66**

For plug-in base AGK11.  
Refer to Data Sheet N7201.



Cable holder **AGK65**

Article no.: **BPZ:AGK65**

For plug-in base AGK11.  
Refer to Data Sheet N7201.



### 5.2 Flame detectors

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Photo resistive detector **QRB1 / QRB3**

See Data Sheet N7714.



Yellow flame detector **QRB4**

See Data Sheet N7720.



Blue-flame detector **QRC**

See Data Sheet N7716.

Frontal illumination:



Lateral illumination:



## 5.3 Service tools

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Optical interface **OCI400**

Article no.: **BPZ:OCI400**

- Optical interface between burner control and P
- Facilitates viewing, handling and recording setting parameters on site with the help of the ACS410 software package

Refer to Data Sheet N7614.



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BC interface module **OCI410**

Article no.: **BPZ:OCI410**

- BC interface module between burner control and PC
- Facilitates viewing, handling and recording setting parameters on site with the help of the ACS410 software package

Refer to Data Sheet N7616.

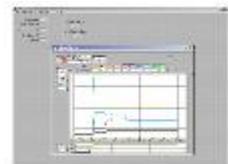


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PC software **ACS410**

Article no.: **BPZ:ACS410**

For parameterization and visualization to burner controls.  
Refer to software documentation J7352.



## 5.4 Display and Operating Units

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Display and operating unit **AZL21.00A9**

Article no.: **BPZ:AZL21.00A9**

Detached unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LMO39, degree of protection IP40.  
Refer to Data Sheet N7542.



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Display and operating unit **AZL23.00A9**

Article no.: **BPZ:AZL23.00A9**

Detached unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LMO39, degree of protection IP54.  
Refer to Data Sheet N7542.



## 5.5 Others

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Extension of lockout reset button **AGK20**



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Signal cable **AGV50.100**

Article no.: **BPZ:AGV50.100**

For AZL2..., with RJ11 connector, cable length 1 m, pack of 10.



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PTC resistor **AGK25**

Article no.: **BPZ:AGK25**

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



## 6 Technical data

### 6.1 General unit data

Mains voltage	
- LMO39.100x1	AC 120 V
- LMO39.100x2	AC 230 V
Mains frequency	50...60 Hz
External primary fuse (Si)	T6.3H250V to IEC 60127-2
Power consumption	12 VA
Mounting position	Optional
Input current at terminal 1	Max. 5 A
Weight	Approx. 160 g
Safety class	I (burner control with plug-in base)
Degree of protection	IP40 (to be ensured through mounting) (if RJ11 jack is not covered, only IP10)
Perm. cable length terminal 1	Max. 1 m at a line capacitance of 100 pF/m (max. 3 m at 15 pF/m)
Cable lengths	
• QRB1 / QRB3	Max. 10 m at 100 pF/m (laid separately)
• QRB4	Max. 3 m at 100 pF/m (laid separately)
• QRC	Max. 10 m at 100 pF/m (laid separately)
Remote reset	Max. 20 m at 100 pF/m (laid separately)
Detector cable	Max. 10 m at 100 pF/m (laid separately)
Control thermostat/pressurestat	Max. 20 m at 100 pF/m (laid separately)
Limit thermostat/pressure switch	Max. 20 m at 100 pF/m (laid separately)
Alarm terminal 10	Max. 20 m at 100 pF/m (laid separately)
Possible input current terminals 7 and 9	1 mA

Current rating	At $\cos\phi \geq 0.6$
- Terminal 1	Max. 5 A
- Terminals 3 and 8	Max 3 A (15 A during max. 0.5 s)
- Terminals 4, 5 and 10	Max. 1 A
- Terminal 6	Max. 2 A

Table 2: Perm. terminal rating

### 6.2 Signal cable AGV50... display → BCI

Signal cable	Color white Unshielded Conductor 4 x 0.141 mm <sup>2</sup> with RJ11-connector
Cable length AGV50.100	1 m
Location	Under the burner hood (extra measures required for compliance with SKII EN 60730-1)

## 6.3 Environmental conditions

<b>Storage</b>	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+70 °C
Humidity	<95% r.h.
<b>Transport</b>	DIN EN 60 721-3-2
Climatic conditions	Class 2K3
Mechanical conditions	Class 2M2
Temperature range	-20...+70 °C
Humidity	<95% r.h.
<b>Operation</b>	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



### Warning!

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.

## 6.4 Flame supervision with QRB... or QRC...

	Detector current required (with flame)	Perm. detector current (without flame)	Possible detector current with flame (typically)
<b>QRB1</b> <sup>1)</sup>	Min. 45 $\mu$ A	Max. 5,5 $\mu$ A	100 $\mu$ A
<b>QRB3</b> <sup>1)</sup>	Min. 45 $\mu$ A	Max. 5,5 $\mu$ A	100 $\mu$ A
<b>QRB4</b> <sup>1)</sup>	Min. 45 $\mu$ A	Max. 5,5 $\mu$ A	70 $\mu$ A
<b>QRC</b> <sup>1)</sup>	Min. 45 $\mu$ A	Max. 5,5 $\mu$ A	70 $\mu$ A

Table 3: Detector data QRB.../QRC...

- <sup>1)</sup> The values given in the table above only apply under the following conditions:
- Mains voltage depending on execution AC 120 V or AC 230 V
  - Ambient temperature 23 °C

Green signal lamp (LED) for indication of operating state

	Detector current in operation: - Flame signal instable - Green signal lamp (LED) flashing	Detector current in operation: - Flame signal stable - Green signal lamp (LED) steady on
<b>QRB...</b> <sup>1)</sup>	<45 $\mu$ A	>45 $\mu$ A
<b>QRC...</b> <sup>1)</sup>	<45 $\mu$ A	>45 $\mu$ A

Table 4: Detector data signal lamp LED

- <sup>1)</sup> The values given in the table above only apply under the following conditions:
- Mains voltage depending on execution AC 120 V or AC 230 V
  - Ambient temperature 23 °C

