

# SIEMENS



## LME71... / LME72... / LME73... Burner control

### Basic Documentation

The LME7 and this Basic Documentation are intended for use by OEMs which integrate the burner controls in their products.

Software version 02.03

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Smart Infrastructure

# Supplementary documentation

Product type	Designation	Type of documentation	Documentation number
PME71.111Ax	Program module	User Documentation	A7105.1
PME71.112Ax	Program module	User Documentation	A7105.2
PME71.401Ax	Program module	User Documentation	A7105.3
PME71.402Ax	Program module	User Documentation	A7105.4
PME71.901Ax	Program module	User Documentation	A7105.5
LME71.901Ax	Program module	User Documentation	A7105.6
PME72.521Ax *)	Program module	User Documentation	A7105.11
PME72.541Ax *)	Program module	User Documentation	A7105.12
PME73.810Ax	Program module	User Documentation	A7105.21
PME73.811Ax	Program module	User Documentation	A7105.22
PME73.812Ax	Program module	User Documentation	A7105.23
PME73.820Ax	Program module	User Documentation	A7105.24
PME73.830Ax	Program module	User Documentation	A7105.25
PME73.831Ax	Program module	User Documentation	A7105.26
PME73.840Ax	Program module	User Documentation (variant 1)	A7105.27
PME73.840Ax	Program module	User Documentation (variant 2)	A7105.28
LME73.231Ax	Program module	User Documentation	A7105.29
LME	Burner control	Environmental Product Declaration	E7105 *)
LME	Burner control	Product Range Overview	Q7101
LME7	Burner control	Data Sheet	N7105
PME	Program module	Environmental Product Declaration	E7105.1 *)

\*) Only on request



### Note

This document only refers to the product type – not the *product designation*. See the table below for details.

Product type	Product designation
ACS410	PC software
AZL2	Display and operating unit
LME7	Burner control
QRB1	Photo resistive detector
QRB3	Photo resistive detector
QRB4	Yellow flame detector
QRC	Blue-flame detector

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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!

The LME7 are safety devices! Do not open, interfere with or modify the unit. Siemens does not assume responsibility for damage resulting from unauthorized interference!

Additional safety notes contained in other chapters of this document must be observed as well!

- All activities (mounting, installation and service work, etc.) must be performed by qualified personnel
- The burner or boiler manufacturer must ensure degree of protection IP40 for burner controls as per DIN EN 60529 through proper installation of the LME7  
If not observed, there will be a risk of electric shock
- 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 observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's connection terminals (e. g. with dummy plugs for inputs and outputs not used). If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock at the LME7 and at all connected electrical components through proper installation. In terms of execution, stability and protection, covers must conform to EN 60730. If not observed, there will be a risk of electric shock
- The area around the PME7 is defined as plugging space and therefore protected against brush contact when the PME7 is not plugged in
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring and parameterization is in an orderly state and make the safety checks as described in *Commissioning notes*. If not observed, there is a risk of impairment of safety functions and of electric shock hazard
- If the housing or the area near the operating panel is damaged, the unit must immediately be put out of operation. If not observed, there is a risk of electric shock hazard
- Press the buttons on the operating panel only manually without using any tools or pointed objects. If the film of the operating panel is damaged, there is a risk of electric shock hazard
- 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 not observed, there is a risk of electric shock hazard
- If the BCI (jack RJ11) is not used, protection against electric shock hazard must be provided (jack must be covered up). If not observed, there is a risk of electric shock hazard
- Fall or shock can adversely affect the safety functions. Such burner controls must not be put into operation, even if they do not exhibit any damage. If not observed, there is a risk of impairment of safety functions and of electric shock hazard
- 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 mains-powered ionization probe is not protected against electric shock hazard. Protection against accidental contact must be ensured. If not observed, there is a risk of electric shock hazard



To ensure safety and reliability of the LME7 system, the following points must also be observed:

- Condensation and ingress of humidity must be avoided.  
Should such conditions occur, make sure that the unit will be completely dry before switching on again! If not observed, there will be a risk of electric shock
- Static charges must be avoided since they can damage the unit's electronic components when touched.  
Recommendation: Use ESD equipment

## 1.2 Mounting notes

- Ensure that the relevant national safety regulations are complied with
- In the geographical areas where DIN regulations are in use, the requirements of VDE must be satisfied, especially DIN/VDE 0100, 0550 and DIN/VDE 0722
- The LME7 must be secured with fixing screws M4 (UNC32) or M5 (UNC24), observing a maximum tightening torque of 1.8 Nm at all 3 fixing points. The additional bearing surfaces on the housing are provided to improve mechanical stability. The additional bearing surfaces must rest on the mounting surface. The evenness of the mounting surface must be within a tolerance range of 0.3 mm

### Installation notes

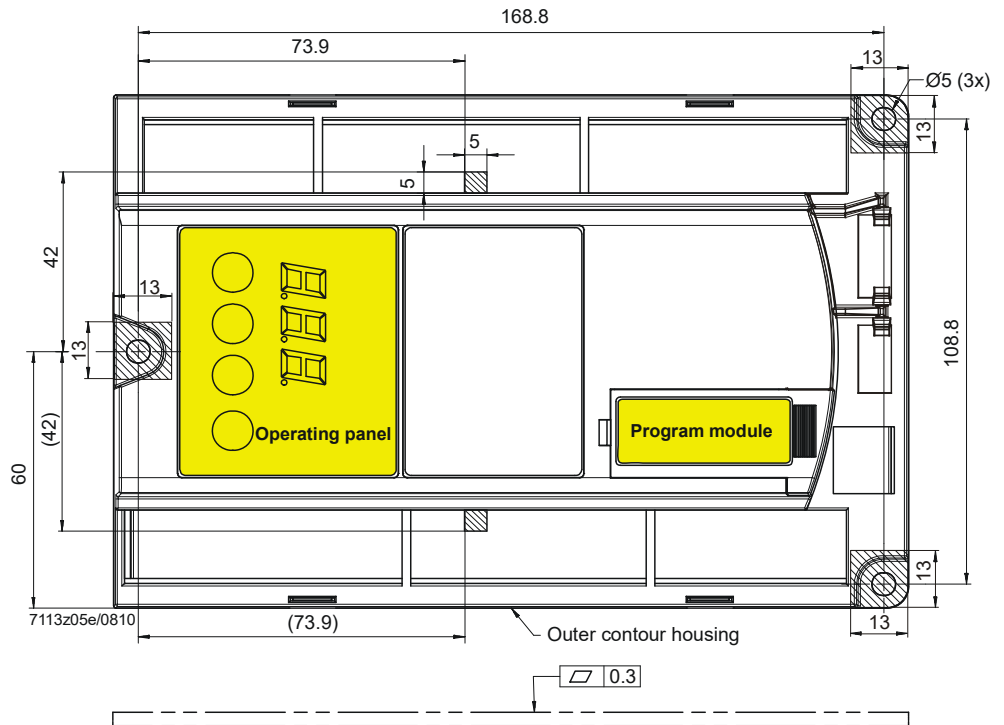
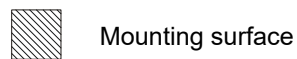


Figure 1: Mounting – mounting surface



## 1.3 Installation notes

- Always run the high-voltage ignition cable 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
- Risk of damage to the switching contacts!  
If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LME7 must be replaced.
- The connection diagrams show the LME7 with an earthed neutral conductor. When monitoring ionization currents in earth-free mains, connect terminal X10-05 pin 1 to burner ground. It is essential to ensure that local regulations are complied with (e.g., protection against electric shock) since 230 V AC (50/60 Hz) mains voltage produces a leakage current of 2.7 mA
- Make certain that the maximum permissible current rating of the connection terminals is not exceeded
- Make certain that strain relief of the connected cables is in compliance with the relevant standards
- Do not feed external (mains) voltage to the control outputs of the LME7. When checking the functions of the components controlled by the LME7 (fuel valves or similar), the LME7 may, in principle, be connected to the components
- Mains power must always be supplied via L and N. This means that no potential differential must exist between the neutral conductor N and protective earth PE
- Make certain that strain relief of the connected cables is in compliance with the relevant standards (e.g. as per DIN EN 60730 and DIN EN 60335)
- Ensure that spliced wires cannot get into contact with neighboring terminals. Use adequate ferrules. If this is not observed, there is a risk of loss of safety functions or a risk of electric shock
- For protection, the burner manufacturer must fit dummy plugs to unused LME7 terminals
- The connectors of the connecting cables for the LME7, may only be removed or exchanged when the plant is shut down (all-polar disconnection), since the connections (especially BCI interface) does not provide safe separation from mains voltage
- The mechanical coupling between the actuators and the controlling elements for fuel and air, or any other controlling elements, must be rigid
- Signal cable AGV50 from LME7 to AZL2 or from LME7 to OCI410:  
Since the BCI has no safe separation from mains voltage, the signal cable AGV50 between LME7 and AZL2, or LME7 and OCI410, must conform to certain specifications. Siemens has specified the signal cable AGV50 for use under the burner hood (see Technical data). When using signal cables of other manufacture, Siemens' requirement will not necessarily be met
- Do not lay the signal cable AGV50 from the LME7 to the AZL2 together with other cables; use a separate cable
- Service operation with a longer signal cable from LME7 to AZL2, or from LME7 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
- 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
- The AZL2 must be used in a dry and clean environment
- Check the connecting lines of the air pressure switch for short-circuits

## 1.4 Electrical connection of flame detectors

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

- Never run the detector cable together with other cables
  - Line capacitance reduces the magnitude of the flame signal
  - Use a separate cable
- Observe the permissible detector cable lengths (see Technical Data)
- The mains-powered ionization probe is not protected against electric shock hazard. Protection against accidental contact must be ensured
- 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 M $\Omega$  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

## 1.5 Commissioning notes

Prior to commissioning the system, the following points must be checked:

- The correct assignment of the fuel valves to the fuel valve outputs on the LME7
- Correct setting of the time parameters, especially the safety and prepurge times
- 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 ignition safety time
- During commissioning, check **all safety functions**
- There is no absolute protection against incorrect use of the RASTx connectors. For this reason, prior to commissioning the plant, check the correct assignment of all connectors
- Electromagnetic emissions must be checked on an application-specific basis
  - For display of the flame on the AZL2, following general conditions apply:
    - Display is subject to various component tolerances so that deviations of  $\pm 10\%$  can occur
    - Note that for physical reasons there is no linear relationship between flame display and detector signal values

The functions of the following available or required input state signals must be checked:

- Air pressure
- Minimum gas pressure and maximum gas pressure or POC
- Safety loop (e.g. safety limit thermostat)

Duties of the expert when making the approval tests

	Action	Check / response
a)	Burner startup with flame detector disconnected	Non-alterable lockout at the end of the first safety time
b)	Burner startup with flame detector exposed to extraneous light, e.g. to incandescent light with detectors for visible radiation, quartz-halogen bulb or cigarette lighter flame with detectors for UV radiation	Non-alterable lockout during the prepurge time
c)	Simulation of loss of flame during operation. For that, disconnect the flame detector in the operating position and maintain that state	Non-volatile lockout or restart depending on the configuration of the LME7
d)	Check the plant response time with loss of flame during operation, which involves manually disconnecting the fuel valves from the power and checking the time from this moment to the time required by the LME7 to turn off power to the fuel valve	Turning off power to the fuel valves by the LME7 within the period of time permitted for the respective plant

Further checks may be required, depending on the field of use and the relevant standards.

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



### Warning!

**On the OEM access level of the LME7, 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 not observed, there is a risk that safety functions will be impaired.**

## 1.6 Standards and certificates



### Applied directives:

- Low-voltage directive 2014/35/EC
- Directive for pressure devices 2014/68/EC
- Gas Appliances Regulation (EU) 2016/426
- 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: DIN EN 60730-2-5  
Special requirements on automatic electric burner control and monitoring systems
- Safety and control devices for gas burners and gas burning appliances - Valve proving systems for automatic shut-off valves DIN EN 1643

**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 LME7 and the PME7 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>



Only AC 120 V versions



## 1.7 Lifetime

The LME7 has a designed lifetime\* of 250,000 burner startup cycles which, under normal operating conditions in heating mode, corresponds to approx. 10 years of service (starting from the date of manufacture on the unit type plate). This lifetime is based on the endurance tests in the standard EN 298. A summary of the conditions has been published by the European Control Manufacturers Association (Afecon) ([www.afecor.org](http://www.afecor.org)).

The designed lifetime is based on use of the LME7 according to the manufacturer's data sheet and the basic documentation. After reaching the designed lifetime in terms of the number of burner startup cycles, or after the corresponding usage time, the LME7 must be replaced by authorized personnel.

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

## 1.8 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.

## 1.9 Typographical conventions

### 1.9.1 Safety notes

This Basic Documentation contains instructions which must be observed to ensure your own personal safety and to prevent damage to equipment and property. The instructions and notes are highlighted by warning triangles-or a hand symbol and are presented as follows, depending on the hazard level:



**Warning** means that death, severe personal injury or substantial property damage **can** occur if adequate precautionary measures are not taken.



**Caution** means that minor personal injury or property damage can occur if adequate precautionary measures are not taken.



**Note** draws your attention to **important information** on the product, on product handling, or to a special part of the documentation.

### 1.9.2 Qualified personnel

Only **qualified personnel** are allowed to install and operate the equipment. Qualified personnel in the context of the safety-related notes contained in this document are persons who are authorized to commission, ground and tag devices, systems and electrical circuits in compliance with established safety practices and standards.

### 1.9.3 Correct use

*Note the following:*

The device may only be used on the applications described in the technical documentation and only in connection with devices or components from other suppliers that have been approved or recommended by Siemens.

The product can only function correctly and safely if shipped, stored, set up and installed correctly, and operated and maintained as specified.

## 2 System makeup / function description

The LME7 is a microprocessor-based burner control with matching system components for controlling and supervision of forced draft burners of medium to large capacity.

LME7 are used for the startup and supervision of 1- or 2-stage forced draft burners in intermittent operation. The flame is supervised with an ionization probe, optionally with flame detector QRA2, QRA4 or QRA10.

- Applications in accordance with EN 267: Gas burners for liquid fuels
- Applications in accordance with EN 676: Automatic forced draft burners for gaseous fuels
- Applications in accordance with EN 746-2: Industrial thermoprocessing equipment - Part 2: Safety requirements for combustion and fuel handling systems
- Type-tested and approved in accordance with DIN EN 298

The following items are integrated into the LME7:

- Burner control
- BCI for connection a display or PC
- Only LME72 / LME73: Control for one actuator
- Lockout reset button (info button)
- 3 multicolor signal lamp LED for operations and fault notifications
- Optional: Analog inputs for load controller DC 0...10 V, DC 0/4...20 mA, 0...135 Ω
- 3 x 7-segment display for service, fault and operating state information
- Interface for PME7

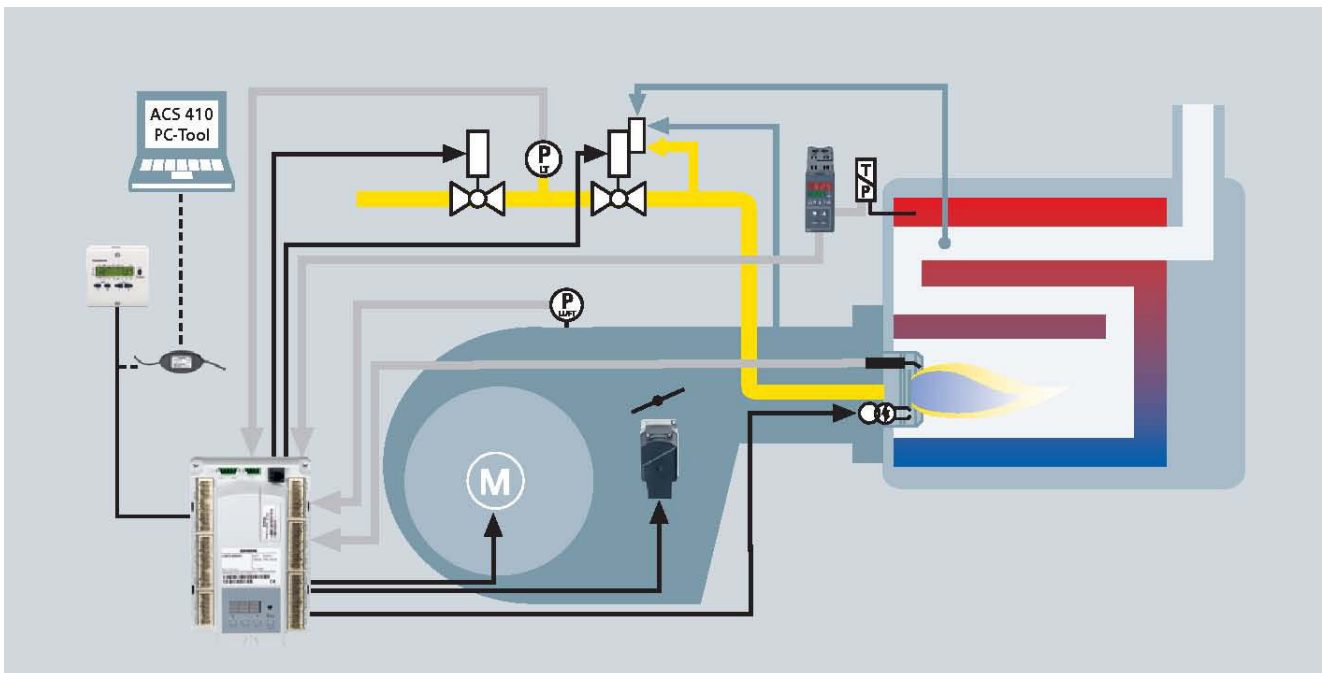


Figure 2: Example: Modulating gas burner

The diagram shows the maximum functionality of the LME7. The actual functions are to be determined based on the respective execution or configuration.



The LME7 system components (AZL2) are connected directly to the LME7 via BCI. All safety-related digital inputs and outputs of the system are supervised by a contact feedback network. For intermittent operation, the ionization probe and the QRA2, QRA4 or QRA10 (optional) can be used in connection with the LME7. The LME7 is operated and parameterized via the AZL2 or ACS410. The AZL2 features an LCD and menu-driven operation, offering straightforward operation and targeted diagnostics. When making diagnostics, the display shows operating states as well as the type and time of errors. The various parameterization levels of the burner/boiler manufacturer and heating engineer are password-protected against unauthorized access. Simple settings that the plant operator can make on site do not require a password.

Indication and diagnostics

- Multicolor indication for operating state and fault status messages via 3-color LED
- Diagnostics of cause of fault via blink code
- Extensive service, fault and operating state information via built-in 3 x 7 segment display
- Extensive service, fault and operating state information via BCI and AZL2

## 2.1 Features

- Undervoltage detection
- Electrical remote reset facility
- Accurate control times thanks to digital signal handling
- Multicolor indication of fault status and operating state messages
- Air pressure supervision with function check of air pressure switch during start and operation
- Restart limitation
- Controlled intermittent operation after max. 24 hours of continuous operation (can be parameterized via parameter 239) (depending on the PME7)
- BCI
- Unit parameter adjustable either via the AZL2 or ACS410
- Plug-in space for PME7

Only LME71.../LME73...:

- Indication of program sequence

### The following items are integrated into the LME7:

- Burner control
- BC interface for connecting an AZL2 or PC
- Lockout reset button (info button)
- 3 multi color signal lamp LED for operations and fault notifications
- Optional: Analog inputs for load controller DC 0...10 V, DC 0/4...20 mA, 0...135 Ω
- Interface for PME7

Only LME71.../LME73...:

- Optional: 3 x 7 segment display for fault and state information's and parameter display
- Control for one actuator

## 3 Type summary

### 3.1 Burner controls

Parameterized burner control for the supervision of multistage or modulating oil/gas forced draft burners and atmospheric burners of medium to higher capacity, in intermittent operation. With controlled air damper control.

Article no.	BPZ:LME71.000A1	BPZ:LME71.000A2	S55333-B205-A100	BPZ:LME72.000A2 *)	BPZ:LME73.000A1	BPZ:LME73.000A2
Type	LME71.000A1	LME71.000A2	LME71.901A2	LME72.000A2 *)	LME73.000A1	LME73.000A2
Mains voltage AC 120 V	●	--	--	--	●	--
Mains voltage AC 230 V	--	●	●	●	--	●
Gas pressure switch-min / POC	●	●	●	●	●	●
Pressure switch valve proving	●	●	●	●	●	●
Air pressure switch	●	●	●	●	●	●
Ionization probe	●	●	●	●	●	●
QRA2 / QRA4 / QRA10	●	●	●	--	●	●
QRB1 / QRB3 / QRB4	--	--	--	--	●	●
QRC	--	--	--	--	--	●
Load controller analog input signal (0...10 V, 4...20 mA, 0...135 Ω)	●	●	●	--	●	●
Load controller input 3-position step input / 2-stage	●	●	●	●	●	●
Output actuator control	--	--	--	●	●	●
Input feedback for actuator with potentiometer 0...1 kΩ	--	--	--	--	●	●
Output PWM control	●	●	●	●	●	●
Onboard LED 7-segment display	●	●	●	--	●	●
BC interface for AZL2	●	●	●	●	●	●

\*) On request

## 3.2 Program module

### 3.2.1 PME7 with mains voltage AC 120 V

PME7 for LME7, with program sequences for oil burners or gas burners.

