SIEMENS

7105

Burner controls

LME71…
LME72…
LME73…

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.

The LME7 and this data sheet are intended for original equipment manufacturers (OEMs) using the LME7 in or on their products.

Use

LME7s are used for the startup and supervision of multistage or modulating forced draft burners and atmospheric gas burners in intermittent operation. The fuel-air ratio can be set either via an air damper actuator – acting on mechanical or pneumatic ratio control – or via pulse width modulated fans and pneumatic ratio control. Flame supervision is performed using an ionization probe, UV flame detector QRA2 / QRA4 / QRA10, photo resistive detector QRB1 / QRB3, yellow flame detector QRB4 or blue-flame detector QRC.

- Applications in accordance with EN 267: Forced draft 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

Notes

Please note!
All the safety, warning, and technical notes given in the basic documentation for the LME7 (P7105) also apply to this document in full. Failure to observe these poses a risk of damaging the safety functions and the risk of electric shock.

Software version V02.03 and later

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

LME71 and LME73 only:
- Program sequence display

The following items are integrated into the LME7:
- Burner control
- BC interface for connecting an AZL2 or PC
- Lockout reset button (info button)
- 3-color LED signal lamp for operating status and error status messages
- Optional: Analog inputs for load controller 0 to 10 V DC, 0/4 to 20 mA, 0 to 135 Ω
- Interface for PME7

LME71 and LME73 only:
- 3 x 7-segment display for service, error and status information
- Control for one actuator

Supplementary documentation

Product type	Designation	Documentation type	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
LME71.901A2	Burner control	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
PME73.231Ax	Program module	User Documentation	A7105.29
LME	Burner control	Environmental declaration	E7105 *)
LME	Burner control	Product range summary	Q7101
LME7	Burner control	Basic documentation	P7105
PME	Program module	Environmental declaration	E7105.1 *)

*) On request only

Applied directives:

- Low Voltage Directive 2014/35/EU
- Pressure Equipment Directive 2014/68/EU
- Gas Appliances Regulation (EU) 2016/426
- Electromagnetic compatibility EMC (immunity) *) 2014/30/EU

*) 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 – Valve proving systems for automatic shutoff valves DIN EN 1643
- Safety and control devices for gas burners and gas-burning appliances – General requirements DIN EN 13611
- Automatic electrical controls for household and similar use Part 2-5: Special requirements on automatic electric burner control and monitoring systems DIN EN 60730-2-5

The edition of the standards that applies in each case can be found in the declaration of conformity.

Note on **DIN EN 60335-2-102**
Household and similar electrical appliances – Safety
Parts 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 (Eurasian conformity)

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

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

120 V AC versions only

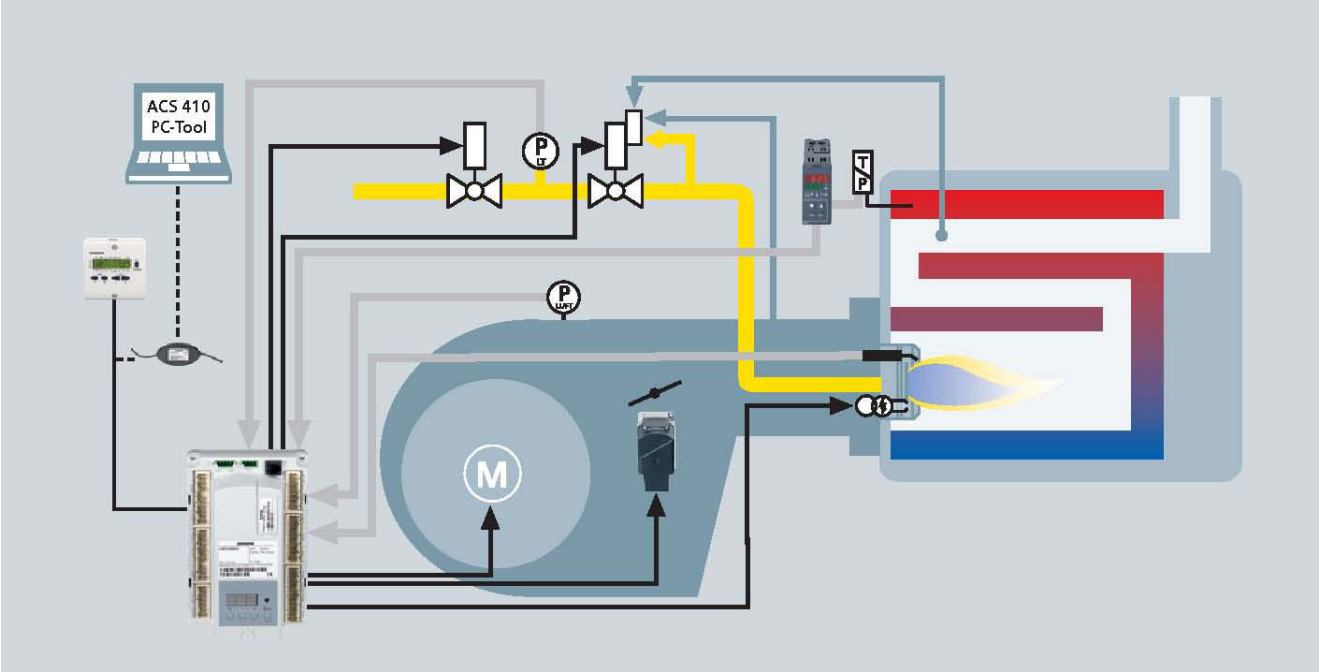
Lifetime

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 (Afecor) (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

System overview



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

Type summary

Burner control

LME7x
Parameterized burner control for the supervision of multistage or modulating forced draft oil/gas burners and atmospheric burners of medium to large capacity in intermittent operation. With controlled air damper control. Refer to Basic Documentation P7105.

