Gas Burner Controls LME...

Gas burner controls for the supervision of 1- or 2-stage gas burners of small to medium capacity, in intermittent operation.

The LME… and this Data Sheet are intended for use by OEMs which integrate the burner controls in their products.

Use, features

Use

LME… burner controls are used for the startup and supervision of 1- or 2-stage gas burners in intermittent operation. The flame is supervised by an ionization probe or flame detector QRA… with ancillary unit AGQ3… or blue–burning flames with blue-flame detectors QRC...

In terms of housing dimensions, the LME... are identical with the LGB… and LMG… burner controls (refer to «Type summary»).

- Burner controls conforming to EN 298
- For gas burners with fans conforming to EN 676

Features

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

Supplementary documentation

Product Range Overview LME…..... Q7101

Warning notes

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

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

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area of the LME…, completely isolate the burner control from the mains supply (all-polar disconnection)
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's connection terminals
- Check the connecting lines of the air pressure switch for short-circuits (connection terminals 3, 6 and 11)
- Press the lockout reset button / operation button only manually (applying a force of no more than 10 N) without using any tools or pointed objects
- Fall or shock can adversely affect the safety functions. Such units must not be put into operation, even if they do not exhibit any damage
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring is in an orderly state and make the safety checks as described in «Commissioning notes»

Engineering notes

- When used in connection with actuators, there is no position feedback signal from the actuator to the burner control
- When used in connection with actuators, the requirements of applicable norms and regulations must be observed
- The running times of the actuators must match the burner control's program. An additional safety check of the burner control together with the actuators is required
- When substituting burner controls type LGB… or LMG… by LME…, the AGQ1… or AGQ2… ancillary unit must be replaced by the AGQ3…

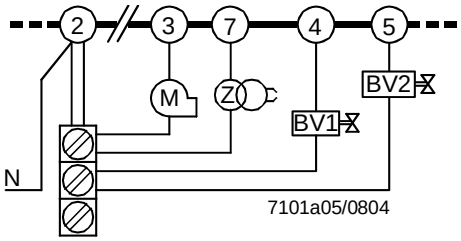
Mounting notes

- Ensure that the relevant national safety regulations are complied with

Installation notes

- Always run the ignition cables separate from the unit and other cables while observing the greatest possible distance
- Do not mix up live and neutral conductors
- Install switches, fuses, earthing, etc., in compliance with local regulations
- The connection diagrams show the burner controls with earthed neutral conductor. In networks with nonearthed neutral conductor and ionization current supervision, terminal 2 must be connected to the earth conductor via an RC unit (type reference ARC 4 668 9066 0). It must be made certain that local regulations are complied with (e.g. protection against electric shock hazard) since AC 230 V / 50 Hz mains voltage produces peak leakage currents of 2.7 mA
- Make certain that the maximum permissible current rating of the connection terminals will not be exceeded
- Do not feed external mains voltage to the control outputs of the unit. When testing the devices controlled by the burner control (fuel valves, etc.), the LME… must not be connected
- In the case of burners with no fan motor, an AGK25 must be connected to terminal 3 of the unit, or else the burner cannot reliably be started up
- For safety reasons, feed the neutral conductor to terminal 2. Connect the burner components (fan, ignition transformer and gas valves) to the neutral distributor as shown below in figure 7101a05. The connection between neutral conductor and terminal 2 is prewired in the base

Example



Legend

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

Wiring of neutral conductors!

Electrical connection of flame detectors

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

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

Commissioning notes

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

	Safety check to be carried out	Anticipated response
a)	Burner startup with previously interrupted line to the flame detector	LME11…: Max. 3 repetitions LME2…: Lockout at the end of «TSA»
b)	Burner operation with simulated loss of flame. For that purpose, cut off the gas supply	LME11…: • Establishment of flame at the end of «TSA» → Max. 3 repetitions • No establishment of flame at the end of «TSA» → Lockout LME2…: Lockout
c)	Burner operation with simulated air pressure failure (not with atmospheric burners)	Immediate lockout

Standards and certificates

Conformity to EEC directives
- Electromagnetic compatibility EMC (immunity) 89 / 336 / EEC
- Directive for gas-fired appliances 90 / 396 / EEC

ISO 9001: 2000
Cert. 00739

ISO 14001: 2004
Cert. 38233

Identification code to EN 298	
LME11…	**F M C L X N**
LME21… / LME22… / LME23…	**F T L L X N**
LME44…	**A M L L X N**

Typ	DVGW	TÜV CERT
LME11.330A2	x	x
LME21.130A1	x	---
LME21.130A2	x	x
LME21.230A2	x	x
LME21.330A1	x	---
LME21.330A2	x	x
LME21.350A1	x	---
LME21.350A2	x	x
LME21.550A2	x	x
LME22.131A2	x	x
LME22.232A2	x	x
LME22.233A2	x	x
LME22.331A1	x	---
LME22.331A2	x	x
LME23.331A2	x	x
LME23.351A2	x	x
LME44.056A2	x	x
LME44.057A1	x	---
LME44.057A2	x	x

Service notes

- Use the KF8872 service adapter for short periods of time only

Disposal notes

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

Mechanical design

LME...	• Units of plug-in design like their predecessor types LGB... and LMG... (refer to «Dimensions») • The housing is made of impact-proof, heat-resistant and flame-retarding plastic. It is of plug-in design and engages audibly in the base • The housing accommodates the - microcontroller for the control sequence and the control relays for load control - electronic flame signal amplifier (ionization) - lockout reset button with its integrated 3-color signal lamp (LED) for operational status and fault status messages and the socket for connecting the OCI400 interface adapter
Indication and diagnostics	• Multicolor indication for operational status and fault status messages • Transmission of operational status and fault status messages and detailed service information via additional OCI400 interface adapter and ACS410 PC Windows software
Versions	• Burner capacity unlimited (thermal output on startup ≤ 120 kW) • 3 repetitions in the event of loss of flame during operation (LME11…)

Type summary (other types of burner controls on request)

The type references given below apply to the LME… burner control without plug-in base and without flame detector. For ordering information on plug-in bases and other accessories, refer to «Ordering».

