



Presentation example PME75

Presentation example LME75

PME75.231Ax

Program module for burner control LME75.000Ax

User Documentation

- Application:**
- 1-stage, 2-stage or modulating, direct or with gas pilot burner ignited automatic forced draft burner for liquid fuels
 - Flame supervision for applications in directly ignited burners with combined supervision of the main flame and gas pilot burner:
 - With optical flame detector QRA7 (UV) or QRI (infrared)
 - Flame supervision for applications with separate supervision of the main flame and gas pilot burner:
 - Main flame with optical flame detector QRA7 (UV) or QRI (infrared)
 - Gas pilot burner with ionization probe
 - Ignition load position = low-fire position
 - Integrated actuator control via 3-position controller or analog signal
 - With or without actuator
 - Flame failure response time can be parameterized.
For example, for burners to EN 267 (forced draft burners for liquid fuels) or for industrial thermo processing plants to EN 746 Part 2
 - Continuous operation > 24 hours of uninterrupted operation

The PME75.231Ax and this user documentation are intended for original equipment manufacturers (OEMs) using the LME75.000Ax with PME75.231Ax in or on their products.



Note!

This documentation is only valid together with basic documentation LME75/LME76 (P7156)!

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1 Supplementary documentation

Product type	Designation	Documentation type	Documentation number
LME	Burner control	Environmental declaration	E7105
LME	Burner control	Product range overview	Q7101
LME75/LME76	Burner control	Data sheet	N7156
LME75/LME76	Burner control	Basic documentation	P7156
PME	Program module	Environmental declaration	E7105.1 *)

*) On request only



Note!

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

Product type	Product designation
AZL2	Display and operating unit
LFS1	Flame safeguard
QRA7	UV flame detector
QRI	Infrared flame detector
SQN7	Actuator
SQM4	Actuator
SQM5	Actuator
QPL	Pressure switch
AGG3	Connector set
AGG9	Connector set
OCI410	BC interface
ACS410	PC software
ASZ	Potentiometer

2 Warning notes



Warning!

All the safety, warning, and technical notes given in the basic documentation LME75/LME76 (P7156) also apply to this document in full.

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

The LME75.000Ax is a safety device. Do not open, interfere with or modify the unit. Siemens does not assume responsibility for damage resulting from unauthorized interference!



Warning!

On the OEM access level of the LME75, it is possible to make parameter settings that differ from application standards. When setting the parameters, it is important to ensure that the application will run safely in accordance with legal requirements. Failure to observe this information poses a risk of damaging the safety functions.

3 Typographical conventions

Safety notes

This user documentation contains notes that must be observed to ensure your personal safety and to prevent material damage. 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 damage to property **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.

Qualified personnel

Only **qualified personnel** are allowed to start up and operate the unit. Qualified personnel in the context of the safety-related notes contained in this user documentation are persons who are authorized to commission, ground, and tag units, systems, and electrical circuits in compliance with established safety practices and standards.

Correct use

Note the following:

The unit may only be used for the applications described in the technical documentation and only in conjunction 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 with care.

4 PME75.231Ax program sequence

4.1 For fuel train LO

→ For direct ignited burners, 2-stage, modulating, with actuator

→ For direct ignited burners, 1-stage, without actuator

4.1.1 Lockout position, standby, and startup

Parameter	Direct ignition		Post ignition		Actuator	
	With	Without	With	Without	With	Without
201	0					
271			>0 s	0 s		
272	0					
295			>0 s	0 s		
515.01					1	0

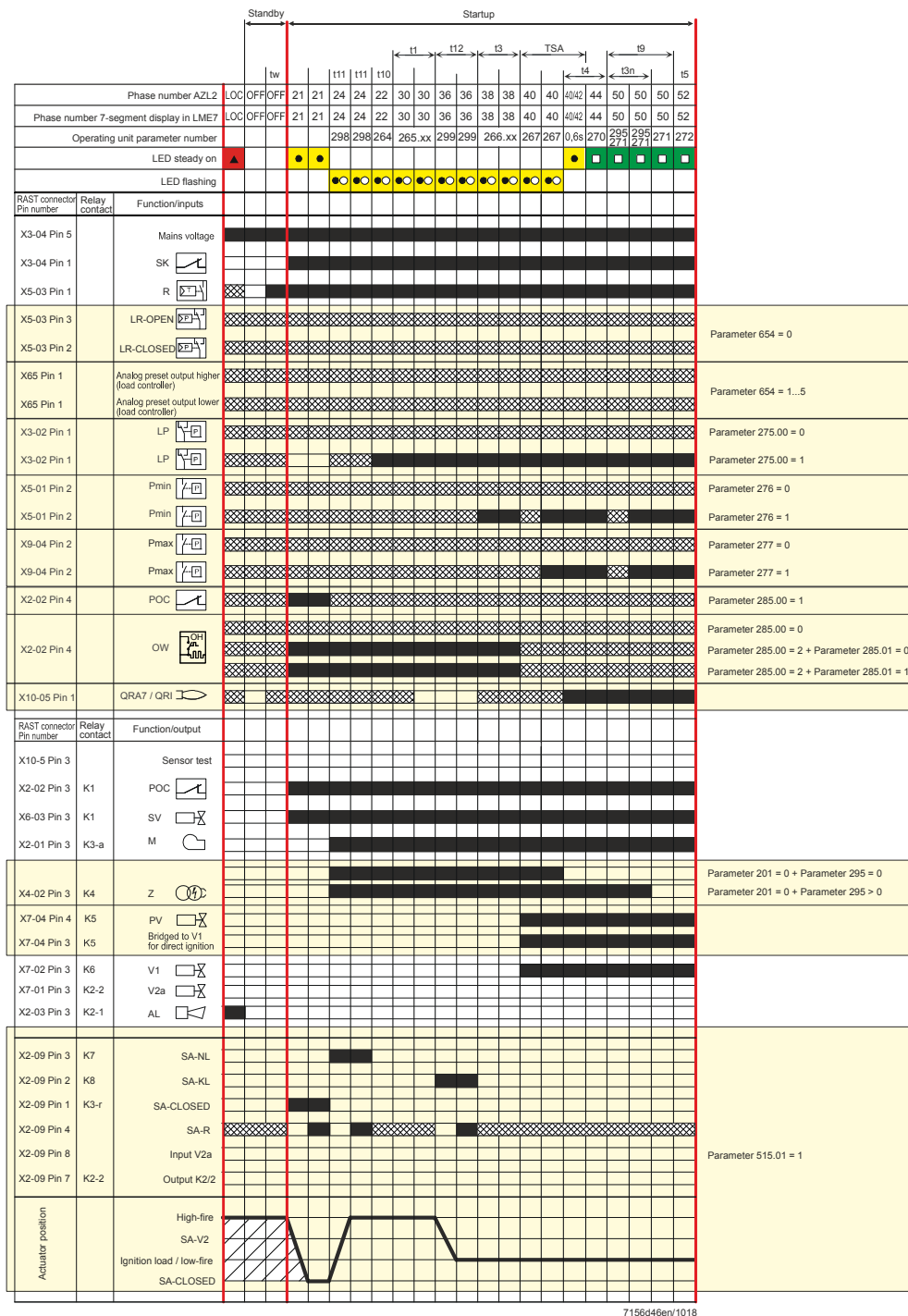


Figure 1: Program sequence for fuel train LO → Lockout position, standby, and startup



Note!
Postignition ends once the postignition time (t_{3n}) and second safety time (t_9) have elapsed.

4.2 For fuel train LOgp

→ For oil burners with gas ignition burner, 2-stage or modulating, with actuator

→ For oil burners with gas ignition burner, 1-stage, without actuator

4.2.1 Lockout position, standby, and startup

Parameter	Gas ignition burner		Post ignition		Actuator	
	With	Without	With	Without	With	Without
201	1					
295			Not permitted		0 s	
515.01					1	0

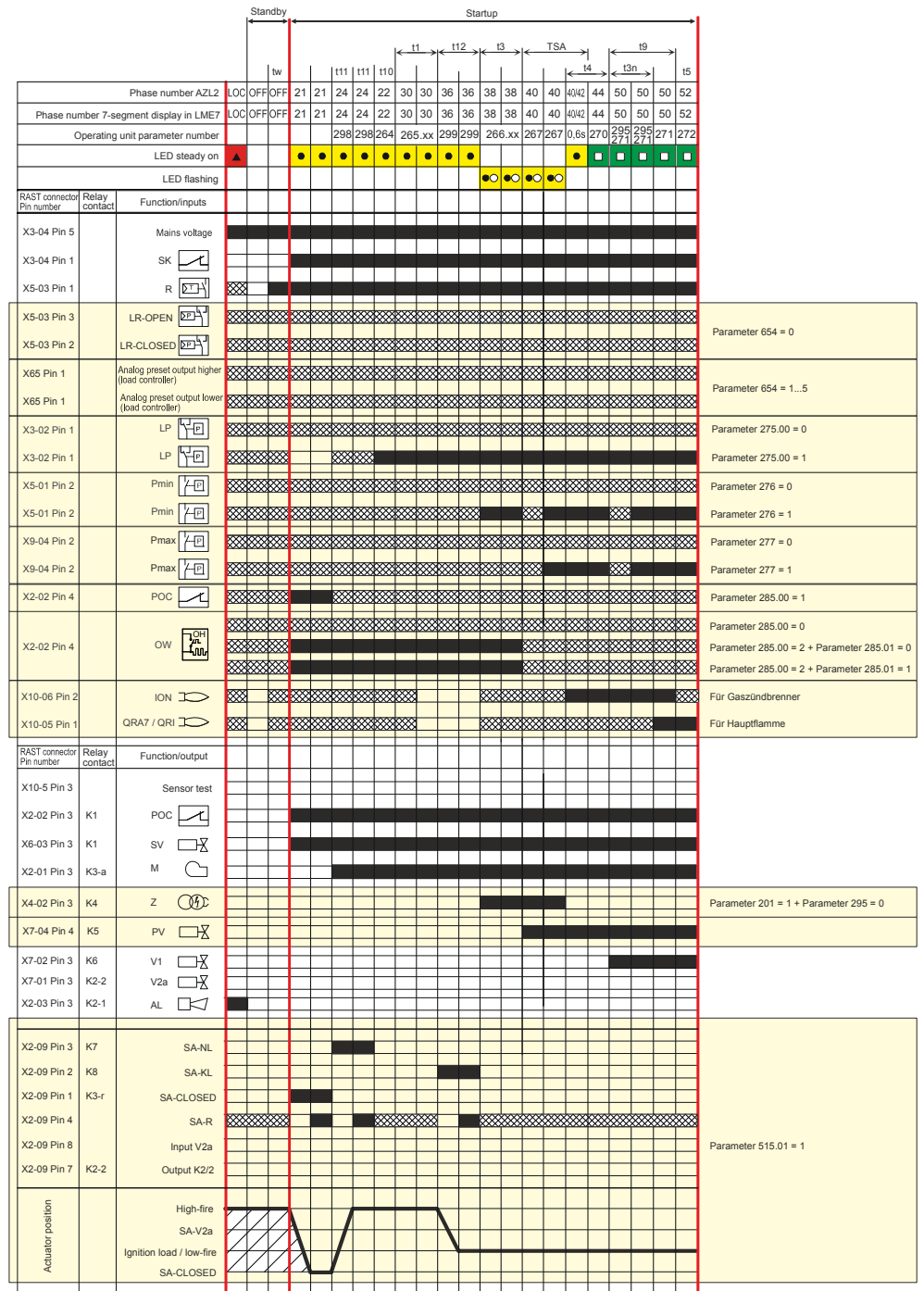


Figure 2: Program sequence for fuel train LOgp → Lockout position, standby, and startup

4.3 For fuel train LO + LOgp

4.3.1 Multistage operation and shutdown

- 2-stage operation
- With actuator

Parameter	563
Adjustment	1

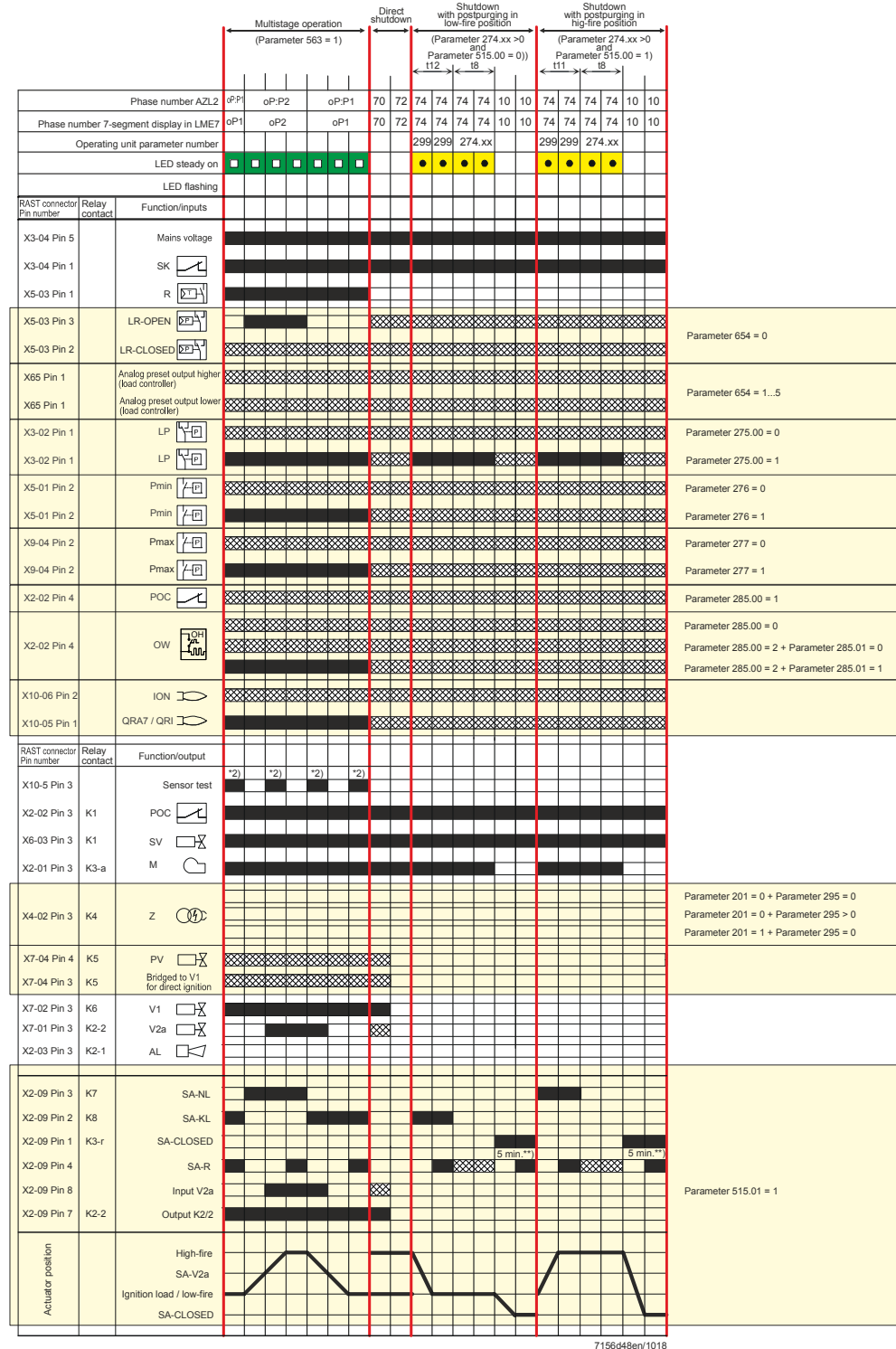


Figure 3: Program sequence for fuel train LO + LOgp → Multistage operation and shutdown