Measuring circuit for detector current

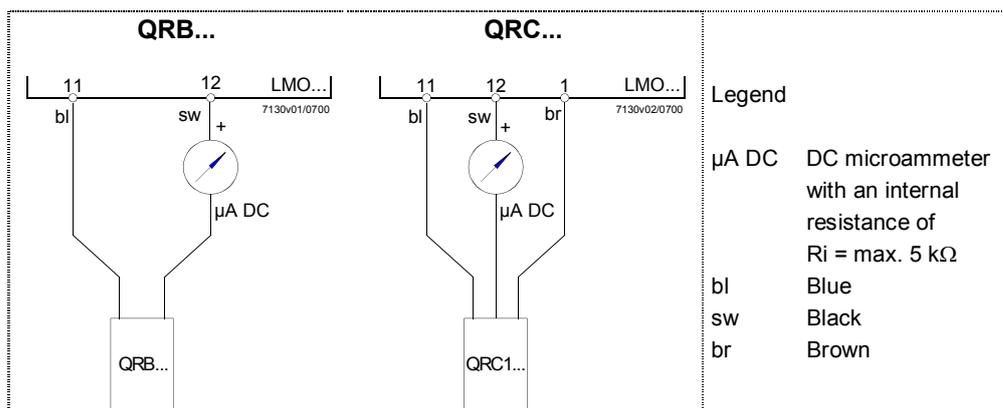


Figure 6: Measuring circuit for detector current

Alternatively, interface OCI400/OCI410 with PC software ACS410 or AZL2 (parameter 954) can be used to measure the detector current. In that case, the DC microammeter is not required.

### Note!

#### QRB4 cable connection!

Connect the blue QRB4 cable to terminal 11.  
Connect the black QRB4 cable to terminal 12.  
Otherwise the QRB4 will not function.



# 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
- Fuel valve 1 is connected
- Fan motor is connected
- Flame detector is darkened and there is no extraneous light
- Lockout reset button not used

## 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 Time supervision oil preheater

If the oil preheater's release contact does not close within 10 minutes, a non-alterable lockout takes place.

## 7.5 Ignition program

If the flame is lost during the safety time (TSA), the burner will be reignited before the end of the safety time (TSA).

This means, depending on parameter 267 and 295, the several ignition attempts can be made during safety time (see Control sequence).

## 7.6 Control sequence in the event of fault

If a non-alterable lockout occurs, the outputs for the fuel valves, the burner motor and the ignition equipment are always immediately deactivated (<1 second).

Cause	Response
Mains failure	Safety shutdown, followed by restart on restoration of mains voltage
Voltage below undervoltage threshold	Safety shutdown, followed by restart when undervoltage threshold is exceeded
Extraneous light during prepurge time, 5 seconds before fuel valve 1 release	Non-alterable lockout, blink code 4
Extraneous light during waiting time	Prevention of startup, a non-alterable lockout occurs after approx. 30 seconds at the latest, blink code 4
No flame at the end of safety time	Non-alterable lockout at the end of safety time, blink code 2
Loss of flame during operation	<b>Factory setting:</b> Non-alterable lockout, blink code 7  <b>Can be parameterized:</b> Max. 3 repetitions
Oil preheaters release contact does not close within 10 minutes	Non-alterable lockout, blink code 8
Release contact of the oil preheater opens 5 times during prepurging	Non-alterable lockout

Table 5: Non-alterable lockout

In the event of a non-alterable lockout, the LMO remains locked and the red signal lamp (LED) lights up permanently.  
The burner control can immediately be reset. This state is also maintained in the event of mains failure.

## 7.7 Resetting the burner control

After a non-alterable lockout, a reset can be carried out immediately.  
Keep the lockout reset button depressed for about 1 second (<3 seconds). The LMO39... 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.

## 7.8 Limitation of repetitions (can be parameterized)

If the flame is lost during operation, a maximum of 3 repetitions per controlled startup can be performed via control thermostat/pressurestat, or else a non-alterable lockout will be initiated. Counting of repetitions is restarted each time a controlled startup via control thermostat/pressurestat takes place.

Factory setting: No repetition in the event of loss of flame during operation.



### Note!

In the event of repetition due to loss of flame during operation, a flame signal must be produced at the end of the safety time; if not, the unit will initiate a non-alterable lockout.

## 8 PC software ACS410

### 8.1 Duty of PC software

The PC software is a component of the LMO39... system and serves primarily as an operator module for the following basic tasks:

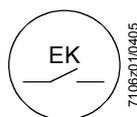
- Visualization of system state with the following data:
  - Parameters
  - Process data
- Configuration and parameterization of the basic unit (individual parameters)
- Reset



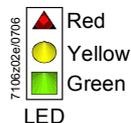
For operating and commissioning instructions, see Installation and Operating Instructions J7352.

# 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/OCI410 and the PC software ACS410 or flue gas analyzers of different makes.
3. On the display of the AZL2... or BCI 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
Waiting for release of prepurging / postpurging by oil pressure switch	● .....	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 (see 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 a non-alterable 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:

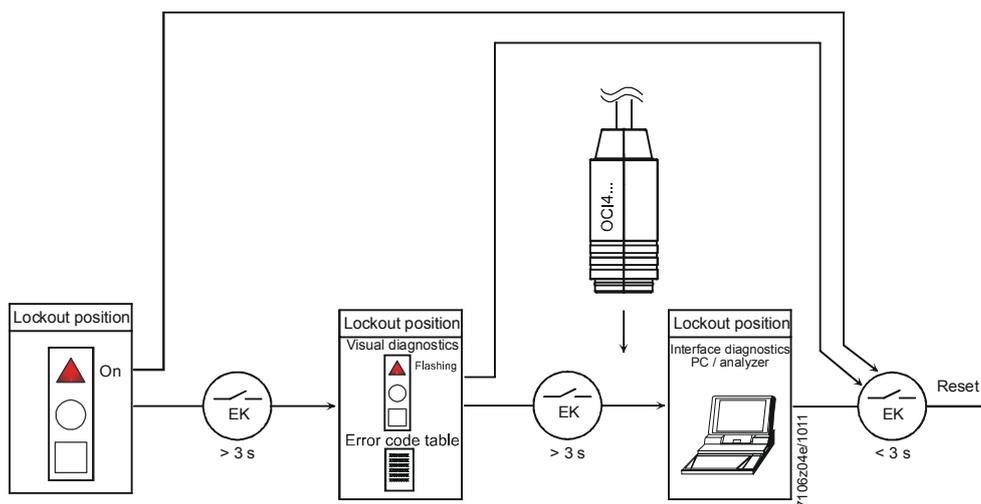


Figure 7: Diagnostics of cause of fault

**Error code table of multicolor signal lamp (LED)**

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	Free
4 blinks	ON	Extraneous light on burner startup
5 blinks	ON	Free
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	Time supervision oil preheater - oil preheater failed 5 times during prepurging
9 blinks	ON	Free
10 blinks	OFF	<ul style="list-style-type: none"> <li>• Wiring error</li> <li>• Internal error</li> <li>• Output contacts</li> <li>• Other fault</li> <li>• Manual lockout</li> </ul>

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).