Flame detector	Type reference	Main voltage	tw approx. s	t1 min. s	TSA max. s	t3n approx. s	t3 approx. s	t4 approx. s	t22 approx. s [2]	t10 min. s [3]	t11 min. s [1]	t12 min. s [1]	For replacing of
Burner controls for 1-stage burners (up to 120 kW output)													
Ionization probe (ION)	LME11.330A2	AC230V	2.5	30	3	2	2	---	---	5	---	---	
Burner controls for 2-stage burners, without actuator control													
Ionization probe (ION) or flame detector QRA... [4] with AGQ3...	LME21.130A1	AC 120 V	2.5	7	3	2	2	8	---	5	---	---	LGB21.130A17
	LME21.130A2	AC 230 V	2.5	7	3	2	2	8	---	5	---	---	LGB21.130A27 LMG21.130B27
	LME21.230A2	AC 230 V	2.5	20	3	2	2	8	---	5	---	---	LGB21.230A27 LMG21.230B27
	LME21.330A1	AC 120 V	2.5	30	3	2	2	8	---	5	---	---	---
	LME21.330A2	AC 230 V	2.5	30	3	2	2	8	---	5	---	---	LGB21.330A27 LMG21.330B27
	LME21.350A1	AC 120 V	2.5	30	5	4	2	10	---	5	---	---	LGB21.350A17
	LME21.350A2	AC 230 V	2.5	30	5	4	2	10	---	5	---	---	LGB21.350A27 LMG21.350B27
	LME21.550A2	AC 230 V	2.5	50	5	4	2	10	---	5	---	---	LGB21.550A27 LMG22.550B27
Burner controls for 2-stage burners, with actuator control													
Ionization probe (ION) or flame detector QRA... [4] with AGQ3...	LME22.131A2	AC 230 V	2.5	7	3	2	3	8	---	3	12	12	LGB22.130A27 LMG22.130B27
	LME22.232A2	AC 230 V	2.5	20	3	2	3	8	---	3	16.5	16.5	LGB22.230A27 LMG22.230B27
	LME22.233A2	AC 230 V	2.5	20	3	2	3	8	---	3	30	30	LMG22.233B27
	LME22.331A1	AC 120 V	2.5	30	3	2	3	8	---	3	12	12	---
	LME22.331A2	AC 230 V	2.5	30	3	2	3	8	---	3	12	12	LGB22.330A27
Burner controls for 2-stage burners, with actuator control													
Blue flame detector QRC…	LME23.331A2	AC 230 V	2.5	30	3	2	3	8	---	3	12	12	LGB32.330A27
	LME23.351A2	AC 230 V	2.5	30	5	4	1	10	---	3	12	12	LGB32.350A27

Legend

tw	Waiting time
TSA	Safety time
t1	Prepurge time
t3	Preignition time
t3n	Postignition time
t4	Interval between ignition «Off» and «BV2»
t10	Specified time for air pressure signal
t11	Programmed opening time for actuator «SA»
t12	Programmed closing time for actuator «SA»
t22	2nd safety time

1) Max. running time available for actuator «SA»
The actuator running time must be shorter
2) t22 + response time of flame relay
3) Max. 65 s
4) Only used for AC 230 V

Type summary (other types of burner controls on request) [cont´d]

Flame detector	Type reference	Main voltage	tw min. s	t1´ min. s	TSA max. s	t3n approx. s	t3 approx. s	t4 approx. s	t22 approx. s	t10 min. s [2]	t11 min. s [1]	t12 min. s [1]	For replacing of
Burner controls for atmospheric burners													
Ionization probe (ION) or flame detector QRA... [4] with AGQ3...	LME44.056A2	AC 230 V	16	9	5	4	2	10	5	---	---	---	LGB41.255A27
	LME44.057A1	AC 120 V	16	9	5	4	2	10	8	---	---	---	LGB41.258A17
	LME44.057A2	AC 230 V	16	9	5	4	2	10	8	---	---	---	LGB41.258A27

Legend

tw	Waiting time
TSA	Safety time
t1´	Purge time
t3	Preignition time
t3n	Postignition time
t4	Interval between ignition «Off» and «BV2»
t10	Specified time for air pressure signal
t11	Programmed opening time for actuator «SA»
t12	Programmed closing time for actuator «SA»
t22	2nd safety time

1) Max. running time available for actuator «SA»
The actuator running time must be shorter
2) Max. 65 s
3) Max. 65 s
4) Only used for AC 230 V