**) Timeout (waiting time) maximum 5 minutes

*2 Detector test interval 5 seconds / 5 minutes depending on parameter 180

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4.4 For fuel train LO + LOgp

4.4.1 Modulating operation and shutdown

→ With actuator

Parameter 563

Adjustment 0

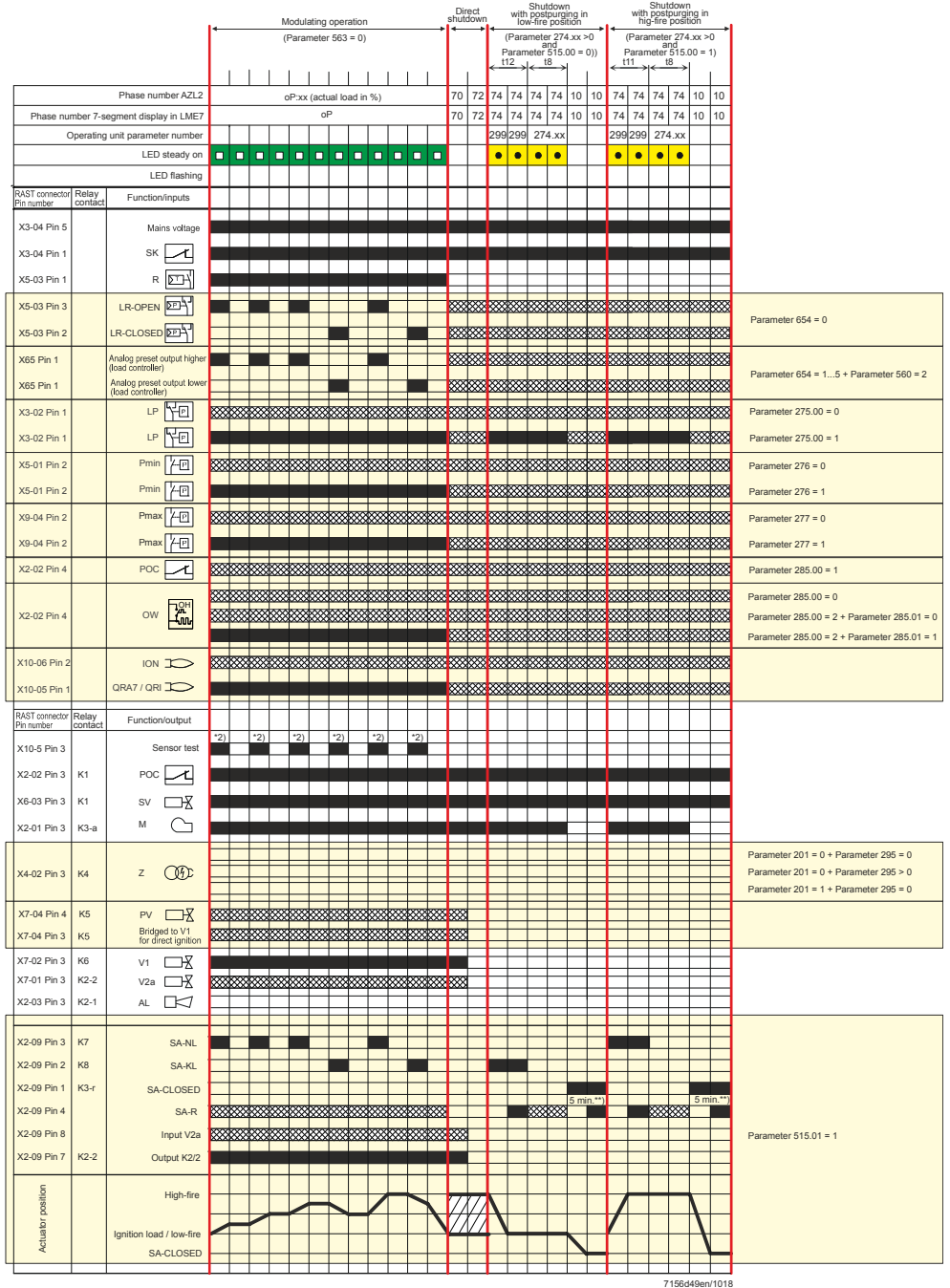


Figure 4: Program sequence for fuel train LO + LOgp → Multistage operation and shutdown

**) Timeout (waiting time) maximum 5 minutes

*2 Detector test interval 5 seconds / 5 minutes depending on parameter 180

4.1 For fuel train LO + LOgp

4.1.1 Multistage operation and shutdown

- 1-stage operation
- Without actuator

Parameter	515.01	560	563
Setting	0	0	0 or 1

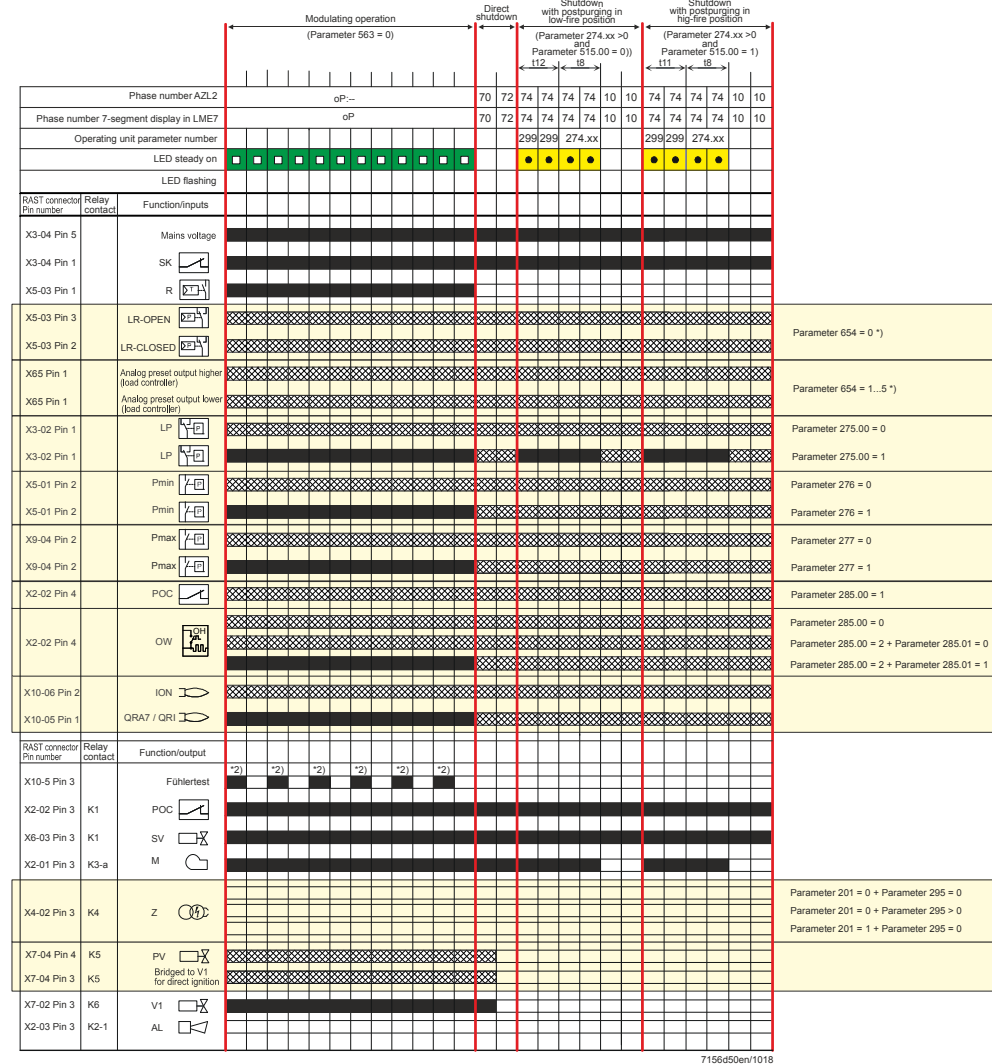


Figure 5: Program sequence for fuel train LO + LOgp → Multistage operation and shutdown

*2 Detector test interval 5 seconds / 5 minutes depending on parameter 180



Note!

Version without actuator control: Parameter 515.01 = 0



*)

Note!

In the case of operation without an actuator, parameter 560 = 0 must be set. Parameter 654 has no function. Failure to observe this information results in a non-alterable lockout (Loc: 6).



Warning!

Voltage at actuator plug-in space X2-09!

A suitable cover provided by the OEM must provide protection against electric shock hazard at plug-in space X2-09. In terms of design, stability, and protection, covers must conform to EN 60730. Failure to observe this poses a risk of electric shock.

5 List of the phase display

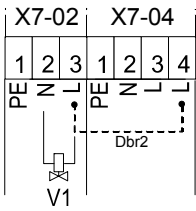
Phase number display		LED	Function
7-segment	AZL2		
LOC	LOC	Red	Lockout phase
Standby			
OFF	OFF	OFF	Standby, waiting for heat request
P08	Ph08	OFF	Power ON / test phase (e.g., detector test)
Startup			
P21	Ph21	Yellow	Safety valve ON, air pressure switch in no-load position Actuator travels to CLOSED position
P22	Ph22	Yellow	Gas: Pilot ignition Part 1: Fan motor ON Part 2: Specified time air pressure switch Message (timeout), stabilization air pressure switch
		Flashing yellow	Oil: Direct ignition Part 1: Fan motor ON Part 2: Specified time air pressure switch Message (timeout), stabilization air pressure switch
P24	Ph24	Yellow	Gas: Pilot ignition Actuator travels to the prepurge position (timeout)
		Flashing yellow	Oil: Direct ignition Actuator travels to the prepurge position (timeout)
P30	Ph30	Yellow	Gas: Pilot ignition Part 1: Prepurge time without extraneous light test Part 2: Prepurging with extraneous light test (1 second)
		Flashing yellow	Oil: Direct ignition Part 1: Prepurge time without extraneous light test Part 2: Prepurging with extraneous light test (1 second)
P36	Ph36	Yellow	Gas: Pilot ignition Actuator closed in ignition load / low-fire
		Flashing yellow	Oil: Direct ignition Actuator closed in ignition load / low-fire
P38	Ph38	Flashing yellow	Preignition time
P40	Ph40	Flashing yellow	Flame not available First safety time / ignition transformer ON
		Green	Flame available First safety time / ignition transformer ON
P42	Ph42	Yellow	Flame not available Safety time (ignition transformer OFF), flame check
		Green	Flame available Safety time (ignition transformer OFF), flame check
P44	Ph44	Green	Interval: End of safety time and fuel valve V2a ON

Phase number display		LED	Function
7-segment	AZL2		
P50	Ph50	Green	Second safety time, fuel valve V2a ON
P52	Ph52	Green	Interval until release of load controller target (analog or 3-position step input)
P54	Ph54	Green	Parameter 299: Actuator closes at low-fire
Operation			
oP	oP:xx	Green	Modulating operation (parameter 563 = 0) Actual load displayed in percent
oP1	oP:P1	Green	Multistage operation (parameter 563 = 1) First stage
oP2	oP:P2	Green	Multistage operation (parameter 563 = 1) Second stage
Shutdown			
P10	Ph10	OFF	Actuator travels to CLOSED position (home run)
P70	Ph70	Yellow	Stop operation
P72	Ph72	Yellow	Stop operation
P74	Ph74	Yellow	Actuator travels to postpurge position / postpurging
Safety shutdown phases			
P01	Ph01	Yellow/red	Undervoltage/overvoltage
P02	Ph02	Yellow	Safety shutdown, followed by a non-alterable lockout with interlocking or start prevention → e.g., safety loop open
P04	Ph04	Green/red	Extraneous light during burner startup / standby (timeout / locking after 30 seconds)

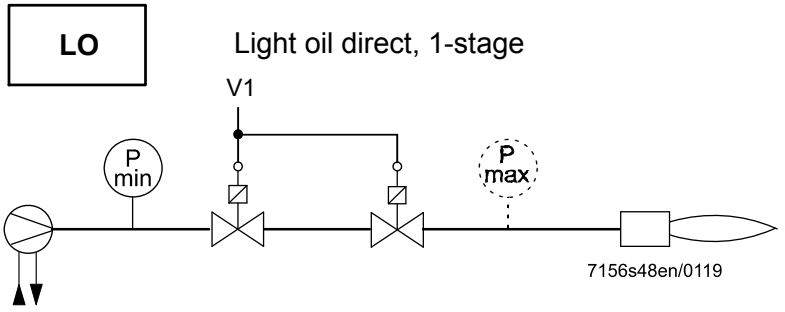
6 Fuel trains (examples)