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 120 V AC	●	---	---	---	●	---
Mains voltage 230 V AC	---	●	●	●	---	●
Gas pressure switch-min or POC	●	●	●	●	●	●
Pressure switch valve proving	●	●	●	●	●	●
Air pressure switch	●	●	●	●	●	●
Ionization probe	●	●	●	●	●	●
QRA2/QRA4/QRA10	●	●	●	---	●	●
QRB1 / QRB3 / QRB4	---	---	---	---	●	●
QRC	---	---	---	---	---	●
Load controller analog input signal (0 to 10 V, 4 to 20 mA, 0 to 135 Ω)	●	●	●	---	●	●
Load controller input, 3-position step input or 2-stage	●	●	●	●	●	●
Actuator control output	---	---	---	●	●	●
Input feedback for actuator with potentiometer 0 to 1 kΩ	---	---	---	---	●	●
Output PWM control	●	●	●	●	●	●
Onboard LED 7-segment display	●	●	●	---	●	●
BC interface for AZL2	●	●	●	●	●	●

*) On request

Accessories (must be ordered separately)

Program module

PME7x
Program module for LME7
With oil or gas burner program sequences for LME7 basic unit.
Refer to Basic Documentation P7105.

PME7 with 120 V AC mains voltage

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 120 V AC	●	●	●	●	●
For use with LME71.000A1	●	●	●	●	●
For use with LME72.000A1	---	---	---	---	---
For use with LME73.000A1	---	---	---	---	---
Forced draft burner gas program	●	---	●	●	●
Atmospheric burner gas program	---	●	---	---	---
1-stage or 1-stage modulating	●	●	●	●	●
2-stage or 1-stage modulating	---	---	●	●	●
Pilot burner, simultaneous/alternating	●	●	---	●	---
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	---	---	---	---	---
Modulating via PWM fan (pneumatic fuel-air ratio control)	---	---	---	---	●
Fan speed control or fan speed control via analog signal or 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	---	---	---	---	●
Valve proving input ON/OFF	---	---	---	---	---

Accessories (to be ordered separately) (continued)

PME7 with 120 V AC mains voltage

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 120 V AC	●	●	●	●	●	●	●	●
For use with LME71.000A1	---	---	---	---	---	---	---	---
For use with LME72.000A1	---	---	---	---	---	---	---	---
For use with LME73.000A1	●	●	●	●	●	●	●	●
Forced draft burner oil program	●	---	---	---	---	---	---	---
Forced draft burner gas program	---	●	●	●	●	●	●	●
Atmospheric burner gas program	---	---	---	---	---	---	---	---
1-stage or 1-stage modulating	●	●	●	●	●	●	●	●
2-stage or 1-stage modulating	●	●	---	---	●	●	●	●
Pilot burner, simultaneous/alternating	●	---	●	●	---	●	●	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	●	●	●	●	●	●	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	---	---	---	---	---	---	---	---
Fan speed control or fan speed control via analog signal or 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	---	●	●	---	●	●	●	●
Valve proving input ON/OFF	---	---	---	---	---	---	●	---

Accessories (to be ordered separately) (continued)

PME7 with 230 V AC mains voltage

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 230 V AC	●	●	●	●	●	●	●
For use with LME71.000A2	●	●	●	●	●	---	---
For use with LME72.000A2	---	---	---	---	---	●	●
For use with LME73.000A2	---	---	---	---	---	---	---
Forced draft burner gas program	●	---	●	●	●	●	●
Atmospheric burner gas program	---	●	---	---	---	---	---
1-stage or 1-stage modulating	●	●	●	●	●	●	●
2-stage or 1-stage modulating	---	---	●	●	●	●	●
Pilot burner, simultaneous/alternating	●	●	---	●	---	---	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	---	---	---	---	---	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	---	---	---	---	●	---	---
Fan speed control or fan speed control via analog signal or 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	---	---	---	---	●	---	---
Valve proving input ON/OFF	---	---	---	---	---	---	---

*) On request only

Accessories (to be ordered separately) (continued)

PME7 with 230 V AC mains voltage

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 230 V AC	●	●	●	●	●	●	●	●
For use with LME71.000A2	---	---	---	---	---	---	---	---
For use with LME72.000A2	---	---	---	---	---	---	---	---
For use with LME73.000A2	●	●	●	●	●	●	●	●
Forced draft burner oil program	●	---	---	---	---	---	---	---
Forced draft burner gas program	---	●	●	●	●	●	●	●
Atmospheric burner gas program	---	---	---	---	---	---	---	---
1-stage or 1-stage modulating	●	●	●	●	●	●	●	●
2-stage or 1-stage modulating	●	●	---	---	●	●	●	●
Pilot burner, simultaneous/alternating	●	---	●	●	---	●	●	●
Modulating via actuator (pneumatic or mechanical fuel-air ratio control)	●	●	●	●	●	●	●	●
Modulating via PWM fan (pneumatic fuel-air ratio control)	---	---	---	---	---	---	---	---
Fan speed control or fan speed control via analog signal or 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	---	●	●	---	●	●	●	●
Valve proving input ON/OFF	---	---	---	---	---	---	●	---

Display units / operating units and accessories

AZL21.00x9
Article no.: **BPZ:AZL21.00x9**
Display and operating unit, remote unit for various types of installation with LCD, 8 digits, 5 buttons, BC interface for LME7, degree of protection IP40.
Refer to Data Sheet N7542.