Technical data

General unit data

Mains voltage	AC 120 V +10 % / -15 % AC 230 V +10 % / -15 %
Mains frequency	50...60 Hz ±6 %
Power consumption	12 VA
External primary fuse (Si)	max. 10 A (slow)
Mounting position	optional
Input current at terminal 12	max. 5 A
Weight	approx. 160 g
Safety class	I
Degree of protection	IP 40 (to be ensured through mounting)
Perm. cable length terminal 1	max. 1 m at a line capacitance of 100 pF/m (max. 3 m at 15 pF / m)
Perm. cable length from QRA… to AGQ3…A27 (lay separate cable)	max. 20 m at 100 pF / m
Remote reset laid separately	max. 20 m at 100 pF / m
Perm. cable length terminals 8 and 10	max. 20 m at 100 pF / m
Perm. cable lengths other terminals	max. 3 m at 100 pF / m

Current rating	At $\cos\varphi \geq 0.6$	At $\cos\varphi = 1$
- Terminal 3	Max. 2.7 A (15 A for max. 0.5 s → only LME2…)	Max. 3 A
- Terminals 4, 5, 7 and 9 (11)	Max. 1.7 A	Max. 2 A
- Terminal 10	Max. 1 A	Max. 1 A

Environmental conditions

Storage	DIN EN 60721-3-1
Climatic conditions	class 1K3
Mechanical conditions	class 1M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
Transport	DIN EN 60 721-3-2
Climatic conditions	class 2K2
Mechanical conditions	class 2M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
Operation	DIN EN 60 721-3-3
Climatic conditions	class 3K3
Mechanical conditions	class 3M3
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.

⚠ **Condensation, formation of ice and ingress of water are not permitted!**

Flame supervision with ionization probe

	At mains voltage UN = AC 230 V [1])
Detector voltage between ionization probe and ground (AC voltmeter Ri ≥ 10 MΩ)	AC 115...240 V
Switching threshold (limit values): Switching on (flame on) (DC ammeter Ri ≤ 5 kΩ) Switching off (flame off) (DC ammeter Ri ≤ 5 kΩ)	 ≥ DC 1.5 µA ≤ DC 0.5 µA
Detector current required for reliable operation	≥ DC 3 µA
Switching threshold in the event of poor flame during operation (LED flashes green)	Approx. DC 5 µA
Short-circuit current between ionization probe and ground (AC ammeter Ri ≤ 5 kΩ)	Max. AC 100...300 µA

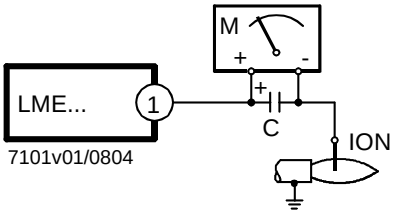
[1]) For applications outside the European Community, operation at mains voltage AC 230 V ±10 % is ensured

Note

With the same quality of flame, the detector current with the LME… may be other than with the LMG… / LGB…

Flame supervision with ionization is accomplished by making use of the conductivity and rectifying effect of the flame. The flame signal amplifier only responds to the DC current component of the flame signal. A short-circuit between ionization probe and ground causes the burner to initiate lockout.

Measuring circuit



Legend

C Electrolytic capacitor 100...470 µF; DC 10...25 V
ION Ionization probe
M Microammeter, Ri max. 5000 Ω

For detector currents, refer to « Technical data ».

Flame supervision with AGQ3… and UV detector QRA...

Mains voltage	AC 230 V +10 % / -15 %
Mains frequency	50...60 Hz ±6 %
Perm. cable length from QRA... to AGQ3… (lay separate cable)	max. 20 m
Perm. cable length from AGQ3... to LME...	max. 2 m
Weight of AGQ3...	approx. 140 g
Mounting position	optional
Degree of protection	IP 40, to be ensured through mounting
Power consumption	4.5 VA

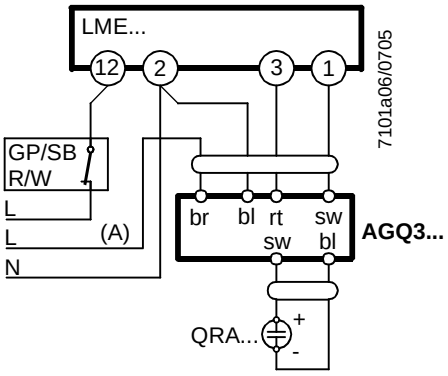
	At mains voltage U_N	
	AC 220 V	AC 240 V
Detector voltage at QRA... (with no load)		
Terminal 3 off (refer to control sequence)	DC 400 V	DC 400 V
Terminal 3 on (refer to control sequence)	DC 300 V	DC 300 V
Detector voltage Load by DC measuring instrument Ri > 10 MΩ		
Terminal 3 off (refer to control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

Ancillary unit AGQ3...

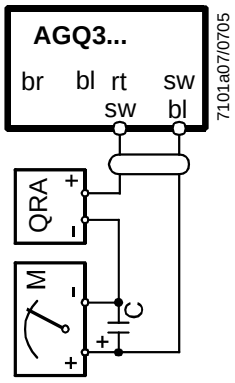
In connection with LME… burner controls, use of UV ancillary unit AGQ3... is mandatory.

(A) Correct functioning of aged UV cells can be checked as UV test with a higher supply voltage across the UV cell after controlled shutdown until terminal 3 on.