## 10 Inputs and outputs/internal connection diagram/control sequence of LMO39.100...

### 10.1 Inputs and outputs/internal connection diagram

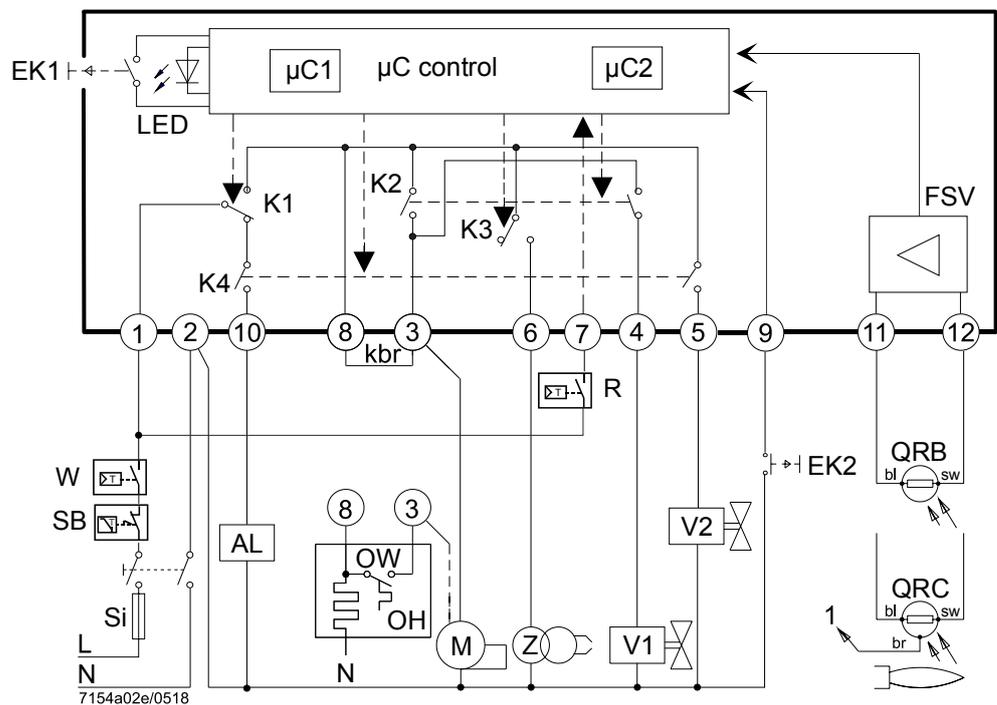


Figure 8: Internal diagram



# 11 Legend

t1	Prepurge time (parameter 265)
t3	Preignition time (parameter 266 + 5.6 seconds)
t3n	Postignition time (parameter 295)
t4	Interval between flame ON and release of fuel valve 2 (parameter 270)
t8	Postpurge time (parameter 274)
TSA	Ignition safety time (parameter 267)
tw	Waiting time
tow	Oil preheater timeout (parameter 296)

AL	Error message (alarm)
BCI	Communication interface
EK	Lockout reset button (internal)
EK2	Remote lockout reset button
FS	Flame signal
FSV	Flame signal amplifier
K1...4	Internal relay
kbr	Jumper
M	Fan motor
OH	Oil preheater
OW	Release contact of oil preheater
QRB1	Photo resistive detector
QRB3	Photo resistive detector
QRB4	Yellow flame detector
QRC...	Blue flame detector (bl = blue, br = brown, sw = black)
R	Control thermostat/pressurestat
SB	Safety limiter
Si	External fuse
V...	Fuel valve
W	Limit thermostat/pressure switch
Z	Ignition transformer



Input signal/output signal 1 (ON)



Input signal/output signal 0 (OFF)



Input permissible signal 1 (ON) or 0 (OFF)

# 12 Dimensions

## 12.1 LMO39...

Dimensions in mm



Plug-in base AGK11.6

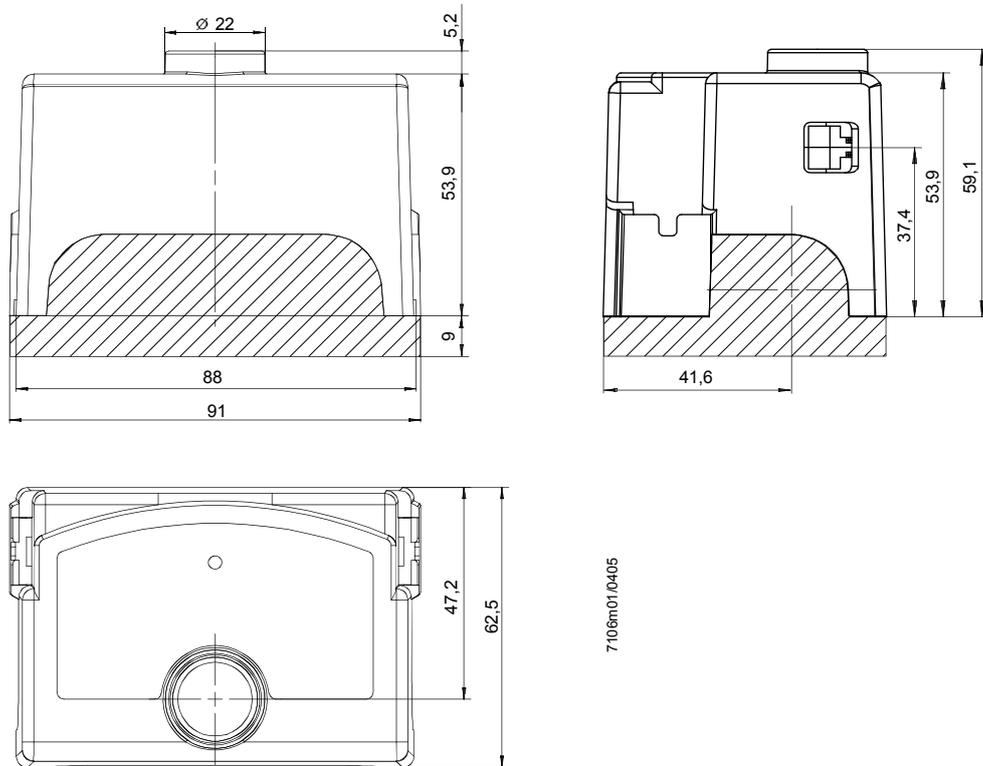


Figure 10: Dimensions LMO39...