Example:



Article no.	BPZ:PME71.111A1	BPZ:PME71.112A1	BPZ:PME71.401A1	BPZ:PME71.402A1	BPZ:PME71.901A1
Type	PME71.111A1	PME71.112A1	PME71.401A1	PME71.402A1	PME71.901A1
Mains voltage AC 120 V	●	●	●	●	●
For use with LME71.000A1	●	●	●	●	●
For use with LME72.000A1	---	---	---	---	---
For use with LME73.000A1	---	---	---	---	---
Gas program forced draft burner	●	---	●	●	●
Gas program atmospheric burner	---	●	---	---	---
1-stage or 1-stage modulating	●	●	●	●	●
2-stage or 1-stage modulating	---	---	●	●	●
Pilot burner simultaneously / alternately	●	●	---	●	---
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	---	---	---	---	---
Modulating via PWM fan (pneumatic fuel-air ratio control)	---	---	---	---	●
Fan speed control / control via analog signal / 3-position step signal	---	---	---	---	●
Actuator control via analog signal or 3-position step signal for actuator with ASZ	---	---	---	---	---
3-position signal for actuator without ASZ	---	---	---	---	---
Control sequence programmable time	●	●	●	●	●
POC	●	●	●	●	●
Valve proving	---	---	---	---	●
Input valve proving ON/Off	---	---	---	---	---

Article no.	S55333-B317-A100	BPZ:PME73.810A1	BPZ:PME73.811A1	BPZ:PME73.812A1	BPZ:PME73.820A1	BPZ:PME73.830A1	BPZ:PME73.831A1	BPZ:PME73.840A1
Type	PME73.231A1	PME73.810A1	PME73.811A1	PME73.812A1	PME73.820A1	PME73.830A1	PME73.831A1	PME73.840A1
Mains voltage AC 120 V	●	●	●	●	●	●	●	●
For use with LME71.000A1	--	--	--	--	--	--	--	--
For use with LME72.000A1	--	--	--	--	--	--	--	--
For use with LME73.000A1	●	●	●	●	●	●	●	●
Forced draft burner oil program	●	--	--	--	--	--	--	--
Gas program forced draft burner	--	●	●	●	●	●	●	●
Gas program atmospheric burner	--	--	--	--	--	--	--	--
1-stage or 1-stage modulating	●	●	●	●	●	●	●	●
2-stage or 1-stage modulating	●	●	--	--	●	●	●	●
Pilot burner simultaneously / alternately	●	--	●	●	--	●	●	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	●	●	●	●	●	●	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	--	--	--	--	--	--	--	--
Fan speed control / control via analog signal / 3-position step signal	--	--	--	--	--	--	--	--
Actuator control via analog signal or 3-position step signal for actuator with ASZ	●	●	●	●	--	●	●	--
3-position signal for actuator without ASZ	●	--	--	--	●	--	●	●
Control sequence programmable time	●	●	●	●	●	●	●	●
POC	●	●	●	●	●	●	--	●
Valve proving	--	●	●	--	●	●	●	●
Input valve proving ON/Off	--	--	--	--	--	--	●	--

### 3.2.2 PME7 with mains voltage AC 230 V

Example:



Article no.	BPZ:PME71.111A2	BPZ:PME71.112A2	BPZ:PME71.401A2	BPZ:PME71.402A2	BPZ:PME71.901A2	BPZ:PME72.521A2 *)	BPZ:PME72.541A2 *)
Type	PME71.111A2	PME71.112A2	PME71.401A2	PME71.402A2	PME71.901A2	PME72.521A2 *)	PME72.541A2 *)
Mains voltage AC 230 V	●	●	●	●	●	●	●
For use with LME71.000A2	●	●	●	●	●	--	--
For use with LME72.000A2	--	--	--	--	--	●	●
For use with LME73.000A2	--	--	--	--	--	--	--
Gas program forced draft burner	●	--	●	●	●	●	●
Gas program atmospheric burner	--	●	--	--	--	--	--
1-stage or 1-stage modulating	●	●	●	●	●	●	●
2-stage or 1-stage modulating	--	--	●	●	●	●	●
Pilot burner simultaneously / alternately	●	●	--	●	--	--	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	--	--	--	--	--	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	--	--	--	--	●	--	--
Fan speed control / control via analog signal / 3-position step signal	--	--	--	--	●	--	--
Actuator control via analog signal or 3-position step signal for actuator with ASZ	--	--	--	--	--	--	--
3-position signal for actuator without ASZ	--	--	--	--	--	●	●
Control sequence programmable time	●	●	●	●	●	--	--
POC	●	●	●	●	●	●	●
Valve proving	--	--	--	--	●	--	--
Input valve proving ON/Off	--	--	--	--	--	--	--

\*) Only on request

Article no.	S55333-B318-A100	BPZ:PME73.810A2	BPZ:PME73.811A2	BPZ:PME73.812A2	BPZ:PME73.820A2	BPZ:PME73.830A2	BPZ:PME73.831A2	BPZ:PME73.840A2
Type	PME73.231A2	PME73.810A2	PME73.811A2	PME73.812A2	PME73.820A2	PME73.830A2	PME73.831A2	PME73.840A2
Mains voltage AC 230 V	●	●	●	●	●	●	●	●
For use with LME71.000A2	--	--	--	--	--	--	--	--
For use with LME72.000A2	--	--	--	--	--	--	--	--
For use with LME73.000A2	●	●	●	●	●	●	●	●
Forced draft burner oil program	●	--	--	--	--	--	--	--
Gas program forced draft burner	--	●	●	●	●	●	●	●
Gas program atmospheric burner	--	--	--	--	--	--	--	--
1-stage or 1-stage modulating	●	●	●	●	●	●	●	●
2-stage or 1-stage modulating	●	●	--	--	●	●	●	●
Pilot burner simultaneously / alternately	●	--	●	●	--	●	●	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	●	●	●	●	●	●	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	--	--	--	--	--	--	--	--
Fan speed control / control via analog signal / 3-position step signal	--	--	--	--	--	--	--	--
Actuator control via analog signal or 3-position step signal for actuator with ASZ	●	●	●	●	--	●	●	--
3-position signal for actuator without ASZ	●	--	--	--	●	--	●	●
Control sequence programmable time	●	●	●	●	●	●	●	●
POC	●	●	●	●	●	●	--	●
Valve proving	--	●	●	--	●	●	●	●
Input valve proving ON/Off	--	--	--	--	--	--	●	--

### 3.3 External display and operating units

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#### AZL21.00x9

Article no.: **BPZ:AZL21.00x9**

Display and operating unit, detached, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LME7, degree of protection IP40.

See Data Sheet N7542



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#### AZL23.00x9

Article no.: **BPZ:AZL21.00x9**

Display and operating unit, detached, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LME7, degree of protection IP54.

See Data Sheet N7542



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#### Built-in in the LME7

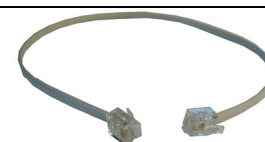
3-colored LED, reset button, 3 other buttons for operation in connection with 3 x 7-segment display

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#### AGV50.100

Article no.: **BPZ:AZL21.00x9**

Signal cable for AZL2, with RJ11 connector, cable length 1 m, pack of 10

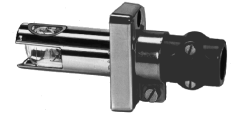


## 3.4 Flame detectors

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### QRA2 (LME71/LME73 only)

UV flame detector for the supervision of gas flames, yellow- / blue-burning oil flames and for ignition spark proving. Plastic insulated housing, metalized to prevent static charging caused by the air flow from the fan, lateral illumination. See Data Sheet N7712



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### QRA4 (LME71/LME73 only)

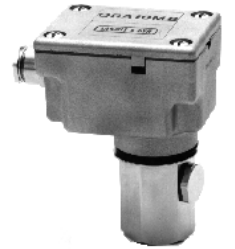
UV flame detector for the supervision of gas flames, yellow- / blue-burning oil flames and for ignition spark proving, metal housing, front illumination. See Data Sheet N7711



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### QRA10 (LME71/LME73 only)

UV flame detector for the supervision of gas flames, yellow- / blue-burning oil flames and for ignition spark proving. Die-cast aluminum housing with a 1 in. mounting coupling and connection facility for cooling air. See Data Sheet N7712



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### QRB1

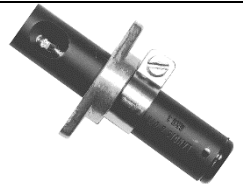
Photo resistive detector for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum. The QRB1 is primarily used in connection with burner controls for burners of small capacity. Refer to data sheet N7714.



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### QRB3

Photo resistive detector for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum. The QRB3 is primarily used in connection with burner controls for burners of small capacity. Refer to data sheet N7714.



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### QRB4

Yellow flame detector for Siemens burner controls, for supervising oil flames in the visible light spectrum. The QRB4 is used in connection with oil burner controls in intermittent operation. Refer to data sheet N7720.



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### QRC

Blue-flame detector for use with Siemens burner controls, for the supervision of blue and yellow-burning oil or gas flames. The QRC is primarily used in connection with burner controls for burners of small capacity. Refer to data sheet N7716.

Frontal illumination:



Lateral illumination:



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### Ionization probe

Flame detector for Siemens burner controls, for supervision of gas flames. To be provided on site





## 3.5 Actuators

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### SQN3

Electromotoric actuators for air dampers and control valves of oil and gas burners of small to medium capacity.

Holding torque / running time 0.8 Nm / 4.5 s  
until 3 Nm / 30 s

See Data Sheet N7808



### SQN7

Electromotoric actuators for air dampers and control valves of oil and gas burners of small to medium capacity.

Holding torque / running time 0.7 Nm / 4 s  
until 2.5 Nm / 30 s

See Data Sheet N7804



### SQM40 / SQM41

Electromotoric actuators for air dampers and control valves of oil and gas burners of small to medium capacity, with UL-registered.

Holding torque / running time 5 Nm / 15 s  
until 10 Nm / 30 s

See Data Sheet N7817.



### SQM5

Electromotoric actuators for air dampers and control valves of oil and gas burners of small to medium capacity, with UL-registered.

Holding torque / running time 10 Nm / 15 s  
until 40 Nm / 60 s

See Data Sheet N7815



## 3.6 Pressure switch

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### QPLx5

The pressure switch is used for monitoring of gas or air pressure.

See Data Sheet N7221



## 3.7 Dummy plugs for RJ11

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### Dummy plug

For 6-pole modular connector (RJ11)

Supplier recommendation:

Molex, order no.: 085 999 3256

## 3.8 Connector sets for LME7

### AGG3.710

Article no.: **BPZ:AGG3.710**  
 Connector set complete for LME7  
 RAST5 and RAST3.5  
 Single packs  
 See List or parts C7105 (74 319 0642 0)

Example:  
 Terminal X5-03

### AGG3.720

Article no.: **BPZ:AGG3.720**  
 10 standard connector sets complete for LME7  
 RAST5 and RAST3.5  
 Single packs  
 The several connectors are delivered into bags to 10 pieces each as a unit.  
 See List or parts C7105 (74 319 0642 0)




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### AGG9.xxx

The individual connectors are supplied in packaging units of 200 pieces each.

Example: **X5-03**



Article no.	Type	Type of connector	Terminal
BPZ:AGG9.201	AGG9.201	RAST5	X2-09B
BPZ:AGG9.203	AGG9.203	RAST5	X3-02
BPZ:AGG9.209	AGG9.209	RAST5	X10-06
BPZ:AGG9.301	AGG9.301	RAST5	X2-01
BPZ:AGG9.302	AGG9.302	RAST5	X2-03
BPZ:AGG9.304	AGG9.304	RAST5	X4-02
BPZ:AGG9.306	AGG9.306	RAST5	X5-01
BPZ:AGG9.309	AGG9.309	RAST5	X6-03
BPZ:AGG9.310	AGG9.310	RAST5	X7-01
BPZ:AGG9.311	AGG9.311	RAST5	X7-02
BPZ:AGG9.313	AGG9.313	RAST5	X9-04
BPZ:AGG9.401	AGG9.401	RAST5	X2-02
BPZ:AGG9.403	AGG9.403	RAST5	X5-03
BPZ:AGG9.405	AGG9.405	RAST5	X7-04
BPZ:AGG9.501	AGG9.501	RAST5	X3-04
BPZ:AGG9.504	AGG9.504	RAST5	X10-05
BPZ:AGG9.601	AGG9.601	RAST5	X2-09A
BPZ:AGG9.822	AGG9.822	RAST3.5	2-pole
BPZ:AGG9.831	AGG9.831	RAST3.5	3-pole
BPZ:AGG9.841	AGG9.841	RAST3.5	4-pole

## 3.9 Service- tools

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### **OCI410**

Article no.: **BPZ:OCI410**

Interface between burner control and PC

Facilitates viewing, handling and recording setting parameters on site in connection with the ACS410 software

See Data Sheet N7616

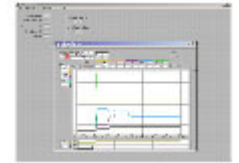


### **ACS410**

Article no.: **BPZ:ACS410**

PC software for setting the parameters and for visualizing the burner controls

See Software Documentation J7352



# 4 Technical data

## 4.1 Basic unit LME7

Mains voltage	AC 120 V	AC 230 V
Mains frequency	50/60 Hz	50/60 Hz
External primary fuse	Max. 6.3 A (slow)	Max. 6.3 A (slow)



### Caution!

**Risk of damage to the switching contacts!**

**If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LME7 must be replaced.**

Power consumption	<10 W, typical	<10 W, typical
Safety class	I with parts according to II and III in accordance with DIN EN 60730-1	
Degree of protection	IP00	



### Note

The burner or boiler manufacturer must ensure degree of protection IP40 in accordance with DIN EN 60529 for burner controls through adequate installation of the LME7.

Rated surge voltage category III (DIN EN 60664)	
• LME7	4 kV
• Creepage distances or air gaps	2.5 kV due to voltage limitation measures
Degree of contamination	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. mounting position	Optional
Weight	Approx. 490 g

## 4.2 Terminal rating *Inputs*

Mains supply: The input current for the mains supply is dependent on the operating status of the LME7		
Under voltage	UMains 120 V	UMains 230 V
<ul style="list-style-type: none"> <li>Safety shutdown from the operating position takes place should mains voltage drop</li> </ul>	≤AC 75 V	≤AC 165 V
<ul style="list-style-type: none"> <li>Restart is initiated when mains voltage exceeds</li> </ul>	≥AC 100 V	≥AC 195 V
<p>The remote lockout reset (terminal X2-03 pin 1), control thermostat, or limit thermostat (terminal X5-03 pin 1), load controller (terminal X5-03 pin 2 / pin 3), POC/CPI (terminal X2-02 pin 4), pressure switch (terminal X5-01 pin 2), air pressure switch (terminal X3-02 pin 1), and actuator (terminal X2-09 pin 4) status inputs for the contact feedback network are used for system supervision and require mains-related input voltage</p>		
<ul style="list-style-type: none"> <li>Terminal X3-04 pin 1 and pin 2: Safety loop input</li> </ul>	See Terminal rating outputs	
<ul style="list-style-type: none"> <li>Input currents and input voltages</li> </ul>		
- UeMax	UN +10%	UN +10%
- UeMin	UN -15%	UN -15%
- IeMax	1.5 mA peak (peak value)	1 mA peak (peak value)
- IeMin	0.8 mA peak (peak value)	0.5 mA peak (peak value)
<ul style="list-style-type: none"> <li>Contact material recommended for external signal sources (air pressure switch, pressure switch-min, pressure switch-max, etc.)</li> </ul>	Gold-plated silver contacts	
<ul style="list-style-type: none"> <li>Transition / settling behavior / bounce</li> </ul>		
- Perm. bounce time of contacts when switching ON/OFF	Max. 50 ms (after the bounce time, the contact must stay closed or open)	
<ul style="list-style-type: none"> <li>UN</li> </ul>	AC 120 V	AC 230 V
<ul style="list-style-type: none"> <li>Voltage detection</li> </ul>		
- ON	>AC 60 V	>AC 120 V
- OFF	<AC 40 V	<AC 80 V
Terminal X65: Analog input	DC 0...10 V / DC 0/4...20 mA / 0...135 Ω	

## 4.3 Terminal rating *Outputs*

### Total contact loading:

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Terminal X3-04: LME7 input current	Max. 5 A	Max. 5 A



### Note

The input current for the LME7 at terminal X3-04 pin 5 also flows through safety loop terminal X3-04 pin 1 / pin 2.

The power supply in the LME7 to the fan motor, ignition transformer, fuel valves, and actuators is interrupted as soon as one of the components opens the safety loop circuit.

### Individual contact loading:

Terminal X2-01 pin 3: Fan motor

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	2 A (15 A max. 0.5 s)	2 A (15 A for max. 0.5 s)
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X2-02 pin 3: POC/CPI or PWM fan motor (depending on the fuel train, refer to User Documentation A7105.x)

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Total current	2 A	2 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$



### Caution!

**Maximum permissible current load may be exceeded!  
If terminal X2-02 pin 3 is used as the connection for supplying the PWM fan motor, no other motor may be connected on terminal X2-01 pin 3.**

Terminal X2-03 pin 3: Alarm output

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	1 A	1 A
• Power factor	$\text{Cos}\varphi \geq 0.6$	$\text{Cos}\varphi \geq 0.6$

Terminal X2-09 pin 7: Output relay contact K2/2 (auxiliary output)

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	1 A	1 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X3-04 pin 2: Safety loop

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Total current	2 A	2 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X4-02 pin 3: Ignition transformer

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	2 A	2 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X6-03 pin 3: Safety valve

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	1.5 A	1.5 A
• Power factor	$\text{Cos}\varphi \geq 0.6$	$\text{Cos}\varphi \geq 0.6$

Terminal X7-01 pin 3: Fuel valve or pilot valve (depending on the fuel train, refer to User Documentation A7105.x)

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	1 A	1 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X7-02 pin 3: Fuel valve (depending on the fuel train; refer to User Documentation A7105.x)

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current		
- Valve proving inactive	2 A	2 A
- Valve proving active	1 A	1 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$

Terminal X7-04 pin 4: Fuel valve or pilot valve (depending on the fuel train; refer to User Documentation A7105.x)

• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current		
- Valve proving inactive	2 A	2 A
- Valve proving active	1 A	1 A
• Power factor	$\text{Cos}\varphi \geq 0.4$	$\text{Cos}\varphi \geq 0.4$



Note

When activating valve proving (e.g., on shutdown), the load on the valve terminals is restricted. If, on the other hand, the terminal load is not reduced, the design lifetime is about 100,000 burner start cycles!

## 4.4 Cable lengths

Terminal X2-01: Fan motor	Max. 30 m (100 pF/m), unshielded
Terminal X2-02: Multifunctional input (POC, valve proving pressure switch), refer to User Documentation A7105.x	Max. 30 m (100 pF/m), unshielded
Terminal X2-03 pin 1/2: Remote lockout reset (laid separately)	Max. 30 m (100 pF/m), unshielded
Terminal X2-03 pin 2/3: Alarm	Max. 30 m (100 pF/m), unshielded
Terminal X3-02: Air pressure switch	Max. 30 m (100 pF/m), unshielded
Terminal X3-04 pin 1/2: Safety loop	Max. 30 m (100 pF/m), unshielded
Terminal X3-04 pin 3 to 5: Mains supply line	Max. 100 m (100 pF/m)
Terminal X4-02 pin 1 to 3: Ignition transformer	Max. 30 m (100 pF/m), unshielded
Terminal X5-01: Pressure switch-min	Max. 30 m (100 pF/m), unshielded
Terminal X5-03 pin 1 to 4: Load controller	Max. 30 m (100 pF/m), unshielded
Terminal X6-03 pin 1 to 3: Safety valve	Max. 30 m (100 pF/m), unshielded
Terminal X7-01 pin 1 to 3 / X7-02 pin 1 to 3 / X7-04 pin 1 to 4: Fuel valve	Max. 30 m (100 pF/m), unshielded
Terminal X7-01 pin 1 to 3 / X7-04 pin 1 to 4: Pilot valve	Max. 30 m (100 pF/m), unshielded
Terminal X9-04: Multifunctional input (valve proving pressure switch), refer to User Documentation A7105.x	Max. 30 m (100 pF/m), unshielded
Terminal X10-05 / X10-06: Flame detector	Refer to the <i>Flame supervision</i> chapter
Terminal X56: Display, BC interface	For use under the burner hood or in a control panel Max. 1 m (100 pF/m), unshielded
Terminal X65: Load controller analog input	Max. 30 m (100 pF/m), shielded <10 m, use an unshielded cable
Terminal X66: Actuator potentiometer feedback	Max. 30 m (100 pF/m), unshielded
Terminal X76: PWM fan motor	Max. 30 m (100 pF/m), unshielded

### Specification as per EN 60730-1

Type of shutdown or interruption of each circuit

Shutdown with microswitch 1 pole

Mode of operation Type 2 B



## 4.5 Actuators

<b>CLOSE / ignition position / OPEN terminal X2-09 pin 1, X2-09 pin 2, X2-09 pin 3</b>	1 mio. switching cycles	1 mio. switching cycles
• Rated voltage	AC 120 V 50/60 Hz	AC 230 V 50/60 Hz
• Rated current	0.1 A	0.1 A
• Power factor	$\text{Cos}\varphi \geq 0.6$	$\text{Cos}\varphi \geq 0.6$
<b>Output K2/2 X2-09 pin 7</b>	AC 120 V 50/60 Hz	AC 230 V 50/60 Hz
• Nominal current	Max. 1 A	Max. 1 A
• Power factor	$\text{Cos}\varphi > 0.4$	$\text{Cos}\varphi > 0.4$
Feedback via input X2-09 pin 8 on the LME depending on the current load of the actuator switching contact used (e.g. cam V2)!		

## 4.6 Cross-sectional areas

The cross-sectional areas of the mains power lines (L, N, and PE) and, if required, the safety loop (safety temperature limiter, water shortage, etc.) must be sized for rated currents according to the selected external primary fuse. The cross-sectional areas of the other cables must be sized in accordance with the primary fuse for the LME7 (max. 6.3 AT).



### Caution!

**Risk of damage to the switching contacts!**

**If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LME7 must be replaced.**

Min. cross-sectional area	0.75 mm <sup>2</sup> (single- or multicore to VDE 0100)
---------------------------	--

Cable insulation must be suited for the respective temperature and environmental conditions!