6.1 Direct ignition with light oil (LO), 1-stage

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Program



Fuel valve control



Figure 6: Fuel train direct ignition with light oil (LO), 1-stage

Key

———— Without Dbr2

- - - - - With Dbr2

Pmax Pressure switch-max can be activated or deactivated via parameter 277

6.2 Direct ignition with light oil (LO), 2-stage

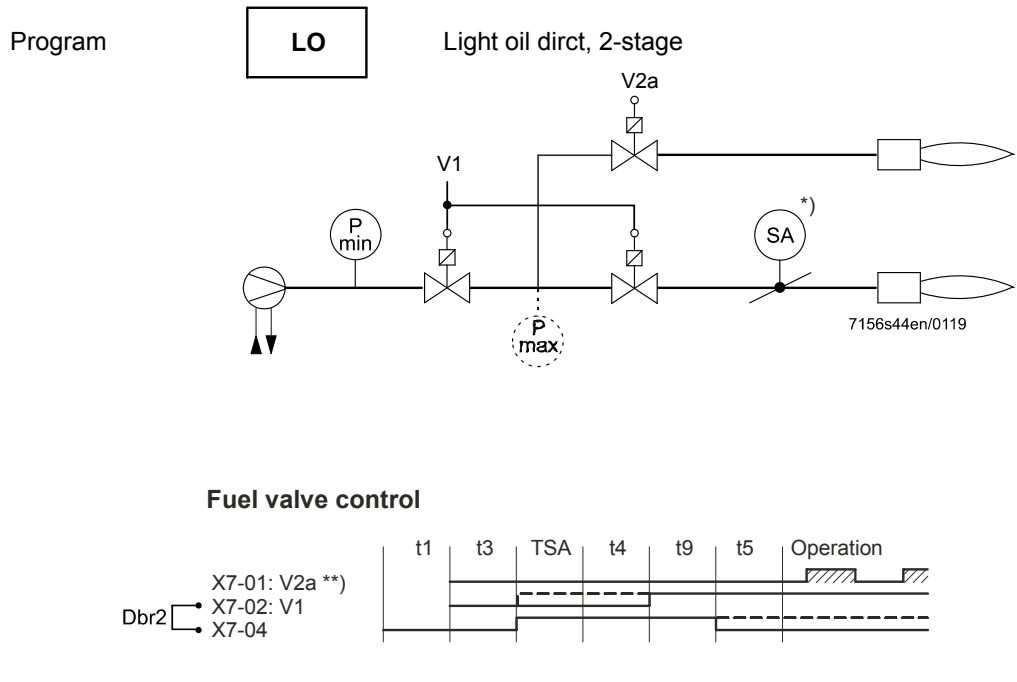


Figure 7: Fuel train direct ignition with light oil (LO), 2-stage

*) Optional

**) Depending on the actuator position

Key

————— Without Dbr2
 - - - - - With Dbr2

6.3 Direct ignition with light oil (LO), modulating, with actuator

6.3.1 Without shutdown facility for adjustable head

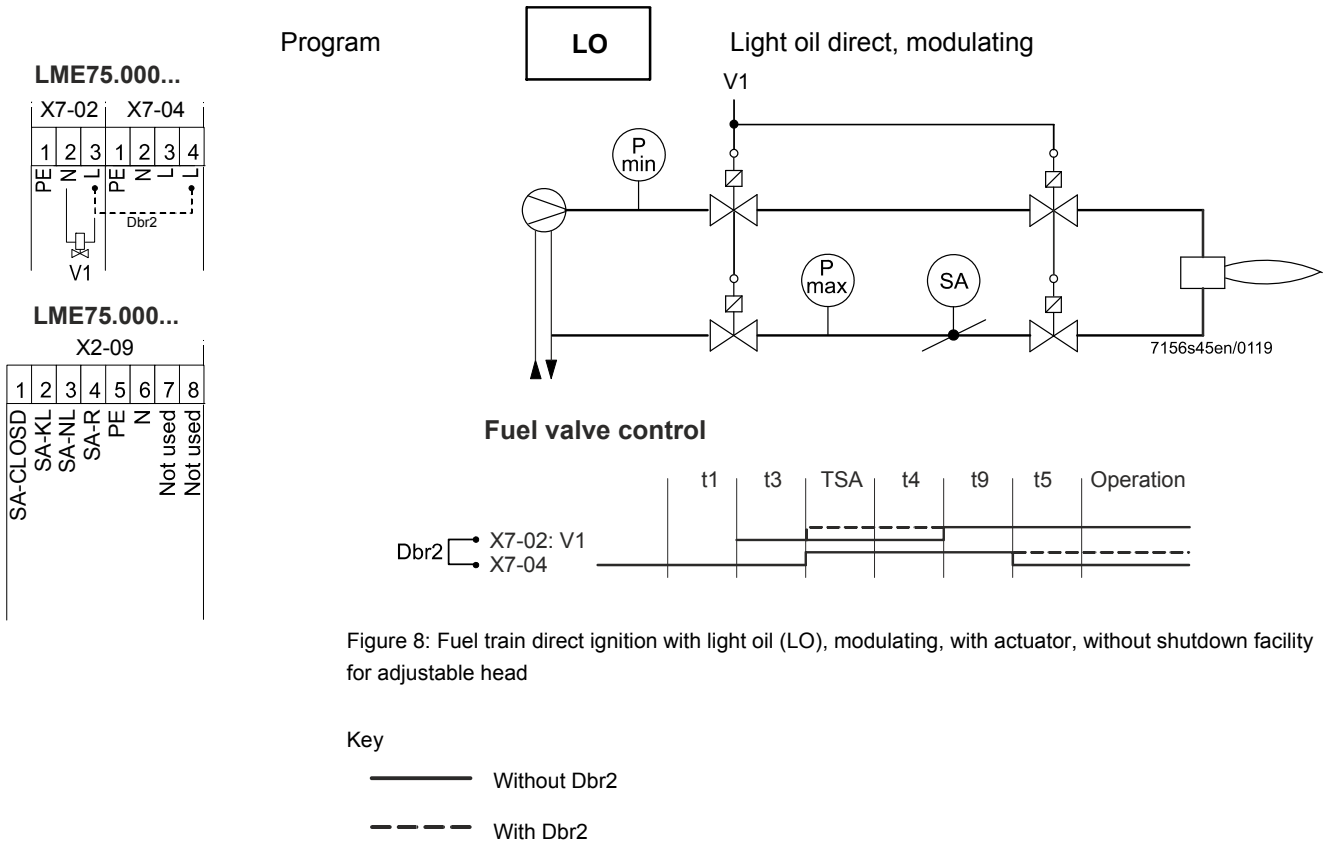


Figure 8: Fuel train direct ignition with light oil (LO), modulating, with actuator, without shutdown facility for adjustable head

Key

- Without Dbr2
- - - With Dbr2

6.3.2 With shutdown facility for adjustable head

LME75.000...

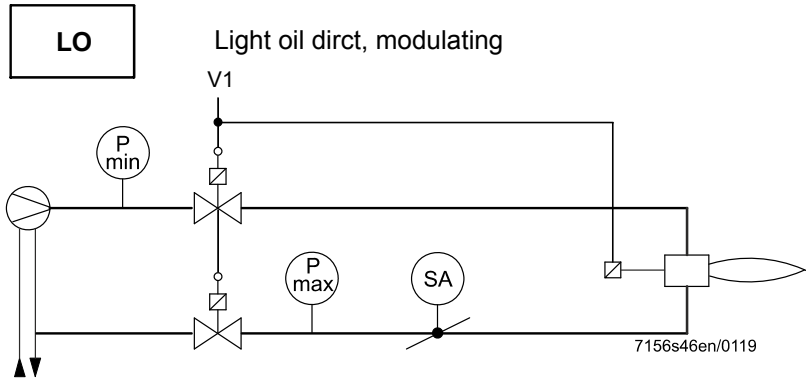
X7-02			X7-04			
1	2	3	1	2	3	4
PE	N	J	PE	N	J	J
V1			Dbr2			

LME75.000...

X2-09

1	2	3	4	5	6	7	8
SA-CLOSED	SA-KL	SA-NL	SA-R	PE	N	Not used	Not used

Program



Fuel valve control

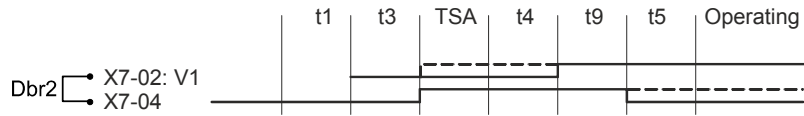


Figure 9: Fuel train direct ignition with light oil (LO), modulating, with actuator, with shutdown facility for adjustable head

Key

- Without Dbr2
- With Dbr2

6.4 Light oil with gas pilot burner (LOgp) (in accordance with EN 676)

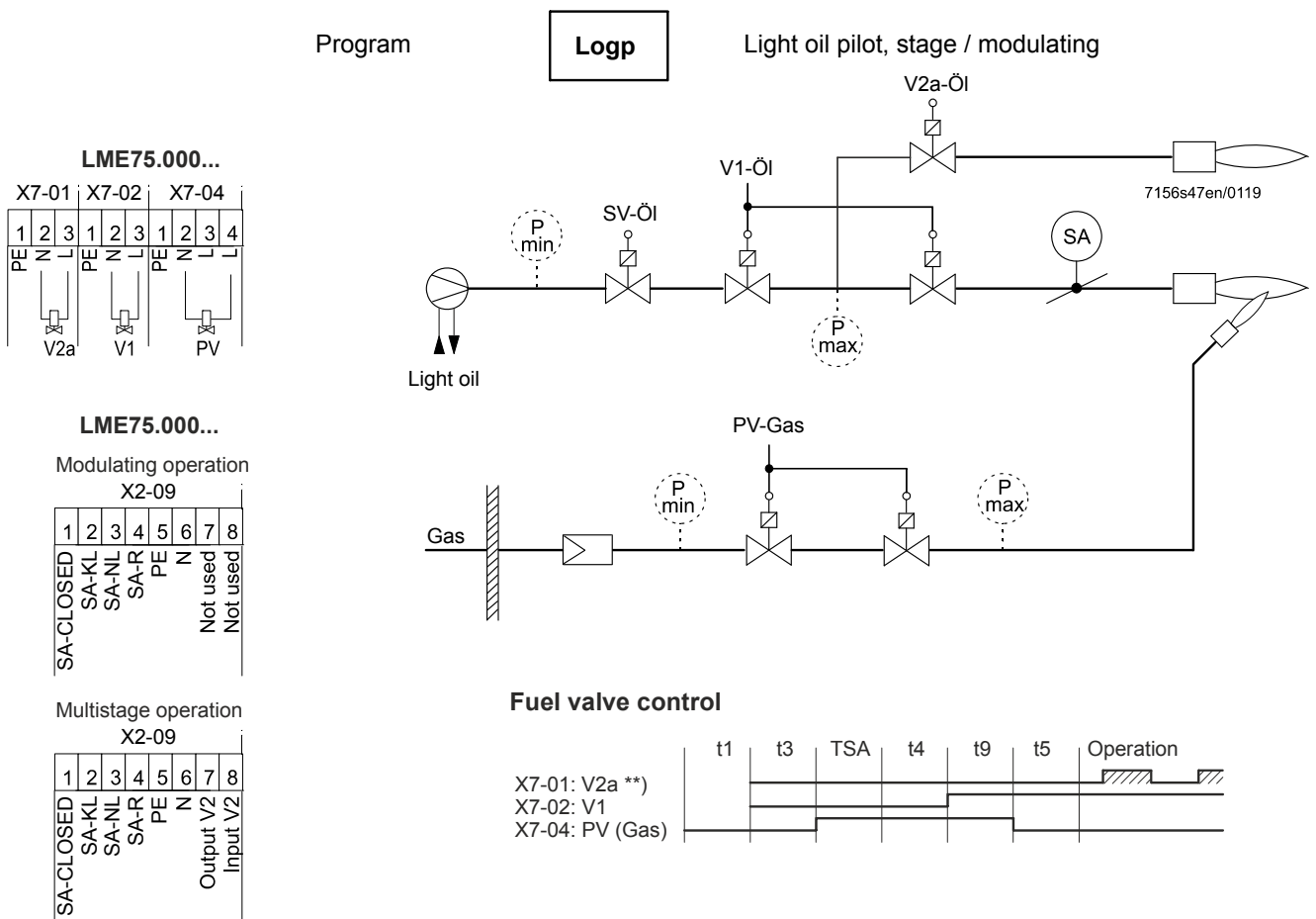


Figure 10: Fuel train light oil with gas pilot burner (LOgp) (in accordance with EN 676)

**) Depending on the actuator position

Key

— Without Dbr2

- - - With Dbr2

Pmax Pressure switch-max can be activated or deactivated via parameter 277



Note!

In the case of 2-stage applications, the switching contact on the connected actuator switches fuel valve V2a on terminal X7-01.

Please note the maximum permissible contact rating for the connected switching cam within the actuator in use, or the maximum permissible contact rating for terminal X7-01:

Rated voltage	120 V AC	230 V AC
	50/60 Hz	50/60 Hz
Rated current	1 A	1 A
Power factor	$\cos\varphi > 0.4$	$\cos\varphi > 0.4$

7 Description of inputs on LME75



Note!

This chapter covers the basic features of the LME75 inputs.
For an exact evaluation and activation of the inputs, see the program sequences in chapter 4 *PME75.231Ax program sequence*.

7.1 Air pressure switch terminal X3-02

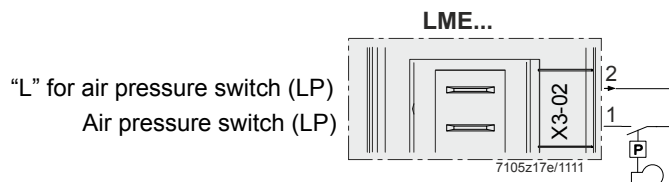


Figure 11: Air pressure switch terminal X3-02

7.1.1 Air pressure switch → specified time

Parameter	Function
264	Air pressure switch → specified time

Input for connection of an air pressure switch. The air pressure is anticipated after the fan has been switched on, depending on parameter 264. If no signal is received, this leads to a non-alterable lockout. The air pressure switch must have an NO contact.

7.1.2 Air pressure switch input

Parameter	Function
275.00	Air pressure switch input in operation 0 = No evaluation of the air pressure switch 1 = Evaluation of the air pressure switch from fan motor ON

Parameter access: OEM level

Evaluation of the air pressure switch input signal can be changed via the selection in parameter 275.00.

Where parameter 275.00 = 0

No evaluation of the air pressure switch.

Parameter 275.00 = 1

Evaluation of the air pressure switch from phase 22 (fan motor ON).



Warning!

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

7.1.3 Response time to loss of air pressure

Parameter	Function
275.01	Air pressure switch – response time to loss 0 = typically 0.7 seconds ≥ 0 = additional delay in response to faulty air pressure switch

Parameter access: OEM level

Parameter 275.01 ≥ 0

Additional delay on loss of air pressure is typically 0.7 seconds + set delay.

Parameter 275.01 = 0.294 (factory setting)

The response time to a faulty air pressure switch is ≤ 1 second.

Example

Typically 0.7 s + 2.758 s = 2.758 s (corresponds to < 3 s according to EN 746-2, chapter 5.2.5.3.4.2 *Maximum safety times for burners without fan*, table 2)

7.1.4 Extension of the prepurging

Parameter	Function
265.00	Prepurge time (t1)
265.01	Multiplicator for prepurge time (t1) (extension of the prepurging)

If required, the prepurge time can be extended to > 20 minutes and up to 87 hours. The two parameters 265.00 (prepurge time) and parameter 265.01 (multiplicator for prepurge time) can be used to this end.

The prepurge time corresponds to the time set in parameter 265.00 multiplied by parameter 265.01.

Example for a prepurge time of 1 hour:

Parameter 265.00 = 1203.048 s x parameter 265.01 = 3

→ 3609.144 s ~ 60.15 min ~ 1 h

Setting the prepurging to 1 hour can also be achieved with other combinations of the two parameters.

The factory setting is:

Parameter 265.00 = 24.255 s x parameter 265.01 = 1 → 24.255 s

7.1.5 Extension of the preignition process

Parameter	Function
266.00	Preignition time (t3)
266.01	Multiplicator for preignition time (t3) (extension of the preignition)

If required, the preignition time can be extended to > 75 seconds and up to 5 hours. The two parameters 266.00 (preignition time) and parameter 266.01 (multiplicator for preignition time) can be used to this end. The preignition time corresponds to the time set in parameter 266.00 multiplied by parameter 266.01.

Example for a prepurge time of 1 hour:
Parameter 266.00 = 74,97 s x parameter 266.01 = 48
→ 3598,56 s ~ 59,57 min ~ 1 h

Setting the preignition to 1 hour can also be achieved with other combinations of the two parameters.

The factory setting is:
Parameter 266.00 = 0 s x parameter 266.01 = 1 → Without preignition

7.1.6 Extension of the postpurging process

Parameter	Function
274.00	Postpurge time (t8) (no extraneous light test)
274.01	Multiplicator for postpurge time (t8) (extension of the postpurge process)

If required, the postpurge time can be extended to > 20 minutes and up to 87 hours. The two parameters 274.00 (postpurge time) and parameter 274.01 (multiplicator for postpurge time) can be used to this end. The prepurge time corresponds to the time set in parameter 274.00 multiplied by parameter 274.01.

Example for a postpurge time of 1 hour:
Parameter 274.00 = 1203.048 s x parameter 274.01 = 3
→ 3609.144 s ~ 60.15 min ~ 1 h

Setting the postpurging to 1 hour can also be achieved with other combinations of the two parameters.

The factory setting is:
Parameter 274.00 = 19.404 s x parameter 274.01 = 1 → Postpurging >15 seconds

7.2 Pressure switch-min terminal X5-01

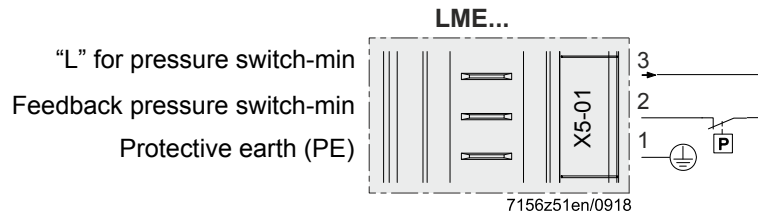


Figure 12: Pressure switch-min terminal X5-01

Parameter	Function
276	Input pressure switch-min 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])

Parameter access: OEM level

7.2.1 Evaluation of pressure switch-min input signal

Parameter access: OEM level

Evaluation of the pressure from the *pressure switch-min input signal* can be changed via the selection in parameter 276.