## 12.2 LMO39... with lockout reset button extension AGK20...

Dimensions in mm

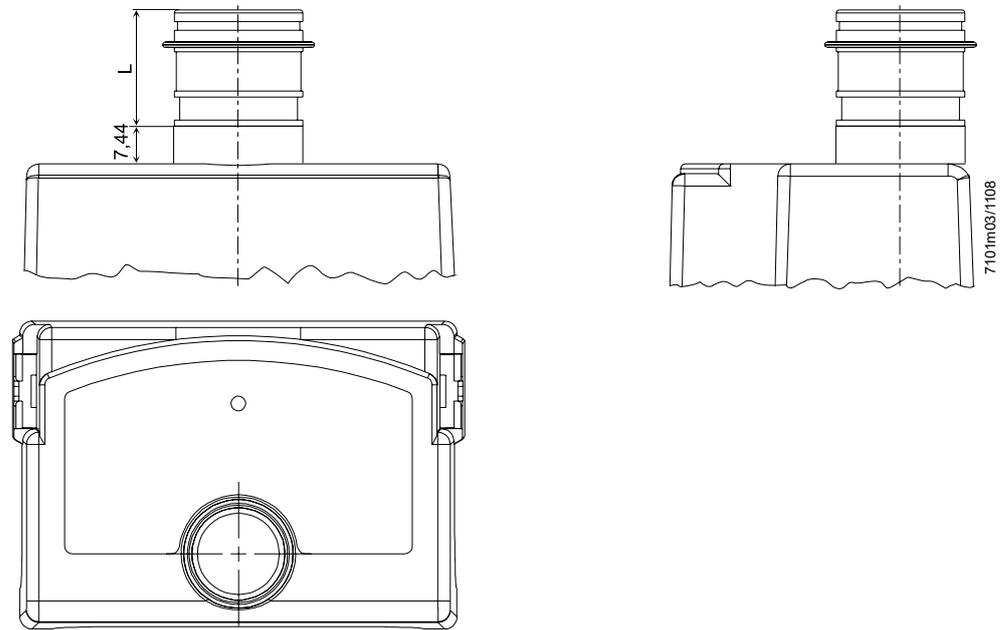


Figure 11: Dimensions LMO39... with AGK20...

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

Table 8: Dimensions table AGK20...

# 13 Operation via the AZL2...

## 13.1 Description of the unit/display and buttons:

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

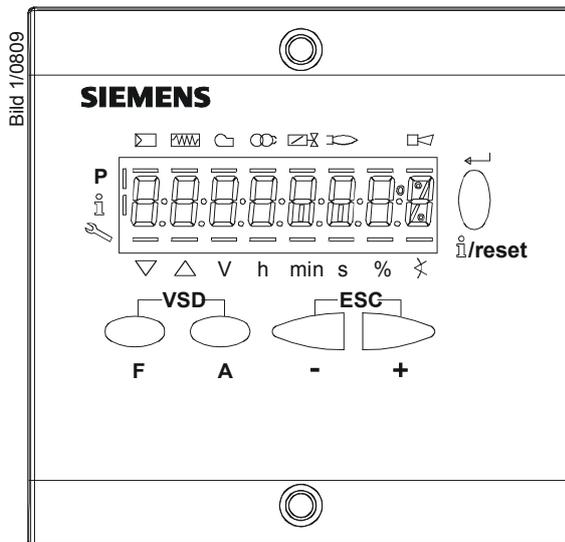
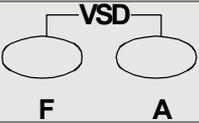
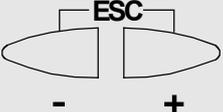


Figure 12: Description of the unit/display and buttons

Button	Function
	<b>Buttons A and F: Parameterized function</b> - For switching to parameter setting mode P (press  and  simultaneously)
 i/reset	<b>Info and Enter button</b> - 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) - <b>Enter</b> in parameter setting mode - <b>Reset</b> in the event of fault - One menu level down
	<b>- button</b> - For decreasing the value
	<b>+ button</b> - One menu level down - For increasing the value
	<b>+ and - button: Escape function</b> (press  and  simultaneously) - No adoption of value - One menu level up

## 13.2 Meaning of symbols on the display:

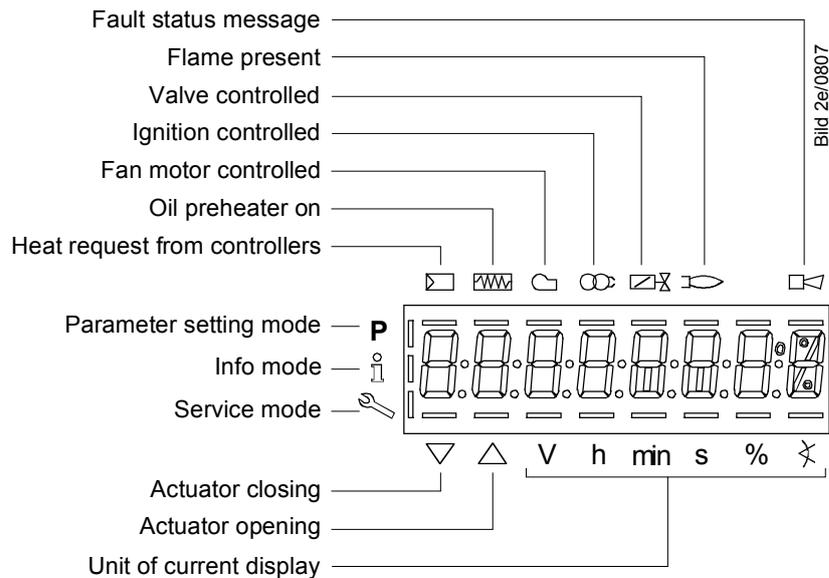
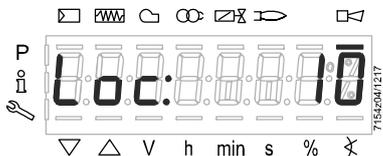