## 4.7 RAST5 connector

Mechanical data

Insertion force / contact	≤4 N
Withdrawal force / contact	≥1 N
Tightening torque / screw	0.5 Nm in accordance with DIN EN 60335-1
Contacting with flat pin connector	6.3 x 0.8 mm in accordance with DIN EN 46244 Male multipoint connector to RAST5 standard
Connection cross-sections conductor screw connection	
• Stranded conductor	Cross-section max. 2.5 mm <sup>2</sup>
• Stranded conductor with ferrule	Cross-section max. 2.5 mm <sup>2</sup>
• Stripping length	Approx. 8 mm

## 4.8 RAST3.5 connector

Mechanical data

Connection cross-sections conductor screw connection	
• Stranded conductor fine-wired (flexible)	Cross-section Min. 0.14 mm <sup>2</sup> Max. 1.5 mm <sup>2</sup>
• Stranded conductor fine-wired (flexible) with ferrule	Cross-section Min. 0.25 mm <sup>2</sup> Max. 1 mm <sup>2</sup>
• Stripping length	Approx. 7 mm
• Tightening torque / screw	0.25 Nm

## 4.9 Signal cable AGV50

### 4.9.1 AZL2 → BCI

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

## 4.10 Dummy plug for RJ11

Dummy plug	For 6 pin modular plug (RJ11)
Supplier	Recommendation: Molex Order no.: 085 999 3256

## 4.11 Environmental conditions

<b>Storage</b>	EN 60721-3-1:1997
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-40...+70 °C
Humidity	<95% r.h.
<b>Transport</b>	EN 60721-3-2:1997
Climatic conditions	Class 2K3
Mechanical conditions	Class 2M2
Temperature range	-40...+70 °C
Humidity	<95% r.h.
<b>Operation</b>	EN 60721-3-3:1994
Climatic conditions	Class 3K3
Mechanical conditions	Class 3M2
Temperature range	-40...+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 not observed, there is a risk of impairment of safety functions and of electric shock hazard.

## 4.12 Flame supervision

### 4.12.1 Ionization probe

No-load voltage at terminal ionization probe (terminal X10-05 pin 2)	AC 300 V
--	----------



#### Warning!

- The ionization probe must be protected against electric shock hazard!
- When monitoring ionization currents in earth-free mains, connect terminal X10-05 pin 1 to burner ground

Short-circuit current	Max. AC 1 mA
Required detector current	Min. DC 1 $\mu$ A, display approx. 20%
Possible detector current	Max. DC 40 $\mu$ A, display approx. 100%
Perm. length of detector cable (normal cable, laid separately) <sup>1)</sup>	30 m (100 pF/m), unshielded

<sup>1)</sup> Multicore cable not permitted

#### Note:

As the detector line capacitance (line length) increases, the voltage at the ionization probe and thus the detector current will drop. Extremely long line lengths and very high-ohmic flames might necessitate the use of low-capacitance cable (e.g. ignition cable). In spite of special electronic circuits designed to compensate possible adverse effects of the ignition spark on the ionization current, it must be made certain that the minimum detector current required is already available during the ignition phase. If this is not the case, the primary ignition transformer connections must be interchanged and/or the electrodes relocated.



#### Threshold values when flame is supervised by ionization

- Start prevention (extraneous light)	Intensity (parameter 954) approx. 12%
- Operation	Intensity (parameter 954) approx. 13%

Parameters	Function
954	Flame intensity

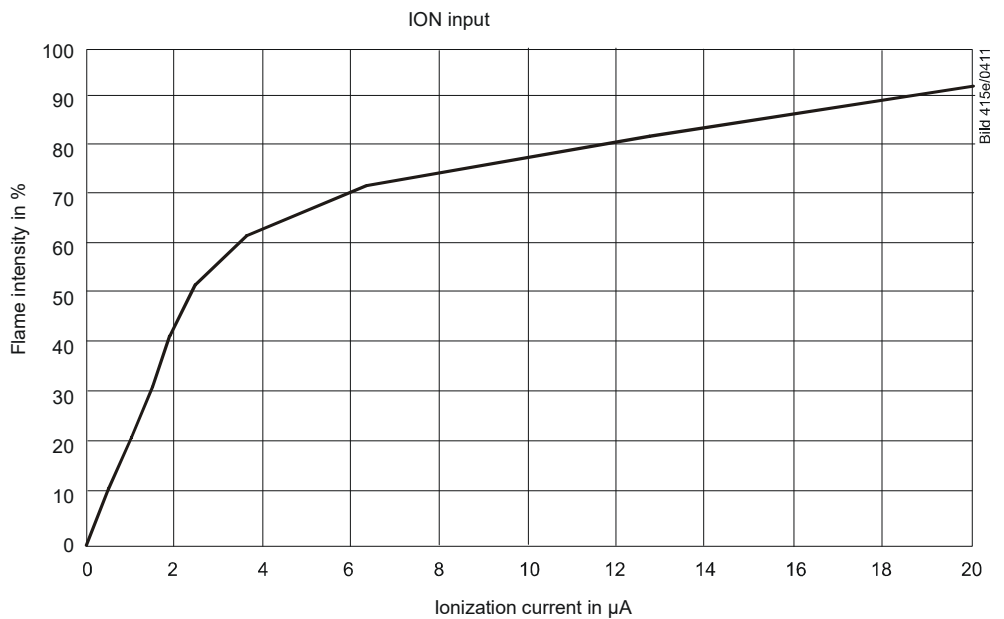
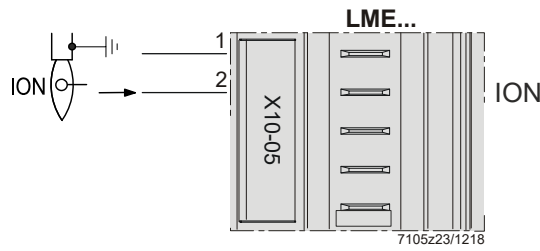


Figure 3: Ionization input at AC 120 V / AC 230 V

Connection diagram



LME7 connection assignment:  
Terminal X10-05 pin 2 flame signal  
ionization input

Measuring circuit for detector  
current measurement

Ionization probe

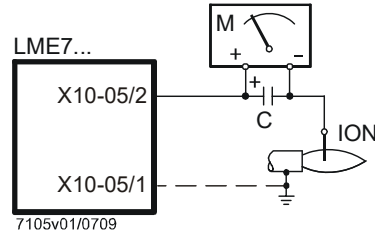


Figure 4: Measuring circuit for ionization probe

Legend

- C Electrolytic condenser 100...470  $\mu$ F; DC 10...25 V
- ION Ionization probe
- M Microammeter  $R_i$  max. 5,000  $\Omega$



**Warning!**  
Simultaneous operation of QRA and ionization probe is not permitted!  
If not observed, there is a risk of impairment of safety functions.

## 4.12.2 QRA2 / QRA4 / QRA10 (LME71 / LME73 only)



### Caution!

If QRA2-UV tubes, QRA4-UV tubes, or QRA10-UV tubes are used for flame supervision on the LME7, it must be ensured that the burner control is permanently connected to power (EN 298), thus enabling the system to detect detector failures during startup and shutdown. The system generally operates with QRA flame detectors in intermittent operation. Failure to observe this information poses a risk of the safety functions being impaired.

**For Technical data, refer to Data Sheet N7712, UV flame detector QRA2 / QRA10!**

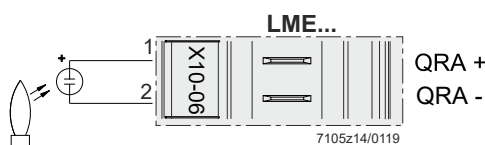
**For Technical Data, refer to Data Sheet N7711, UV flame detector QRA4!**

Threshold values when flame is supervised by QRA	
- Start prevention (extraneous light)	Intensity (parameter 954) approx. 12%
- Operation	Intensity (parameter 954) approx. 13%
Operating voltage	
	AC 280 V $\pm$ 15%
Mains frequency	
	50...60 Hz $\pm$ 6%
Required detector current	
	Min. 70 $\mu$ A
Possible detector current during operation	
	Max. 700 $\mu$ A
Perm. length of detector cable (normal cable, laid separately) <sup>1)</sup>	
	Max. 100 m, unshielded

<sup>1)</sup> Multicore cable not permitted

Parameters	Function
954	Flame intensity

Connection diagram



Measuring circuit for detector current measurement

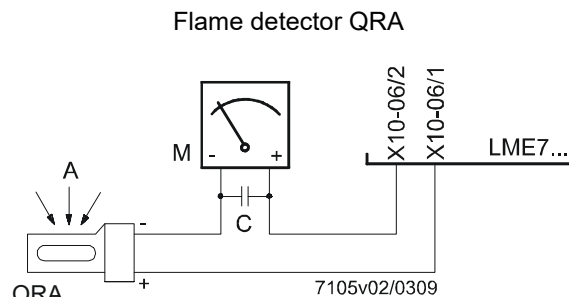


Figure 5: Measuring circuit for QRA

Legend

- A Exposure to light
- C Electrolytic condenser 100...470  $\mu$ F; DC 10...25 V
- M Microammeter  $R_i$  max. 5,000  $\Omega$



### Warning!

- **Input QRA is not short-circuit-proof!**  
Short-circuits of terminal X10-06 pin 2 against earth can destroy the QRA input
- **Simultaneous operation of flame detector QRA and ionization probe is not permitted.** If not observed, there is a risk of impairment of safety functions.
- **To ensure that the age of the UV tubes can be determined, the LME7 must always be connected to mains voltage.** Failure to observe this information poses a risk of the safety functions being impaired

### 4.12.3 QRB1/QRB3/ QRB4

No-load voltage at the QRB4 terminal (X10-05, terminal 3)	Approx. 5 V DC
Required detector current in operation	Min. 20 µA (display intensity approx. 35%)
Possible detector current in operation	Max. 60 µA (display intensity 100%)
Perm. length of detector cable (normal cable, laid separately) <sup>1)</sup>	Max. 3 m (core-core 100 pF/m)

<sup>1)</sup> Multicore cable not permitted



#### Notes

- Increasing line capacitance between QRB connection and “L” mains phase impairs sensitivity. Always run detector cables separately
- Before using a highly sensitive QRB1B and QRB3S, check carefully whether they are necessary
- QRB4 cable connection!  
Blue QRB4 cable to terminal X10-05 pin 4.  
Black QRB4 cable to terminal X10-05 pin 3.  
Otherwise the QRB4 will not function.

Check the flame intensity via the AZL2 or the internal LED display (flame current, FL2).

The maximum possible QRB flame current is limited to approx. 60 µA for system-specific reasons. The maximum display intensity (parameter 954 in the AZL2 or via internal LED display FL2) corresponds to 100%.

Threshold values when flame is supervised by QRB		
• Start prevention (extraneous light)		
Intensity		AZL2 (parameter 954) or FL2 >10%
Flame current		>10 µA
Operation, minimum required flame signal		
Intensity		AZL2 (parameter 954) or FL2 >35%
Flame current		Approx. 20 µA
• Signaling good/bad flame (LED starts flashing green during operation)		
Intensity		AZL2 (parameter 954) or FL2 approx. 50%
Flame current		Approx. 30 µA
• Typical flame signal during operation		
Intensity		AZL2 (parameter 954) or FL2 ≥60%
• Maximum flame signal during operation		
Intensity		AZL2 (parameter 954) or FL2 ≤100%
Flame current		Approx. 60 µA

Parameters	Function
954	Flame intensity

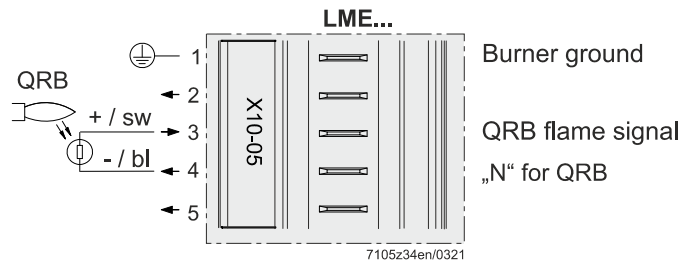
The values specified in the table only apply under the following ambient conditions and may vary under other conditions:

- Mains voltage 230 V AC
- Ambient temperature 23°C

Green LED for indication of operating mode

	Detector current in operation:	Detector current in operation:
	<ul style="list-style-type: none"> <li>Flame signal instable</li> <li>Green LED flashing</li> </ul>	<ul style="list-style-type: none"> <li>Flame signal stable</li> <li>Green LED steady on</li> </ul>
<b>QRB</b>	< 50%	> 50%

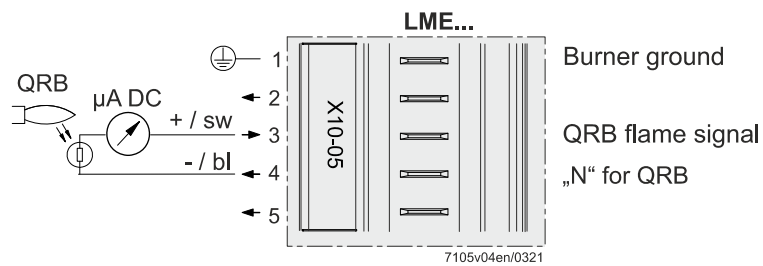
Connection diagram



Key

sw Black  
bl Blue

Measuring circuit for detector current measurement



Key

μA DC DC microammeter with internal resistance  $R_i = \text{max. } 5 \text{ k}\Omega$   
bl Blue  
sw Black



#### 4.12.4 QRC



##### Warning!

The QRC is only suitable for operation at 230 V AC. Failure to observe this information poses a risk of damaging the safety functions.

Operating voltage	230 V AC $\pm$ 15%
Mains frequency	50 to 60 Hz $\pm$ 6%
Required detector current in operation	Min. 20 $\mu$ A (display intensity approx. 35%)
Possible detector current in operation	Max. 60 $\mu$ A (display intensity 100%)
Perm. length of detector cable (normal cable, laid separately) <sup>1)</sup>	Max. 3 m (core-core 100 pF/m)

<sup>1)</sup> Multicore cable not permitted

Check the flame intensity via the AZL2 or the internal LED display (flame current, FL2).

The maximum possible QRC flame current is limited to approx. 60  $\mu$ A for system-specific reasons. The maximum display intensity (parameter 954 in the AZL2 or via internal LED display FL2) corresponds to 100%.

Threshold values when flame is supervised by QRC

• Start prevention (extraneous light)	
Intensity	AZL2 (parameter 954) or FL2 >10%
Flame current	>10 $\mu$ A
Operation, minimum required flame signal	
Intensity	AZL2 (parameter 954) or FL2 >35%
Flame current	Approx. 20 $\mu$ A
• Signaling good/bad flame (LED starts flashing green during operation)	
Intensity	AZL2 (parameter 954) or FL2 approx. 50%
Flame current	Approx. 30 $\mu$ A
• Typical flame signal during operation	
Intensity	AZL2 (parameter 954) or FL2 $\geq$ 60%
• Maximum flame signal during operation	
Intensity	AZL2 (parameter 954) or FL2 $\leq$ 100%
Flame current	Approx. 60 $\mu$ A

Parameters	AZL2	Function
954	FL2	Flame intensity

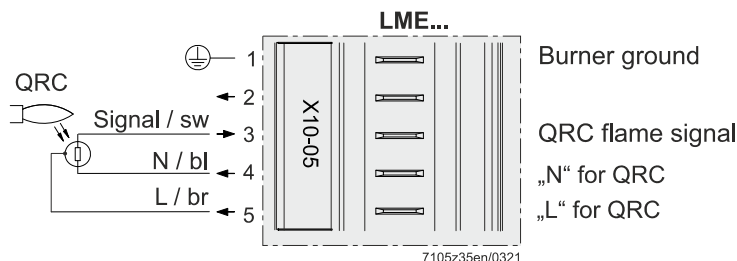
The values specified in the table only apply under the following ambient conditions and may vary under other conditions:

- Mains voltage 230 V AC
- Ambient temperature 23°C

Green LED for indication of operating mode

QRC	Detector current in operation:	Detector current in operation:
	<ul style="list-style-type: none"> <li>• Flame signal instable</li> <li>• Green LED flashing</li> </ul>	<ul style="list-style-type: none"> <li>• Flame signal stable</li> <li>• Green LED steady on</li> </ul>
	< 50%	> 50%

Connection diagram



Key  
 sw Black  
 bl Blue  
 br Brown

# 5 Dimensions

Dimensions in mm

LME7

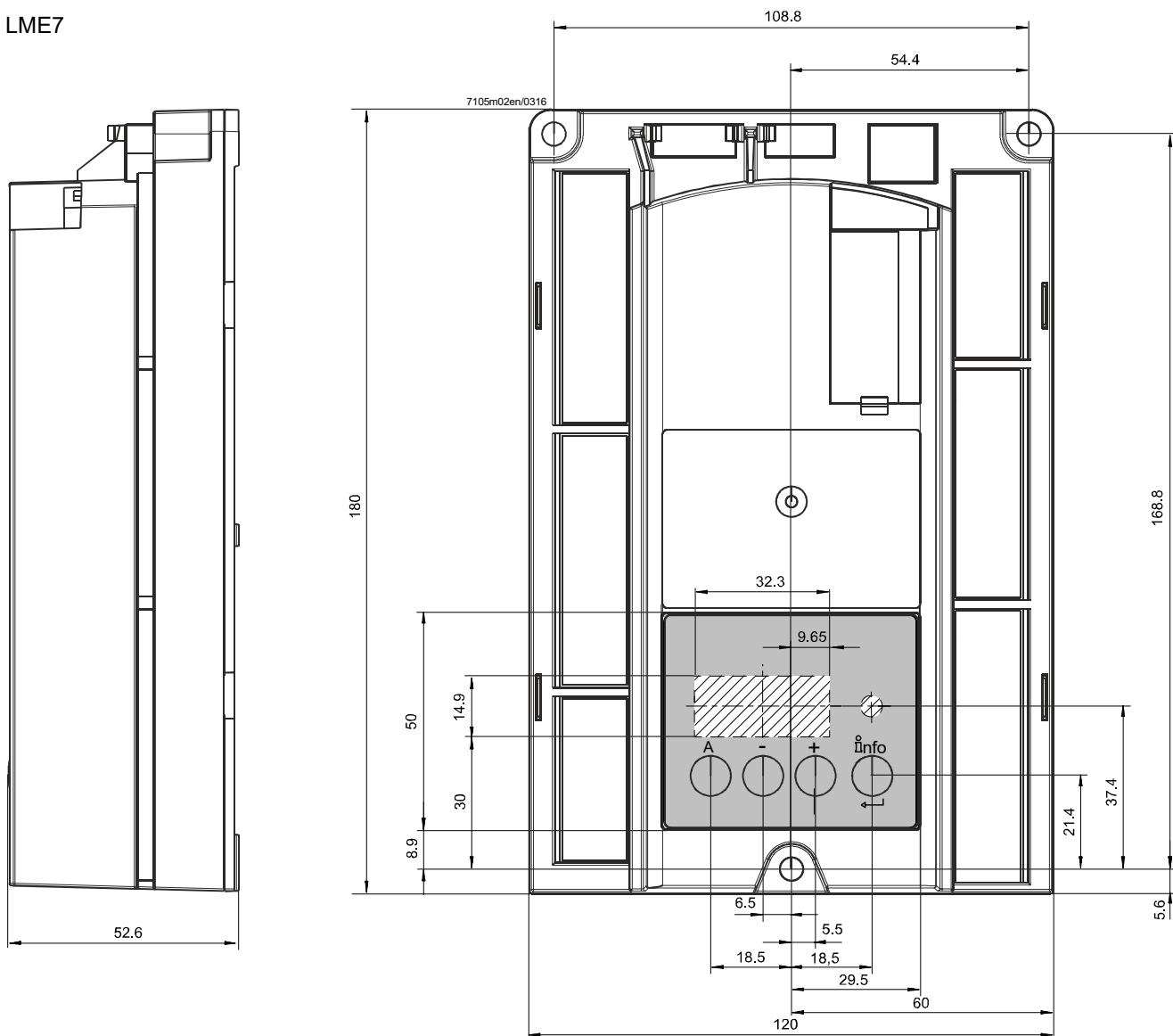


Figure 6: Dimensions of LME7

## 6 Function

### 6.1 Preconditions for burner startup

- 
- LME7 is reset
- All contacts in the line are closed, there is a request for heat
- No undervoltage
- Air pressure switch or POC must be in its no-load position, or Dbr1 is connected to terminal X2-02 (depending on program sequence)
- Flame detector is darkened and there is no extraneous light
- All contacts in the safety loop are closed

### 6.2 Undervoltage

- - Safety shutdown from the operating position takes place should mains voltage drop below about AC 75 V (UN = AC 120 V)
  - Restart is initiated when mains voltage exceeds about AC 100 V (UN = AC 120 V)
- - Safety shutdown from the operating position takes place should mains voltage drop below about AC 165 V (UN = AC 230 V)
  - Restart is initiated when mains voltage exceeds about AC 195 V (UN = AC 230 V)

### 6.3 Controlled intermittent operation

Depending on the PME7, refer to *User Documentation A7105.x*.

After no more than 24 hours of continuous operation, the LME7 initiates an automatic controlled shutdown followed by a restart.

## 6.4 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 voltage failure	Restart
Voltage below undervoltage threshold	Safety shutdown
Voltage above undervoltage threshold	Restart
Extraneous light before safety time	Non-alterable lockout
Extraneous light during waiting time	Start prevention, after approx. 30 seconds of a non-alterable lockout
No flame at the end of safety time	Non-alterable lockout at the end of the safety time
Loss of flame during operation	Depending on the PME7, refer to <i>User Documentation A7105.x</i> . Non-volatile lockout or 1 x restart
Air pressure switch has welded in the operating position	Start prevention, after a maximum of 30 seconds of a non-alterable lockout
Air pressure switch has welded in the no-load position	Non-alterable lockout at the end of the specified time
No air pressure signal on completion of the specified time	Non-alterable lockout, with down time $\geq 0.3$ seconds
POC contact is open during startup	Non-alterable lockout, approx. 5 seconds after control thermostat or pressurestat ON or pressure switch ON
Pressure switch-min: Failure during operation	Shutdown and start prevention

In the event of a non-volatile lockout, the LME7 remains locked and the signal lamp (LED) lights up red permanently. The LME7 can then be reset immediately. This state is also maintained in the event of mains voltage interruptions.

## 6.5 Resetting the LME7

After a non-alterable lockout, the burner control can be immediately reset. To do this, press the lockout reset button (info button) for about 1 second (<3 seconds). The LME7 can only be reset when all contacts in the line are closed and when there is no undervoltage.

## 6.6 Restart limitation

Depending on the PME7, refer to *User Documentation A7105.x*.