Parameter 276 = 0

Inactive, no signal evaluation takes place.

Parameter 276 = 1

Active, signal evaluation takes place from phase 38 (preignition).

7.3 Pressure switch-max terminal X9-04

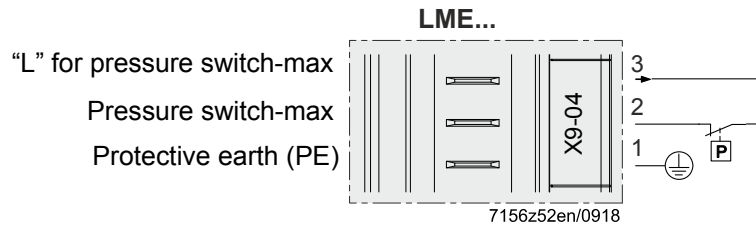


Figure 13: Pressure switch-max terminal X9-04

Parameter	Function
277	Input for pressure switch-max 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])

A pressure switch-max can be connected at input terminal X9-04 pin 2 / pin 3.

Setting the parameter:

Parameter 277 = 1 (input for pressure switch-max)

The pressure switch-max function can be activated by parameter 277 = 1. When the pressure switch-max function is active, the pressure switch-max monitors the maximum pressure and opens if it is exceeded. The monitoring starts after the safety time (TSA). If the maximum pressure is exceeded and the pressure switch-max opens, a non-alterable lockout is performed with lockout code 21.

7.4 Flame detector input

7.4.1 Ionization probe terminal X10-06

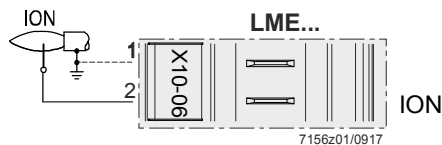


Figure 14: Ionization probe terminal X10-06

Parameter	Function
216	Extraneous light tolerance time in standby
217.00	Flame signal flame-on response time (extension) (not adjustable) 0 = maximum 1 second with ionization probe, QRA7 or QRI
217.01	Flame signal flame-out response time (extension) 0 = maximum 1 second with ionization probe, QRA7 or QRI ≥ 0 = additional extension to response to a flame fault
220	Response to extraneous light in standby or extraneous light test in the prepurging 0 = start prevention 1 = non-alterable lockout
280	<ul style="list-style-type: none"> Flame supervision with ionization probe: Restart at loss of flame during interval (t4) an second safety time (t9) Flame supervision with QRA7/QRI: Restart at loss of flame during interval (t5) and in operation 0 = no restart 1 = no restart 2...255 = 1...254 x restart
954.00	Intensity of flame for ionization probe (0...100%)

Response time

Parameter access: OEM level

Parameter 217.01 = 0

The response time to a flame fault (flame fault response time) is ≤ 1 second.

Parameter 217.01 ≥ 0

Additional delay on flame fault (flame fault response time) is 1 second + set delay.

Example

1 s + 1.911 s = 2.911 s ~3 s (e.g., EN 746-2, chapter 5.2.5.3.4.2 *Maximum safety times for burners without fan*, table 2)



Caution!

Ensure the correct polarity of the ionization probe connecting wires. If connected incorrectly to terminal X10-05, there is a risk that the LME75 and ionization probe may malfunction.



Note!

Please observe the requirements outlined in standard EN 267, chapter 4.5.6.2, with regard to flame supervision. If the gas pilot burner and the main burner each have their own flame supervision equipment, the ionization probe may only be used to supervise the flame in the gas pilot burner (in accordance with EN 676). The flame in the main burner is supervised by means of the optical flame supervision with QRA7/QRI.

7.4.2 QRA7/QRI terminal X10-05

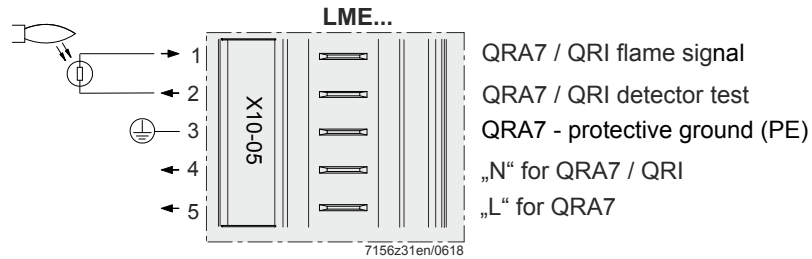


Figure 15: QRA7/QRI terminal X10-05

Parameter	Function
180	Test interval for flame detector QRA7/QRI 0 = ≤5 minutes 1 = ≤5 seconds
216	Extraneous light tolerance time in standby
217.00	Flame signal flame-on response time (extension) (not adjustable) 0 = maximum 1 second with ionization probe, QRA7 or QRI
217.01	Flame signal flame-out response time (extension) 0 = maximum 1 second with ionization probe, QRA7 or QRI ≥ 0 = additional extension to response to a flame fault
220	Response to extraneous light in standby or extraneous light test in the prepurging 0 = start prevention 1 = non-alterable lockout
280	<ul style="list-style-type: none"> Flame supervision with ionization probe: Restart at loss of flame during interval (t4) an second safety time (t9) Flame supervision with QRA7/QRI: Restart at loss of flame during interval (t5) and in operation 0 = no restart 1 = no restart 2...255 = 1...254 x restart
954.01	Intensity of flame QRA7/QRI (0...100%)

Response time

Parameter access: OEM level

Parameter 217.01 = 0

The response time to a flame fault (flame signal flame-out response time) is ≤ 1 second.

Parameter 217.01 ≥ 0

Total delay time to flame fault (flame signal flame-out response time, extension) is 1 seconds + set delay.

Example

$1 \text{ s} + 1.911 \text{ s} = 2.911 \text{ s} \sim 3 \text{ s}$ (e.g., EN 746-2, chapter 5.2.5.3.4.2 *Maximum safety times for burners without fan*, table 2)



Caution!

Ensure the QRA7/QRI connection wires are connected properly and in-phase. If connected incorrectly to terminal X10-05, there is a risk that the LME75 and QRA7/QRI may malfunction.



Note!

Please observe the requirements outlined in standard EN 267, chapter 4.5.6.2, with regard to flame supervision.

Only optical flame supervision with QRA7/QRI may be used for directly ignited burners.

For burners with a separate gas pilot burner (in accordance with EN 676), the flame in the gas pilot burner and the flame in the main burner can be supervised together by means of optical flame supervision with QRA7/QRI.

OR

If the gas pilot burner and the main burner each have their own flame supervision equipment, the ionization probe must be used to supervise the flame in the gas pilot burner.

The flame in the main burner must be supervised by means of the optical flame supervision with QRA7/QRI.

Test interval for continuous operation

Parameter access: OEM level

The interval for testing the QRA7/QRI for continuous operation can be changed via the selection in parameter 180.

Parameter 180 = 0

The flame detector test in the operating position is triggered every 5 minutes.

Parameter 180 = 1

The flame detector test in the operating position is triggered every 5 seconds.

Parameter	Function
180	Test interval for flame detector QRA7/QRI 0 = ≤5 minutes 1 = ≤5 seconds



Warning!

Risk of mixing up with LME71/LME73.

Only QRA7 or QRI may be connected to connection terminal X10-05.

Only an ionization probe may be connected to connection terminal X10-06.

Failure to observe this information poses a risk of loss of device functions or a fault in the LME75 equipment.



Warning!

The QRA7 input is not short-circuit-proof.

A short circuit in terminal X10-05 pin 2 to ground can destroy the QRA7 input.

Failure to observe this information poses a risk of loss of device functions.



Warning!

It is not permitted to connect the LFS1. Failure to observe this information poses a risk of damaging the LME75.



Note!

If an ionization probe is operated simultaneously with a QRA7 or QRI, be sure to note the parameter settings.

7.5 Limitation of restarts

Parameter	Functions
280	<ul style="list-style-type: none">Flame supervision with ionization probe: Restart at loss of flame during interval (t4) an second safety time (t9)Flame supervision with QRA7/QRI: Restart at loss of flame during interval (t5) and in operation <p>0 = no restart 1 = no restart 2...255 = 1...254 x restart</p>

7.5.1 Restart in the event of loss of flame

If the main flame is lost during interval (t5) or operation, or the pilot flame during interval (t4) or the second safety time (t9), several restarts per controlled startup can be performed via the control thermostat or pressurestat, or else a non-alterable 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-alterable lockout will be initiated.

7.6 Logical combination and evaluation of the flame signal inputs for the ionization probe and QRA7/QRI

Parameter access: OEM level

The two flame signal inputs (ionization probe and QRA7/QRI) are *logically* combined or evaluated depending on the program phases.



Note!

An **OR** operation is always used for extraneous light detection in the startup or standby phases.

This means that, as soon as a flame signal is detected at one of the two flame signal inputs during extraneous light detection (phase 30), a non-alterable lockout is performed (Loc: 4).

At the end of the first safety time until the end of phase 50, at least one of the two flame signals must be available. If no flame signal has been established at the end of the first safety time, a non-alterable lockout is performed (Loc: 2).

At the end of the second safety time until the end of burner operation (end of phase oP:xx), the flame signal must be available at the QRA7/QRI input. If the flame signal at the QRA7/QRI input extinguishes, a non-alterable lockout is performed (Loc: 7).

If a flame signal is present at the input of the ionization probe, the period from the end of the second safety time to the end of the burner operation (end of phase oP:xx) is not evaluated.



Note!

Please observe the requirements outlined in standard EN 267, chapter 4.5.6.2, with regard to flame supervision.

Only optical flame supervision with QRA7/QRI may be used for directly ignited burners.

For burners with a separate gas pilot burner (in accordance with EN 676), the flame in the gas pilot burner and the flame in the main burner can be supervised together by means of optical flame supervision with QRA7/QRI.

OR

If the gas pilot burner and the main burner each have their own flame supervision equipment, the ionization probe must be used to supervise the flame in the gas pilot burner.

The flame in the main burner must be supervised by means of the optical flame supervision with QRA7/QRI.

7.7 Behavior in the event of extraneous light

Parameter	Function
216	Extraneous light tolerance time in standby
220	Response to extraneous light in standby or extraneous light test in the prepurging 0 = start prevention 1 = non-alterable lockout

Parameter access: OEM level

The response to extraneous light in standby or during the extraneous light test in the prepurging can be changed using the option in parameter 220.

Parameter 220 = 0

In the event of an extraneous light signal in standby or during the extraneous light test in prepurging, a signal is output via the LED (red/green) and via the 7-segment display (P04) / AZL2 (Ph04).

A safety shutdown and start prevention takes place.

Once the extraneous light signal has been extinguished, a restart is carried out.

Parameter 220 = 1

In the event of an extraneous light signal during the extraneous light test in the prepurging, a non-alterable lockout is performed (Loc: 4).

In the event of an extraneous light signal in standby, a signal is output via the LED (red/green) and via the 7-segment display (P04) / AZL2 (Ph04). Once the extraneous light tolerance time in standby has elapsed, a non-alterable lockout is performed (Loc: 4).

This extraneous light tolerance time can be parameterized by parameter 216 in the range of 0...1237 seconds (factory setting 30 seconds).

7.8 Analog input load controller terminal X65

→ Only in modulating operation

PME75.231Ax

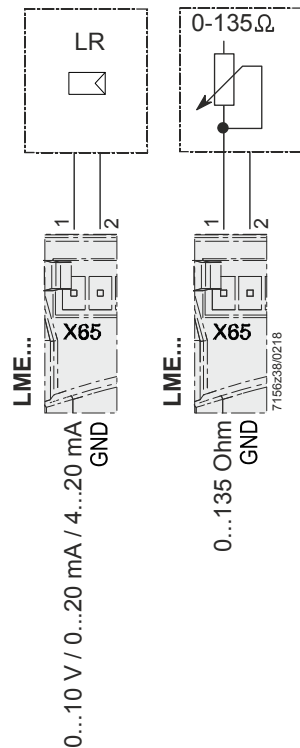


Figure 16: Load controller terminal X65

Parameter	Function
140	Mode display in the 7-segment display 1 = standard (program phase) 2 = flame 1 (ionization) 3 = flame 2 (QRA7/QRI) 4 = active power (power value)
560	Pneumatic combustion control 0 = OFF / 3-position step modulation 1 = PWM fan motor / analog modulation <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Note! Setting = 1 No function. This selection puts the LME75 in lockout position.</p> </div> 2 = Air damper / analog modulation (ASZxx.3x feedback required)
563	Operating mode of the ratio control 0 = modulating 1 = multistage
654	Only with analog modulating (parameter 560 = 2) Analog input (ASZxx.3x feedback required) 0 = 3-position step input 1 = 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4 = 4...20 mA with a non-alterable lockout at I < 4 mA 5 = 4...20 mA without a non-alterable lockout at I < 4 mA

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

- 3-position step input for modulation with analog signal (feedback ASZxx.3x required / depending on the program sequence)
- 0...10 V
- 0...135 Ω
- 0...20 mA
- 4...20 mA with a non-alterable lockout at $I < 4$ mA (AZL2: Loc: 60)
- 4...20 mA without a non-alterable lockout at $I < 4$ mA



Note!

Shielded cables must be used if cables are > 10 m.

Parameter access: Heating engineer level

The function of the analog input *load controller* terminal X65 can be adapted via parameter 654.

Parameter 654 = 0

3-position step input (factory setting)

With this setting, load control takes place solely via the contact inputs for the external load controller terminal X5-03 pin 2 and 3.

Parameter 654 = 1...4

Load control via analog input terminal X65

With this setting, load control takes place via a preset analog value.

An analog signal (terminal X65) is only taken into account in the operating phases (oP). If a signal is present during startup, shutdown, standby, and in the lockout position, it is ignored.



Note!

Load control via analog input terminal X65 always requires an actuator with a built-in potentiometer for position feedback and the analog modulation to be activated (parameter 560 = 2).

The display mode for the internal 7-segment display is defined via parameter 140.

Setting 1 = standard (program phase, factory setting)

Setting 2 = flame 1 (ION)

Setting 3 = flame 2 (QRA7/QRI)

Setting 4 = active power

(power value, only for actuators with a built-in ASZ for position feedback)

7.9 External load controller (ON/OFF) terminal X5-03

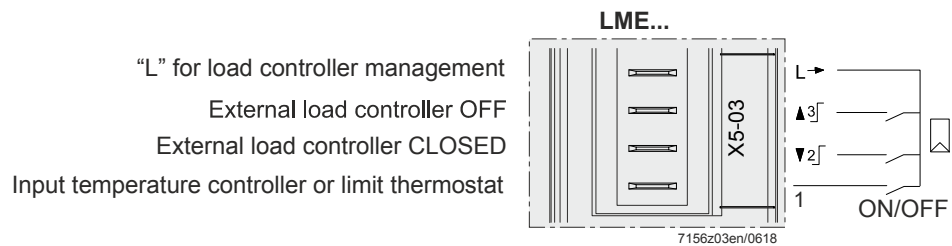




Figure 17: Load controller ON/OFF terminal X5-03

Parameter	Function
272	Interval (t5): Stabilization time main flame
274.00	Postpurge time (t8) (no extraneous light test)
274.01	Multiplicator for postpurge time (t8) (extension of the postpurge process)
515.00	Actuator position during postpurge time (t8) 0 = Purging in low-fire 1 = Purging in high-fire
515.01	Actuator control 0 = OFF 1 = ON
	<p> Note! Setting = 0 No actuators may be connected and parameter 560 must be set to 0.</p>
560	Pneumatic combustion control 0 = OFF / 3-position step modulation 1 = PWM fan motor / analog modulation
	<p> Note! Setting = 1 No function. This selection puts the LME75 in lockout position.</p>
	2 = Air damper / analog modulation (ASZxx.3x feedback required)
563	Operating mode of the ratio control 0 = modulating 1 = multistage
654	Only with analog modulating (parameter 560 = 2) Analog input (ASZxx.3x feedback required) 0 = 3-position step input 1 = 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4 = 4...20 mA with a non-alterable lockout at I < 4 mA 5 = 4...20 mA without a non-alterable lockout at I < 4 mA

The load controller input is evaluated by making a 2-out-of-3 selection. 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 LME75.000Ax.