Figure 13: Meaning of display

## 13.3 Special functions:

### 13.3.1 Manual lockout:

  
 plus any other  
button



Press /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 **10**

(See chapter *Error code list*)

The reset must be carried out as follows:

  
 1 s



When the /reset button is pressed for 1 second, **rESEt** appears on the display.

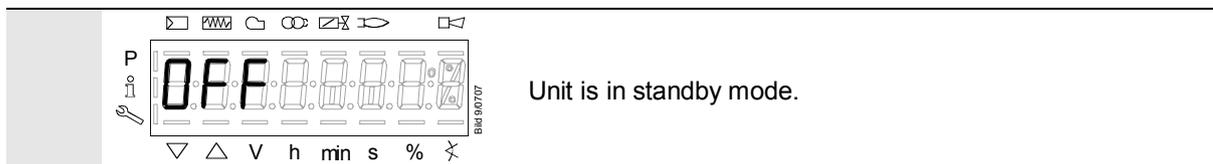
When the button is released, the basic unit is reset.

# 14 Operation:

## 14.1 Normal display:

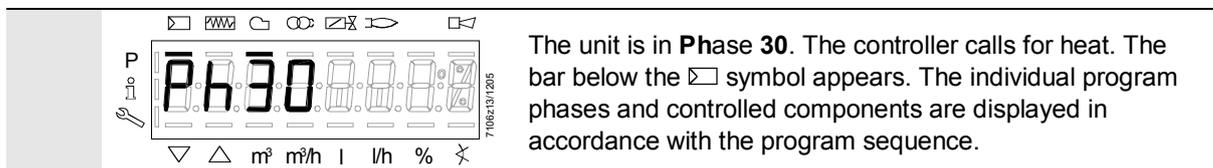
Normal display is the standard display in normal operation, representing the highest menu level. From the normal display, you can change to the info, service or parameter level.

### 14.1.1 Display in standby mode:



### 14.1.2 Display during startup/shutdown:

#### 14.1.2.1 Display of program phases:

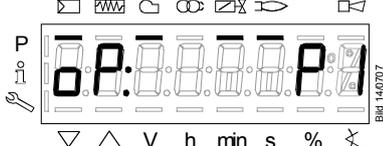


#### 14.1.2.2 List of phase displays:

Phase	Function
Ph1	Undervoltage
Ph2	Fault without lockout
Ph4	Extraneous light on burner startup
Ph10	Home run
OFF	Standby
Ph21	Heating up time oil preheater
Ph30	Prepurge time
Ph38	Preignition time
Ph40	Safety time (ignition transformer ON)
Ph42	Safety time (ignition transformer OFF)
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 9: List of phase

### 14.1.3 Display of operating position:



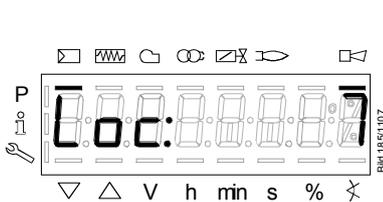
Display **oP**: **P1** stands for stage 1.  
The display following **oP** is unit-specific.



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

### 14.1.4 Fault status messages, display of errors and info:

#### 14.1.4.1. Display of errors (faults) with lockout:



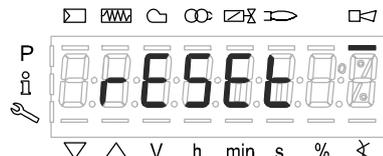
The display shows **Loc.**. The bar under the fault status message  appears.

The unit is in the lockout position.

The current error code is displayed (see Blink code table).

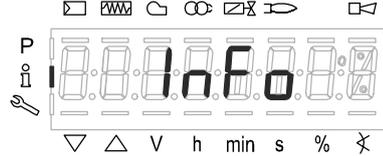
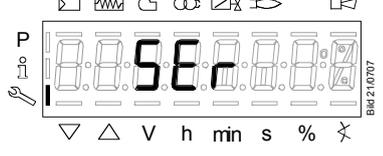
Example: Error code 7

#### 14.1.4.2. 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.



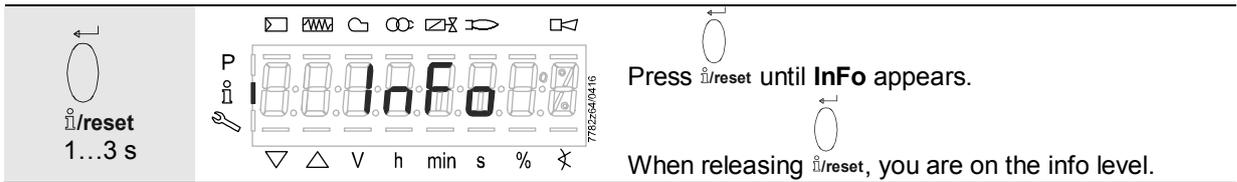
#### Note!

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



# 16 Info level:

## 16.1 Display of 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 for <1 second.



**Note!**

You can press or for >8 seconds to return to the normal display.



**Note!**

No change of value on the info level.

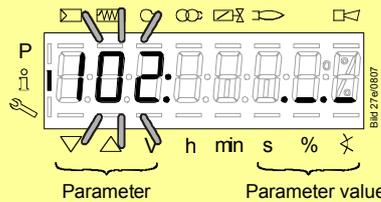


Figure 15: Info level

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

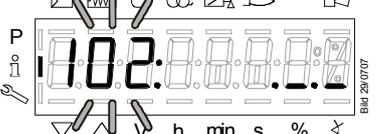
When pressing for >1 second and <3 seconds, the value will be displayed.