AZL23.00x9
Article no.: **BPZ:AZL23.00x9**
Display and operating unit, remote unit for various types of installation with LCD, 8 digits, 5 buttons, BC interface for LME7, degree of protection IP54.
Refer to Data Sheet N7542.

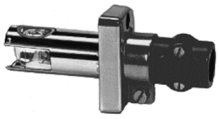
Integrated into the LME7
3-color LED, lockout reset button (info button), 3 other buttons for operation in connection with 3 x 7-segment display.

AGV50.100
Article no.: **BPZ:AGV50.100**
Signal cable for AZL2, with RJ11 connector, cable length 1 m, pack of 10.

Accessories (to be ordered separately) (continued)

Flame detector

QRA2 (LME71/LME73 only)
UV flame detector for the supervision of gas flames and yellow or blue-burning oil flames as well as for ignition spark control. Plastic insulated housing, metalized to prevent static charging caused by the air flow from the fan, lateral illumination.
Refer to data sheet N7712.

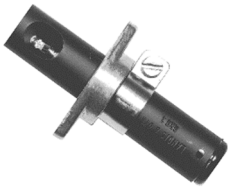


QRA4 (LME71/LME73 only)
UV flame detector for the supervision of gas flames and yellow or blue-burning oil flames as well as for ignition spark control, metal housing, frontal illumination.
Refer to data sheet N7711.

QRA10 (LME71/LME73 only)
UV flame detector for the supervision of gas flames and yellow or blue-burning oil flames as well as for ignition spark control. Detector housing made of injection molded aluminum with a 1" mounting coupling and connection facility for cooling air.
Refer to data sheet N7712.

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.

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.



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.

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:

Ionization probe
Flame detector for use with Siemens burner controls for the supervision of gas flames.
Supplied by customer.

Accessories (to be ordered separately) (continued)

Actuators

SQN3x
Electromotoric actuators for air dampers and control valves for oil and gas burners of small to medium capacity.

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

Refer to Data Sheet N7808.

SQN7x
Electromotoric actuators for air dampers and control valves for oil and gas burners of small to medium capacity.

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

Refer to Data Sheet N7804.

SQM40/SQM41
Electromotoric actuators for air dampers and control valves of oil and gas burners of medium to larger capacity, with UL certification.

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

Refer to data sheet N7817.

SQM5x
Electromotoric actuators for air dampers and control valves of oil and gas burners of medium to larger capacity, with UL certification.

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

Refer to Data Sheet N7815.

Gas pressure switch

QPLx5
The pressure switch is used to supervise gas or air pressure.
Refer to data sheet N7221.

Dummy plug for RJ11

Dummy plug
For 6-pin modular plug (RJ11)
Supplier recommendation: Molex
Order number: 085 999 3256

Connector sets for LME7

AGG3.710
Article no.: **BPZ:AGG3.710**
Complete connector set
RAST5 and RAST3.5
Single pack
See parts list C7105 (74 319 0642 0).

Example: X5-03

AGG3.720
Article no.: **BPZ:AGG3.720**
10 complete standard connector sets
RAST5 and RAST3.5
Packing in bags of 10 pieces for each connector type.
See parts list C7105 (74 319 0642 0).

AGG9.xxx
The individual connectors are delivered in packages of up to 200 pieces each.

Example: X5-03

Article no.	Type	Connector type	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

Service tools

OCI410
Article no.: **BPZ:OCI410**
Interface between burner control and PC.
Facilitates viewing, processing, and recording of setting parameters on site using the ACS410 PC software.
Refer to data sheet N7616.

ACS410
Article no.: **BPZ:ACS410**
PC software for parameterization and visualization of the burner control.
See Software Documentation J7352.

Basic unit LME7

General

Mains voltage	120 V AC	230 V AC
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.

Internal consumption	< 10 W, typically	< 10 W, typically
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 and 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
Response time in the event of loss of flame	Max. 1 s
Permissible mounting position	Optional
Weight	Approx. 490 g

Terminal loading: *Inputs*

Mains supply: The input current for the mains supply is dependent on the operating status of the LME7

Undervoltage	U_{Mains} 120 V	U_{Mains} 230 V
• Safety shutdown from the operating position at mains voltage	≤ 75 V AC	≤ 165 V AC
• Restart is initiated when mains voltage exceeds	≥ 100 V AC	≥ 195 V AC

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		
• Terminal X3-04 pin 1 and pin 2: Safety loop input	Refer to *Terminal loading: Outputs*	
• Input currents and input voltages		
- 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)
• Contact material recommended for external signal sources (air pressure switch, pressure switch-min, pressure switch-max, etc.)	Gold-plated silver contacts	
• Transition / settling behavior / bounce: Permissible bounce time of contacts when switching ON/OFF	Max. 50 ms (after the bounce time, the contact must stay closed or open)	
• UN	120 V AC	230 V AC
• Voltage detection		
- ON	> 60 V AC	> 120 V AC
- OFF	< 40 V AC	< 80 V AC
Terminal X65: Analog input	0 to 10 V DC / DC 0/4 to 20 mA / 0 to 135 Ω	

Terminal loading: 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.