Connection diagram



Measuring circuit for measuring the UV detector current



Measurement made at the UV detector QRA…

Legend

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

Flame supervision with QRC...
(only LME23…)

	Detector current required (with flame)	Perm. detector current (without flame)	Possible detector current with flame (typically)
QRC...	Min. 70 µA	Max. 5.5 µA	Max. 100 µA

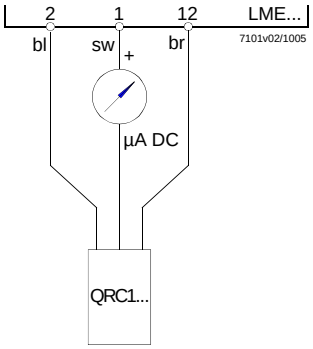
The values given in the table above only apply under the following conditions:
- Mains voltage AC 230 V
- Ambient temperature 23 °C

Green LED for operational status indication

	Detector current in operation: - Flame signal instable - Green LED flashing	Detector current in operation: - Flame signal stable - Green LED steady on
QRC...	< 45 µA	> 45 µA

The values given in the table above only apply under the following conditions:
- Mains voltage AC 230 V
- Ambient temperature 23 °C

Measuring circuit for detector current



Legend

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

As an alternative to detector current measurement, the OCI400 / ACS400 diagnostics tool can be used. In that case, the DC microammeter is not required.

Preconditions for burner startup

- Burner control must be reset
- All contacts in the line are closed, request for heat
- No undervoltage
- Air pressure switch «LP» must be in its no-load position or CPI in no-load position or wire link 2 is closed
- Fan motor or AGK25 is closed
- Flame detector is darkened and there is no extraneous light

Undervoltage

- Safety shutdown from the operating position takes place should mains voltage drop below about AC 175 V (at U_N = AC 230 V)
- Restart is initiated when mains voltage exceeds about AC 185 V (at U_N = AC 230 V)

Controlled intermittent operation

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

Reversed polarity protection with ionization

If the connections of live conductor (terminal 12) and neutral conductor (terminal 2) are mixed up, the burner control will initiate lockout at the end of «TSA».

Control sequence in the event of fault

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

Cause	**Response**
Mains failure	Restart
Voltage below undervoltage threshold	Safety shutdown
Voltage above undervoltage threshold	Restart
Extraneous light during «t1»	Lockout
Extraneous light during «tw»	Prevention of startup, lockout after 30 seconds at the latest
No flame at the end of «TSA»	LME11…: Max. 3 repetitions, followed by lockout at the end of «TSA» LME2…: Lockout at the end of «TSA»
Loss of flame during operation	LME11…: • Establishment of flame at the end of «TSA» → Max. 3 repetitions • No establishment of flame at the end of «TSA» → Lockout LME2…: Lockout
«LP» is welded in working position	Prevention of startup, lockout after 65 seconds at the latest
«LP» is welded in no-load position	Lockout max 65 s after completion of «t10»
No air pressure signal after completion «t10»	Lockout
«CPI» contact is open during «tw»	Prevention of startup, lockout after 60 seconds at the latest

In the event of lockout, the LME… remains locked and the red signal lamp (LED) will light up. The burner control can immediately be reset. This state is also maintained in the case of mains failure.

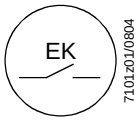
Resetting the burner control

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

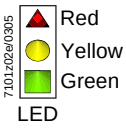
Limitation of repetitions (only LME11…)

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

Operation



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



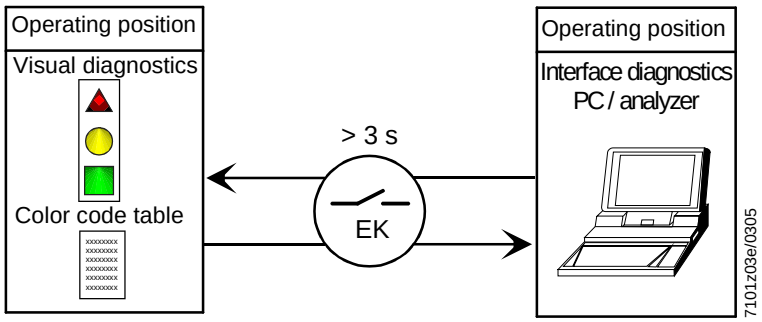
The multicolor signal lamp (LED) in the lockout reset button is the key indicating element for visual diagnostics and interface diagnostics.

Both «EK...» and LED are located under the transparent cover of the lockout reset button.

There are 2 diagnostics choices:

1. Visual diagnostics: Operational status indication or diagnostics of the cause of fault
2. Interface diagnostics: With the help of the OCI400 interface adapter and the ACS400 PC software or flue gas analyzers of different makes (refer to Data Sheet N7614)

Visual diagnostics:
In normal operation, the different operating states are indicated in the form of color codes according to the color code table given below. Interface diagnostics is activated by pressing the lockout reset button for at least 3 seconds (refer to Data Sheet N7614). If, by accident, interface diagnostics has been activated, in which case the slightly red light of the signal lamp flickers, it can be deactivated by pressing again the lockout reset button for at least 3 seconds. The instant of switching over is indicated by a yellow light pulse.