Terminal X5-03 pin 1

Heat request (input external temperature controller or limit thermostat):

The burner starts if a signal (L → terminal X5-03 pin 4) is present at pin 1 for a heat request.

The burner shuts down and then enters standby once a heat request (at L → terminal X5-03 pin 4) is no longer present.

7.9.1 Shutdown sequence

Burner without actuator: Parameter 515.01 = 0

The burner without actuator shuts down and then enters standby once a heat request (at L → terminal X5-03 pin 4) is no longer present.

Burner with actuator, without postpurge time (t8):

Parameter 274.xx = 0, parameter 515.01 = 1

The burner shuts down in the final actuator position and then enters standby once a heat request (at L → terminal X5-03 pin 4) is no longer present.

Burner with actuator, with postpurge time (t8) in low-fire position:

Parameter 274.xx > 0, parameter 515.01 = 1, parameter 515.00 = 0

The burner travels the actuator in low-fire position and starts the postpurging according to the time settings in parameter P274.xx. Once the postpurge time is complete, the burner shuts down and then enters standby once a heat request (at L → terminal X5-03 pin 4) is no longer present.

Burner with actuator, with postpurge time (t8) in high-fire position:

Parameter 274.xx > 0, parameter 515.01 = 1, parameter 515.00 = 1

The burner travels the actuator in high-fire position and starts the postpurging according to the time settings in parameter P274.xx. Once the postpurge time is complete, the burner shuts down and then enters standby once a heat request (at L → terminal X5-03 pin 4) is no longer present.

7.9.2 Modulating operation: Parameter 563 = 0

Terminal X5-03 pin 2

Load controller CLOSED (input *external load controller CLOSED*)

A signal (L → terminal X5-03 pin 4) at pin 2 is ignored during startup, shutdown, standby, or in the lockout position. If a signal is present in the operating phases (oP), the actuator travels toward the low-fire position. If no signal is present in the operating phases (oP), the actuator stays in the position it has reached.

Terminal X5-03 pin 3

Load controller OPEN (input *external load controller OPEN*)

A signal (L → terminal X5-03 pin 4) at pin 3 is ignored during startup, shutdown, standby, or in the lockout position. If a signal is present in the operating phases (oP), the actuator travels toward the high-fire position. If no signal is present in the operating phases (oP), the actuator stays in the position it has reached.

7.9.3 Multistage operation: Parameter 563 = 1

Terminal X5-03 pin 2

Load controller CLOSED (input *external load controller CLOSED*)

A signal (L → terminal X5-03 pin 4) at pin 2 is ignored during startup, shutdown, standby, or in the lockout position. If a signal is present in the operating phases, it is ignored.

Terminal X5-03 pin 3

Load controller OPEN or high-fire stage (input *external load controller OPEN*)

A signal (L → terminal X5-03 pin 4) at pin 3 is ignored during startup, shutdown, standby, or in the lockout position. If a signal is present in the operating phase (oP1), the actuator travels to the high-fire position (oP2). If there is no signal present in the operating phase (oP2), the actuator travels to the low-fire position (oP1).

7.10 Safety loop terminal X3-04

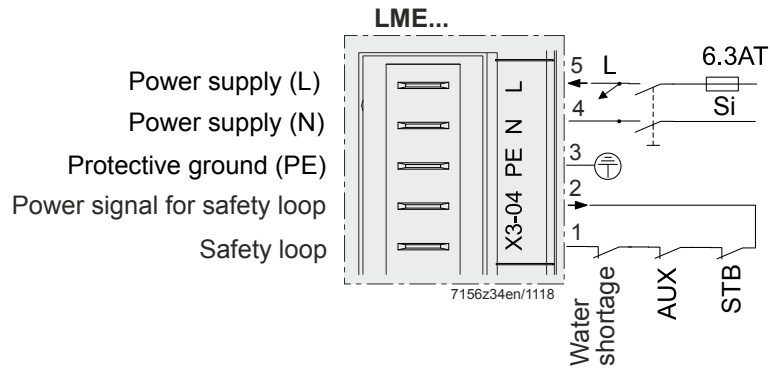


Figure 18: Safety loop terminal X3-04

Parameter	Function
215.00	Response when opening the safety loop (safety loop failure) 0 = safety shutdown and start prevention 1 = safety shutdown followed by non-alterable lockout
215.01	Tolerance time for the <i>safety loop during heat request</i> (start of startup sequence after standby)

Input for 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 is instantly cut.

The following contacts are included in the safety loop:

- Safety limiter / safety pressure limiter
- External limit thermostat and/or pressure switch, if required
- Water shortage switch

Parameter access: OEM level

The response to opening the safety loop can be changed with the options in parameter 215.xx. For diagnostic purposes, the contacts of the safety loop are combined to the message *safety loop*.

Parameter 215.00 = 0

If the safety loop is not closed during a heat request or else opens during operation, a safety shutdown and start prevention take place. If the safety loop is or becomes closed again, a restart takes place.

Parameter 215.00 = 1

If the safety loop opens during operation, a non-alterable lockout is performed (Loc: 22). If the safety loop is not closed during a heat request (load controller ON/OFF at terminal X5-01 pin 3), a non-alterable lockout is performed (Loc: 22) once the tolerance time for the *safety loop during heat request* parameter 215.01 > 0 seconds.

Parameter 215.01 > 0 seconds

If the tolerance time for the safety loop elapses during a heat request, either a safety shutdown or a non-alterable lockout is performed (Loc: 22) depending on parameter 215.00.



Note!

The power signal for the safety loop is only active if a heat request (load controller ON/OFF) is present at terminal X5-01 pin 3. In the lockout position, the power signal switches off too.



Warning!

The in-phase connection of the power supply must be observed. Failure to observe this information poses a risk of loss of device functions.

8 Function input/output terminal X2-02



Note!

This chapter covers the basic features of the function input/function outputs of terminal X2-02. For an exact evaluation and activation of the outputs, see the program sequences in chapter 4 *PME75.231Ax program sequence*.

8.1 POC function input



Figure 19: POC function input terminal X2-02

8.2 Oil preheater function input / oil temperature limiter function output

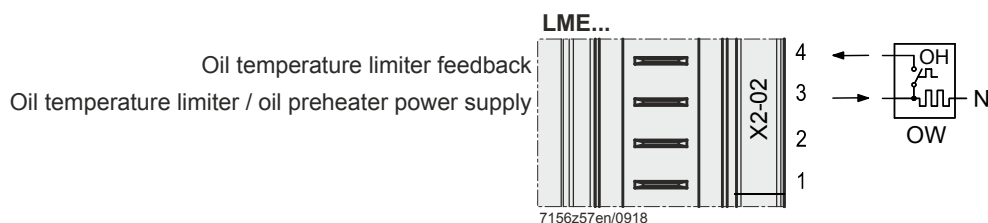


Figure 20: Oil preheater / oil temperature limiter terminal X2-02

Parameter	Function
285.00	Function input terminal X2-02, oil temperature limiter / POC 0 = inactive 1 = POC input (valve closing control) 2 = Oil temperature limiter input
285.01	Evaluation of the oil temperature limiter 0 = inactive during operation 1 = active during operation
296	Oil preheater waiting time (timeout) 600 seconds (factory setting)

Parameter 285.00 defines which function is required.

Function output terminal X2-02 pin 3 serves as a power supply for an oil preheater, oil temperature limiter, or POC (valve closing control).

Parameter access: OEM level

Parameter 285.00 is used to determine the oil temperature limiter or POC (valve closing control) function of the function input terminal X2-02 pin 4.

Parameter 285.01 defines how the oil temperature limiter is tested.

Parameter 285.00 = 0 (factory setting)

Function input terminal X2-02 pin 4 is not evaluated. The function input does not need to be connected.

Parameter 285.00 = 1

Function input terminal X2-02 pin 4 is used as a POC (valve closing control). The fully closed position of the POC is not subject to a safety-relevant check during startup (phase 21). The POC can be replaced with a wire link Dbr1.

The POC contact must be closed after a maximum waiting time of 5 seconds at the start of phase 21.

An incorrect signal from the POC is detected in the corresponding phases and leads to a non-alterable lockout (LOC: 14).



Warning!

Welding the POC contact.

If several contacts are connected in series, the valve closure contact (POC) must not be welded in the closed position.

Parameter 285.00 = 2

Function input terminal X2-02 pin 4 is used to provide feedback from the oil temperature limiter.

The signal for the oil temperature limiter is checked during startup (phases 21...38) and during operation depending on parameter 285.01.

The signal for the oil temperature limiter must be closed, latest after end of the oil preheater waiting time (parameter 296), at the start of phase 21.

Depending on parameter 285.01 = 1, the signal from the oil temperature limiter must also remain closed in the operating position.

An incorrect signal from the oil temperature limiter leads to a non-alterable lockout (LOC: 8).

Parameter 285.01 = 0 (factory setting)

The signal for the oil temperature limiter is evaluated during startup (phase 21...38).

Parameter 285.01 = 1

The signal for the oil temperature limiter is evaluated during startup (phases 21...38) and during the operating phase.

Parameter 296 > 0 seconds (factory setting = 600 seconds)

Oil preheater waiting time (timeout) defines the time frame at the start of the startup sequence (phase 21).

A signal must be issued by the oil temperature limiter by no later than the end of the oil preheater waiting time.

An incorrect signal from the oil temperature limiter leads to a non-alterable lockout (LOC: 8).

9 Description of outputs on LME75



Note!

This chapter covers the basic features of the LME75 outputs. For an exact evaluation and activation of the outputs, see the program sequences in chapter 4 *PME75.231Ax program sequence*.

9.1 Fan motor terminal X2-01

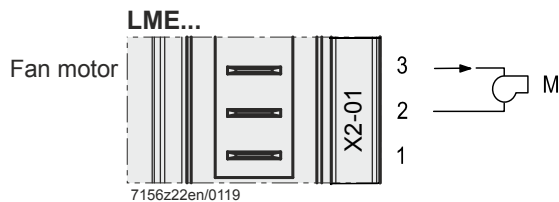


Figure 21: Fan motor terminal X2-01

Output for connection of a fan motor.

9.2 Alarm terminal X2-03

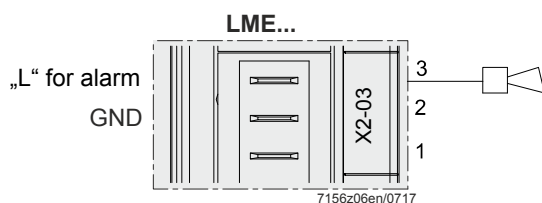


Figure 22: Alarm terminal X2-03

Output for connection of an alarm lamp or horn.
The output is activated when the LME75 is in the lockout position.

9.3 Actuator terminal X2-09

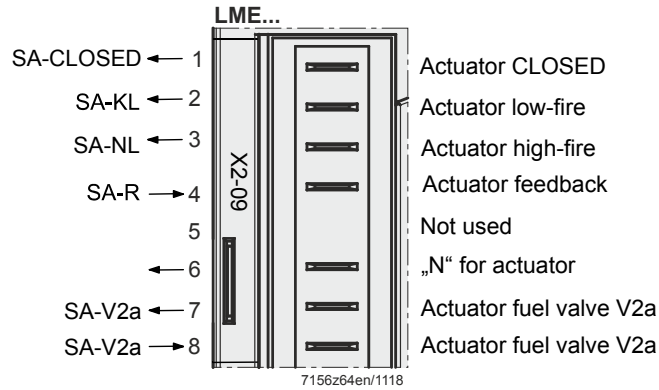




Figure 23: Actuator terminal X2-09

Parameter	Function
123	Minimum load control step
272	Interval (t5): Stabilization time main flame
274.00	Postpurge time (t8) (no extraneous light test)
274.01	Multiplicator for postpurge time (t8) (extension of the postpurge process)
298	Opening time of actuator (timeout)
299	Closing time of actuator (timeout)
515.01	Actuator control 0 = OFF 1 = ON
	<p> Note! Setting = 0 No actuators may be connected and parameter 560 must be set to 0.</p>
560	Pneumatic combustion control 0 = OFF / 3-position step modulation 1 = PWM fan motor / analog modulation
	<p> Note! Setting = 1 No function. This selection puts the LME75 in lockout position.</p> <p>2 = Air damper / analog modulation (ASZxx.3x feedback required)</p>
563	Operating mode of the ratio control 0 = modulating 1 = multistage
654	Only with analog modulating (parameter 560 = 2) Analog input (ASZxx.3x feedback required) 0 = 3-position step input 1 = 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4 = 4...20 mA with a non-alterable lockout at I < 4 mA 5 = 4...20 mA without a non-alterable lockout at I < 4 mA

The actuators are powered by mains voltage delivered directly via the LME75.

9.3.1 Connection of feedback actuator position with ASZ in actuator at terminal X66

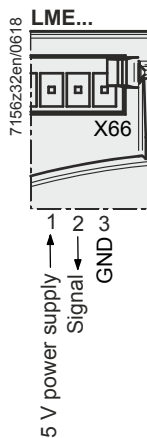


Figure 24: Actuator terminal X66

Type	Terminal X66			Direction of rotation	
	Pin 1 (5 V signal)	Pin 2 (Signal)	Pin 3 (GND)	Clockwise	Counterclockwise
ASZ	a	b	c	•	---
ASZ	c	b	a	---	•
Terminal ASZxx30 (1 kΩ conductive plastic 90°)					

9.3.2 Engineering notes

Connection diagram

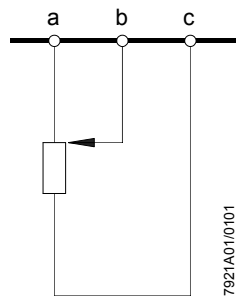


Figure 25: ASZ connection diagram

ASZ shown in start position.

Terminal markings:
a = potentiometer end tap
b = potentiometer wiper
c = potentiometer end tap

Apply operating voltage to “a” and “c”.
ASZ based on conductive plastic can be destroyed if operating voltage is applied between “a → b” or “b → c”.