Single 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 max. 0.5 s)
• Power factor	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.6	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.6	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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	Cosφ ≥0.4	Cosφ ≥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!

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 *Flame supervision* chapter in the LME7 basic documentation (P7105)
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

Specifications as per EN 60730-1	
Type of shutdown or interruption for each circuit	
Shutdown with micro switch	1-pole
Mode of operation	Type 2 B

Actuators

CLOSED / ignition position / OPEN X2-09 pin 1, X2-09 pin 2, X2-09 pin 3	1 million switching cycles	1 million switching cycles
• Rated voltage	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	0.1 A	0.1 A
• Power factor	Cosφ ≥0.6	Cosφ ≥0.6
Output K2/2 X2-09 pin 7	120 V AC, 50/60 Hz	230 V AC, 50/60 Hz
• Rated current	Max. 1 A	Max. 1 A
• Power factor	Cosφ >0.4	Cosφ >0.4

Feedback via input X2-09 pin 8 on the LME7 depending on the current load of the actuator switching contact used (e.g. cam V2)!

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.

Minimum cross-sectional area	0.75 mm² (single-core or multi-core in accordance with VDE 0100)

Cable insulation must be suitable for the respective temperatures and environmental conditions.

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 blade connector	6.3 x 0.8 mm in accordance with DIN EN 46244 Male multipoint connector in accordance with RAST5 standard
Connection cross sections, conductor screw connection	
• Stranded conductor	Cross section max. 2.5 mm²
• Stranded conductor with ferrule	Cross section max. 2.5 mm²
• Stripping length	Approx. 8 mm

RAST3.5 connector

Mechanical data

Connection cross sections, conductor screw connection	
• Stranded conductor, fine-wired (flexible)	Cross section Min. 0.14 mm² Max. 1.5 mm²
• Stranded conductor, fine-wired (flexible) with ferrule	Cross section Min. 0.25 mm² Max. 1 mm²
• Stripping length	Approx. 7 mm
• Tightening torque / screw	0.25 Nm

AGV50 signal cable AZL2 → BC interface	**Signal cable**	White in color Unshielded Conductor 4 x 0.141 mm² With RJ11 connector
	Cable length AGV50.100	1 m
	Place of use	Under the burner hood (arrangements for SKII EN 60730-1 additionally required)
Dummy plug for RJ11	**Dummy plug**	For 6-pin modular plug (RJ11)
	Supplier	Recommended: Molex Order number: 085 999 3256
Environmental conditions	**Storage**	EN 60721-3-1:1997
	Climatic conditions	Class 1K3
	Mechanical conditions	Class 1M2
	Temperature range	-40 to +70 °C
	Humidity	< 95% r.h.
	Transport	EN 60721-3-2:1997
	Climatic conditions	Class 2K3
	Mechanical conditions	Class 2M2
	Temperature range	-40 to +70 °C
	Humidity	< 95% r.h.
	Operation	EN 60721-3-3:1994
	Climatic conditions	Class 3K3
	Mechanical conditions	Class 3M2
	Temperature range	-40 to +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. Failure to observe this poses a risk of damaging the safety functions and a risk of electric shock.

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

Warning!
- **Provide protection to prevent people from coming into contact with the ionization probe (risk of electric shock)!**
- **When monitoring ionization currents in earth-free mains, connect terminal X10-05 pin 1 to burner ground**

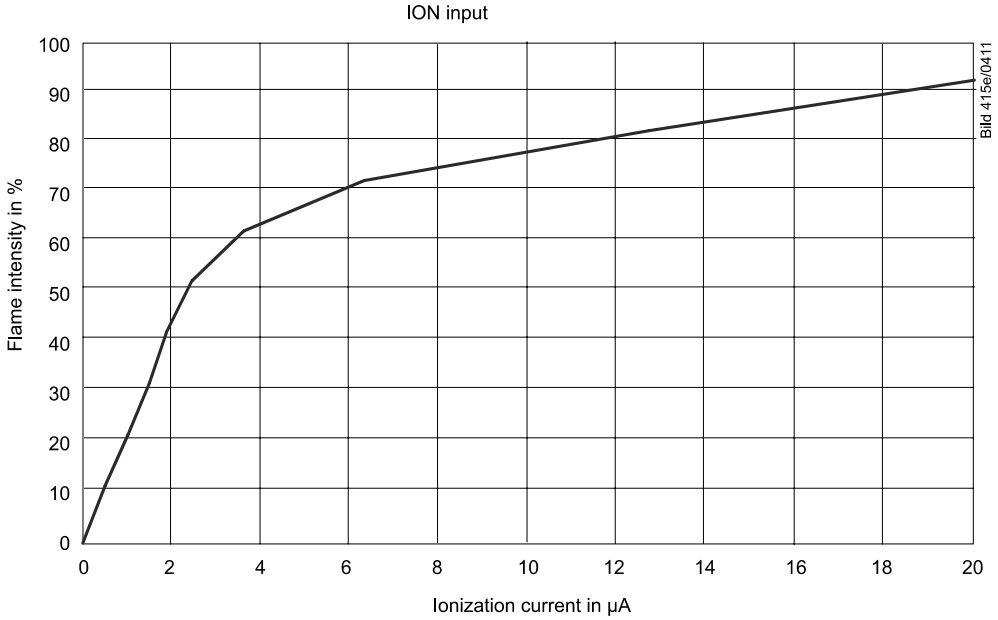
Short-circuit current	Max. 1 mA AC
Detector current required	Min. 1 µA DC, display approx. 20%
Possible detector current	Max. 40 µA DC, display approx. 100%
Permissible length of the standard detector cable (laid separately) [1]	30 m (100 pF/m), unshielded