Operational status indication

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

Color code table for multicolor signal lamp (LED)		
Status	**Color code**	**Color**
Waiting time «tw», other waiting states	❍.....	Off
Ignition phase, ignition controlled	● ❍ ● ❍ ● ❍ ● ❍ ● ❍ ●	Flashing yellow
Operation, flame o.k.	□.....	Green
Operation, flame not o.k.	□ ❍ □ ❍ □ ❍ □ ❍ □ ❍	Flashing green
Extraneous light on burner startup	□ ▲ □ ▲ □ ▲ □ ▲ □ ▲	Green-red
Undervoltage	● ▲ ● ▲ ● ▲ ● ▲ ● ▲	Yellow-red
Fault, alarm	▲.....	Red
Error code output (refer to «Error code table»)	▲❍ ▲❍ ▲❍ ▲❍	Flashing red
Interface diagnostics	▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲	Red flicker light

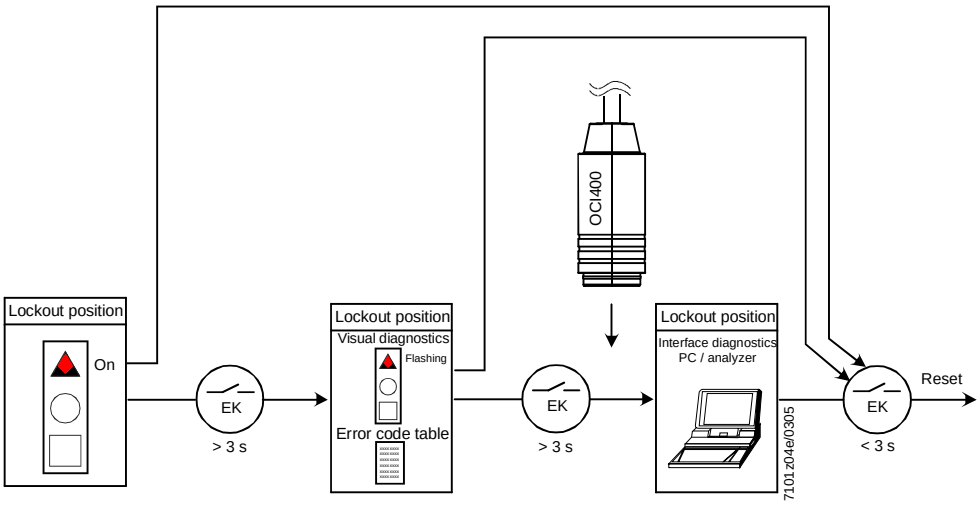
Legend

..... Steady on
❍ Off
▲ Red
● Yellow
□ Green

Diagnostics of the cause of fault

After lockout, the red fault signal lamp will remain steady on. In that condition, visual diagnostics of the cause of fault according to the error code table can be activated by pressing the lockout reset button for more than 3 seconds. Pressing the reset button again for at least 3 seconds, interface diagnostics will be activated (for more detailed information, refer to Data Sheet N7614).

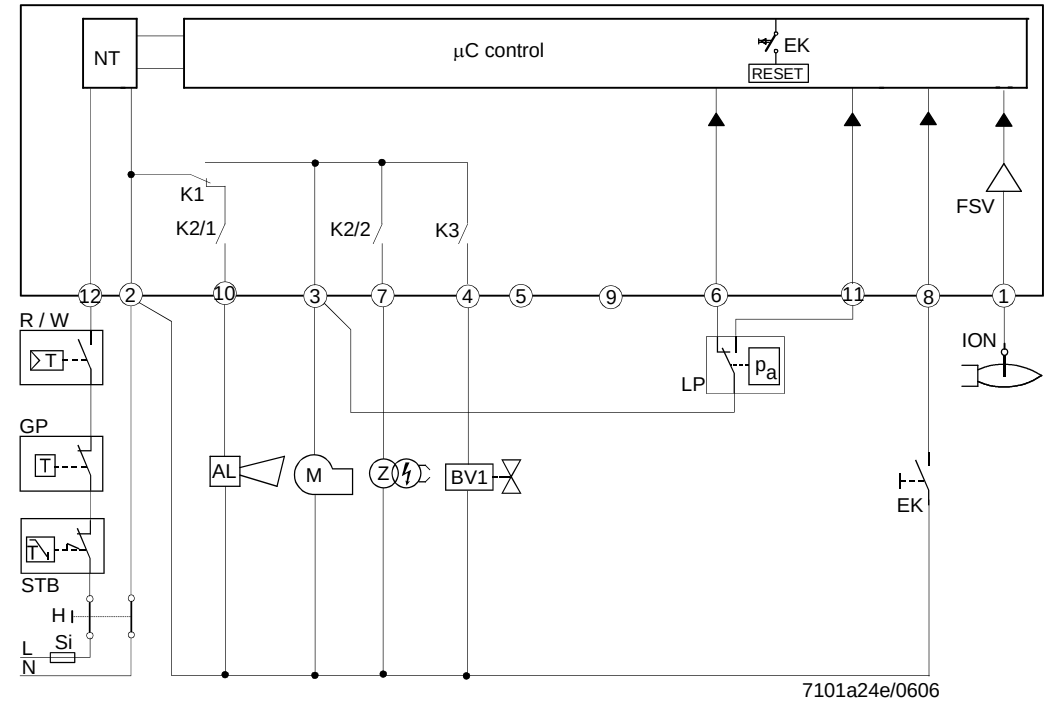
The following sequence activates the diagnostics of the cause of fault:

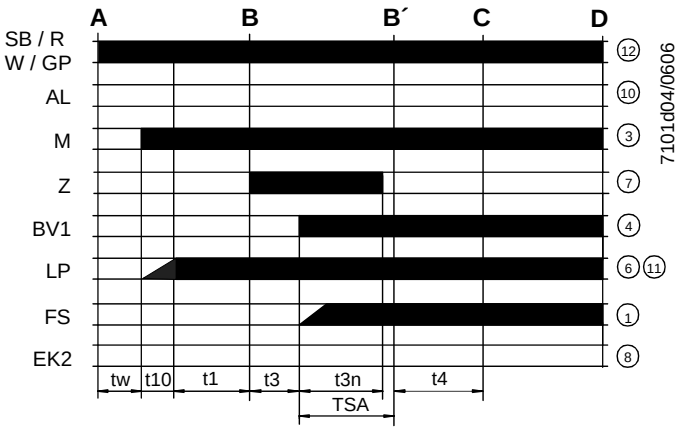


Error code table		
Red blink code of signal lamp (LED)	**«AL» at term. 10**	**Possible cause**
2 blinks • •	On	No establishment of flame at the end of «TSA» - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
3 x blinks • • •	On	«LP» faulty - Loss of air pressure signal after «t10» - «LP» is welded in normal position
4 blinks • • • •	On	Extraneous light when burner startup
5 blinks • • • • •	On	Time out «LP» - «LP» is welded in working position
6 blinks • • • • • •	On	Free
7 blinks • • • • • • •	On	Too many losses of flame during operation (limitation of repetitions) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
8 x blinks • • • • • • • •	On	Free
9 blinks • • • • • • • • •	On	Free
10 blinks • • • • • • • • • •	Off	Wiring error or internal error, output contacts, other faults
14 blinks • • • • • • • • • • • • • •	On	CPI contact not closed

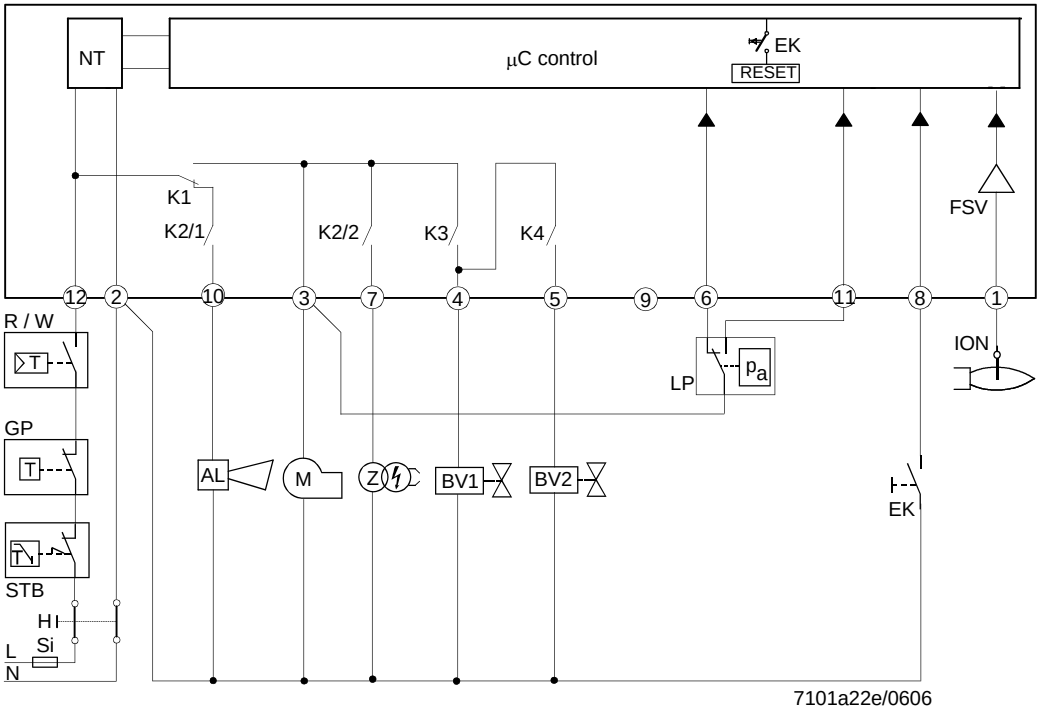
During the time the cause of fault is diagnosed, the control outputs are deactivated
- Burner remains shut down
- External fault indication remains deactivated
- Fault status signal «AL» at terminal 10, according to the error code table

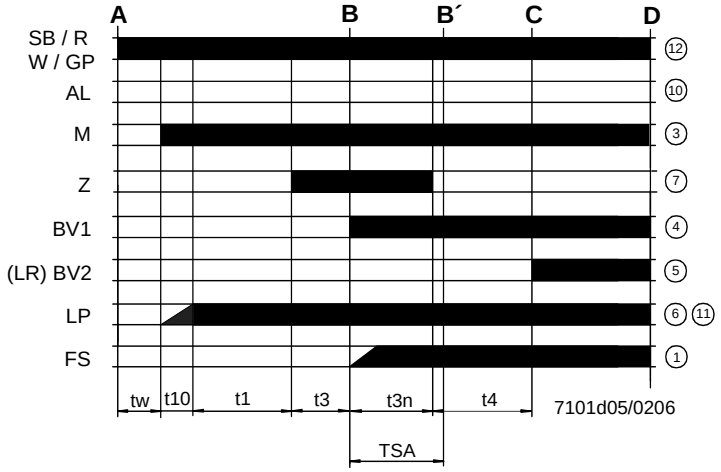
The diagnostics of the cause of fault is quit and the burner switched on again by resetting the burner control. Press the lockout reset button for about 1 second (< 3 seconds).