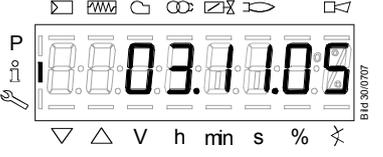
By pressing for >3 seconds or , you return to the selection of the parameter number (parameter number flashes).

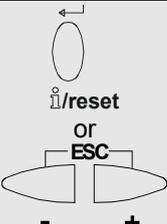
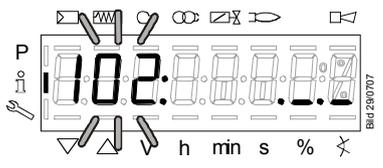
## 16.2 Display of info values:

### 16.2.1 Identification date:

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

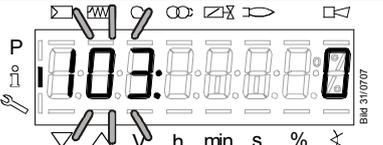
		<p>On the left, parameter <b>102</b>: is displayed flashing. On the right, <b>._._</b> is displayed.</p> <p>Example: <b>102: ._. _</b></p>
--	---	--

 <p><b>reset</b> 1...3 s</p>		<p>Pressing the <b>reset</b> button (1...3 seconds) and releasing it when <b>._._</b> flashes displays the identification date (creation date of the program sequence), <b>DD.MM.YY</b>.</p> <p>Example: Identification date <b>03.11.05</b></p>
---	---	--

 <p><b>reset</b> or <b>ESC</b></p>		<p>Press <b>reset</b> or <b>- +</b> to return to the display of parameters.</p>
--	--	---

<p>To the next parameter</p>	 <p><b>+</b></p>
------------------------------	---

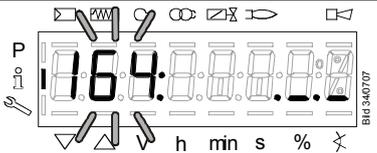
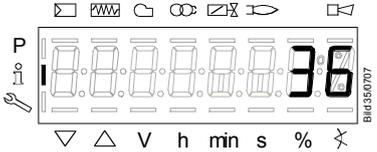
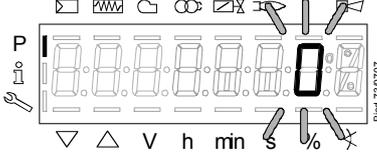
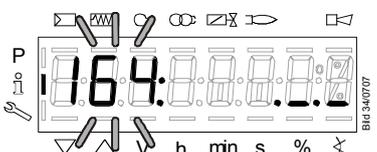
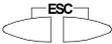
### 16.2.2 Identification number:

		<p>On the left, parameter <b>103</b>: is displayed flashing. On the right, identification number <b>0</b> appears.</p> <p>Example: <b>103: 0</b></p>
--	---	--

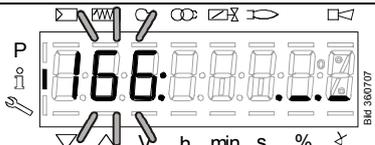
<p>To the next parameter</p>	  <p><b>+</b> or <b>reset</b> for &lt;1 s</p>	 <p><b>-</b> Back to the previous parameter</p>
------------------------------	---	--



## 16.2.4 Number of startups resettable:

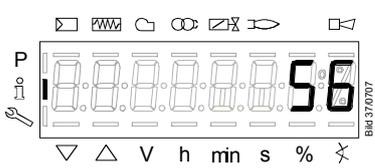
		<p>On the left, parameter <b>164</b>: is displayed flashing. On the right, characters <b>. _ . _</b> appear.</p> <p>Example: Parameter <b>164</b>: <b>. _ . _</b></p>
 <b>1...3 s</b>		<p>Pressing the  button (1...3 seconds) and releasing it when <b>. _ . _</b> flashes displays the number of startups (can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

## 16.2.5 Total number of startups:



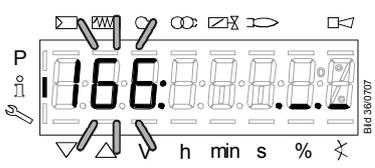
On the left, parameter **166:** is displayed flashing. On the right, characters **. \_ . \_** appear.

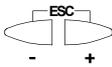
Example: Parameter **166:** **. \_ . \_**



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

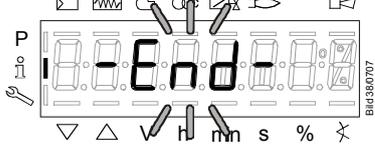
Example: **000056**



Press  or  to go back to the display of parameters.

To the next parameter  **+** Back to the previous parameter  **-**

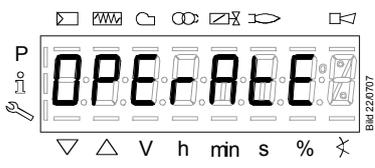
## 16.2.6 End of info level:

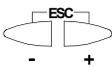


When this display appears, you have reached the end of the info level.

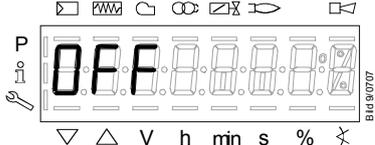
The display shows **- End -** flashing.

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



Press  or  (>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  to switch between the service and the parameter level.

# 17 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.

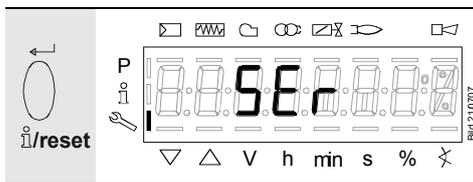
Instead of pressing + , you can also press for <1 second.



Note!

Press - + or for >8 seconds to return to the normal display.

## 17.1 Display of the service level.



Press for >3 seconds until **SEr** appears.

When releasing , you are on the service level.

## 17.2 Display of service values:

### 17.2.1 Error history:

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



Note!

Can be deleted for service (see chapter *Parameter list*)!