[1]) Multicore cable not permitted

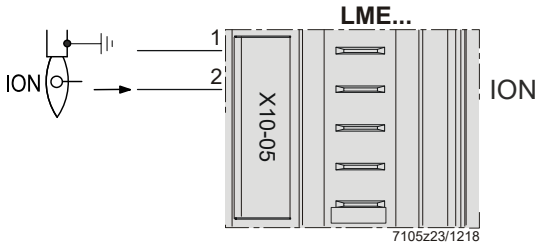
Note
As the detector line capacitance (detector line length) increases, the voltage at the ionization probe – and thus the detector current – will drop. Long line lengths and very high-ohmic flames may necessitate the use of a low-capacitance cable (e.g., ignition cable). In spite of special electronic circuits designed to compensate possible adverse effects of the ignition spark on the ionization current, it is important to ensure 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 for flame supervision with ionization	
• Start prevention (extraneous light)	Intensity (parameter 954) approx. 12%
• Operation	Intensity (parameter 954) approx. 13%

Parameters	Function
954	Flame intensity



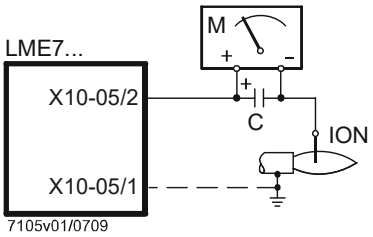
Connection diagram



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

Measuring circuit for detector current measurement

Ionization probe



Key

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

Warning!
Simultaneous operation of QRA and ionization probe is not permitted! Failure to observe this information poses a risk of damaging the safety functions.

Flame supervision with 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

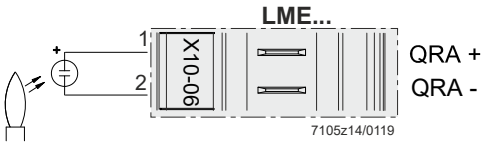
- Start prevention (extraneous light) — Intensity (parameter 954) approx. 12%
- Operation — Intensity (parameter 954) approx. 13%

Operating voltage	280 V AC ±15%
Mains frequency	50 to 60 Hz ±6%
Required detector current in operation	Min. 70 µA
Possible detector current in operation	Max. 700 µA
Permissible length of the standard detector cable (laid separately) [1]	Max. 100 m, unshielded

[1]) Multicore cable not permitted

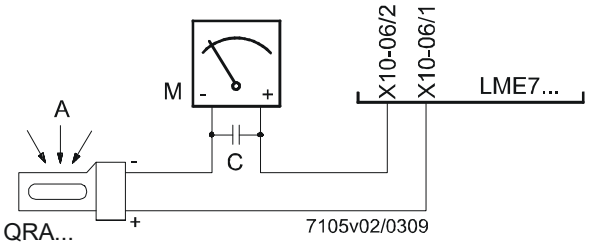
Parameters	Function
954	Flame intensity

Connection diagram



Measuring circuit for detector current measurement

UV flame detector QRA



Key

A	Incidence of light
C	Electrolytic capacitor 100 to 470 µF; 10 to 25 V DC
M	Micro-ammeter Ri max. 5,000 Ω

Warning!

- **The QRA input is not short-circuit-proof! A short-circuit in X10-06 pin 2 to ground can destroy the QRA input**
- **Simultaneous operation of QRA and ionization probe is not permitted. Failure to observe this information poses a risk of the safety functions being impaired**
- **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**

Flame supervision with 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%)
Permissible length of the standard detector cable (laid separately) [1])	Max. 3 m (core-core 100 pF/m)

[1]) 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

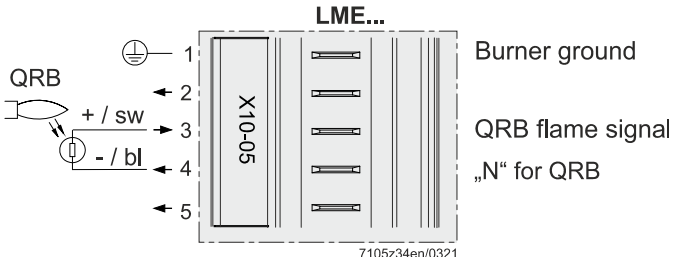
The values specified in the table only apply under the following ambient conditions and may vary under other conditions:

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

Green LED for indication of operating mode

	Detector current in operation: • Flame signal instable • Green LED flashing	Detector current in operation: • Flame signal stable • Green LED steady on
QRB	< 50%	> 50%

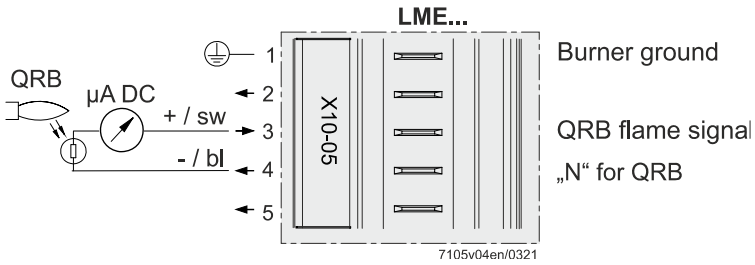
Connection diagram



Key

sw	Black
bl	Blue

Measuring circuit for detector current measurement



Key

µA DC	DC microammeter with internal resistance Ri = max. 5 kΩ
bl	Blue
sw	Black

Flame supervision with 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 ±15%
Mains frequency	50 to 60 Hz ±6%
Required detector current in operation	Min. 20 µA (display intensity approx. 35%)
Possible detector current in operation	Max. 60 µA (display intensity 100%)
Permissible length of the standard detector cable (laid separately) [1])	Max. 3 m (core-core 100 pF/m)

[1]) 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 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 QRC	
• 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

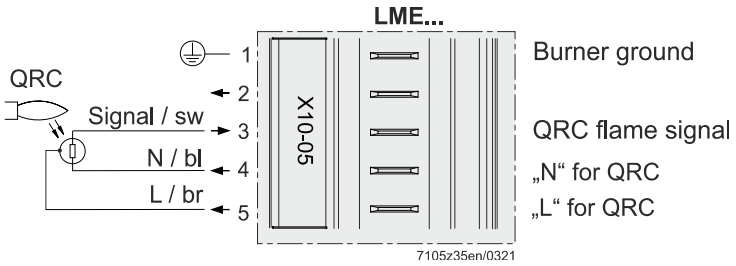
Parameters	AZL2	Function
954	FL2	Flame intensity

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

	Detector current in operation: • Flame signal instable • Green LED flashing	Detector current in operation: • Flame signal stable • Green LED steady on
QRC	< 50%	> 50%