### 6.6.1 Restart in the event of loss of flame

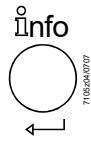
If the flame is lost during operation, a certain number of restarts per controlled startup can be performed via the control thermostat or pressurestat depending on the parameter settings in the PME7, otherwise a non-volatile lockout will be initiated. With restarts from the operating position (loss of flame), the flame must have been established on completion of the safety time, or else a non-volatile lockout will be initiated.

### 6.6.2 Repetition in case of *no flame is established by the end of safety time (TSA)*

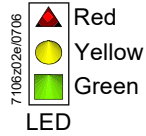
If there is *no establishment of flame at the end of the safety time*, a non-volatile lockout will be initiated.

# 7 Operation, indication, diagnostics

## 7.1 Operation



The lockout reset button (info button) is the key operating element for resetting the burner control and for activating / deactivating the diagnostics functions.



The multicolor signal lamp is the key indicating element for visual diagnostics.

Both lockout reset button and signal lamp are located in the control panel.

There are 2 diagnostics choices:

1. Visual diagnostics: Indication of operating state or diagnostics of cause of fault
2. Diagnostics: Via BCI to AZL2 display and operating unit

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.

## 7.2 Indication of operating state

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

Color code table for multicolor signal lamp		
State	Color code	Color
Waiting time, other waiting states	○.....	OFF
Ignition phase, ignition controlled	○●○●○●○●○●○●○●○●○	Blinking yellow
Operation, flame o.k.	■.....	Green
Operation, flame not o.k.	○■○■○■○■○■○■○■○■○	Blinking green
Extraneous light on burner startup	■▲■▲■▲■▲■▲■▲■▲■▲	Green-red
Undervoltage	●▲●▲●▲●▲●▲●▲●▲●▲	Yellow-red
Fault, alarm	▲.....	Red
Error code output (see Error code table)	○▲○▲○▲○▲○▲○▲○▲○▲	Blinking red
Interface diagnostics	▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲	Red flicker light
Heating request	●.....	Yellow
New program card	●●▲●●▲●●▲●●▲●●▲●●▲	Yellow-yellow-red

Legend

..... Steady on  
○ OFF

▲ Red  
● Yellow  
■ Green

### 7.3 Diagnostics of cause of fault

After a non-alterable lockout, the red fault signal lamp (LED) lights up. In that condition, visual diagnostics of cause of fault according to the error code table can be activated by pressing the lockout reset button (info button) for more than 3 seconds. Pressing the lockout reset button (info button) again for at least 3 seconds, interface diagnostics will be activated. 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 (info button) for >3 seconds. The instant of switching over is indicated by a yellow light pulse.

The following sequence activates the diagnostics of cause of fault:

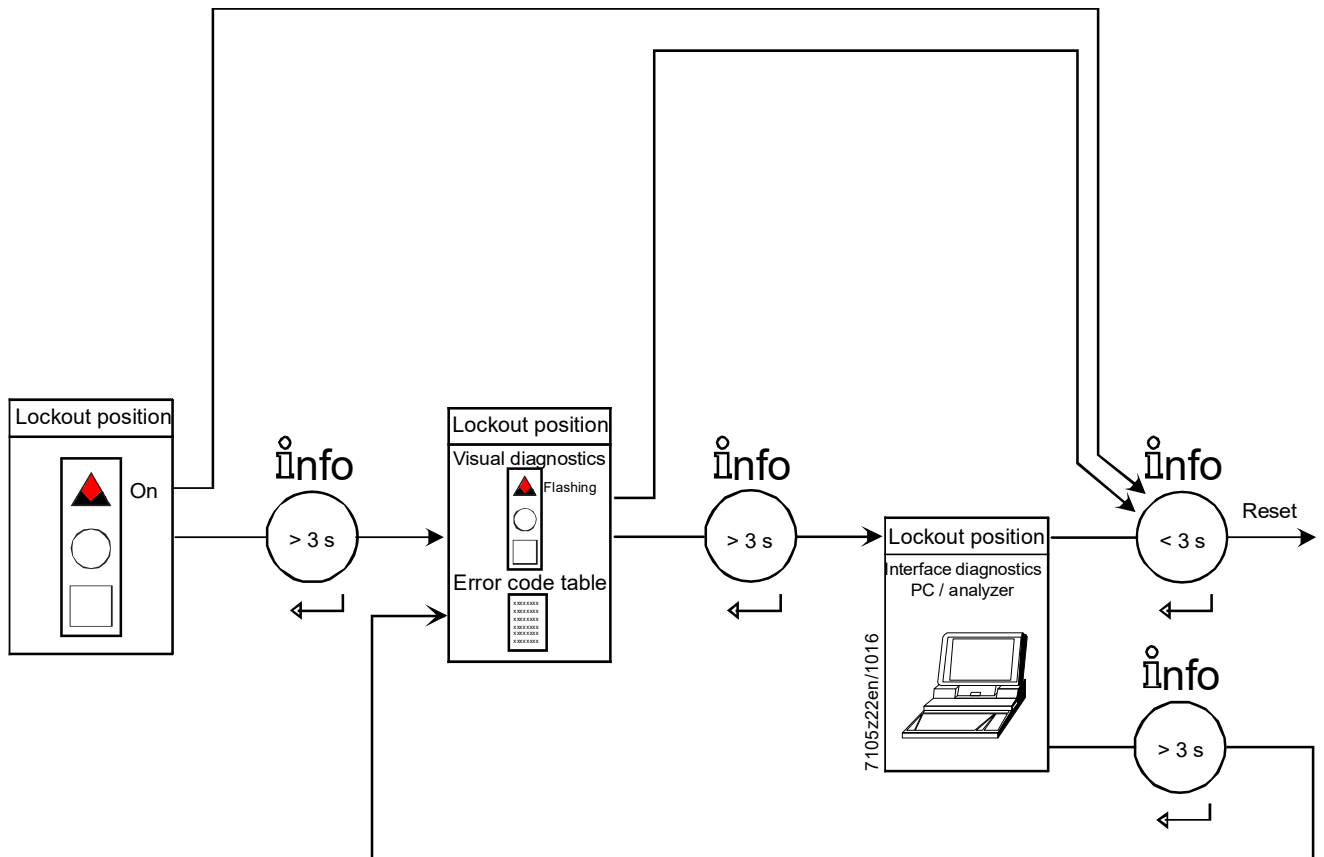


Figure 7: Diagnostics of cause of fault

## Error code table

Red blink code of fault signal lamp	Possible cause
2 x blinks	No establishment of flame at the end of the safety time - Faulty or soiled fuel valves - Defective, soiled or incorrectly connected flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
3 x blinks	Air pressure switch faulty - Loss of air pressure after specified time - Air pressure switch welded in no-load position
4 x blinks	Extraneous light on burner startup
5 x blinks	Time supervision air pressure switch - Air pressure switch welded in working position
6 x blinks	Actuator position not reached - Actuator faulty - Wrong adjustment of cam - Actuator defective or blocked - False connection - Misadjustment
7 x blinks	Too many losses of flame during operation (restart limitation) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
8 x blinks	Free
9 x blinks	Free
10 x blinks	Non-volatile lockout with alarm output switched on at terminal X2-03 pin 3 (fault lamp ON) • Wiring error or internal error, other errors  Non-volatile lockout with alarm output switched off at terminal X2-03 pin 3 (fault lamp OFF) • Output contact error (welded contact of an output relay)
12 x blinks	Valve proving - Fuel valve V1 leaking
13 x blinks	Valve proving - Fuel valve V2 leaking
14 x blinks	Error in connection with valve closure control POC
15 x blinks	Error code $\geq 15$ , dependent on PME7 E.g. error code 20: Failure of gas pressure switch-min E.g. error code 22: Error of safety loop

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

- Burner remains shut down
- External fault indication (alarm) at terminal X2-03 pin 3 steady on

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



## 8 Inputs / outputs

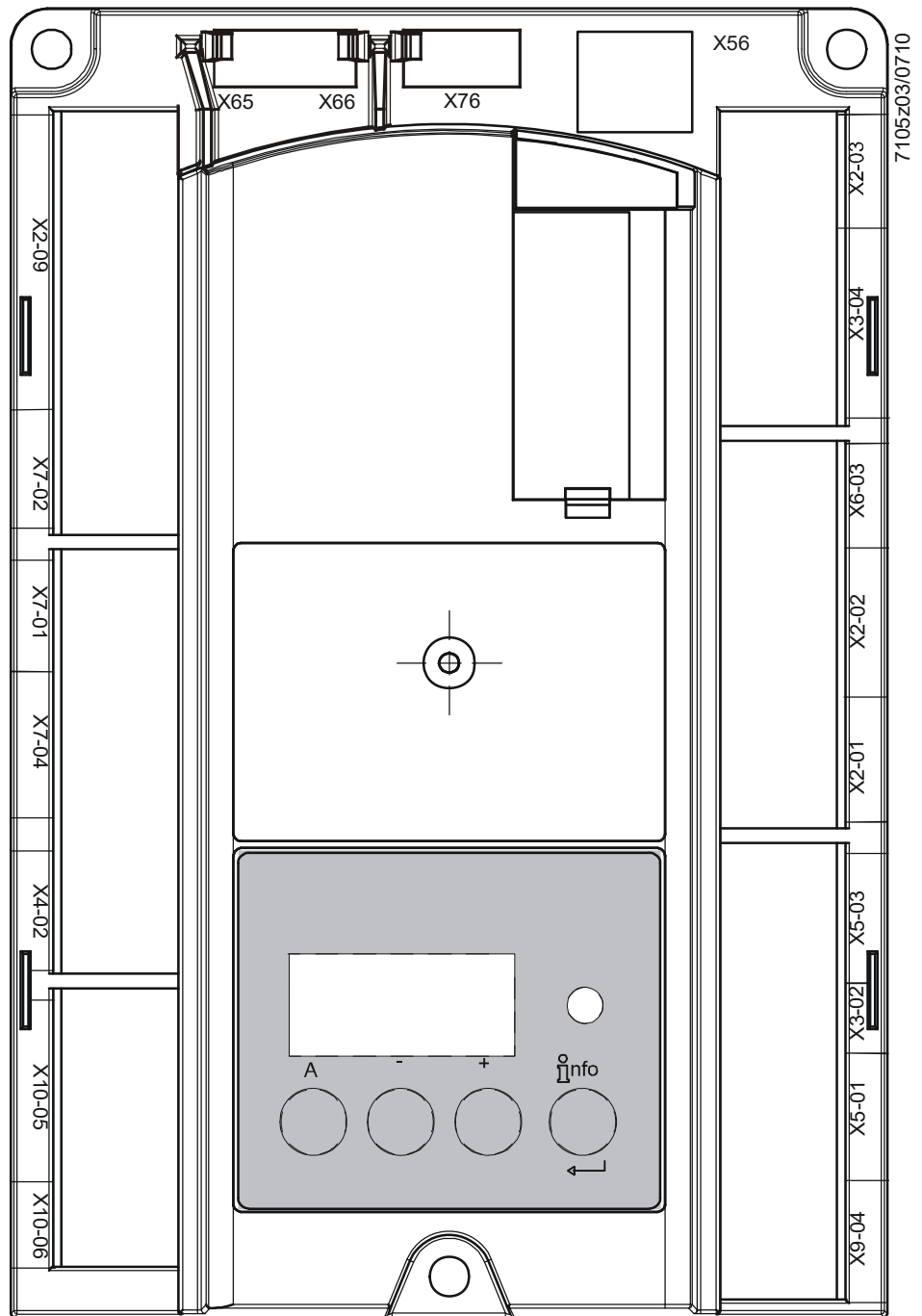


Figure 8: Inputs / outputs

# 9 Connection diagram AGG9 connector

## 9.1 LME71

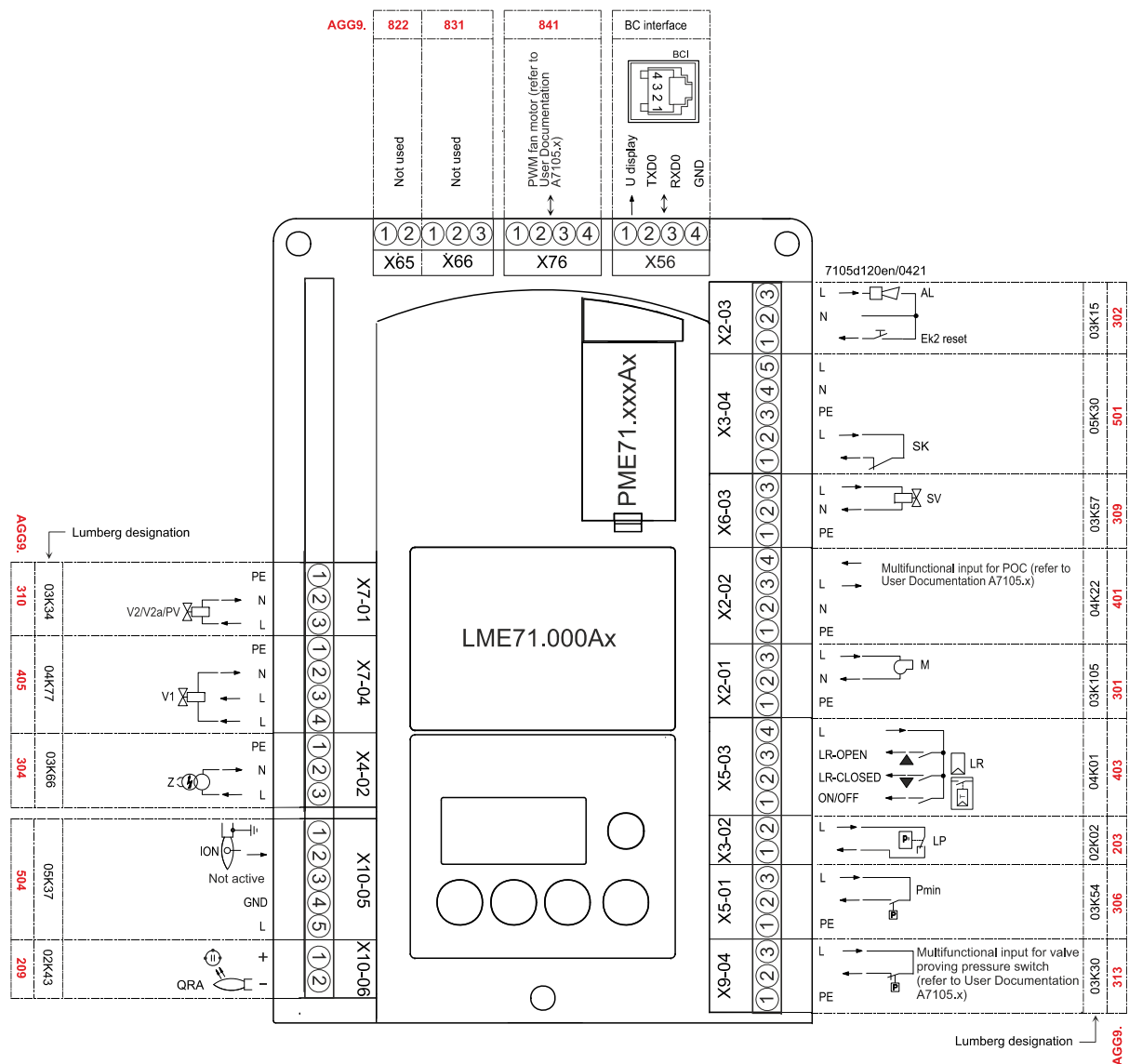


Figure 9: Connection diagram LME71 → AGG9

# 9.2 LME72

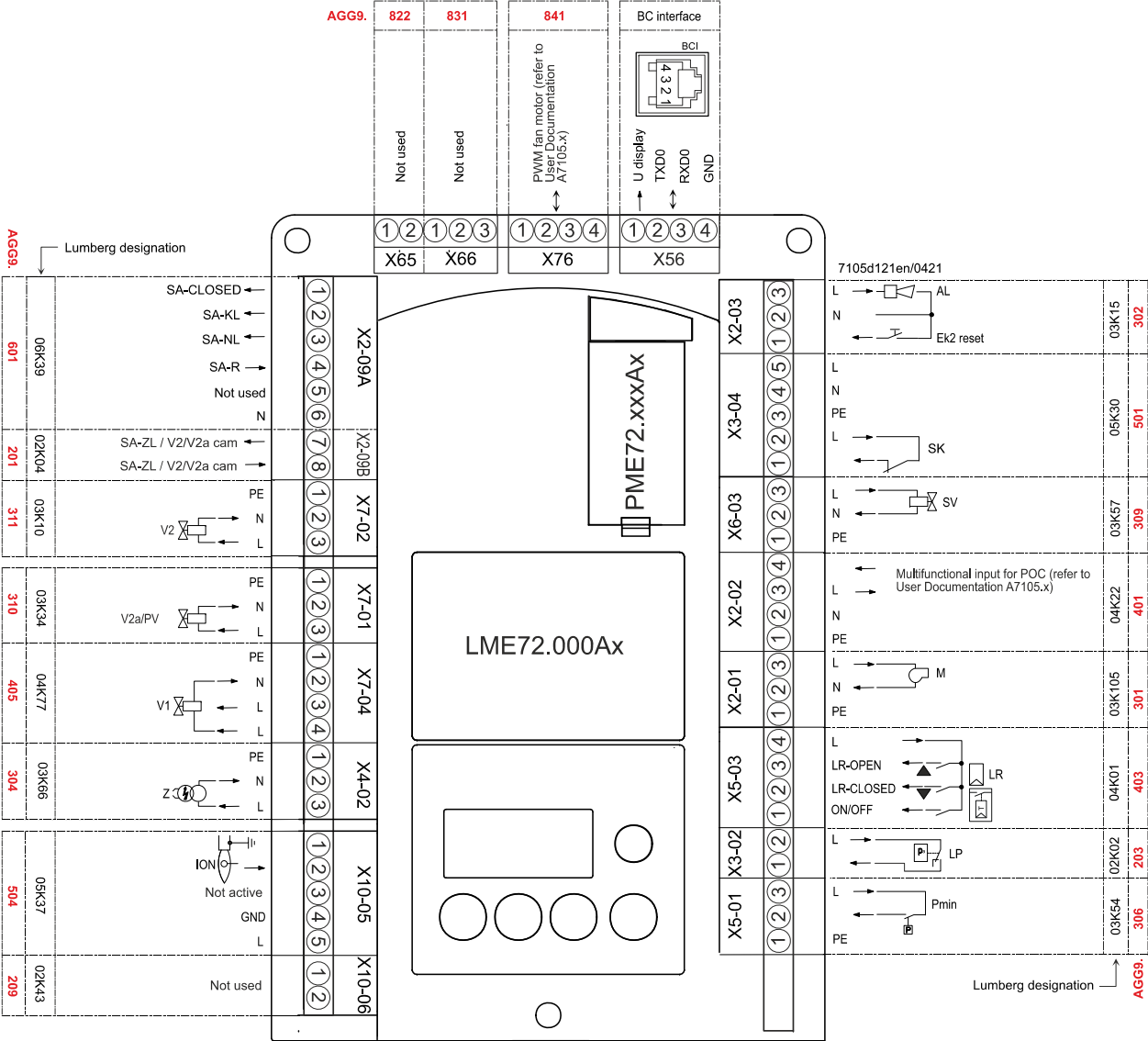


Figure 10: Connection diagram LME72 → AGG9

# 9.3 LME73

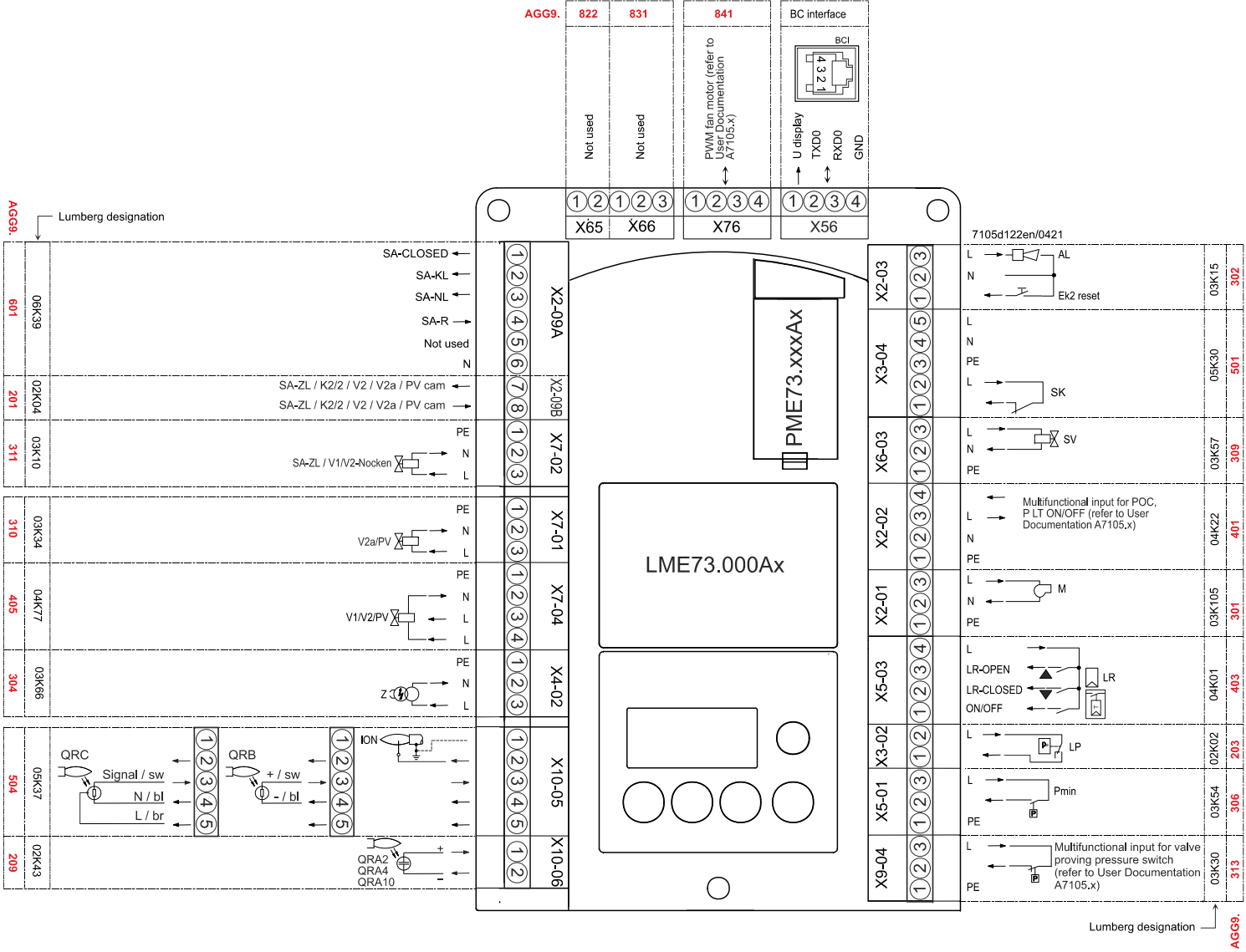


Figure 11: Connection diagram LME73 → AGG9

# 10 LME7 burner control

## 10.1 Description of inputs and outputs



**Note**  
This chapter covers the basic features of the inputs and outputs of the LME7. For an exact evaluation of the inputs and activation of the outputs, refer to the sequence diagrams.