Refer to chapter *Error code list!*

### 17.2.2 Mains voltage:

	<p>Parameter <b>951</b>: appears flashing.</p> <p>Mains voltage is displayed on the right.</p> <p>Example: <b>951: 224</b></p>
--	--

		<p>To the next parameter</p> <p>Back to the previous parameter</p>
--	--	--

### 17.2.3 Intensity of flame:

	<p>The display shows parameter <b>954</b>: flashing.</p> <p>On the right, the intensity of the flame is displayed as a microamperes (<math>\mu\text{A}</math>).</p> <p>Example: <b>954: 0.0</b></p>
--	---

		<p>End of service level – End –</p> <p>Back to the previous parameter</p>
--	--	---

### 17.2.4 End of service level:

	<p>When this display appears, you have reached the end of the service level.</p> <p>The display shows – End – flashing.</p>
--	---

		<p>To the start of the service level</p> <p>To the end of the service level</p>
--	--	---

		<p>Press  to return to operating mode.</p> <p>The display shows <b>OPERAtE</b>.</p>
--	--	---

	<p>When this display appears, you are back to standby and you can change to the next level mode.</p>
--	--

# 18 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 LMO39... with the factory settings according to *Type summary*.

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

With the LMO39..., the burner control's characteristics are determined primarily through parameterization. Every time the unit is recommissioned, the parameter settings must be checked. The LMO39... 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, 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 LMO39... 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	
<b>Caution! OEM settings:</b>	
Parameter no.	
265 = 30 s (t1)	266 = 2 s (t3)
270 = 10 s (t4)	274 = 0 s (t8)
280 = 1 (repetition)	
295 = 2 s (t3n)	TSA = t3n + 0,7 s

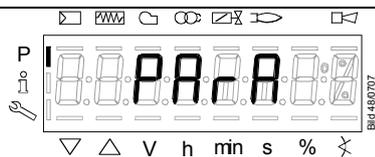
## 18.1 Entering the password:



### Note!

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

		<p>Press button combination  to display <b>CodeE</b>.</p>
		<p>When releasing the buttons, 6 bars appear the first of which flashes.</p>
		<p>Press  to select a numeral or letter.</p>
		<p>Press  to confirm the entry. The value entered changes to a minus sign (-). The next bar starts flashing.</p>
		<p>Press  to select a numeral or letter.</p>
		<p>After entry of the last character, the password must be confirmed by pressing .</p> <p>Press  again to finish entry of the password.</p> <p>Example: Password consisting of 4 characters.</p>



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

## 18.2 Changing the heating engineer's password:



### Note!

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

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

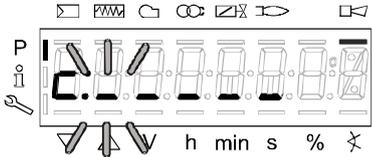
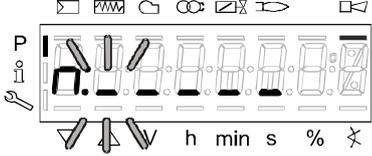
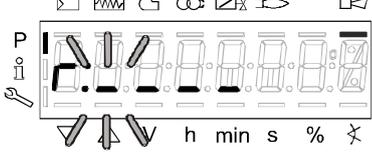
Pressing the  reset button takes you to parameter **041** heating engineer's password.

Continue in the parameter level to the next parameter group **100**:



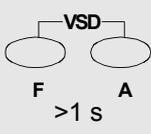

End of the parameter level  
**-End-**

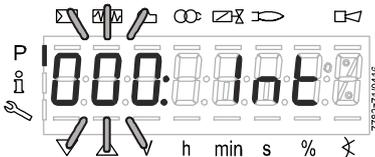
## 18.3 Changing the OEM's password:

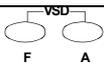
		<p>Parameter <b>042</b>: flashes.</p> <p>Press /reset to go to level <b>c</b>: for password changes.</p>
 /reset		<p>Letter <b>c</b>: for confirmation appears flashing.</p> <p>Proceed as described in section <i>Entering the password</i> and enter the former password.</p> <p>After entry of the last character, the password must be confirmed by pressing /reset.</p>
 /reset		<p>Letter <b>n</b>: for new appears flashing.</p> <p>Proceed as described in section <i>Entering the password</i> and enter the new password (5 characters).</p> <p>After entry of the last character, the password must be confirmed by pressing /reset.</p>
 /reset		<p>Letter <b>r</b>: for repeat appears flashing.</p> <p>Proceed as described in section <i>Entering the password</i> and repeat entry of the new password.</p> <p>After entry of the last character, the password must be confirmed by pressing /reset.</p>
		<p><b>SEt</b> confirms that the new password has been saved.</p>
		<p>Parameter <b>042</b>: flashes again.</p>

# 19 Operating variants of the parameters:

The parameters stored in the burner control LMO39... can be displayed and changed on the parameter level.





Press button combination  to display **000: Int.**

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





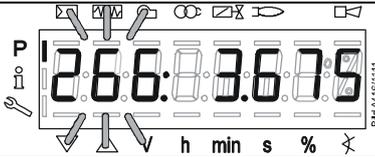
With , select the parameter group **200: PArA.**

Pressing the  takes you to parameter **226: Preignition time.**

## 19.1 Parameters without index, with direct display:

### 19.1.1 Example of parameter 266 (preignition time) on the parameter level

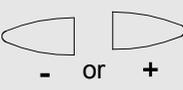


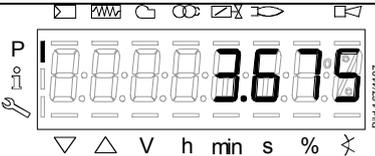


Press  to select preignition time.

Display: Parameter **266:** flashes, value **3.675** does not.

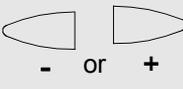


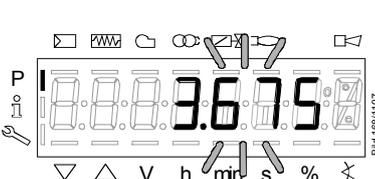




Press  or  to go to editing mode.

Display: **3.675**

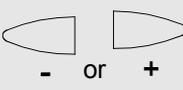


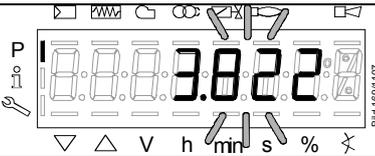


Press  or  to shift the former preignition time to change mode one place to the left.