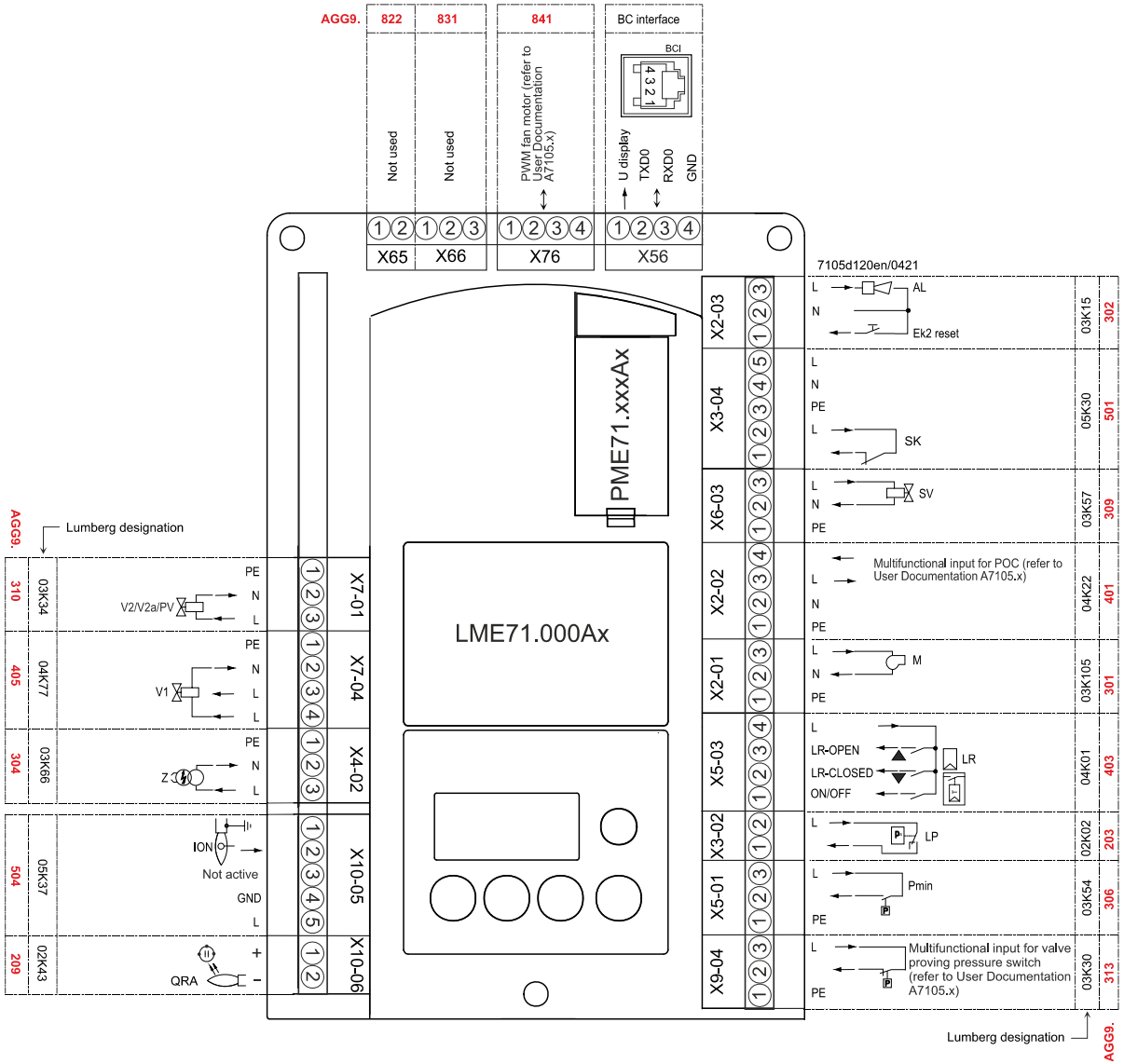
Connection diagram



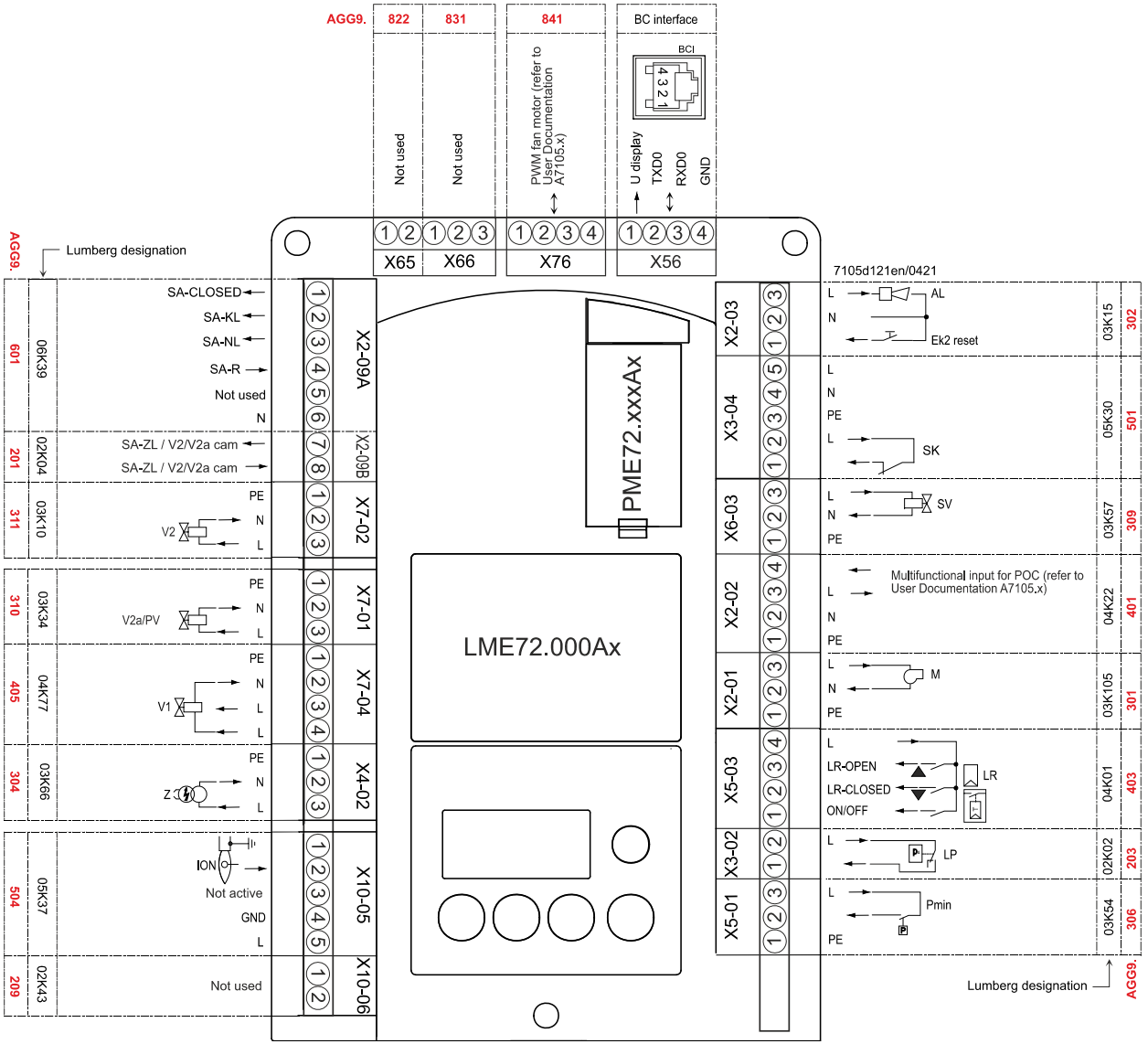
Key

sw	Black
bl	Blue
br	Brown

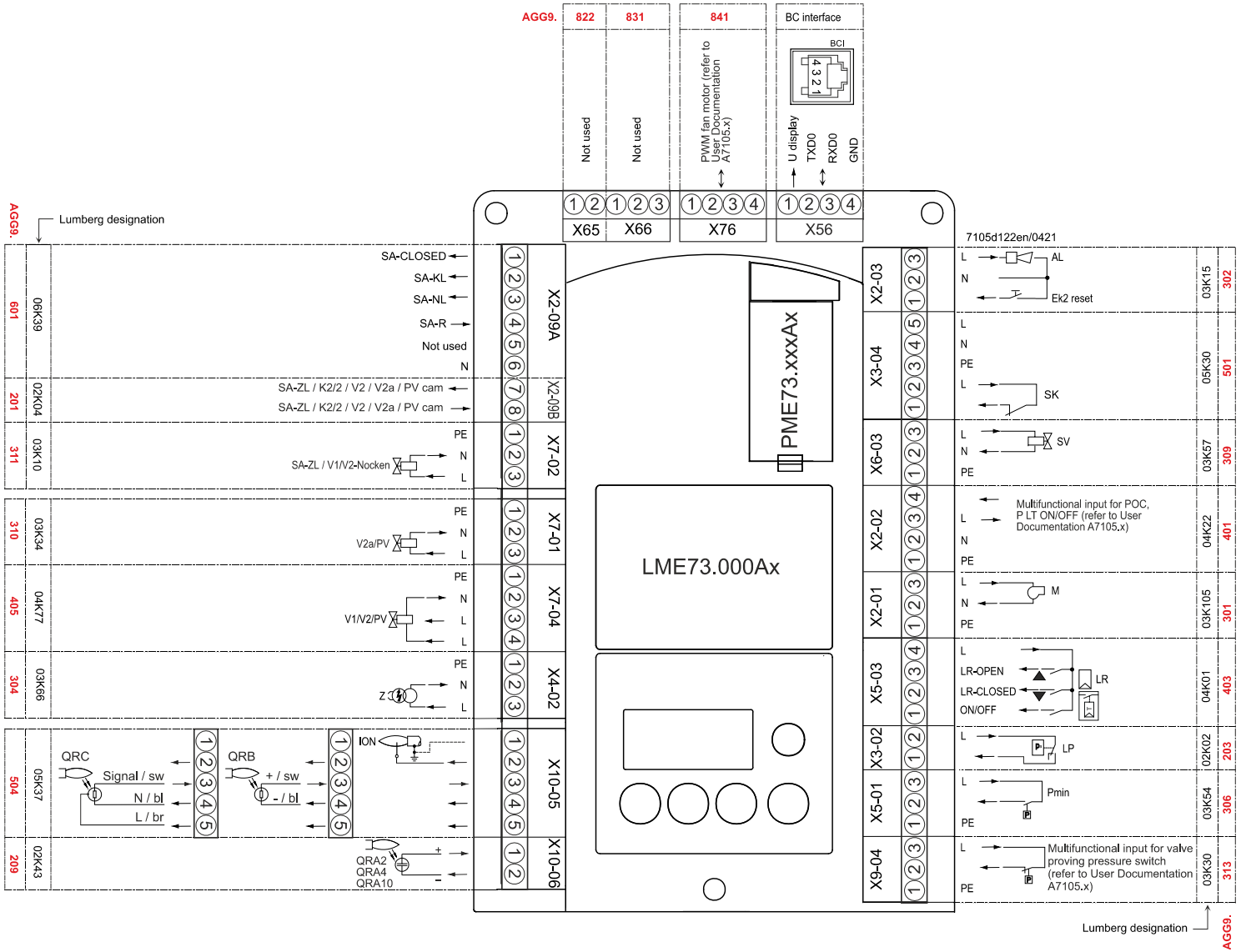
Assignment of terminals for plug AGG9 → LME71



Assignment of terminals for plug AGG9 → LME72



Assignment of terminals for plug AGG9 → LME73



Key

AL	Alarm device
AUX	Auxiliary output
Dbr…	Wire link
 /reset (EK1)	Lockout reset button (info button)
EK2	Remote lockout reset button
FSV	Flame signal amplifier
ION	Ionization probe
Kx	Relay contact
LED	3-color signal lamp
LP	Air pressure switch
LR	Load controller
LR-OPEN	Load controller OPEN position
LR-CLOSED	Load controller CLOSED position
M	Fan motor
NT	Power supply unit
P LT	Pressure switch valve proving
Pmax	Pressure switch-max
Pmin	Pressure switch-min
POC	Valve closure control (proof of closure)
PV	Pilot valve
QRA2	UV flame detector
QRA4	UV flame detector
QRA10	UV flame detector
QRB	Photo resistive detector
QRC	Blue-flame detector
R	Temperature controller or pressure regulator
SA	Actuator
SA-KL	Actuator low-fire
SA-NL	Actuator high-fire
SA-R	Actuator feedback
SA-CLOSED	Actuator CLOSED
SA-ZL	Actuator ignition load
SK	Safety loop
STB	Safety limit thermostat (SLT)
SV	Safety valve
V1	Fuel valve
V2	Fuel valve
V2a	Fuel valve
W	Temperature limiter or pressure switch
Z	Ignition transformer
µC	Microcontroller
	Input/output signal 1 (ON)
	Input/output signal 0 (OFF)
	Permissible signal 1 (ON) or 0 (OFF)

Key Dimensions

Dimensions in mm

LME7