**Flame signal input and flame detector terminal X10-06**

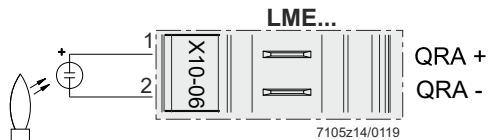


Figure 12: Flame signal input terminal X10-06

Connection choices (LME71 / LME73 only):

- QRA2 / QRA10
- QRA4

## 10.2 Digital input

### 10.2.1 Safety Loop terminal X3-04 pin 1 and 2

Input for connection of the safety loop. When any of the series-connected contacts included in the loop opens, power supply to the fuel valves, the fan and the ignition equipment is instantly cut.

The safety loop includes the following components:

- External burner switch (ON/OFF)
- Safety limiter / safety pressure limiter (SB / SDB)
- External control thermostat and/or pressurestat, if required
- Water shortage switch

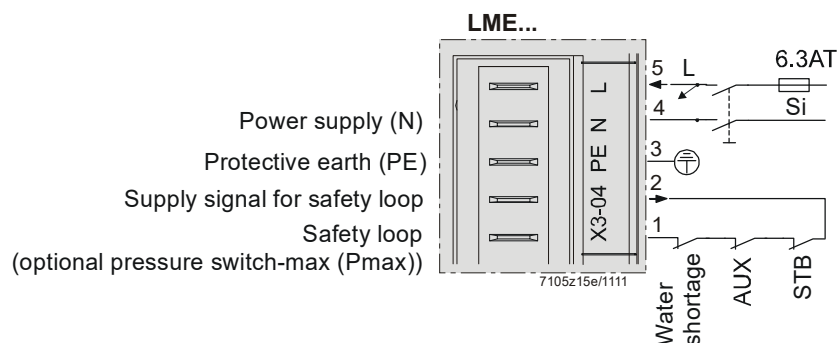


Figure 13: Safety Loop terminal X3-04

For diagnostic purposes, the contacts of the components included in the safety loop are combined for delivering the safety loop signal. If there is no such signal, the system initiates safety shutdown in any event.

If, with *Load controller ON/OFF* there is no signal from the safety loop (start prevention), error code **Loc: 22** is translated to text display.

### 10.2.2 Input for external controller (ON/OFF) terminal X5-03 pin 1

When the external control loop is closed, the internal input message *Heat request* is generated.

A heat request exists when the external controller signal is pending and, depending on the configuration, a load controller calls for heat

When there are no more requests for heat, the burner shuts down. The fuel valves are closed, either immediately when the timer has elapsed, or when the low-fire position is reached, depending on the parameter settings



**Note**  
Burner startup takes place only when this contact is closed.

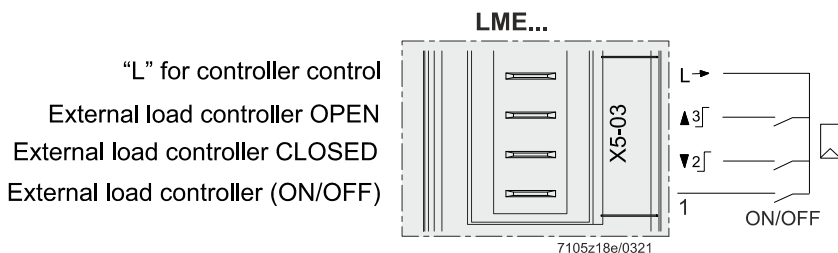


Figure 14: Inputs for external load controller ON/OFF terminal X5-03

### 10.2.3 Air pressure switch terminal X3-02

Input for connection of an air pressure switch. Air pressure is anticipated when the fan is switched on. If there is no air pressure signal, the system initiates lockout. The air pressure switch must have an NO contact.

If no air pressure switch is required (e.g. when firing on oil), a wire link to the fan output must be fitted (terminal X3-02 pin 1 to terminal X2-01 pin 3).



#### Caution!

**The OEM must check to see whether the burner can be operated without air pressure switch. This may necessitate a special approval, depending on the type of application.**

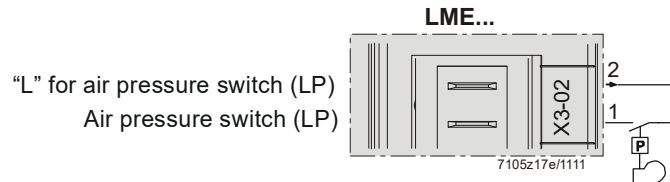


Figure 15: Air pressure switch terminal X3-02

### 10.2.4 Input gas pressure switch-min

Behavior in the event gas pressure switch-min fails (terminal X5-01 pin 2 and pin 3)

If gas pressure switch-min fails, safety shutdown is triggered and startup prevented until gas pressure switch-min closes again. During start prevention, the yellow LED is lit, and the safety circuit is active. The LME7 is in phase 90.

# 11 Multistage or modulating mode with actuator

## 11.1 Relevant parameters

Parameter	Meaning
123	Minimum output control step
259	Opening time of actuator (timeout)
260	Closing time of actuator (timeout)
654	Analog input (feedback potentiometer ASZxx.3x required) 0 = 3-position step input 1 = DC 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4: 4...20 mA with a non-alterable lockout at I < 4 mA (AZL2: Loc: 60) 5 = 4...20 mA

### 11.1.1 Connection diagram for feedback potentiometer

#### ASZ12.33



#### Note!

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

#### PME7

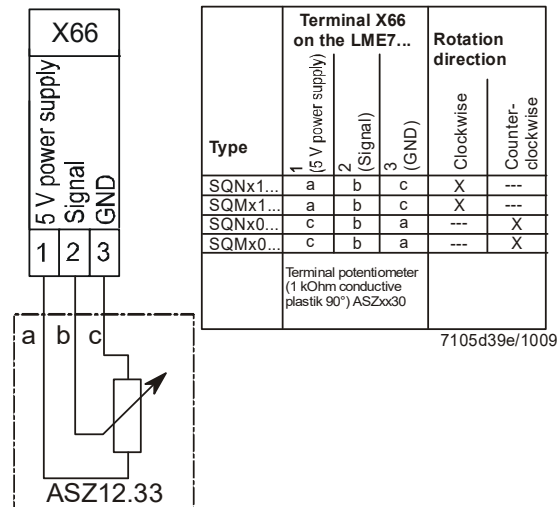


Figure 16: Connection diagram for feedback potentiometer ASZ12.33



## 11.1.2 Connection diagram for load controller (LME71/LME73 only)



Note!

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

PME7

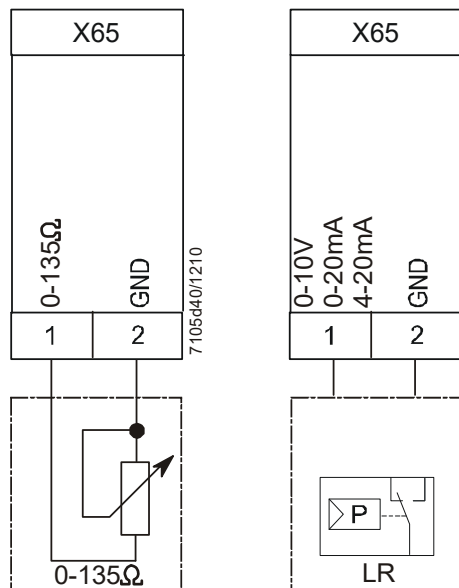


Figure 17: Connection diagram for load controller

## 11.2 Actuators

The LME7 has terminals for the connection of electromotoric actuators for the control of air dampers and regulating dampers of oil and gas burners.

Possible types of actuator:

Type	Data Sheet	Operating mode <sup>1)</sup> stage / modulating via 3-position step input terminal X5-03	Operating mode <sup>1)</sup> modulating via analog input signal terminal X65	Potentiometer ASZxx.3x
SQN3	N7808	●	●	●
SQN7	N7804	●	●	●
SQM2	N7812	●	●	●
SQM40 SQM41	N7817	●	●	●
SQM5	N7815	●	●	●

<sup>1)</sup> Depending on the program sequence of LME7 or in the PME7

## 11.3 Function

The internal program cycle time of the LME7 is about 0.147 s ( $\approx 0.15$  s). In each program sequence, each input is read, and the outputs are switched on or off accordingly.

## 11.4 Load controller inputs

### 11.4.1 3-position step input terminal X5-03

The load controller input is valued by making a 2-out-of-3 section. This means that to trigger a control action via the actuator outputs, an ON or OFF signal must be identified within at least 2 successive cycles. As a result of this sampling process, an ON or OFF signal must be present for a time between minimum 0.3 seconds and maximum 0.45 seconds to produce an output signal change at the LME7

### 11.4.2 Analog input terminal X65 (LME71/LME73 only)

The LME7 handles the analog input signals with the help of an 8-bit A/D converter.

### 11.4.3 Selection source preset output analog / 3-position step input (parameter 654) (LME71/LME73 only)

The following input signals can be selected and handled via parameter 654

- 3-position step input (feedback potentiometer ASZxx.3x required / depending on the program sequence)
- 0...10 V
- 0...135  $\Omega$
- 0...20 mA
- 4...20 mA with a non-alterable lockout at  $I < 4$  mA AZL2: Loc: 60)
- 4...20 mA

### 11.4.4 Actuator output terminal X2-09

The actuators are powered by mains voltage delivered directly via the LME7

### 11.4.5 Setting the maximum running time of the actuator (parameter 259 / 260 timeout)

Parameters 259 and 260 are used to set the actuator's running time in accordance with the type of actuator used. The time set must at least correspond to the running time required by the actuator to travel from the fully closed to the high-fire position (e.g. 30 seconds for 90° or more). If the actuator does not reach its position within this period of time, the LME7 will initiate lockout.

## 11.5 Multistage / modulating mode via 3-position step input terminal X5-03

The signal time of a control pulse is a minimum of 147 ms.

### 11.5.1 Maximum possible resolution

The maximum possible resolution via 3-position step input terminal X5-03 is calculated according to the following formula:

Working range in angular degrees x 0.147 s  
----- = maximum possible resolution in angular degree  
Running time in seconds

Example: Actuator, 30 seconds running time for 90°

90° x 0.147 s  
----- = 0.441° ≈ 0.5°  
30 s

## 11.6 Modulating mode via analog input signal terminal X65 (LME71/LME73 only)

### 11.6.1 Maximum possible resolution

For maximum possible resolution see chapter *Setting the minimum power control step (dead band) (parameter 123) in modulating mode via analog input signal terminal X65.*

### 11.6.2 Standardization of modulation range

In the modulation range, the analog input signal is standardized. This means that the low-fire position corresponds to a preset output of 0% = 0 V- / 0 mA- / 4 mA- / 0 Ω input signal and the high-fire position corresponds to a preset output of 100% = 10 V- / 20 mA- / 135 Ω input signal.

The modulation range in angular degrees corresponds to the angular rotation from the low-fire to the high-fire position.

**Calculation:** High-fire position minus low-fire position = modulation range.

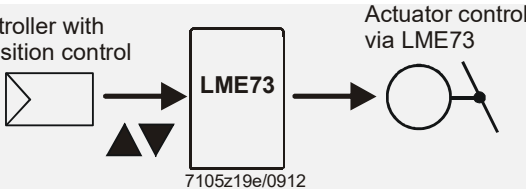
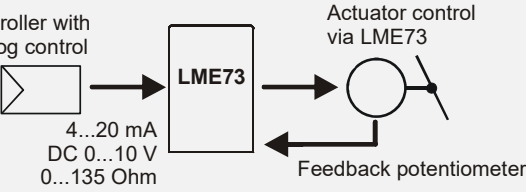
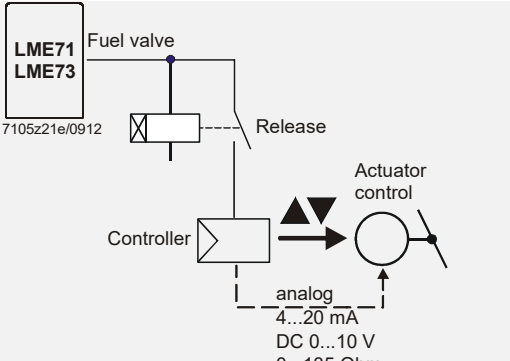
## 11.7 Setting the minimum power control step (dead band) (parameter 123) in modulating mode via analog input signal terminal X65 (LME71/LME73 only)

The minimum output control step must be greater than or equal to the percentage proportion of the maximum resolution of the entire modulation range and, depending on the actuator's running time (protection against hunting).

Typical actuator values and settings:

Presettings				Parameter		Comment
Low-fire cam position in °	High-fire cam position in °	Maximum working range in °	Actuator running time in s	Setting value parameter 123 in %	Typical number of steps (between low-fire and high-fire cam position)	
0	90	90	15	2.1	27	Actuator running time at 50 Hz mains frequency
0	90	90	30	1.3	43	
0	90	90	60	1.0	55	
20	90	90	15	2.1	21	
20	90	90	30	1.3	33	
20	90	90	60	1.0	43	
0	90	90	12.5	2.4	24	Actuator running time at 60 Hz mains frequency
0	90	90	24	1.5	37	
0	90	90	50	1.1	51	
20	90	90	12.5	2.4	19	
20	90	90	24	1.5	29	
20	90	90	50	1.1	40	
0	135	135	45	1.1	50	Actuator running time at 50 Hz mains frequency
20	135	135	45	1.1	43	
0	135	135	38	1.2	47	Actuator running time at 60 Hz mains frequency
20	135	135	38	1.2	40	

## User limitations / application examples

Application	Typical resolution	Typical modulation range
<p>Controller with 3 position control</p>  <p>Actuator control via LME73</p> <p>7105z19e/0912</p>	<ul style="list-style-type: none"> <li>- pulse lengths min. 150 ms</li> <li>- approx. 0.5°</li> <li>- with 30 s running time 0...90° with 50 Hz</li> </ul>	<p>1 : 30 / 1 : 50</p> <p>For boiler and process heat</p>
<p>Controller with analog control</p>  <p>Actuator control via LME73</p> <p>Feedback potentiometer</p> <p>7105z20e/0912</p> <p>4...20 mA DC 0...10 V 0...135 Ohm</p>	<p>See table <i>Typical actuator values and settings</i>.</p> <ul style="list-style-type: none"> <li>- approx. 2...3°</li> <li>- with 30 s running time 0...90° with 50 Hz</li> </ul>	<p>1 : 10 / 1 : 15</p> <p>For boiler and process heat with lower resolution</p>
 <p>Fuel valve</p> <p>Release</p> <p>Actuator control</p> <p>7105z21e/0912</p> <p>Controller</p> <p>analog 4...20 mA DC 0...10 V 0...135 Ohm</p>	<p>Resolution depending on controller.</p> <ul style="list-style-type: none"> <li>- 0.5...2° / 0.5...3°</li> <li>- with 30 s running time 0...90° with 50 Hz</li> </ul>	<p>1 : 10 / 1 : 50 depending on controller</p> <p>For boiler and process heat</p>



### Note!

If the value set for parameter 123 is too small, the actuator oscillates about the setpoint, leading to more running cycles, increased switching frequency and more wear and tear.

# 12 Safety notes relating to operation of AZL2

## Caution!

The following information must be observed to prevent the risk of fire or explosion, damage to the heating plant or damage resulting from improper usage:

The LME7 described in this basic documentation may only be used as specified and only in connection with the appropriate burner and heating plant. Failure to observe this information poses a risk of the safety functions being impaired.

The LME7 with AZL2 and the heating control may only be installed and commissioned by authorized personnel. Failure to observe this information poses a risk of loss of safety functions and a risk of electric shock.



The AZL2 is designed for use in dry rooms only. Do not install the AZL2 outdoors and protect it from heat, frost and liquids, such as water, oil, and fuel oil. Failure to observe this information poses a risk of electric shock.

The operating steps and settings instructions detailed in this basic documentation must be observed precisely. Certain settings may only be made by authorized personnel and these are clearly identified as such. Failure to observe this information poses a risk of the safety functions being impaired.

Only clean the AZL2 with a dry cloth when dirty or dusty.

Do not perform any maintenance or repair work on the AZL2 yourself. This type of work may only be performed by authorized personnel. Failure to observe this information poses a risk of electric shock.

If you have any other questions relating to the AZL2, please contact your heating engineer at any of the addresses provided in this basic documentation.

# 13 Operation via AZL2

## 13.1 Description of the unit / display and buttons

Function and operation of versions AZL21 and AZL23 are identical.

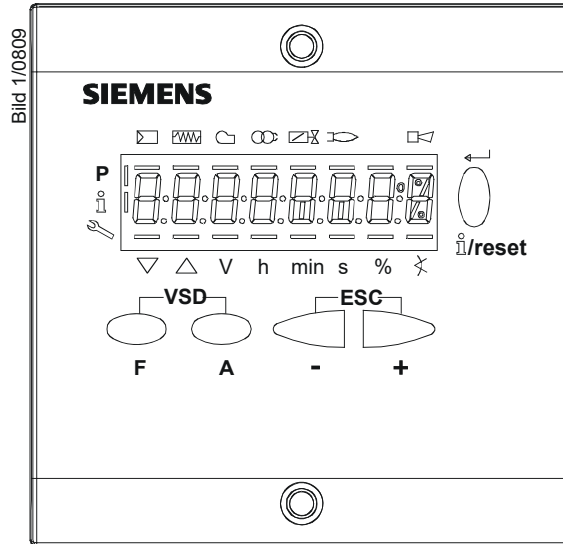


Figure 18: Description of the unit / display and buttons

Button	Function
	<b>Buttons A and F: Parameterized function</b> - For switching to parameter setting mode P (press  and  simultaneously)
	<b>Info and Enter button</b> - For navigation in info and service mode * For selection (symbol blinking) (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

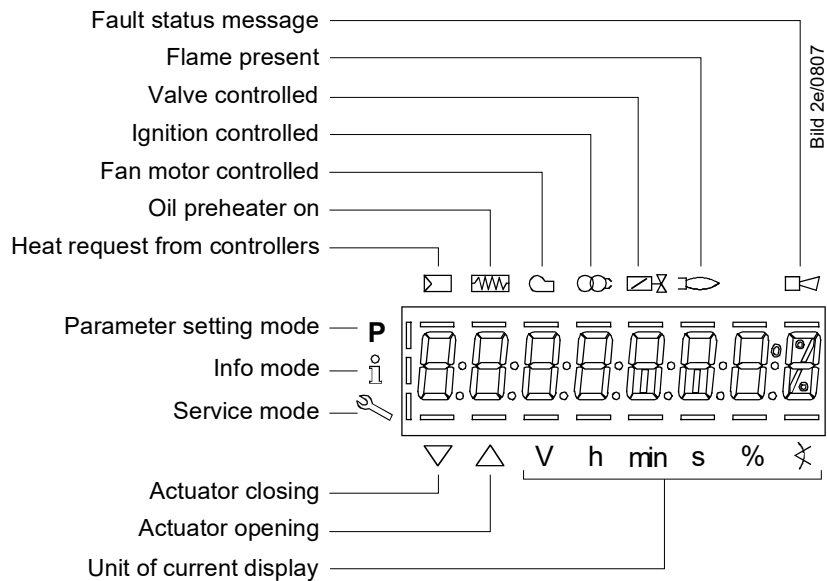



Figure 19: Meaning of display

## 13.3 Special functions

### 13.3.1 Manual lockout



**reset**

plus any other button

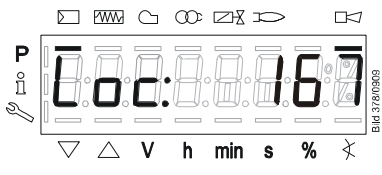


Bild 3/080803

Press **reset** together with any **other button**.


The LME7 switches instantly to the lockout position, no matter what the operating position.

The display shows the fault status message.

(Refer to chapter *Error code list!*)

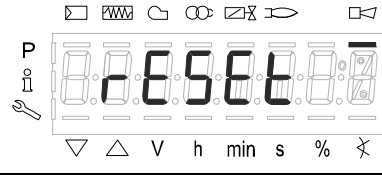
Display: **Loc: 167**

The reset must be carried out as follows:



**reset**

1 s



7/825/0415

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

When the button is released, the LME7 is reset.



## 13.4 Operation

### Warning!

All changes to parameters and settings are only set and saved in the internal unit memory of the LME7.



A backup must be triggered manually to save the modified settings to the PME7. Failure to observe this information poses a risk of the safety functions being impaired.

→ Chapter *Operation via AZL2 / backup*

→ Chapter *Operation via internal LED / backup*

### Warning!

For initial commissioning or replacement of the PME7, the function sequence and parameter settings must be checked on completion of the restore process. Failure to observe this information poses a risk of the safety functions being impaired.



→ See chapter *Operation via AZL2 / first startup, restore*

→ See chapter *Operation via internal LED / first startup, restore*

### Warning!

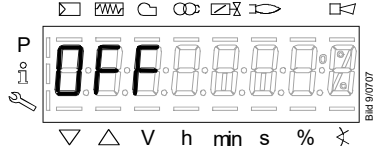
If any parameters are changed, a backup must be made! If this is not observed, there is a risk of loss of safety functions.