9.3.3 Pin assignment of actuators for terminal X2-09 at LME75

9.3.3.1. SQN70/SQN71

→ See diagram 6 in SQN70/SQN71 data sheet N7804

Terminal X2-09			Actuator		
Pin	Function	Wire link Dbr2	Pin	Cam	Function
1	Travel to CLOSED position		2	II	CLOSED (Wire link in the actuator pin 2 to pin 3)
2	Travel to low-fire position		4	III	Low-fire/ignition load
3	Travel to high-fire position		1	I	High-fire
4	Feedback high-fire position/low-fire position/CLOSED position		5	---	Feedback
5	Free		---	---	---
6	Mains connection neutral (N)		N	---	Neutral
7	Output for fuel valve V2a (second stage power supply)	Pin 7 to pin 8 (for 1-stage applications only)	6	IV	Cam power supply for fuel valve V2a (for 2-stage applications only)
8	Control and feedback for fuel valve V2a (second stage)	Pin 7 to pin 8 (for 1-stage applications only) *)	7	IV	Control for fuel valve V2a (for 2-stage applications only)



*)

Note!

In 1-stage operation with wire link Dbr2, the external load controller (LR-OPEN) at terminal X5-03 pin 3 must not be actuated. Otherwise a non-alterable lockout is performed (Loc: 6 → Actuator fault)

9.3.3.2. SQN72

→ See diagram C in SQN72 data sheet N7802

Terminal X2-09			Actuator		
Pin	Function	Wire link Dbr2	Pin	Cam	Function
1	Travel to CLOSED position		2	II	CLOSED (wire link in the actuator pin 2 to pin 3)
2	Travel to low-fire position		6	III	Low-fire/ignition load
3	Travel to high-fire position		1	I	High-fire
4	Feedback high-fire position/low-fire position/CLOSED position		5	---	Feedback
5	Free		---	---	---
6	Mains connection neutral (N)		N	---	Neutral
7	Output for fuel valve V2a (second stage power supply)	Pin 7 to pin 8 (for 1-stage applications only)	6	IV	Cam power supply for fuel valve V2a (for 2-stage applications only)
8	Control and feedback for fuel valve V2a (second stage)	Pin 7 to pin 8 (for 1-stage applications only) *)	7	IV	Control for fuel valve V2a (for 2-stage applications only)



*)

Note!

In 1-stage operation with wire link Dbr2, the external load controller (LR-OPEN) at terminal X5-03 pin 3 must not be actuated. Otherwise a non-alterable lockout is performed (Loc: 6 → Actuator fault)

9.3.3.3. SQM5

→ See diagram in SQM5 data sheet N7815

Terminal X2-09			Actuator		
Pin	Function	Wire link Dbr2	Pin	Cam	Function
1	Travel to CLOSED position		2	II	CLOSED (wire link in the actuator pin 13 to pin 2)
2	Travel to low-fire position		3	III	Low-fire/ignition load
3	Travel to high-fire position		1	I	High-fire
4	Feedback high-fire position/low-fire position/CLOSED position		11	---	Feedback
			22		
			23		
5	Free		---	---	---
6	Mains connection neutral (N)		N	---	Neutral
7	Pilot valve output (power supply)	Pin 7 to pin 8 (for 1-stage applications only)	4	IV	Cam power supply for fuel valve V2a (for 2-stage applications only)
8	Pilot valve control and feedback	Pin 7 to pin 8 (for 1-stage applications only) *)	14	IV	Control for fuel valve V2a (for 2-stage applications only)



*)

Note!

In 1-stage operation with wire link Dbr2, the external load controller (LR-OPEN) at terminal X5-03 pin 3 must not be actuated. Otherwise a non-alterable lockout is performed (Loc: 6 → Actuator fault)

9.3.3.4. SQM40/SQM41

→ See diagram 8 in SQM40/SQM41 data sheet N7817

Terminal X2-09			Actuator		
Pin	Function	Wire link Dbr2	Pin	Cam	Function
1	Travel to CLOSED position		X1-5	II	CLOSED
2	Travel to low-fire position		X1-1	III	Low-fire/ignition load
3	Travel to high-fire position		X1-6	I	High-fire
4	Feedback high-fire position/low-fire position/CLOSED position		X2-3	---	Feedback
5	Free		---	---	---
6	Mains connection neutral (N)		X1-4	---	Neutral
7	Pilot valve output (power supply)	Pin 7 to pin 8 (for 1-stage applications only)	X3-3	VI	Cam power supply for fuel valve V2a (for 2-stage applications only)
8	Pilot valve control and feedback	Pin 7 to pin 8 (for 1-stage applications only) *)	X3-1	VI	Control for fuel valve V2a (for 2-stage applications only)



*)

Note!

In 1-stage operation with wire link Dbr2, the external load controller (LR-OPEN) at terminal X5-03 pin 3 must not be actuated. Otherwise a non-alterable lockout is performed (Loc: 6 → Actuator fault)

→ Fuel train **LO** "Light oil direct ignition, 1-stage, modulating"

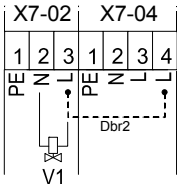
Example 1: LME75.000Ax with SQM40/SQM41 and ASZ

→ See diagram 8 in SQM40/SQM41 data sheet N7817



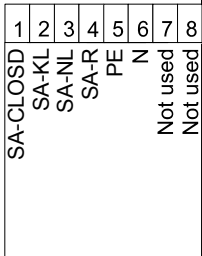
Note!
For other possible fuel trains, see chapter *Fuel trains*.

LME75.000...

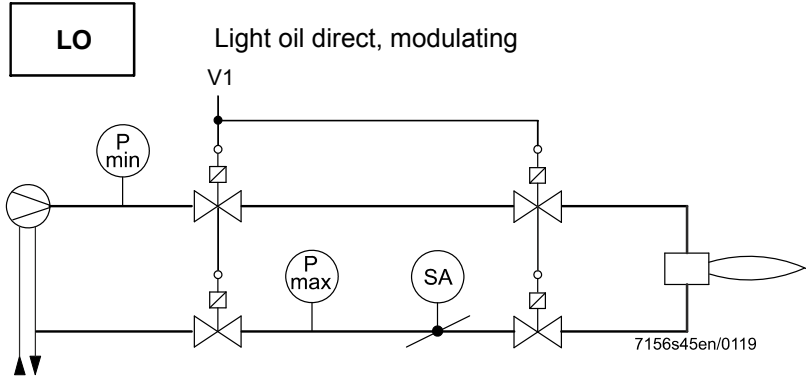


LME75.000...

X2-09



Program



Fuel valve control



Figure 26: Example 1: Fuel train direct ignition with light oil (LO), 1-stage

Key

- Without Dbr2
- - - - With Dbr2



Note!
See Figure 27: Connection diagram example 1: LME75.000Ax with SQM40/SQM41 (diagram 8) and ASZ!

PME75.231Ax

- 1-stage or modulating
- With/without pilot ignition

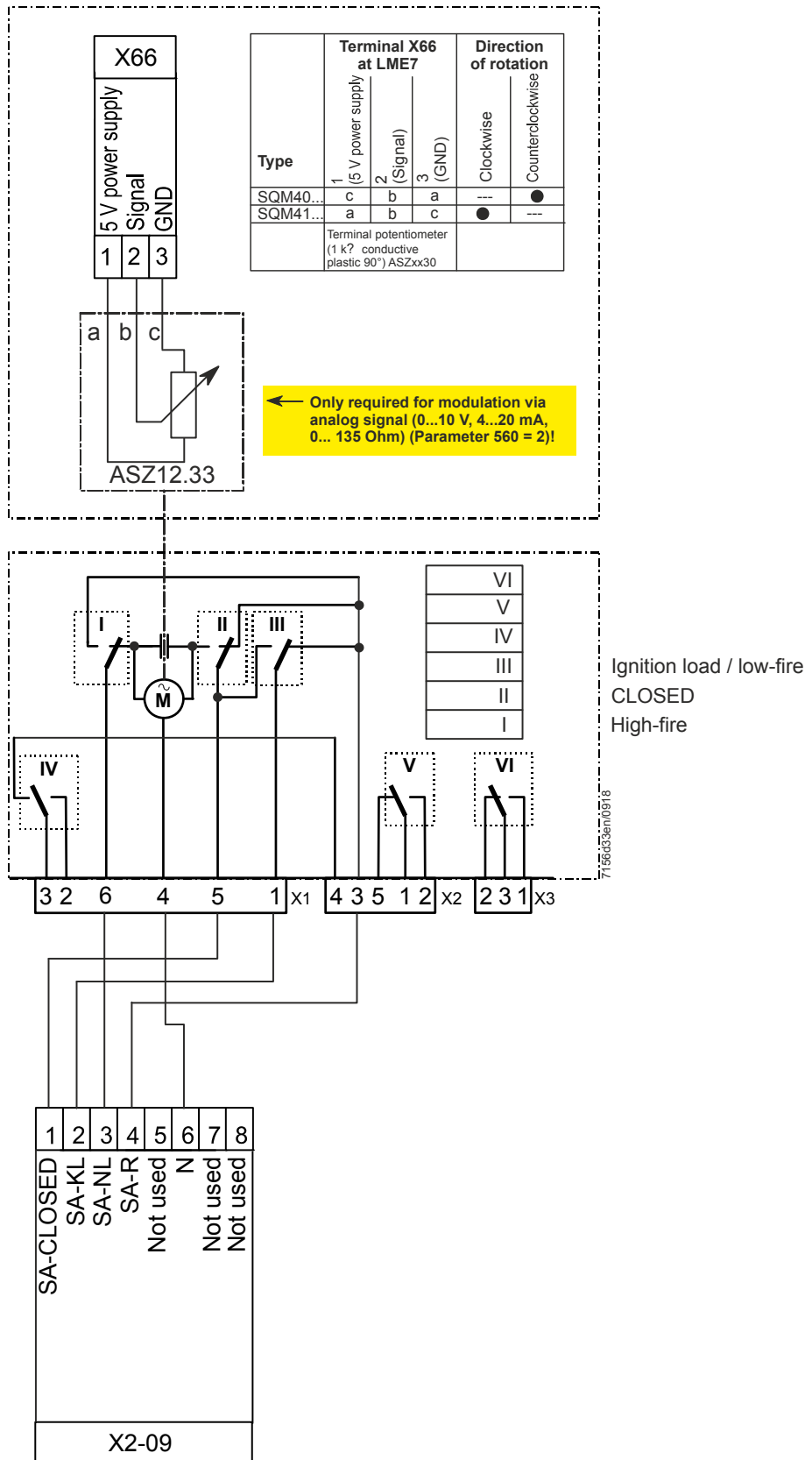


Figure 27: Connection diagram example 1: LME75.000Ax with SQM40/SQM41 (diagram 8) and ASZ

→ Fuel train **LO** "Light oil direct ignition, 2-stage"

Example 2: LME75.000Ax with SQM40/SQM41 and ASZ

→ See diagram 8 in SQM40/SQM41 data sheet N7817



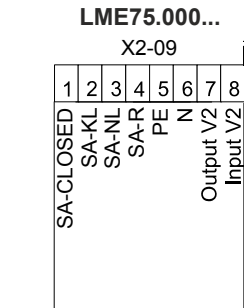
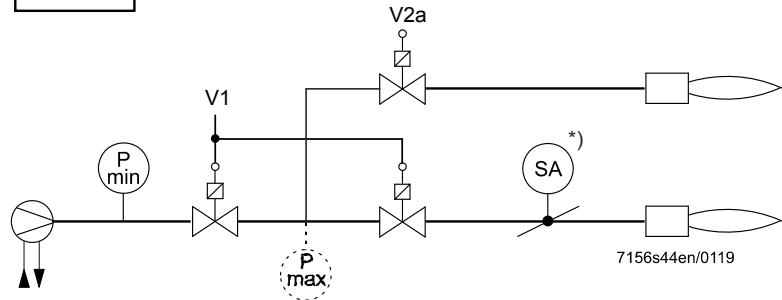
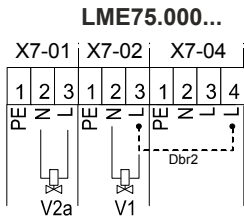
Note!

For other possible fuel trains, see chapter *Fuel trains*.

Program

LO

Light oil direct, 2-stage



Fuel valve control



Figure 28: Example 2: Fuel train direct ignition with light oil (LO), 2-stage

*) Optional (SQM41 only)

Key

———— Without Dbr2

----- With Dbr2

Pmax Pressure switch-max can be activated or deactivated via parameter 277



Note!

See Figure 27: Connection diagram example 1: LME75.000Ax with SQM40/SQM41 (diagram 8) and ASZ!

PME75.231Ax

- 2-stage
- With/without pilot ignition

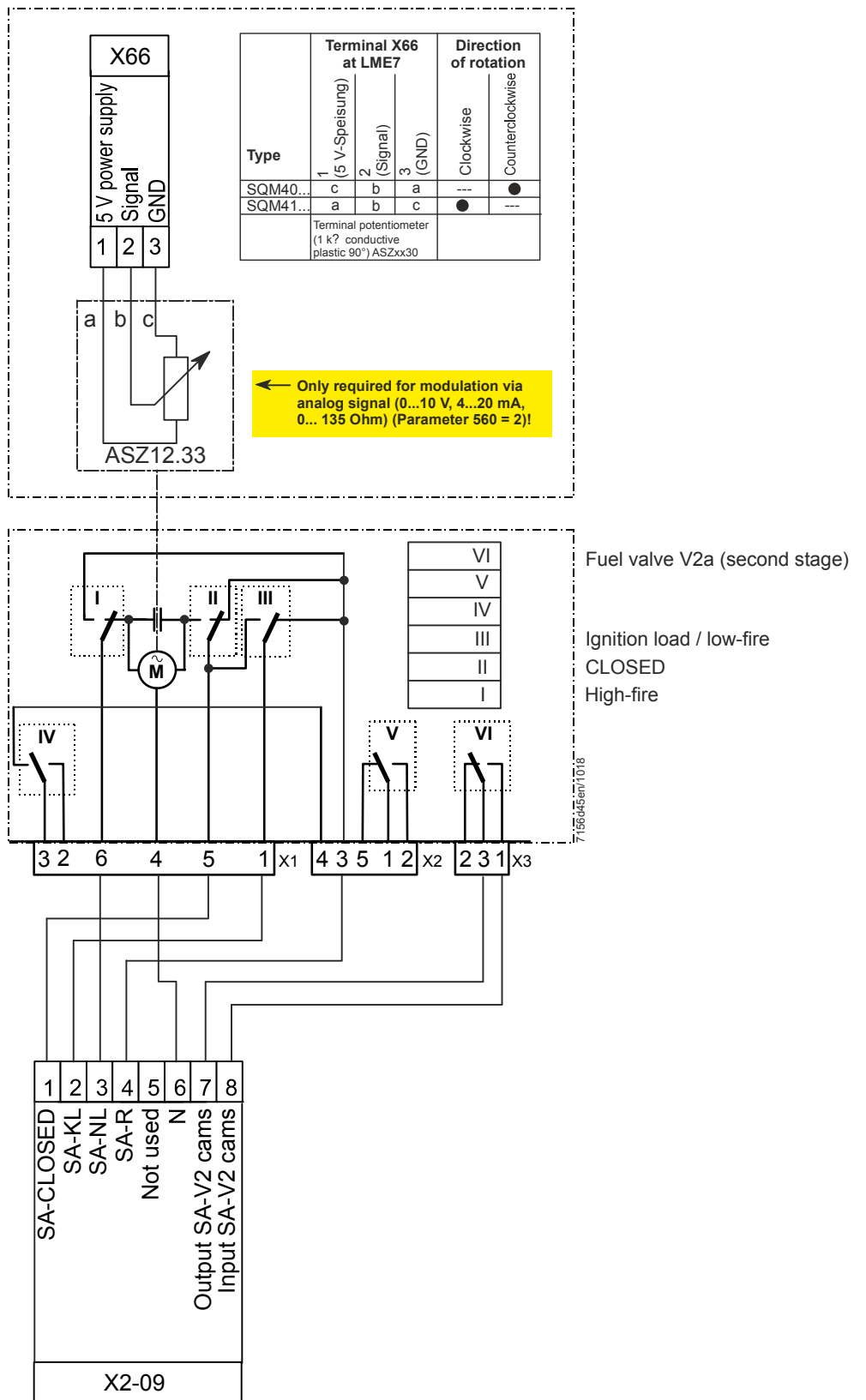


Figure 29: Connection diagram example 2: LME75.000Ax with SQM40/SQM41 (diagram 8) and ASZ

→ Fuel train **LO** "Light oil direct ignition or pilot ignition, 1-stage"

Example 3: LME75.000Ax with PME75.231Ax without actuator

PME75.231Ax

- 1-stage, direct ignition or pilot ignition
- Without actuator

1	2	3	4	5	6	7	8
SA-CLOSED	SA-KL	SA-NL	SA-R	Not used	N	Not used	Not used
7156d30en/0918							
X2-09							

Figure 30: Connection diagram example 3: for LME75.000Ax with PME75.231Ax without actuator

The actuator function can be deactivated using parameter 515.01.