NT
µC control
EK
RESET
K1
K2/1
K2/2
K3
FSV
12
2
10
3
7
4
5
9
6
11
8
1
R / W
T
GP
T
T
STB
H
Si
L
N
AL
M
Z
BV1
LP
pa
ION
EK
7101a24e/0606


A
B
B´
C
D
SB / R
W / GP
AL
M
Z
BV1
LP
FS
EK2
12
10
3
7
4
6
11
1
8
tw
t10
t1
t3
t3n
t4
TSA
7101d04/0606

Connection diagram and control sequence LME21…

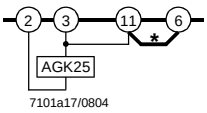




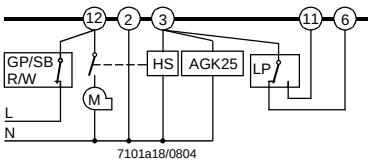
Application examples only LME11… / LME21… / LME22…

The suitable wiring schemes are merely examples which must be verified in the individual case depending on application!

Burner without fan and without «LP»



Only for burner with fan control via auxiliary contactor «HS» with «LP»

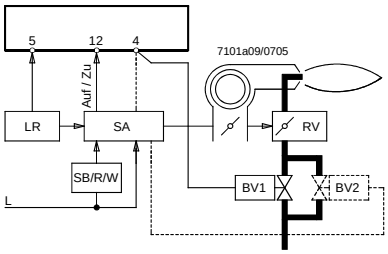


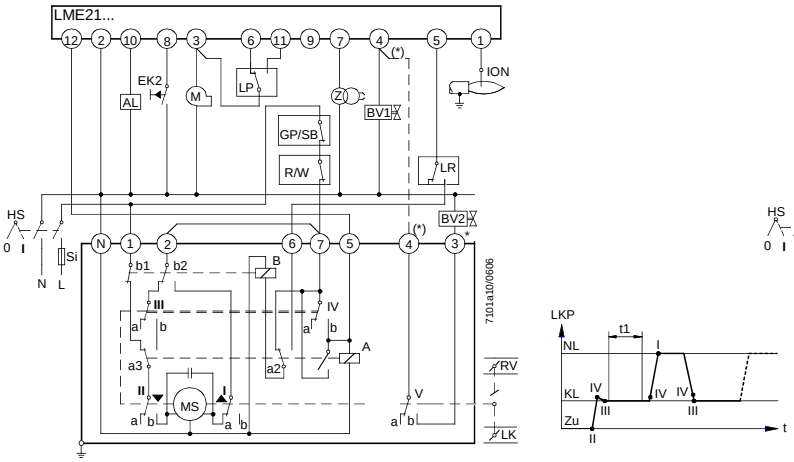
*** Note:** Different from LGB...

The suitable wiring schemes are merely examples which must be verified in the individual case depending on application!

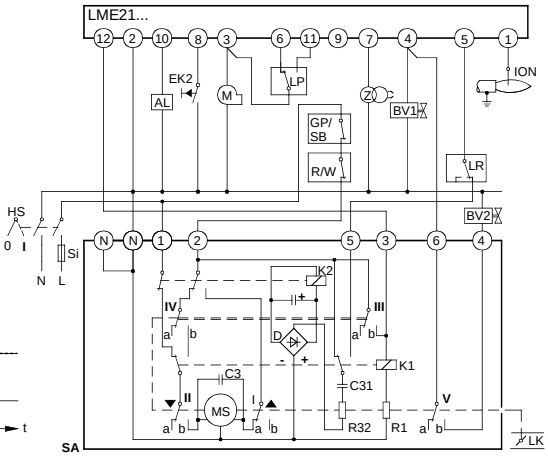
Control of actuators of 2-stage or 2-stage modulating burners. Controlled prepurging «t1» with low-fire air volume. Same low-fire actuator position during startup and operation.

For information about actuators «SA»:
SQN3...: Refer to Data Sheet N7808
SQN7…: Refer to Data Sheet N7804
SQN9...: Refer to Data Sheet N7806