### 13.4.1 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.

#### 13.4.1.1. Display in standby mode

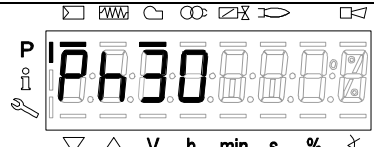




The LME7 is in standby.

Note:  
**OFF** flashes when manual OFF function or manual control is active, and when controller is OFF.

#### 13.4.1.2. Display during startup / shutdown

##### Display of program phases



The LME7 is in phase 30 (**Ph30**). A controller request has been made. The bar below the symbols  and  appears. The individual program phases and controlled components are displayed in accordance with the program sequence.

## List of phase display (display depending on program)

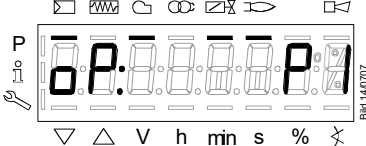
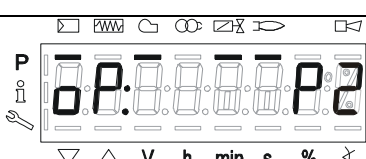
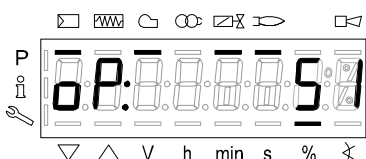


### Note

Display depending on the PME7, refer to *User Documentation A7105.x*.

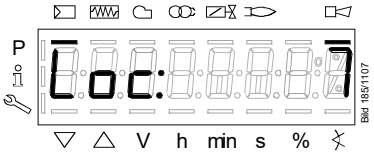
Phase number AZL2 display	Function
<b>Standby</b>	
OFF	Standby, waiting for heat request
Ph08	Power ON / test phase (e.g. detector test)
<b>Startup</b>	
Ph21	Safety valve ON, air pressure switch test / POC test (timeout / locking after 5 seconds), actuator opens in low-fire position / CLOSE position
Ph22	Fan motor ON and air pressure switch test / settling time
Ph24	Actuator travels to the prepurge position
Ph30	Prepurging
Ph36	Actuator closes until ignition load / low-fire is reached, and parameter 259.02: Actuator opens to a position > ignition load
Ph38	Preignition
Ph40	1st safety time / ignition transformer ON
Ph42	Safety time (ignition transformer OFF), flame check
Ph44	Interval: End of safety time and fuel valve V1 ON Interval: End of safety time and load controller release Interval: End of safety time and fuel valve V2 ON
Ph50	2nd safety time
Ph54	Parameter 259.01: Actuator opens to a position > low-fire
Ph54	Parameter 260: Actuator closes until low-fire position is reached
oP:P1	Interval to release of preset load controller (analog or 3-position step input)
<b>Operation</b>	
oP:xx	Operation, modulating operation
oP:P1	Operation first stage
oP:P2	Operation second stage
<b>Shutdown</b>	
Ph10	Actuator travels to the CLOSED position (home run)
Ph72	Actuator opens until high-fire position / operation shutdown is reached
Ph74	Postpurging
<b>Valve proving</b>	
Ph80	Test space evacuating
Ph81	Test time atmospheric pressure
Ph82	Test space filling
Ph83	Test time gas pressure
<b>Waiting phases (start prevention)</b>	
Ph01	Undervoltage / overvoltage
Ph02	Safety shutdown, followed by a non-alterable lockout with interlocking → e.g. safety loop open
Ph04	Extraneous light on burner startup (timeout / locking after 30 seconds)
Ph90	Pressure switch-min open → safety shutdown / non-alterable lockout with interlocking
<b>Non-alterable lockout</b>	
LOC	Lockout phase


### 13.4.1.3. Display of operating position

	<p>Display <b>oP</b>: <b>P1</b> means stage 1. Display after <b>oP</b> is unit-specific.</p>
	<p>Display <b>oP</b>: <b>P2</b> means stage 2. Display after <b>oP</b> is unit-specific.</p>
	<p>Display <b>oP</b>: means modulating operation. Display after <b>oP</b>: is unit-specific.</p> <p>Display shows the relative value of the actual position of actuator (51).</p> <p>Position of actuator <math>0^\circ = 0 \Omega</math> value of potentiometer = 0% display.</p> <p>Position of actuator high-fire <math>&gt;0^\circ = &gt;0 \Omega &lt; 1000 \Omega</math> value of potentiometer = 100% display.</p>

### 13.4.1.4. Fault status messages, display of errors and info

#### Display of errors (faults) with lockout




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


The LME7 is in lockout position.


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

Example: Error code **7**


#### Reset

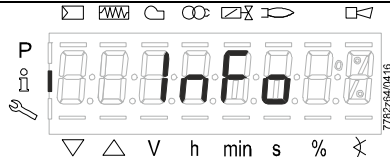


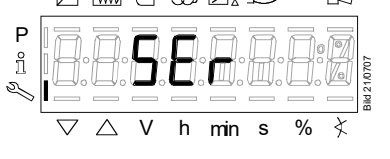


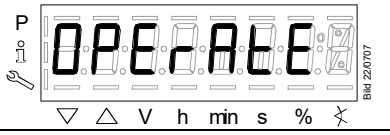
When  is pressed for 1 second, rESEt appears on the display.


When the button is released, the LME7 is reset.









When pressing  for >3 seconds, the display shows **InFo**, **SEr** and then **OPeAtE**.



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

# 13.5 Menu-driven operation

## 13.5.1 Assignment of levels

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

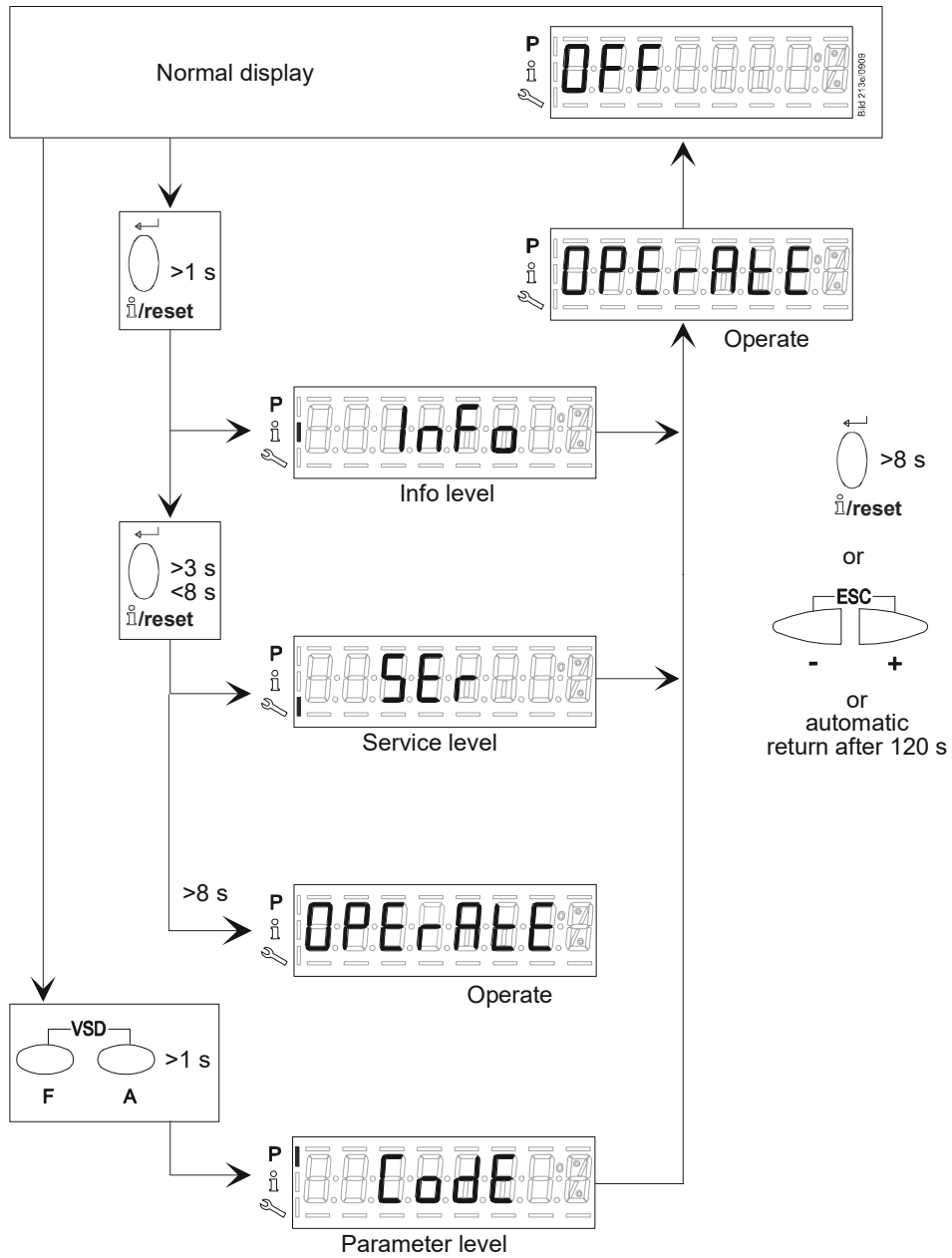
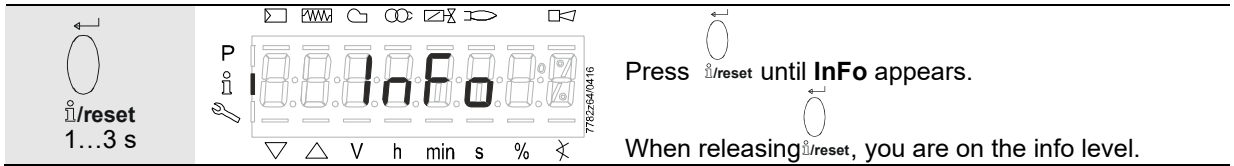


Figure 20: Assignment of levels

# 13.6 Info level

## 13.6.1 Display of info level



The info level displays information about the LME7 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.  
 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 no. (parameter number blinks).

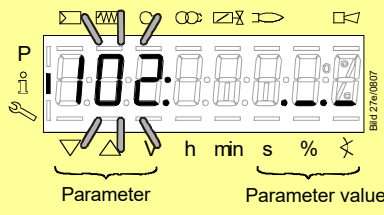


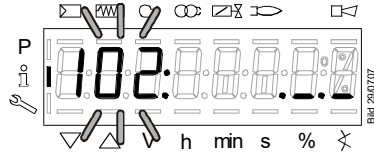
Figure 21: Info level

No.	Parameter
<b>Info level</b>	
102	Identification date
103	Identification number
113	Burner identification
123	Minimum output control step
140	Mode display for the 7-segment display 1 = standard (program phase) 2 = flame 1 (QRA / ION) 3 = flame 2 (QRB / QRC) ⇒ not used 4 = active power (power value)
164	Number of startups resettable
166	Total number of startups
170.00	Switching cycles relay K12
170.01	Switching cycles relay K11
170.02	Switching cycles relay K2
170.03	Switching cycles relay K1
171	Signaling of "Switching cycle exceeded" for one of the relay contact counters (parameters 170.00 to 170.03) → not active
End	

## 13.6.2 Display of info values



### 13.6.2.1 Identification date

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



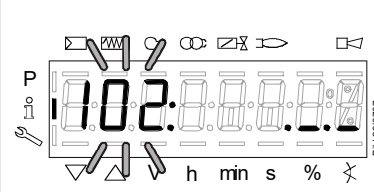

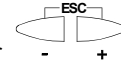
On the left, parameter **102:** is displayed blinking.  
On the right, **.\_.** is displayed.

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

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

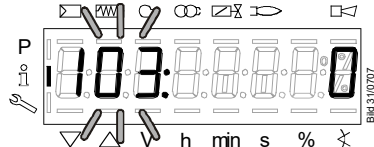
Example: Identification date **03.11.05**

Press **reset** or **- +** to return to the display of parameters.



To the next parameter 


### 13.6.2.2 Identification number



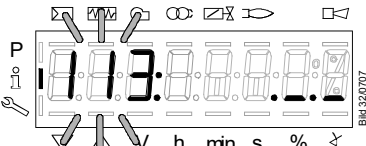

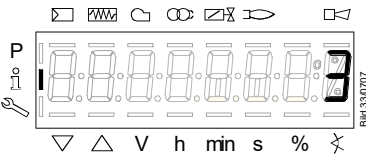


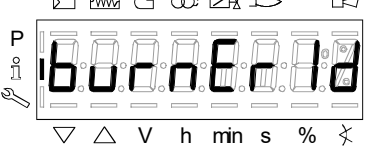

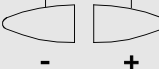
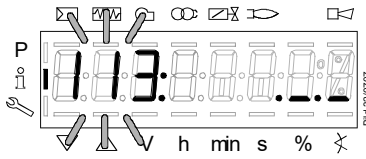

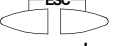


On the left, parameter **103:** is displayed blinking.  
On the right, identification number **0** appears.

Example: **103: 0**

To the next parameter   or **reset** for <1 s

 Back to the previous parameter

### 13.6.2.3. Identification of burner

		<p>On the left, parameter <b>113</b>: is displayed blinking. On the right, <b>._._</b> appears.</p> <p>Example: <b>113</b>: <b>._._</b></p>
 <p><b>/reset</b> 1...3 s</p>		<p>Press  for 1...3 seconds to display the burner's identification.</p> <p>Factory setting: <b>-----</b></p> <p>Example: <b>3</b></p>
		<p>The <b>burnErd</b> can only be changed with the ACS410.</p>
 <p><b>/reset</b> or <b>ESC</b></p> 		<p>Press  or  to return to the display of parameters.</p>
<p>To the next parameter</p> 	 <p>Back to the previous parameter</p>	



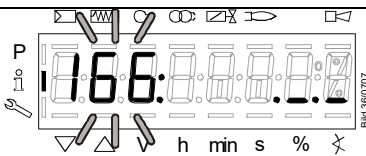
### 13.6.2.4. Number of startups resettable



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

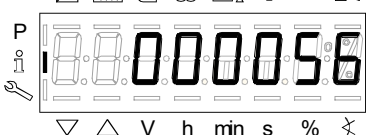
		<p>On the left, parameter <b>164</b>: is displayed blinking. On the right, characters <b>._._</b> appear.</p> <p>Example: Parameter <b>164</b>: <b>._._</b></p>
 <b>reset</b> 1...3 s		<p>Pressing the <b>reset</b> button (1...3 seconds) and releasing it when <b>._._</b> flashes displays the number of startups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

### 13.6.2.5. Total number of startups



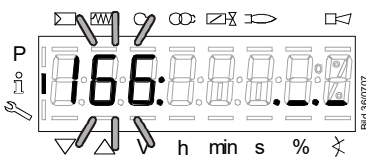
On the left, parameter **166:** is displayed blinking. On the right, characters **.\_.** appear.

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




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

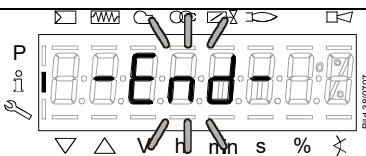
Example: **000056**



Press **reset** or **ESC** to go back to the display of parameters.

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


### 13.6.2.6. End of info level



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

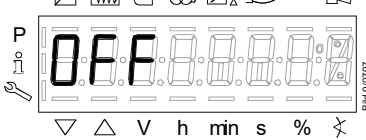
Display shows **- End -** blinking.

To start of info level  To end of info level 




Press **ESC** or the **reset** button (>8 seconds) to return to operating mode

Display shows **OPERAtE**.



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

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

## 13.7 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.



**Note!**

No change of values on the service level.

If characters **.....** are displayed by the parameter, the value may consist of more than 5 digits.

Press for >1 s and <3 s to display the value.

Press for >3 s or to return to the selection of the parameter number (flashing).

Figure 22: Service level

### 13.7.1 Display of the service level

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

When releasing , you are on the service level.

No.	Parameter
<b>Service level</b>	
920	Current PWM signal fan
936	Normalized speed
951	Mains voltage
954	Flame intensity

## 13.7.2 Display of service values

### 13.7.2.1 Error history

See 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*!

### 13.7.2.2 Mains voltage

	<p>Parameter <b>951</b>: appears blinking.</p> <p>Mains voltage is displayed on the right.</p> <p>Example: <b>951: 120</b></p>
--	--

To the next parameter	Back to the previous parameter

### 13.7.2.3 Intensity of flame

	<p>Display shows parameter <b>954</b>: blinking.</p> <p>On the right, the intensity of the flame is displayed in 0...100%.</p> <p>Example: <b>954: 0</b></p>
--	--

End of service level – End –	Back to the previous parameter

### 13.7.2.4 End of service level

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

To the start of the service level	To the end of the service level

		<p>Press  to return to standby mode.</p> <p>Display shows <b>OPERAtE</b>.</p>
--	--	---

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

## 13.8 Parameter level

The parameters stored in the LME7 can be displayed or changed at parameter level. The change to the parameter level requires entry of a password.

Siemens supplies the LME7 with the factory settings according to *Type summary*.

The OEM can change the Siemens factory settings to match its own requirements.

With the LME7, the burner control's characteristics are determined primarily through parameterization. Every time the unit is recommissioned, the parameter settings must be checked. The LME7 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 personnel**.

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.

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 LME7 accordingly and include at least the list of unit parameters and settings in the burner documentation.

Siemens also recommends attaching an additional mark on the LME7 in the form of an adhesive label. According to EN 298, the label should be easy to read and wipeproof.

The label with a maximum size of 50 mm x 40 mm can be attached to the upper part of the housing.

Example of label:

OEM logo	
Type / part no.: 1234567890ABCD	
<b>CAUTION! OEM settings:</b>	
Parameter no.	
225 = 30 s (t1)	
234 = 0 s (t8)	
257 = 2 s (t3n)	TSA = t3n + 0.45 s
259 = 30 s (t11)	

### 13.8.1 Entering the password



**Note!**

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

Press button combination to display **Code**.

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

Press to select a numeral or letter.

Press to confirm the entry.

The value entered changes to a minus sign (-).

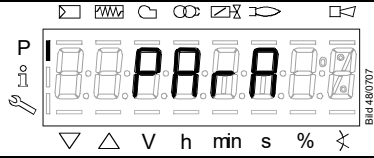
The next bar starts blinking.

Press to select a numeral or letter.

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

Press 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.



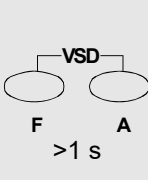
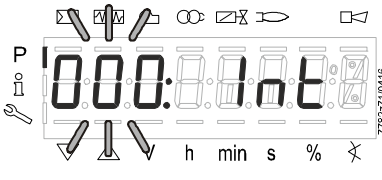
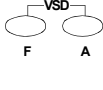

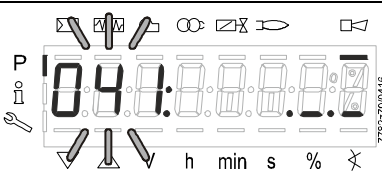


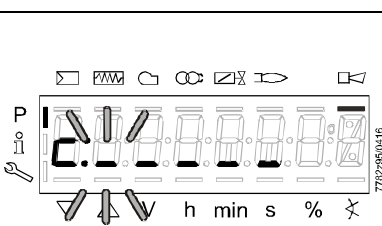


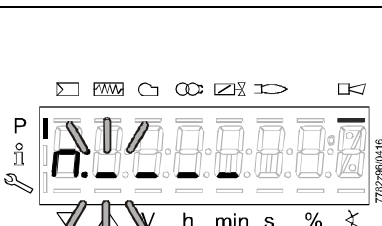

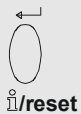
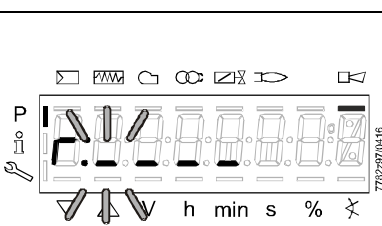


**Note:**

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


	= 1		= 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		

## 13.8.2 Changing the heating engineer's password

**Note:**  
 For the OEM to change the heating engineer's password, **c**: demands 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>: blinks.</p> <p>Press  to go to level <b>c</b>: for password changes.</p>
		<p>Letter <b>c</b>: for confirmation appears blinking.</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 blinking.</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 blinking.</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>SEt</b> confirms that the new password has been saved.</p>







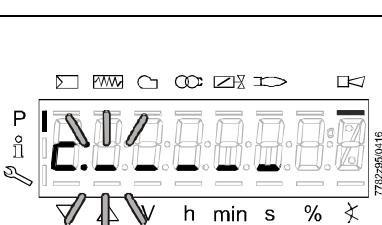


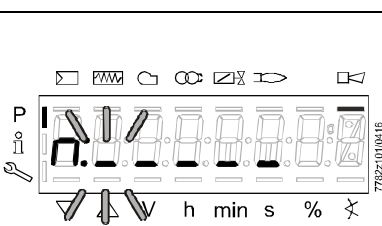


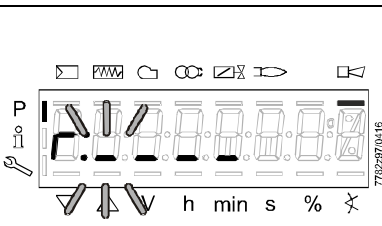



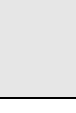

Pressing the  reset button takes you to parameter **041** heating engineer's password.

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










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

### 13.8.3 Changing the OEM's password

		<p>Parameter <b>042</b>: blinks.</p> <p>Press  to go to level <b>c</b>: for password changes.</p>
		<p>Letter <b>c</b>: for confirmation appears blinking.</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 blinking.</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 .</p>
		<p>Letter <b>r</b>: for repeat appears blinking.</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>SEt</b> confirms that the new password has been saved.</p>
		<p>Parameter <b>042</b>: blinks again.</p>

### 13.8.4 Backup

		<p>Parameter <b>000</b>: blinks.</p> <p>Display: Parameter <b>000</b>: blinks, display <b>Int</b> does not</p>
		<p>Press  for parameter group <b>041</b>.</p> <p>Display: Parameter <b>041</b>: blinks, display <b>._._</b> does not</p>
		<p>Press  for parameter <b>060</b>.</p> <p>Display: Parameter <b>060</b>. blinks, index <b>00</b>: and value <b>0</b> do not</p>
		<p>Press  for parameter <b>rESTorE</b>.</p> <p>Display: Parameter <b>rESTorE</b> blinks</p>
		<p>Press  for parameter <b>bAC UP</b>.</p> <p>Display: Parameter <b>bAC UP</b> blinks</p>
		<p>Press  for the backup process.</p> <p>Display: Value <b>0</b></p>
		<p>Press  to shift the value to change mode one place to the left.</p> <p>Display: Value <b>0</b> blinks</p> <p><b>Note:</b> To identify display faults, the value changes one place to the left.</p>

Press **+** for value **1**.