Parameter access: OEM level

Parameter 515.01 = 0

Actuator deactivated (setting for applications without actuator).

Parameter 515.01 = 1

Actuator activated

The following conditions must be observed for the PME75.231Ax program sequence with the actuator function deactivated:

- The *pneumatic combustion control* operating mode must be switched off.
Parameter 560 = 0
- If an input signal is present at the 3-position step inputs for load controller OPEN at terminal X5-03 pin 3 or load controller CLOSED at terminal X5-03 pin 2, a mains voltage signal may be issued at the actuator high-fire terminal X2-09 pin 3 and actuator low-fire terminal X2-09 pin 2 outputs, see table below:

Output request		Actuator control response	
Load controller OPEN (Terminal X5-03 pin 3)	Load controller CLOSED (Terminal X5-03 pin 2)	Actuator low-fire (Terminal X2-09 pin 2)	Actuator high-fire (Terminal X2-09 pin 3)
OFF	OFF	OFF	OFF
OFF	ON	ON	OFF
ON	OFF	OFF	ON
ON	ON	ON (prio)	OFF



Warning!

In applications without an actuator, no other components may be connected at the actuator control outputs (terminal X2-09 pin 1...4). To ensure protection against electric shock hazards, all unused connections must be fitted with corresponding AGG plugs (see basic documentation LME75/LME76 (P7156) chapters *Safety notes* and *Installation notes*).

9.4 Ignition transformer terminal X4-02

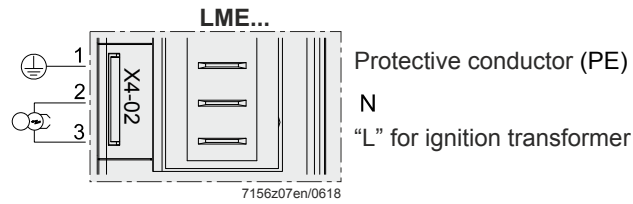


Figure 31: Ignition transformer terminal X4-02

Parameter	Function
201	Fuel train 0 = direct oil ignition 1 = gas pilot ignition
295	Postignition time (t3n)

Output for the connection of ignition transformers or electronic ignition modules.



Note!

It is only permitted to extend the postignition time (t3n) (parameter > 0 seconds) for directly ignited burners. The postignition time (t3n) (parameter = 0 seconds) must not be extended for burners with a separate gas pilot burner (in accordance with EN 676).

9.5 Safety valve terminal X6-03

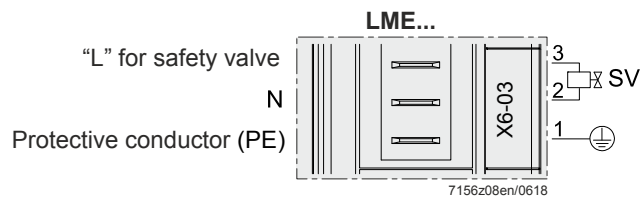


Figure 32: Safety valve terminal X6-03

Output for connection of a safety valve, e.g., for liquefied gas.



Note!

The safety valve is only active if a heat request (load controller ON/OFF) is present at terminal X5-01 pin 3.

9.6 Pilot valve PV terminal X7-04

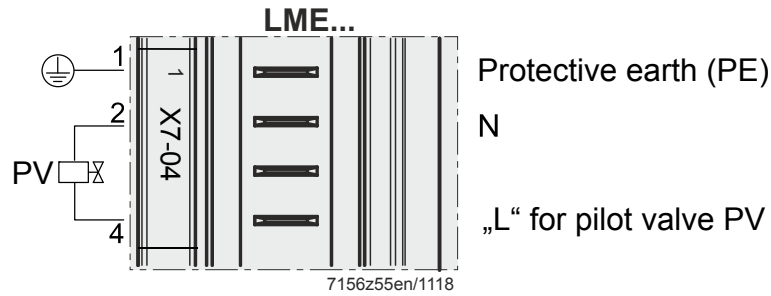


Figure 33: Pilot valve PV terminal X7-04

Parameter	Function
201	Fuel train 0 = direct oil ignition 1 = gas pilot ignition
270	Interval (t4): Stabilization time pilot flame
271	Interval (t9): Second safety time
272	Interval (t5): Stabilization time main flame
295	Postignition time (t3n)

Output for connection of the pilot valve, depending on the fuel train selected.

9.7 Fuel valve V1 terminal X7-02

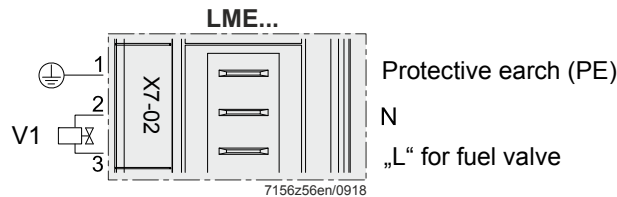


Figure 34: Fuel valve V1 terminal X7-02

Parameter	Function
270	Interval (t4): Stabilization time pilot flame
271	Interval (t9): Second safety time
272	Interval (t5): Stabilization time main flame

Output for connection of fuel valve depending on the fuel train selected.

9.8 Fuel valve V2a terminal X7-01

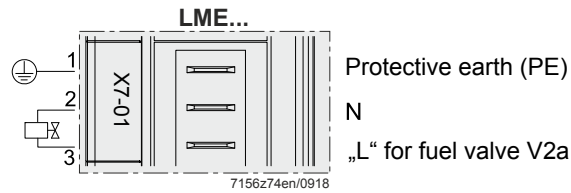


Figure 35: Fuel valve V2a terminal X7-01

Parameter	Function
270	Interval (t4): Stabilization time pilot flame
271	Interval (t9): Second safety time
272	Interval (t5): Stabilization time main flame
563	Operating mode of the ratio control 0 = modulating 1 = multistage

Output for connection of fuel valve depending on the fuel train selected.



Note!

In the case of 2-stage applications, the switching contact on the connected actuator switches fuel valve V2a on terminal X7-01.

Please note the maximum permissible contact rating for the connected switching cam within the actuator in use, or the maximum permissible contact rating for terminal X7-01:

Rated voltage	120 V AC	230 V AC
	50/60 Hz	50/60 Hz
Rated current	1 A	1 A
Power factor	$\cos\varphi > 0.4$	$\cos\varphi > 0.4$



10 Time table and settings

Times in seconds												
Parameter		267	265.00	265.01	266.00	266.01	295	270	271	272	274.00	274.01
Type PME75.231Ax	tw	TSA	t1		t3		t3n	t4	t9	t5	t8	
		max.	min.		min.		approx.	min.	approx.	min.	min.	
Requirements	2.5	5	20		0		0	2	4.5	2	15	
Factory setting	---	4.116 + 0.45	24.255 + 1.2	1	0	1	0	2.352	4.704	2,352	19.404	1
Max.	2.5	37.485	1237 + 1.2	255	74.97	255	37.338	74.97	37.338	74,97	1237	255
Min.	---	1.176	0 + 1.2	1	0	0	0	0	0	0	0	1
Increment	---	0.147	4.851	1	0.294	1	0.147	0.294	0.294	0,294	4.851	1

Times in seconds								
Parameter	264	298	299				275.01	217.01
Type PME75.231Ax	t10	t11	t12	t22				ION/QRI/QRA7 FFRT (TSB)
	approx.	approx.	approx.	1) / 3)	2)	3)	4)	max.
Requirements	13	65	65	t9+217.01	---	---	1	1
Factory setting	12.348	67.914	67.914	---	---	---	0.295 + 0.45	0 + 1
Max.	14.406	1237	1237	---	0.45	0.45	2.205 + 0.45	14.406 + 1
Min.	0	0	0	---	0.3	---	0.3	---
Increment	0.294	4.851	4.851	---	---	---	0.147	0.147

Parameter number	Function	Factory setting
201	Fuel train 0 = direct oil ignition 1 = gas pilot ignition	0
215.00	Response when opening the safety loop (safety loop failure) 0 = safety shutdown and start prevention 1 = safety shutdown followed by non-alterable lockout	1
215.01	Tolerance time for the <i>safety loop during heat request</i> (start of startup sequence after standby)	4.704 s
216	Extraneous light tolerance time in standby	30 s
217.01	Flame signal flame-out response time (extension) 0 = maximum 1 second with ionization probe ≥ 0 = additional extension to response to a flame fault	1.911 s
218	Time for controlled intermittent operation	83640.01 s
220	Response to extraneous light in standby or extraneous light test in the prepurging 0 = start prevention 1 = non-alterable lockout	1
264	Specified time for the air pressure switch	12.348 s
265.00	Prepurge time (t1)	24.255 s
265.01	Multiplicator for prepurge time (t1) (extension of the prepurging)	1
266.00	Preignition time (t3)	0 s
266.01	Multiplicator for preignition time (t3) (extension of the preignition)	1
267	Safety time (TSA)	4.116 s
270	Interval (t4): Stabilization time pilot flame	2.352 s
271	Interval (t9): Second safety time	4.704 s
272	Interval (t5): Stabilization time main flame	2.352 s
274.00	Postpurge time (t8) (no extraneous light test)	19.404 s
274.01	Multiplicator for postpurge time (t8) (extension of the postpurge process)	1

Parameter number	Function	Factory setting
275.00	Air pressure switch input 0 = No evaluation of the air pressure switch 1 = Evaluation of the air pressure switch from fan motor ON	1
275.01	Air pressure switch – response time to loss during operation 0 = typically 0.7 seconds ≥ 0 = additional delay in response to faulty air pressure switch	0.294 s
276	Input pressure switch-min 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])	0
277	Input for pressure switch-max 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])	0
279	Controlled intermittent operation after 24 hours of continuous operation 0 = OFF 1 = ON	0
280	<ul style="list-style-type: none"> • Flame supervision with ionization probe: Restart at loss of flame during interval (t4) an second safety time (t9) • Flame supervision with QRA7/QRI: Restart at loss of flame during interval (t5) and in operation 0 = no restart 1 = no restart 2...255 = 1...254 x restart	0
285.00	Function input for terminal X2-02, oil temperature limiter / POC 0 = inactive 1 = POC input (valve closing control) 2 = Oil temperature limiter input	0
285.01	Evaluation of the oil temperature limiter 0 = inactive during operation 1 = active during operation	0
295	Postignition time (t3n)	0 s
298	Opening time of actuator (timeout)	67.914 s
299	Closing time of actuator (timeout)	67.914 s

Parameter number	Function	Factory setting
515.00	Actuator position during postpurge time 0 = Postpurging in low-fire 1 = Postpurging in high-fire	1
515.01	Actuator control 0 = OFF 1 = ON  Note! Setting = 0 No actuators may be connected and parameter 560 must be set to 0.	1
560	Pneumatic combustion control 0 = OFF / 3-position step modulation 1 = PWM fan motor / analog modulation  Note! Setting = 1 No function. This selection puts the LME75 in lockout position. 2 = Air damper / analog modulation (ASZxx.3x feedback required)	0
563	Operating mode of the ratio control 0 = modulating 1 = multistage	1
654	Only with analog modulating (parameter 560 = 2) Analog input (ASZxx.3x feedback required) 0 = 3-position step input 1 = 0...10 V 2 = 0...135 Ω 3 = 0...20 mA 4 = 4...20 mA with a non-alterable lockout at I < 4 mA 5 = 4...20 mA without a non-alterable lockout at I < 4 mA	0

Key

FFRT	Flame failure response time
tw	Waiting time
TSA	Startup safety time
TSB	Operation safety time
t1	Prepurge time
t3	Preignition time
t3n	Postignition time parameter 295
t4	Interval (t4): Stabilization time pilot flame
t5	Interval (t5): Stabilization time main flame
t8	Postpurge time
t9	Interval (t9): Second safety time
t10	Specified time air pressure switch message (timeout)
t11	Opening time of actuator (timeout)
t12	Closing time of actuator (timeout)
t22	Second safety time
1)	Flame-out response time with loss of flame
2)	Response time to a change of signal by the inputs (e.g., pressure switch-min)
3)	Flame detection time
4)	Response time to a change of signal at the input to the air pressure switch during operation

11 Inputs and outputs / internal connection diagram

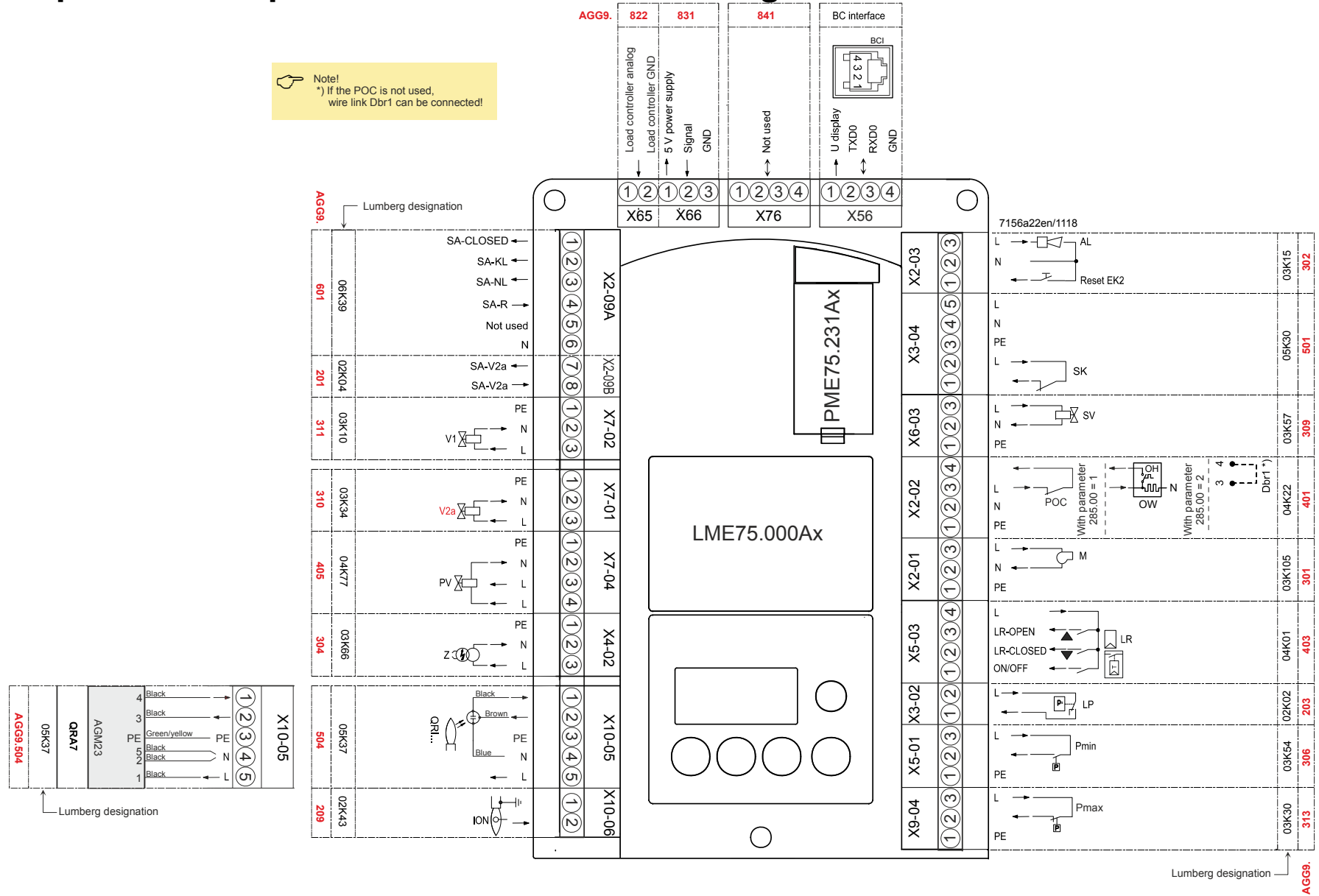


Figure 36: LME75.000Ax: Inputs and outputs / internal connection diagram

12 Parameter list (AZL2/ACS410)

Abbreviations for password level:

HF	Heating engineer
OEM	Manufacturer of the original product



Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
000	Internal parameters							
041	Heating engineer (HF) password (4 characters)	Adjustable	xxxx	xxxx	---	On request	---	OEM
042	OEM password (5 characters)	Adjustable	xxxxx	xxxxx	---	On request	---	OEM
060	Backup/Restore	Adjustable	Restore	Backup	---	---	---	HF

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
100	General							
101	Type (ASN) of the basic unit	Read only	xxxxx.xxxxx	xxxxx.xxxxx	---	---	Via ACS410 only	---
102	Identification date	Read only	---	---	---	---	Info	---
103	Identification number	Read only	0	9999	1	0	Info	---
113	Burner identification • Can be read via AZL2 • Can be adjusted via ACS410	Read only/selectable	0	99999999	1	-----	Info	OEM via ACS410
119	Type of OEM program module	Read only	xxxxx.xxxxx	xxxxx.xxxxx	--	PME75.231Ax	Via ACS410 only	---
120	Type of program module	Read only	xxxxx.xxxxx	xxxxx.xxxxx	--	PME75.231Ax	Via ACS410 only	---
123	Minimum load control step	Adjustable	1%	10%	0.1%	2%	HF	HF
140	Mode display in the 7-segment display 1 = standard (program phase) 2 = flame 1 (ionization) 3 = flame 2 (QRA7/QRI) 4 = active power (power value)	Adjustable	1	4	1	1	HF	HF
164	Number of startups	Resettable	0	999999	1	0	Info	Info
166	Total number of startups	Read only	0	999999	1	0	Info	---
170.00	Relay contact K8 switching cycles (SA-KL: X2-09 pin 2)	Read only	0	999999	1	0	Info	---
170.01	Relay contact K7 switching cycles (SA-NL: X2-09 pin 3)	Read only	0	999999	1	0	Info	---
170.02	Relay contact K2 switching cycles (V2a: X7-01 pin 3)	Read only	0	999999	1	0	Info	---
170.03	Relay contact K1 switching cycles (SV: X6-03 pin 3)	Read only	0	999999	1	0	Info	---
171	Maximum relay switching cycles	Read only	0	999999	1	0	Info	---
180	Test interval for flame detector QRA7/QRI 0 = ≤5 minutes 1 = ≤5 seconds	Adjustable	0	1	1	0	HF	OEM

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
200	Burner control LME75							
201	Fuel train 0 = direct oil ignition 1 = gas pilot ignition	Adjustable	0	1	1	0	HF	OEM
215.00	Response to a safety loop failure 0 = safety shutdown and start prevention 1 = safety shutdown followed by non-alterable lockout	Adjustable	0	1	1	1	HF	OEM
215.01	Tolerance time for safety loop during heat request (start of startup sequence after standby)	Adjustable	0 s	37.338 s	0.147 s	4.704 s	HF	OEM
216	Extraneous light tolerance time in standby	Adjustable	0 s	1237 s	4.851 s	29.106 s	HF	HF
217.00	Flame signal flame-on response time (extension) (not adjustable) 0 = maximum 1 second with ionization probe, QRA7 or QRI	Read only	0 s	0 s	0.147 s	0 s	HF	---
217.01	Flame signal flame-out response time (extension) 0 = maximum 1 second with ionization probe, QRA7 or QRI ≥ 0 = additional extension to response to a flame fault	Adjustable	0 s	14.406 s	0.147 s	0 s	HF	OEM
218	Time for controlled intermittent operation	Adjustable	0 s	83640.01 s	358.97 s	83640.01 s	HF	OEM
220	Response to extraneous light in standby or extraneous light test in prepurging 0 = start prevention 1 = lockout	Adjustable	0	1	1	1	HF	OEM
264	Specified time for the air pressure switch	Adjustable	0 s	14.406 s	0.294 s	12.348 s	HF	OEM
265.00	Prepurge time (t1)	Adjustable	0 s	1237 s	4.851 s	24.255 s	HF	OEM
265.01	Multiplicator for prepurge time (t1) (extension of the prepurging)	Adjustable	1	255	1	1	HF	OEM
266.00	Preignition time (t3)	Adjustable	0 s	74.97 s	0.294 s	0 s	HF	OEM
266.01	Multiplicator for preignition time (t3) (extension of the preignition)	Adjustable	1	255	1	1	HF	OEM
267	Safety time (TSA)	Adjustable	1.176 s	37.485 s	0.147 s	4.116 s	HF	OEM
270	Interval (t4): Stabilization time pilot flame	Adjustable	0 s	74.97 s	0.294 s	2.352 s	HF	OEM
271	Interval (t9): Second safety time	Adjustable	0 s	37.338 s	0.294 s	4.704 s	HF	OEM

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
272	Interval (t5): Stabilization time main flame	Adjustable	0 s	74.97 s	0.294 s	2.352 s	HF	OEM
274.00	Postpurge time (t8) (no extraneous light test)	Adjustable	0 s	1237 s	4.851 s	19.404 s	HF	HF
274.01	Multiplicator for postpurge time (t8) (extension of the postpurge process)	Adjustable	1	255	1	1	HF	HF
275.00	Air pressure switch input 0 = no evaluation of the air pressure switch 1 = evaluation of the air pressure switch from fan motor ON	Adjustable	0	1	1	1	HF	OEM
275.01	Air pressure switch – response time to loss during operation 0 = typically 0.7 seconds ≥ 0 = additional delay in response to faulty air pressure switch	Adjustable	0 s	2.205 s	0.147 s	0.294 s	HF	OEM
276	Input pressure switch-min 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])	Adjustable	0	1	1	0	HF	OEM
277	Input for pressure switch-max 0 = inactive (no evaluation) 1 = active (evaluation from preignition time [t3])	Adjustable	0	1	1	0	HF	OEM
279	Controlled intermittent operation after 24 hours of continuous operation 0 = OFF 1 = ON	Adjustable	0	1	1	0	HF	OEM
280	<ul style="list-style-type: none"> • Flame supervision with ionization probe: Restart at loss of flame during interval (t4) an second safety time (t9) • Flame supervision with QRA7/QRI: Restart at loss of flame during interval (t5) and in operation 0 = no restart 1 = no restart 2...255 = 1...254 x restart	Adjustable	0	255	1	0	HF	HF

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
285.00	Temperature limiter / POC input 0 = inactive 1 = POC active 2 = temperature limiter active	Adjustable	0	2	1	0	HF	OEM
285.01	Evaluation of the oil temperature limiter / POC during operation 0 = inactive during operation 1 = active during operation (non-alterable lockout)	Adjustable	0	1	1	0	HF	OEM
295	Postignition time (t3n)	Adjustable	0 s	37.338 s	0.147 s	0 s	HF	OEM
296	Oil preheater waiting time	Adjustable	0 s	1237 s	4.851 s	596.7 s	HF	OEM
298	Opening time (t11) of actuator (timeout)	Adjustable	0 s	1237 s	4.851 s	67.914 s	HF	OEM
299	Closing time (t12) of actuator (timeout)	Adjustable	0 s	1237 s	4.851 s	67.914 s	HF	OEM

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
500	Ratio control							
515.00	Actuator position during postpurge time 0 = Postpurging in low-fire 1 = Postpurging in high-fire	Adjustable	0	1	1	1	HF	HF
515.01	Actuator control 0 = OFF 1 = ON  Note! Setting = 0 No actuators may be connected and parameter 560 must be set to 0.	Adjustable	0	1	1	1	HF	OEM
560	Pneumatic combustion control 0 = OFF / 3-position step modulation 1 = PWM fan motor / analog modulation  Note! Setting = 1 No function. This selection puts the LME75 in lockout position. 2 = Air damper / analog modulation (AZSxx.3x potentiometer feedback required)	Adjustable	0	2	1	0	HF	HF
563	Operating mode of the ratio control 0 = modulating 1 = multistage	Adjustable	0	1	1	1	HF	HF

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
600	Power setting							
654	<p>Only with analog modulating (parameter 560 = 2)</p> <p>Analog input (ASZxx.3x feedback required)</p> <p>0 = 3-position step input</p> <p>1 = 0...10 V</p> <p>2 = 0...135 Ω</p> <p>3 = 0...20 mA</p> <p>4 = 4...20 mA with a non-alterable lockout at I < 4 mA</p> <p>5 = 4...20 mA without a non-alterable lockout at I < 4 mA</p>	Adjustable	0	5	1	0	HF	HF

Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
700	Error history							
701	Current error: 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1	---	Service	---
702	Latest error in the history 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1	---	Service	---
.								
.								
.								
711	Oldest error in the history 00: Error code 01: Startup meter reading 02: MMI phase 03: Power value	Read only	2 0 --- 0%	255 999999 --- 100%	1 1 --- 1	---	Service	---






Parameter number	Function	Edit	Value range		Increment	Factory setting	Password level reading from level	Password level writing from level
			Min.	Max.				
900	Process data							
903	Modulating operation: Current output (0...100% in 1% increments)	Read only	0%	100%	1%	---	Via ACS410 only	---
	Multistage operation: Fuel level (first stage, second stage)	Read only	---	---	---	---	Via ACS410 only	---
908	Target fan speed (standardized)	Read only	0%	100%	1%	---	Via ACS410 only	---
920	Current signal of PWM fan motor	Read only	0%	100%	1%	---	Service	---
922	Actuator position	Read only	0%	100%	1%	---	Via ACS410 only	---
923	Target actuator position	Read only	0%	100%	1%	---	Via ACS410 only	---
935	Absolute speed of PWM fan motor	Read only	0	9999	rpm	---	Service	---
936	Standardized speed of PWM fan motor	Read only	0%	100%	0.01%	---	Service	---
944	Capacity of external load controller	Read only	0%	100%	1%	---	Via ACS410 only	---
951	Mains voltage	Read only	0 V	LME75.000A1: 175 V LME75.000A2: 350 V	1 V	---	Service	---
954.00	Intensity of flame for ionization probe (0...100%)	Read only	0%	100%	1%	---	Service	---
954.01	Intensity of flame QRA7/QRI (0...100%)	Read only	0%	100%	1%	---	Service	---

13 Error code list

Error code		Plain text	Possible cause
AZL2	LCD display (alternating)		
Loc: 2	Loc 2	No flame at end of safety time	<ul style="list-style-type: none"> Faulty or soiled fuel valves Faulty or soiled flame detector Poor adjustment of burner, no fuel Faulty ignition
Loc: 3	Loc 3	Air pressure faulty (air pressure switch welded in no-load position, decrease to specified time) (air pressure switch flame-on response time)	Air pressure switch faulty <ul style="list-style-type: none"> Loss of air pressure signal after specified time Air pressure switch welded in no-load position
Loc: 4	Loc 4	Extraneous light	Extraneous light during burner startup / standby or after extraneous light tolerance time has elapsed (parameter 216) in standby
Loc: 5	Loc 5	Air pressure faulty, air pressure switch welded in operating position Timeout = 30 seconds	Time supervision air pressure switch <ul style="list-style-type: none"> Air pressure switch welded in operating position
Loc: 6	Loc 6	Actuator fault	<ul style="list-style-type: none"> Actuator faulty or blocked Faulty connection Faulty adjustment
Loc: 7	Loc 7	Loss of flame	Too many losses of flame during operation (limitation of restarts) <ul style="list-style-type: none"> Faulty or soiled fuel valves Faulty or soiled flame detector Poor adjustment of burner
Loc: 8	Loc 8	Oil temperature limiter open	Minimum oil temperature not reached
Loc: 10	Loc 10	Errors that cannot be assigned (application) Internal error	Wiring fault or internal fault, output contacts, other faults
Loc: 14	Loc 14	POC fault	Fault valve closing control POC
Loc: 20	Loc 20	Pressure switch-min open	Oil pressure has dropped below minimum limit
Loc: 21	Loc 21	Pressure switch-max open	Oil pressure has exceeded maximum limit
Loc: 22	Loc 22	Safety loop open	<ul style="list-style-type: none"> External limit thermostat or pressure switch open Safety temperature limiter has tripped

Error code		Plain text	Possible cause
AZL2	LCD display (alternating)		
Loc: 60	Loc 60	Analog load controller source 4...20 mA, I < 4 mA	Wire breakage
Loc: 138	Loc 138	Restore process successful	Restore process successful
Loc: 139	Loc 139	No PME75 detected	No PME75 plugged in
Loc: 167	Loc 167	Manual locking	Manual locking
Loc: 206	Loc 206	AZL2 incompatible	Use the latest version
rSt Er1	rSt Er1	Error in compatibility between PME75 and LME75 during restore process	Program sequence of PME75 does not match the LME75
rSt Er2	rSt Er2	Error in compatibility between PME75 and LME75 during restore process	LME75 hardware does not match the PME75
rSt Er3	rSt Er3	Error during restore process	<ul style="list-style-type: none"> • PME75 faulty • PME75 removed during restore process
bAC Er3	bAC Er3	Error in compatibility between PME75 and LME75 during backup process	Program sequence of PME75 does not match the LME75
Err PrC	Err PrC	Fault in PME75	<ul style="list-style-type: none"> • Error in data content of the PME75 • No PME75 plugged in

14 Key

AL	Alarm device
Dbr...	Wire link
	Lockout reset button (info button)
 /reset (EK1)	
EK2	Remote lockout reset button
FSV	Flame signal amplifier
ION	Ionization probe
K...	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
Pmax	Pressure switch-max
Pmin	Pressure switch-min
POC	Valve closing control (proof of closure)
PV	Pilot valve
QRA7	UV flame detector
QRI	Infrared flame detector
R	Control thermostat or pressurestat
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
SV	Safety valve
V1	Fuel valve
V2a	Fuel valve
Z	Ignition transformer
	Input/output signal 1 (ON)
	Input/output signal 0 (OFF)
	Permissible input signal 1 (ON) or 0 (OFF)

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