Display: Preignition time **3.675** flashes.

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



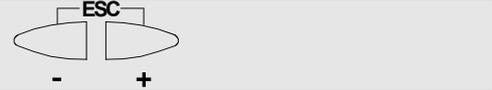
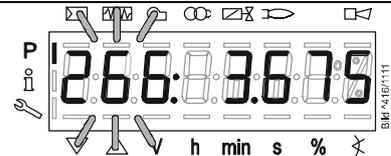


Press  or  to select the required preignition time.

Display: Preignition time **3.822** flashes

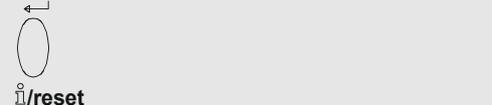
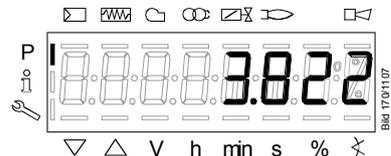
**Alternative 1:**

Discard the change!

**Alternative 2:**

Adopt the value!

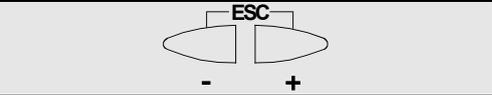
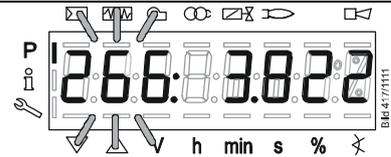



Press  to return to editing mode.

The value set will be adopted.

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

Display: Value **3.822**

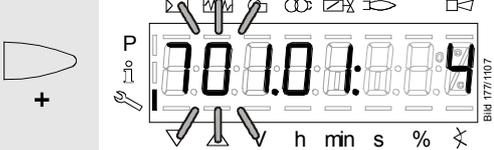



To the next parameter   Back to the previous parameter

## 19.2 Parameters with index, with or without direct display:

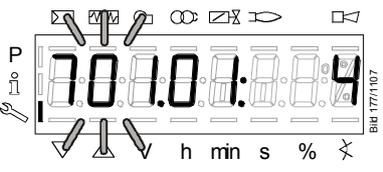
### 19.2.1 Example of parameter 701 (actual error) on the service level

See chapter *Error code list!*



Press  + to select parameter **701**.

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



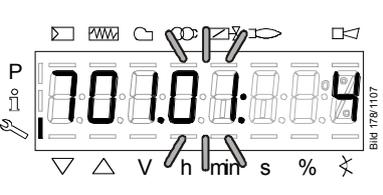
On the left, the current error **701**. appears flashing, index **01**: does not flash.

On the right, error code **4** is displayed.

Example:  
Parameter **701**., index **01**., error code **4**



 /reset 1...3 s



Press  /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  +



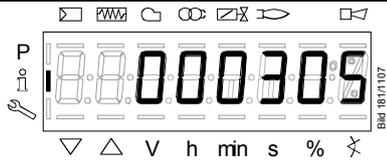
Press  + to select the index.

.01 = error code  
.02 = diagnostic code

Example:  
Parameter **701**., index **02**., diagnostic code **.\_.\_**

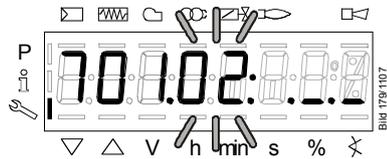
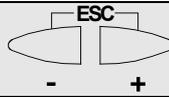


 /reset 1...3 s



Press reset to go to the display mode.

Display: Value **000305**



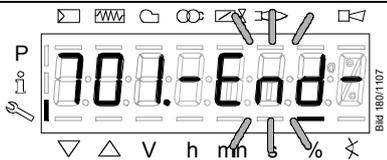
Press - + to return to the index.

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

To the next index

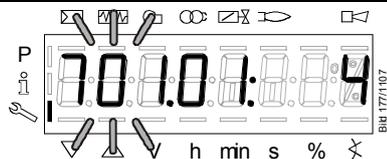
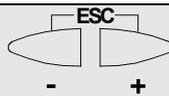


Back to the previous index



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

## 20 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	Free	Free
Loc: 4	Extraneous light	Extraneous light on burner startup
Loc: 5	Free	Free
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: 8	Oil preheater	Time supervision oil preheater Oil preheater failed 5 times during prepurging
Loc: 9	Free	Free
Loc: 10	Errors that cannot be assigned (application) Internal error	Wiring error or internal error, output contacts, other errors, manual locking

Table 10: Error code list

# 21 Parameter list

Parameter number	Parameter	Edit	Value range		Increment	Default setting	Password level reading from level	Password level writing from level
			Min.	Max.				
<b>Internal parameters</b>								
41	Heating engineer's password (4 characters)	Edit	xxxx	xxxx	1	---	---	OEM
42	OEM's password (5 characters)	Edit	xxxxx	xxxxx	1	---	---	OEM
<b>General</b>								
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	---
<b>Burner control</b>								
265	Prepurge time	Edit	0 s	1237.005 s	4.851 s	0 s	SO	OEM
266	Preignition time	Edit	0 s	1237.005 s	4.851 s	29.106 s	SO	OEM
267	Safety time	Edit	0 s	14.994 s	0.147 s	4.557 s	SO	OEM
270	Interval: Flame ON until fuel valve 2 (BV2) release	Edit	0 s	1237.005 s	4.851 s	4.851 s	SO	OEM
274	Postpurge time	Edit	0 s	1237.005 s	4.851 s	0 s	SO	OEM
280	Repetition limit value loss of flame or 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
295	Postignition time	Edit	0 s	14.994 s	0.147 s	4.41 s	SO	OEM
296	Timeout oil preheater	Edit	0 s	1237.005 s	4.851 s	596.673 s	SO	OEM

Parameter number	Parameter	Edit	Value range		Increment	Default setting	Password level reading from level	Password level writing from level
			Min.	Max.				
<b>Error history</b>								
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	---
<b>Process data</b>								
951	Mains voltage	Read only	0 V	LMO39.100x1: AV 155 V LMO39.100x2: AC 290 V	1 V	---	Service	---
954	Flame intensity	Read only	0 µA	122 µA	0.1 µA	---	Service	---

Table 11: Parameter list

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