Display: Value **1** blinks

**i/reset**

Press **i/reset** to activate the backup process.

Display shows **run**

After approx. 3 seconds (depending on the duration of the program sequence), the displays shows **bAC End** and signals the end of the backup process.

Display: **bAC End**

It will now be displayed for 2 minutes, or can be finished by pressing the **i/reset** button

Display shows **OFF** when the backup process is finished.



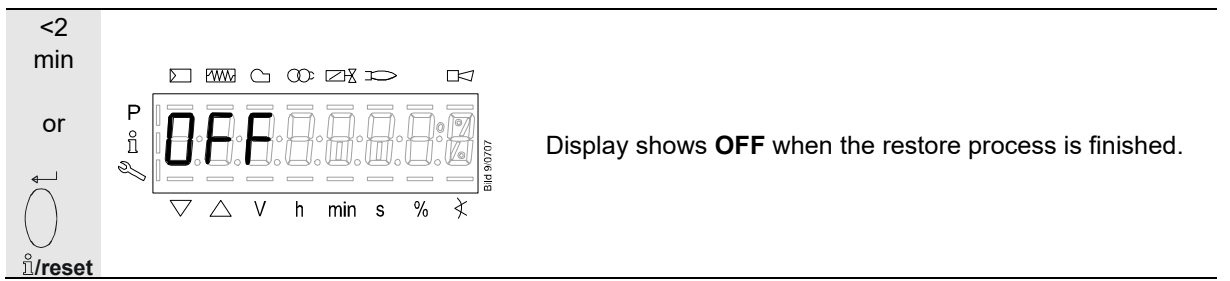
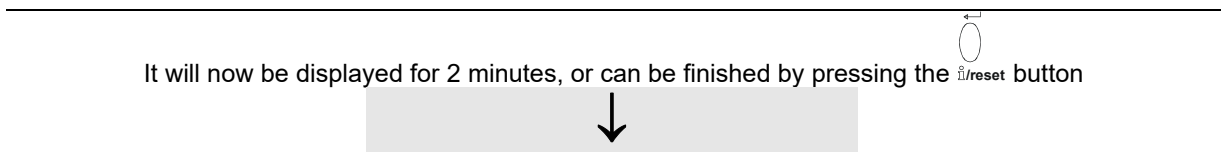
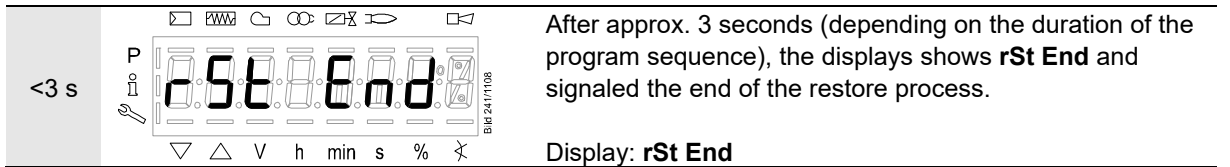
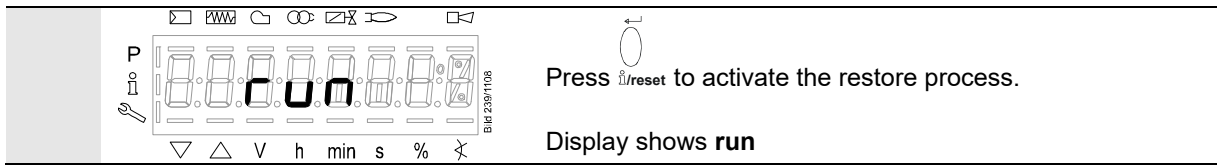
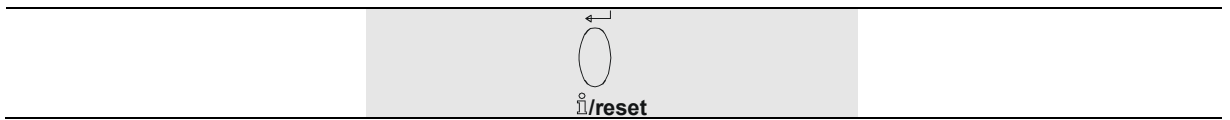
**Note**  
The backup process saves all settings and parameters from the LME7 memory to the PME7.



**Warning!**  
If any parameters are changed, a backup must be made! If this is not observed, there is a risk of loss of safety functions.

## 13.8.5 Restore

		<p>Parameter <b>000</b>: blinks.</p> <p>Display: Parameter <b>000</b>: blinks, display <b>Int</b> dos not</p>
	<p><b>/reset</b></p>	
		<p>Press  for parameter group <b>041</b>.</p> <p>Display: Parameter <b>041</b>: blinks, display <b>._._</b> does not.</p>
		<p>Press  for parameter <b>060</b>.</p> <p>Display: Parameter <b>060</b>. blinks, index <b>00</b>: and value <b>0</b> do not.</p>
	<p><b>/reset</b></p>	
		<p>Press  for parameter <b>rESTorE</b>.</p> <p>Display: Parameter <b>rESTorE</b> blinks.</p>
	<p><b>/reset</b></p>	
		<p>Press  to select the restore process.</p> <p>Display: value <b>0</b></p>
		<p>Press  to shift the value to change mode one place to the left.</p> <p>Display: Value <b>0</b> blinks</p>
<p><b>Note:</b> For realizing display faults, the value change one place to the left.</p>		
		<p>Press  for value <b>1</b>.</p> <p>Display: Value <b>1</b> blinks.</p>



**Note**

During the restore process, all settings and parameters are written from the PME7 to the internal memory of the LME7. As part of this process, it is possible that previous program sequences, parameters, and settings in the internal memory of the LME7 will be overwritten.



**Warning!**

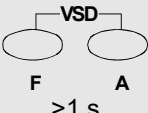
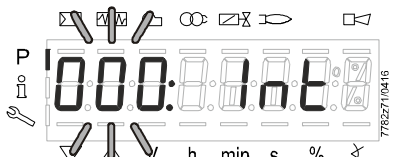
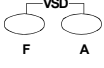





For initial commissioning or replacement of the PME7, the function sequence and parameter settings must be checked on completion of the restore process. Failure to observe this information poses a risk of the safety functions being impaired.

→ See chapter *Operation via AZL2 / first startup, restore*

→ See chapter *Operation via internal LED / first startup, restore*





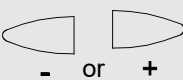
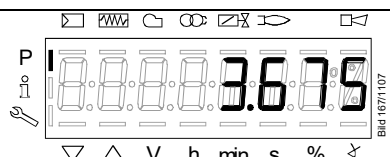


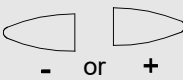
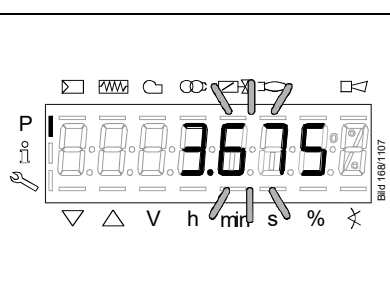


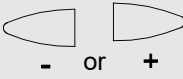
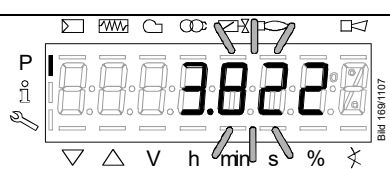


## 13.9 Operating variants of the parameters

The parameters stored in the LME7 can be displayed and changed at parameter level.

		<p>Press button combination  to display <b>000: Int.</b></p> <p>With , select the parameter group <b>100: PArA.</b></p>
		<p>With , select the parameter group <b>200: PArA.</b></p> <p>Pressing the  takes you to parameter <b>226: Preignition time.</b></p>

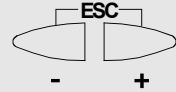
### 13.9.1 Parameters without index, with direct display

#### 13.9.1.1 Example of parameter 225 (prepurge time) on the parameter level

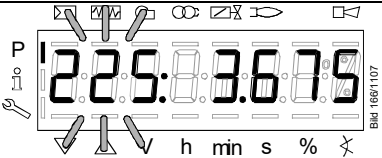
		<p>Press  for <i>prepurge time</i>.</p> <p>Display: Parameter <b>225</b>: blinks, value <b>3.675</b> does not.</p>
		
		<p>Press  or  for editing mode.</p> <p>Display: <b>3.675</b></p>
		<p>Press  or  to shift the former prepurge time to change mode one place to the left.</p> <p>Display: Prepurge time <b>3.675</b> blinks.</p> <p><b>Note:</b> To detect display errors, the value appears one place shifted to the left.</p>
		<p>Press  or  for the required prepurge time.</p> <p>Display: Prepurge time <b>3.822</b> blinks.</p>

**Alternative 1:**

Discard the change!




---

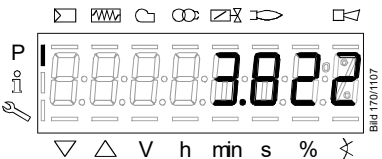



**Alternative 2:**

Adopt the value!




---

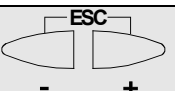


Press  to return to editing mode.


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

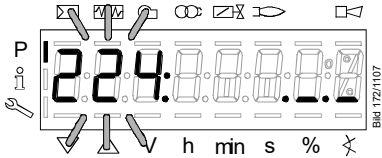



## 13.9.2 Parameters without index, with no direct display

### 13.9.2.1 Example of parameter 224 (specified time air pressure switch) on the parameter level




+





Press  + for specified time for air pressure signal.


Display: Parameter **224**: blinks, characters **·-·-** do not.




i/reset






Press  i/reset for editing mode.

Display: **48.510**

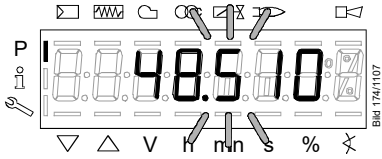




-

or




+



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


Display: Specified time **48.510** blinks.

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

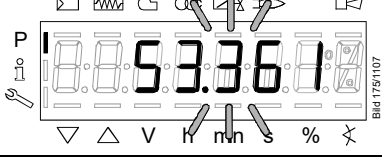




-

or



+

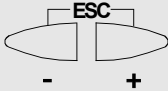
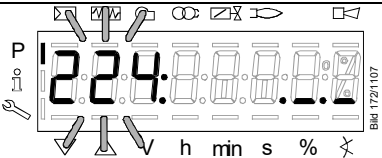


Press  or  to set the specified time.

Display: Specified time **53.361** blinks.

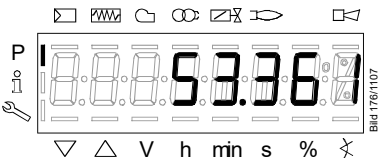
**Alternative 1:**


Discard the change!

**Alternative 2:**

Adopt the change!

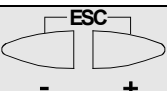
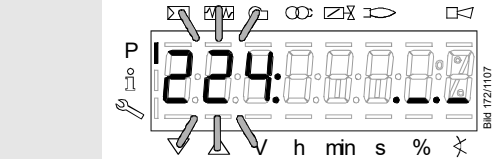




Press  to return to editing mode.

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.

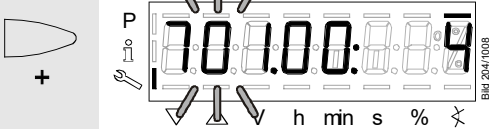
Display: Parameter **224**: blinks, characters **·-·-** do not.


To the next parameter   Back to the previous parameter

### 13.9.3 Parameters with index, with or without direct display

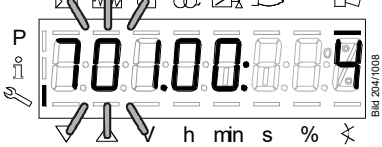
#### 13.9.3.1 Example of parameter 701: Actual error on the service level

See chapter *Error code list!*



Press  + to select parameter **701**.


Display: Parameter **701**. blinks, index **00**: and error **4** do not.



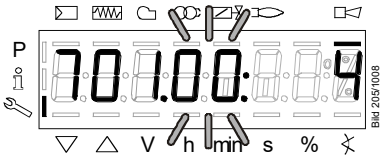
On the left, the current error **701**. appears blinking, index **00**: does not blink.


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

Example:  
Parameter **701**., index **00**., error code **4**.



**/reset 1...3 s**



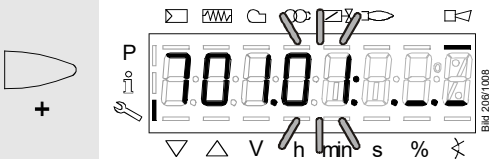
Press  for 1...3 seconds to show index **00**: for the error code blinking.


Display: Parameter **701**. does not blink, index **00**: blinks, error **4** does not blink.

To the next index



+




Press  + to select the index.

- .00 = error code
- .01 = startup meter reading
- .02 = MMI phase to the time of fault
- .03 = power value to the time of fault

Example  
Parameter **701**., index **01**., startup meter reading.

To the next index



+

Press + to select the index.

.02 = MMI phase to the time of fault

Example:  
Parameter **701.**, index **02.**, Phase **02** = safety shutdown

To the next index +

Press + to select the index.

.03 = power value to the time of fault

Example:  
Parameter **701.**, index **03.**, power value **60%**

/reset 1...3 s

Press - + to return to the index.

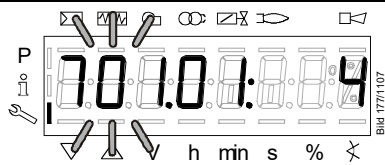
Display: Parameter **701.** does not blink, index **03:** blinks, characters **--** do not.


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 blinking.

- +



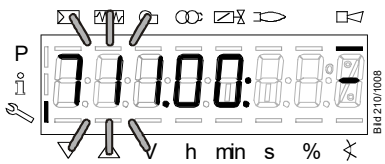
Press  - + to return to the parameter level.

Display: Parameter **701.** blinks, 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 **711.**)

Example:  
Parameter **711.**, index **00:** -

To the next parameter



Back to the previous parameter

# 14 Error code list with operation via external AZL2 display



Note  
Display depending on the PME7, refer to *User Documentation A7105.x*.

Error code	Clear text	Possible cause
Loc: 2	No establishment of flame at the end of safety time	<ul style="list-style-type: none"> <li>- Faulty or soiled fuel valves</li> <li>- Defective, soiled or incorrectly connected flame detector</li> <li>- Poor adjustment of burner, no fuel</li> <li>- Faulty ignition equipment</li> </ul>
Loc: 3	Air pressure faulty (air pressure switch welded in no-load position, decrease to specified time (air pressure switch response time)	Air pressure switch faulty <ul style="list-style-type: none"> <li>- Loss of air pressure signal after specified time</li> <li>- Air pressure switch has welded in no-load position</li> </ul>
Loc: 4	Extraneous light	Extraneous light during burner startup
Loc: 5	Air pressure faulty, air pressure switch welded in working position	Timeout air pressure switch <ul style="list-style-type: none"> <li>- Air pressure switch has welded in working position</li> </ul>
Loc: 6	Fault of actuator	<ul style="list-style-type: none"> <li>- Actuator faulty or blocked</li> <li>- Faulty connection</li> <li>- Wrong adjustment</li> </ul>
Loc: 7	Loss of flame	Too many losses of flame during operation (restart limitation) <ul style="list-style-type: none"> <li>- Faulty or soiled fuel valves</li> <li>- Faulty or soiled flame detector</li> <li>- Poor adjustment of burner</li> </ul>
Loc: 8	---	Free
Loc: 9	---	Free
Loc: 10	Non-volatile lockout with alarm output switched on at terminal X2-03 pin 3 (fault lamp ON)	Wiring error or internal error, other errors
Loc: 10	Non-volatile lockout with alarm output switched off at terminal X2-03 pin 3 (fault lamp OFF)	Output contact error (welded contact of an output relay)
Loc: 12	Valve proving	Fuel valve V1 leaking
Loc: 13	Valve proving	Fuel valve V2 leaking
Loc: 14	POC error	Error valve closure control POC
Loc: 20	Gas pressure switch-min open	Gas shortage
Loc: 22	Safety loop open	<ul style="list-style-type: none"> <li>- Gas pressure switch-max open</li> <li>- Safety limit thermostat cut out</li> </ul>
Loc: 60	Analog power source 4...20 mA, I <4 mA	Wire breakage
Loc: 83	PWM fan faulty	<ul style="list-style-type: none"> <li>- PWM fan does not reach the target speed within the preset period of time, or</li> <li>- After reaching the target speed, the PWM fan leaves the tolerance band again (parameter 650) for a time exceeding the tolerance time speed deviation (parameter 660)</li> </ul>
Loc: 138	Restore process successful	Restore process successful
Loc: 139	No PME7 detected	No PME7 plugged in
Loc: 167	Manual locking	Manual locking
Loc: 206	AZL2 incompatible	Use the latest version

Error code	Clear text	Possible cause
Loc: 225	PWM fan faulty	<ul style="list-style-type: none"> <li>- After the prepurge speed was reached, the minimum PWM prepurge speed was undercut (parameter 675.00) or ...</li> <li>- After reaching the ignition load speed, the maximum ignition load PWM (parameter 675.01) was exceeded</li> </ul>
Loc: 226	PWM fan faulty	Parameterization error: <ul style="list-style-type: none"> <li>- Speed low-fire &gt; speed high-fire, or</li> <li>- Low-fire = 0 rpm, or</li> <li>- Maximum speed = 0 rpm</li> </ul>
Loc: 227	PWM fan faulty	One or several parameters violate the minimum / maximum limit
rSt Er1	Error in compatibility between PME7 and LME7 during restore process	Program sequence of PME7 does not match the LME7
rSt Er2	Error in compatibility between PME7 and LME7 during restore process	LME7 hardware does not match the PME7
rSt Er3	Error during restore process	<ul style="list-style-type: none"> <li>• PME7 faulty</li> <li>• PME7 removed during restore process</li> </ul>
bAC Er3	Error in compatibility between PME7 and LME7 during backup process	Program sequence of PME7 does not match the LME7
Err PrC	Error in PME7	<ul style="list-style-type: none"> <li>• Data content of the PME7 defective</li> <li>• No PME7 plugged in</li> </ul>

# 15 Operation via internal LED

## 15.1 Description of display and buttons

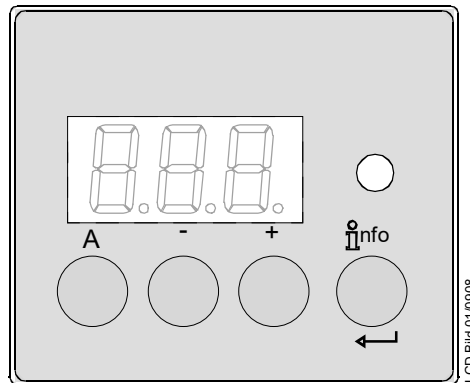





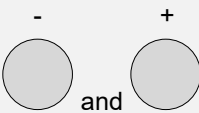




Figure 23: Description of display and buttons

Button	Function
	<b>Button A</b> - Display preset output - In lockout position: Power value to the time of fault
	<b>Info and Enter button</b> - <b>Reset</b> in the event of fault, changeover visual diagnostic of the cause of fault (see chapter <i>Diagnostics of cause of fault</i> )
	<b>- button</b> - Display flame signal current 2 or phases display - In lockout position: MMI phase to the time of fault
	<b>+ button</b> - Display flame signal current 1 or phases display - In lockout position: MMI phase to the time of fault
	<b>3 multicolor signal lamp</b> - See chapter <i>Blink code table</i>
	<b>+ and - button: Escape function</b> (press  and  simultaneously) - No adoption of value - One menu level up - Keep depressed for >1 second for backup / restore function



## 15.2 Normal display

Normal display is the standard display in normal operation.

### 15.2.1 Display in standby mode



The LME7 is in standby.

### 15.2.2 Display during startup / shutdown

#### 15.2.2.1 Display of program phases



The LME7 is in phase 21 (**P21**). The individual program phases are displayed in accordance with the program sequence. For the color display of the signal lamp, see *List of phase display*.

### 15.2.2.2. List of phase display





Note  
Display depending on the PME7, refer to *User Documentation A7105.x*.

Phase number AZL2 display	LED	Function
<b>Standby</b>		
OFF	Off	Standby, waiting for heat request
P08	Off	Power ON / test phase (e.g. detector test)
<b>Startup</b>		
P21	Yellow	Safety valve ON, air pressure switch test / POC test (timeout / locking after 5 seconds), actuator opens in low-fire position / CLOSE position
P22	Yellow	Fan motor ON and air pressure switch test / settling time
P24	Yellow	Actuator travels to the prepurge position
P30	Yellow	Prepurging
P36	Yellow	Actuator closes until ignition load / low-fire is reached, and parameter 259.02: Actuator opens to a position > ignition load
P38	Yellow flashing	Preignition time
P40	Yellow flashing	1st safety time / ignition transformer ON
P42	Green	Safety time (ignition transformer OFF), flame check
P44	Green	Interval: End of safety time and fuel valve V1 ON Interval: End of safety time and release of load controller Interval: End of safety time and fuel valve V2 ON
P50	Green	2nd safety time
P54	Green	Parameter 259.01: Actuator opens to a position > low-fire
P54	Green	Parameter 260: Actuator closes until low-fire position is reached
oP1	Green	Interval to release of preset load controller (analog or 3-position step input)
<b>Operation</b>		
oP:xx	Green	Operation, modulating operation
oP1	Green	Operation first stage
oP2	Green	Operation second stage
<b>Shutdown</b>		
P10	OFF	Actuator travels to the CLOSED position (home run)
P72	Yellow	Actuator opens in high-fire position / operation shutdown
P74	Yellow	Postpurging
<b>Valve proving</b>		
P80	Yellow	Test space evacuating
P81	Yellow	Test time atmospheric pressure
P82	Yellow	Test space filling
P83	Yellow	Test time gas pressure



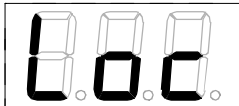




Phase number AZL2 display	LED	Function
<b>Waiting phases (start prevention / safety shutdown phases)</b>		
P01	Red / yellow flashing	Undervoltage
P02	Yellow	Safety loop open → Safety shutdown, followed by a non-alterable lockout with interlocking
P04	Red / green flashing	Extraneous light on burner startup (timeout / locking after 30 seconds)
P90	Yellow	Pressure switch-min open → Safety shutdown, followed by a non-alterable lockout with interlocking
<b>Non-alterable lockout</b>		
LOC	Red	Lockout phase

## 15.2.3 Display of operating position

	 <p>LCD Bild 04/09/08</p>	 <p>Display <b>oP1</b> means stage 1. Display after <b>oP</b> is unit-specific. The signal lamp blinks green.</p>
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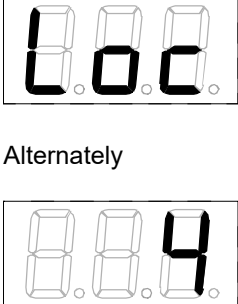








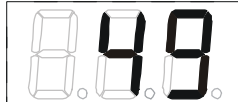


## 15.3 Special functions

### 15.3.1 Manual lockout

  and other button	 <p>LCD Bild 06/09/08</p> <p>Alternately</p>  <p>LCD Bild 32/06/10</p>	 Press  simultaneously <b>with any other button</b> .  LME7 changes from any operating position directly to lockout. Signal lamp lights up red. Display shows current error code <b>167</b> .
--	--	---

## 15.4 Fault status messages, display of errors


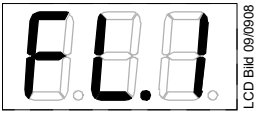



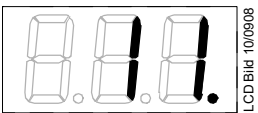



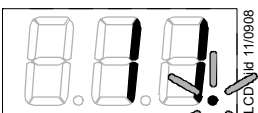


### 15.4.1 Display of errors (faults) with lockout

	 <p>LCD Bild 06/0908</p> <p>Alternately</p> <p>LCD Bild 07/0908</p>	 <p><b>Loc</b> and <b>4</b> are displayed alternately.</p> <p>The LME7 is in lockout position.</p> <p>The current error code is displayed and the signal lamp flashes red.</p> <p>Example: Error code <b>4</b></p>
<p>+</p>  <p>or</p> <p>-</p> 	 <p>LCD Bild 05/0908</p>	 <p>Press  or  for display of the phase, where the fault appeared.</p> <p>Signal lamp blinks red.</p> <p>Example: Phase <b>P02</b></p>
<p>A</p> 	 <p>LCD Bild 33/0910</p>	 <p><b>Only with modulation via analog signal</b></p> <p>Press  for display of the output position / actuator position where the error occurred.</p> <p>Signal lamp lights up red.</p> <p>Example: Output position / actuator position <b>49</b></p>






## 15.4.2 Display of flame current ION or QRA



Note:  
This display is only possible in operating mode or standby!

 +	 LCD Bild: 09/09/08	 Press  for display of the flame signal amplifier. Signal lamp blinks green.  Display shows <b>FL.1</b> .
 + 1...3 s	 LCD Bild: 10/09/08	 When pressing  (1...3 seconds), the flame signal current is displayed. Signal lamp blinks green.  Example: <b>11</b> .
 + >3 s	 LCD Bild: 11/09/08	 When pressing  (>3 seconds), the point after the number begins to blink. When the button is released, the value is displayed for 2 minutes. Signal lamp blinks green. Then, the normal display appears.  Display: Point . blinks, value <b>11</b> does not.

## 15.4.3 Reset

 info  ← >1 s	 LCD Bild: 02/09/08	 Press  (for 1 to 3 seconds) to reset the LME7.  When the button is released, <b>OFF</b> is displayed.  The LME7 is reset.
---	---	---



Note:  
For meaning of the error and diagnostic codes, see chapter *Error code list...*





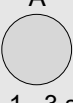







## 15.4.4 Display of preset output

**Note:**

Display is possible only when ...

- in operating mode or standby,
- program sequence for modulating operation via analog preset output.



	 <small>LCD Bild 13/0908</small>	 <p>Press  for display of the relative current position of the actuator. Signal lamp blinks green.</p> <p>Display shows <b>.0P</b>.</p>		
 <p>1...3 s</p>	 <small>LCD Bild 16/1108</small>	 <p>Press  (1...3 seconds) for display of the relative current position. Signal lamp blinks green. The <b>relative</b> value <b>.57</b> of the current position is displayed.</p> <table border="1"> <tr> <td data-bbox="778 819 1114 1205"> <p><b>PME7 with actuator control:</b> Position of actuator 0° 0 Ω value of potentiometer = 0% display</p> <p>Position of actuator high-fire &gt;0° &lt;90° = value of potentiometer &lt;1000 Ω = 100% display &gt;0 Ω &lt;1000 Ω</p> </td> <td data-bbox="1129 819 1465 1077"> <p><b>PME7 with PWM fan:</b></p> <p>Current speed 0 rpm = 0% display</p> <p>Current speed corresponds to the rated load speed = 100% display</p> </td> </tr> </table> <p>Example: Value <b>.57</b></p>	<p><b>PME7 with actuator control:</b> Position of actuator 0° 0 Ω value of potentiometer = 0% display</p> <p>Position of actuator high-fire &gt;0° &lt;90° = value of potentiometer &lt;1000 Ω = 100% display &gt;0 Ω &lt;1000 Ω</p>	<p><b>PME7 with PWM fan:</b></p> <p>Current speed 0 rpm = 0% display</p> <p>Current speed corresponds to the rated load speed = 100% display</p>
<p><b>PME7 with actuator control:</b> Position of actuator 0° 0 Ω value of potentiometer = 0% display</p> <p>Position of actuator high-fire &gt;0° &lt;90° = value of potentiometer &lt;1000 Ω = 100% display &gt;0 Ω &lt;1000 Ω</p>	<p><b>PME7 with PWM fan:</b></p> <p>Current speed 0 rpm = 0% display</p> <p>Current speed corresponds to the rated load speed = 100% display</p>			
 <p>&gt;3 s</p>	 <small>LCD Bild 17/1108</small>	 <p>When pressing  for &gt;3 seconds, the point after the number begins to blink. When the button is released, the value is displayed for 2 minutes. Signal lamp blinks green. Then, the normal display appears.</p> <p>Display: Value <b>.57</b>, point <b>.</b> blinks.</p>		

## 15.5 Manual adjustment (depending on the PME7)

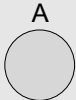



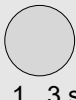




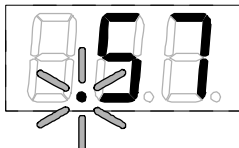


### 15.5.1 Position of actuator or speed of PWM fan in modulating operation with analog signal

Note:

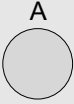
Display is possible only when ...

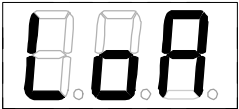
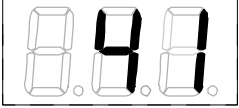
- in operating mode or standby,
- program sequence for modulating operation via analog preset output and with connected actuator with potentiometer for position feedback to the LME7





	 <p>LCD Bild 13/0908</p>	 <p>Press  for the relative current position of the actuator or the relative current speed of the PWM fan. Signal lamp blinks green.</p> <p>Display shows <b>.0P</b>.</p>				
 <p>1...3 s</p>	 <p>LCD Bild 16/1108</p>	 <p>Press  (1...3 seconds) for display of the relative current position or the current speed. Signal lamp blinks green. The <b>relative</b> value <b>.57</b> of the current position is displayed.</p> <table border="0" data-bbox="778 963 1452 1254"> <tr> <td data-bbox="778 963 1117 1052">                     Position of actuator 0°                      0 Ω value of potentiometer =                      0% display                 </td> <td data-bbox="1133 963 1452 1030">                     Actual speed                      0 rpm = 0% display                 </td> </tr> <tr> <td data-bbox="778 1086 1117 1254">                     Position of actuator high-fire                      &gt;90°                      &lt;90° = value of                      potentiometer &gt;0 Ω &lt;1000 Ω                      = 100% display                 </td> <td data-bbox="1133 1064 1452 1153">                     Current speed corresponds                      to the rated load speed =                      100% display                 </td> </tr> </table> <p>Example: Value <b>.57</b></p>	Position of actuator 0° 0 Ω value of potentiometer = 0% display	Actual speed 0 rpm = 0% display	Position of actuator high-fire >90° <90° = value of potentiometer >0 Ω <1000 Ω = 100% display	Current speed corresponds to the rated load speed = 100% display
Position of actuator 0° 0 Ω value of potentiometer = 0% display	Actual speed 0 rpm = 0% display					
Position of actuator high-fire >90° <90° = value of potentiometer >0 Ω <1000 Ω = 100% display	Current speed corresponds to the rated load speed = 100% display					
 <p>&gt;3 s</p>	 <p>LCD Bild 17/1108</p>	 <p>When pressing  (&gt;3 seconds), the point after the number begins to blink. When the button is released, the value is displayed for 2 minutes. Signal lamp blinks green. Then, the normal display appears.</p> <p>Display: Value <b>57</b>, point <b>.</b> blinks.</p>				




  
 >3 s


LCD Bild 18/1108
  
 Alternately
   

LCD Bild 19/1108




Press  for >3 seconds to display alternately **LoA** and **41**.


The **relative** value **41** of the current position or current speed is displayed.


Actuator position 0° 0 Ω potentiometer value = 0% display	Current speed 0 rpm = 0% display
Actuator position high-fire >90° <90° = potentiometer value >0 Ω <1000 Ω = 100% display	Current speed corresponds to the rated load speed = 100% display




The actual value (example **41%**) is displayed and the signal lamp blinks green.

Example: Position of actuator or the current speed **41%**  
 (based on range between high-fire and 0° or 0 rpm)

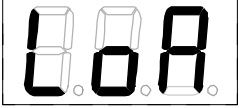


  
 and +
   
  
 or -



LCD Bild 20/1108



Press  simultaneously with  or  to adjust the actuator position or the fan speed between low-fire (x%) and high-fire (100%). Release the buttons when the required position or speed is reached. Signal lamp blinks green.

Example: Value **43**




LCD Bild 18/1108
  
 Alternately
   

LCD Bild 20/1108





Display shows alternately **LoA** and **43**.



Signal lamp blinks green.

Example: Required position of actuator or current speed **43%**


  
 and +
   



LCD Bild 24/1108



Press  and  simultaneously (Escape) to return to normal operation.

Display: **oP**

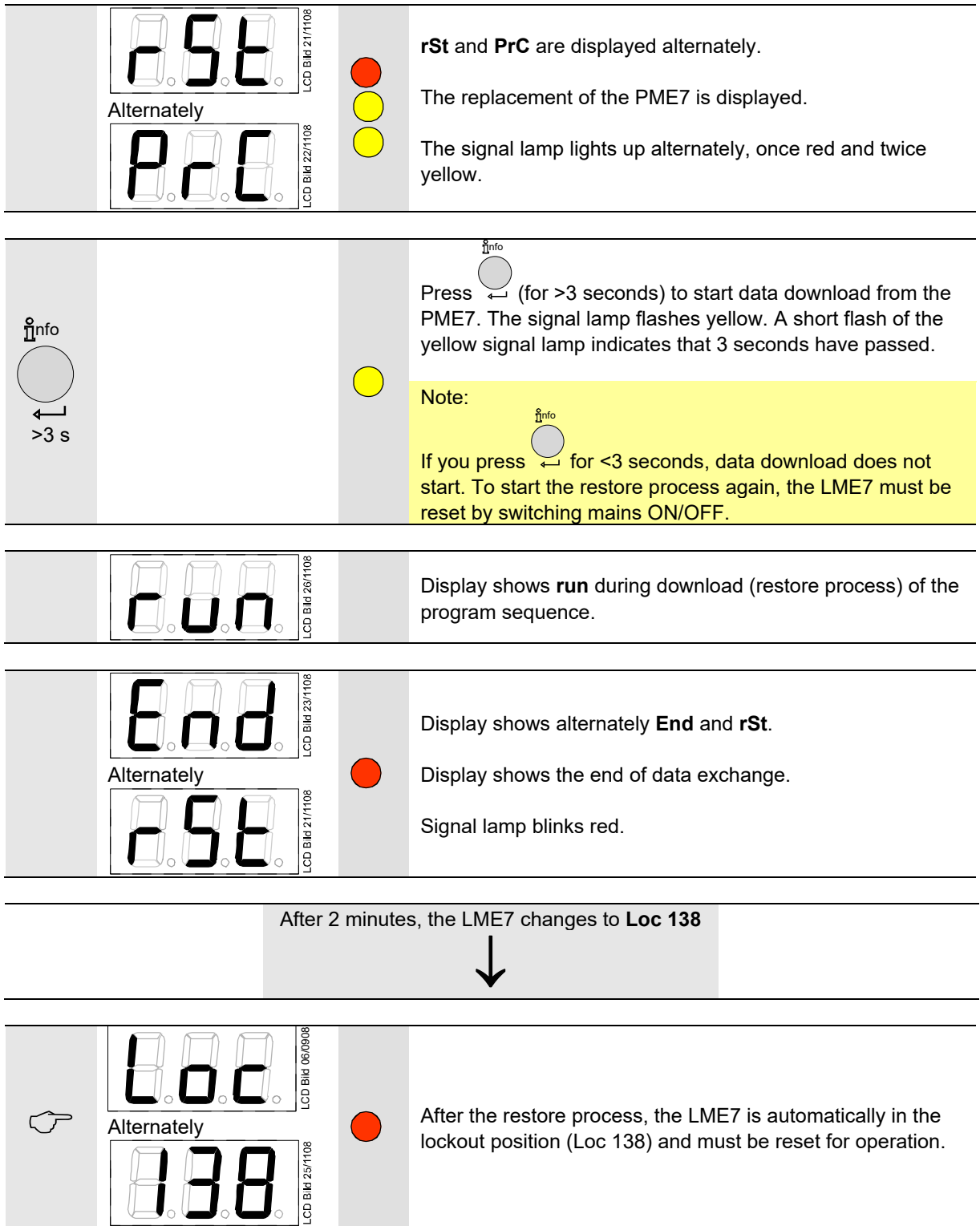
When manual adjustment is completed, the actuator or the PWM fan returns to the analog preset output!








Note:

- When the program phase (e.g. P10 - shutdown) changes during manual adjustment, the display blinks
- The mode (manual adjustment mode) remains active until 'Escape' is used to switch the LME7 back to normal operation or until the LME7 is reset via mains ON/OFF. This means that – in the case of a new heat requirement and after startup – the actuator or the PWM fan is driven to the position or speed of the manually preset value.

## 15.6 Initial startup with a new PME7 or in case of replacement of the PME7



   Press  (for > 1 second) to reset the LME7.

 >1 s

Display **OFF**




**Warning!**



For initial commissioning or replacement of the PME7, the function sequence and parameter settings must be checked on completion of the restore process.

→ See chapter *Operation via AZL2 / first startup, restore*


→ See chapter *Operation via internal LED / first startup, restore*



## 15.7 Manual backup

 LCD Bild 27/1108

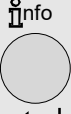
Press  and  simultaneously for >1 second (Escape) to start a manual backup process. Parameter **PrC** appears.

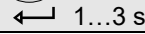
Display: **PrC**

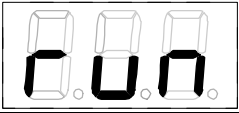
 LCD Bild 27/1108

Press  or  for parameter **bAC**.


Display: **bAC**






 LCD Bild 26/1108

**run** appears during download (backup process) of the program sequence.


 LCD Bild 23/1108

Alternately

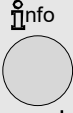
 LCD Bild 27/1108

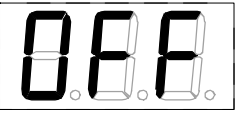
Display shows alternately **End** and **bAC**.

Display shows the end of data exchange.


Display appears for 2 minutes or can be finished by pressing .

↓



 LCD Bild 02/0908

**OFF** is displayed when the backup process is complete.


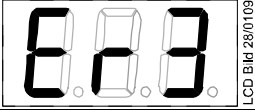
Press  (for > 1 second) to reset the LME7.

Display **OFF**



**Warning!**  
 If any parameters are changed, a backup must be made!  
 If not observed, there is a risk of impairment of safety functions!

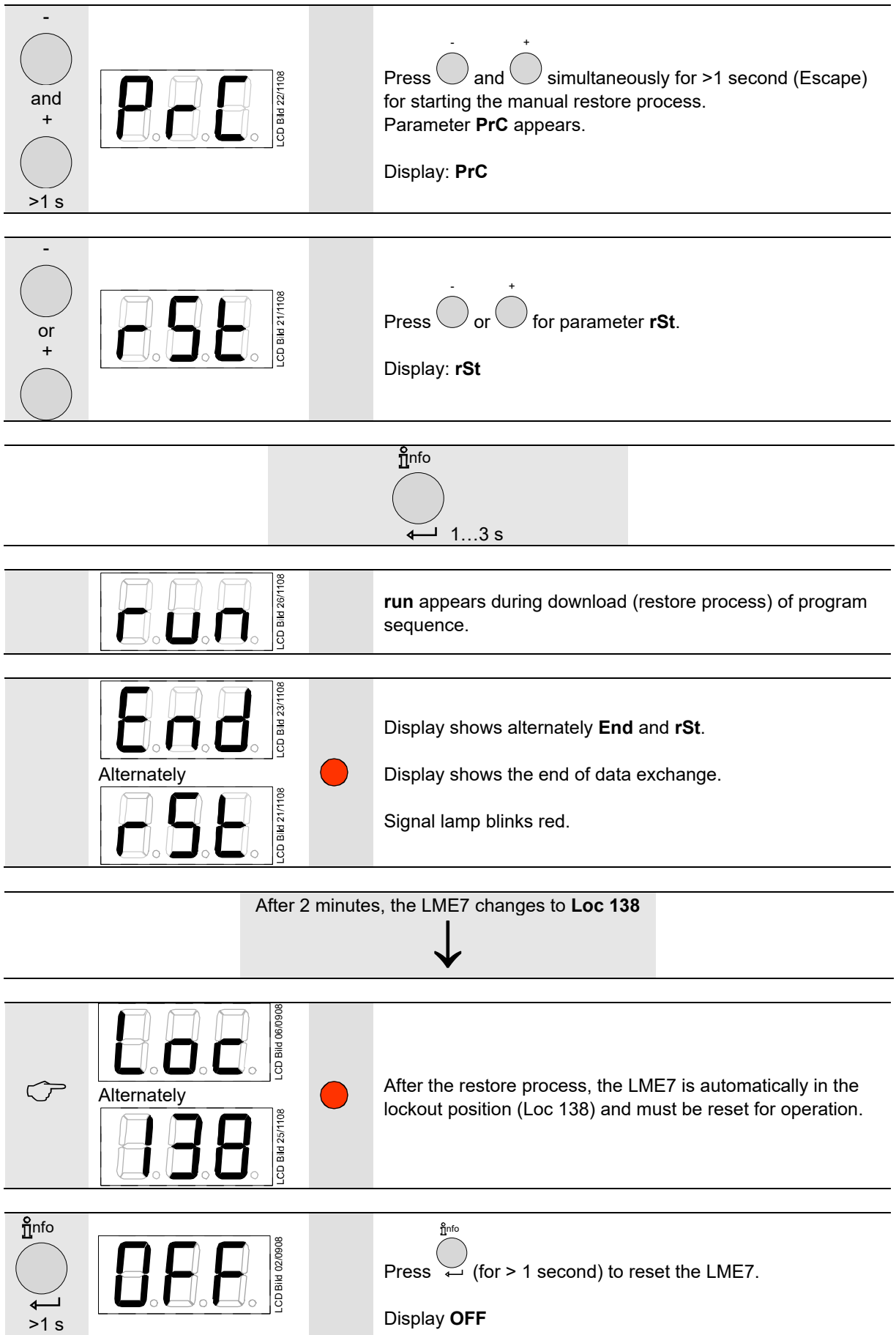
## 15.7.1 Error during backup process

	<p>Display shows alternately <b>bAC</b> and <b>Er3</b>.</p> <p>For meaning of a possible cause, see chapter <i>Error code list with operation via internal LED</i>.</p>
<p>Alternately</p> 	


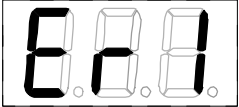
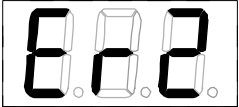
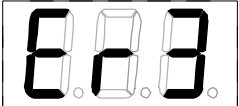


**Note**  
The backup process saves all settings and parameters from the LME7 memory to the PME7.

## 15.8 Manual restore



## 15.8.1 Errors during the restore process






 LCD Bld 21/1108	<p>Display shows alternately <b>rSt</b> and <b>Er1</b>, <b>Er2</b> or <b>Er3</b>.</p> <p>For meaning of a possible cause, see chapter <i>Error code list with operation via internal LED</i>.</p>
Alternately with  LCD Bld 23/0103	
or with  LCD Bld 30/0103	
or with  LCD Bld 28/0103	



### Note

During the restore process, all settings and parameters are written from the PME7 to the internal memory of the LME7. As part of this process, it is possible that previous program sequences, parameters, and settings in the internal memory of the LME7 will be overwritten.

## 15.8.2 Reset

  >1 s	 LCD Bld 02/0908	 Press  (for 1 to 3 seconds) and <b>OFF</b> will appear. When the button is released, the LME7 is reset.
--	--	--



### Note:

For meaning of the error and diagnostic codes, see chapter *Error code list...*



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