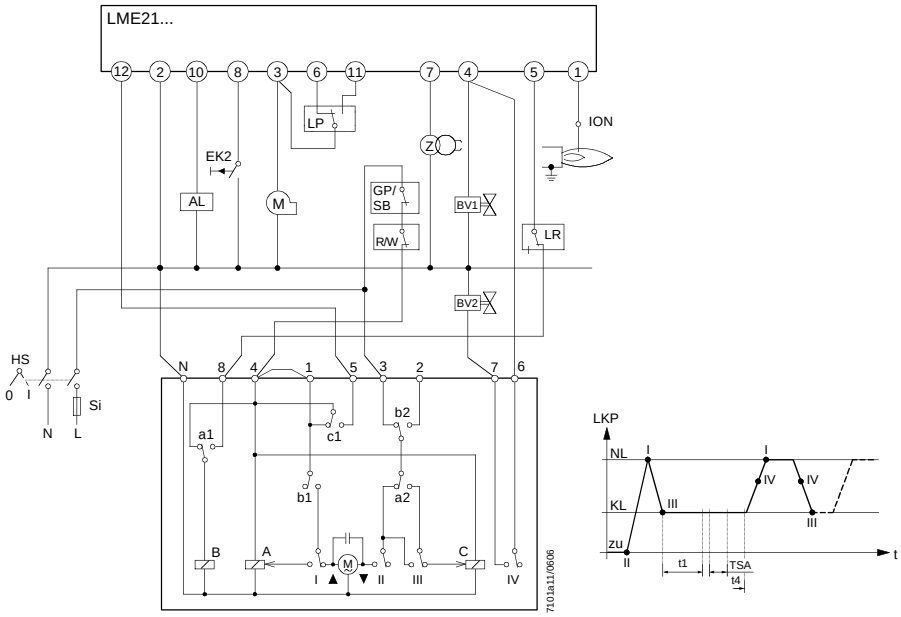


SQN3...121... / 2-stage control

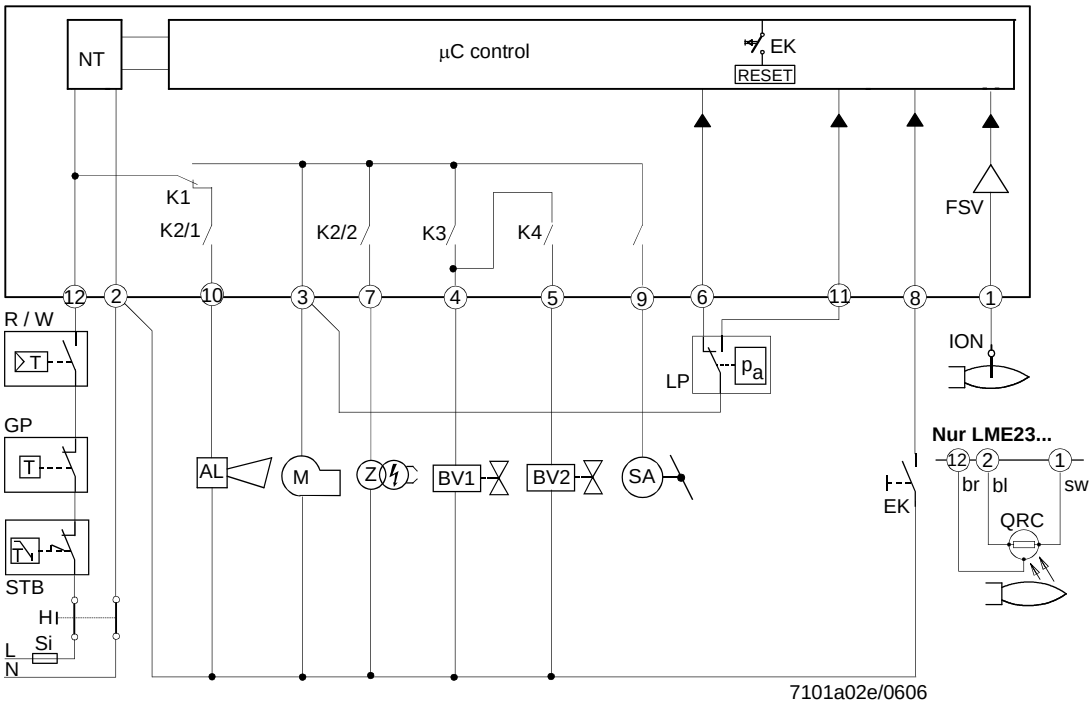


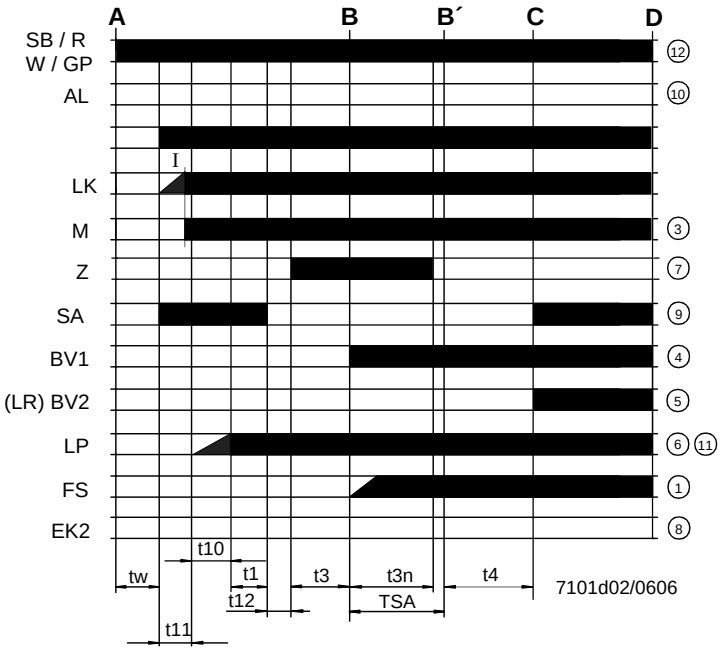
SQN91.140... / 2-stage control

*** Note**
With 2-stage modulating burners (with gas regulation damper «RV»), «BV2» and the dotted connection between terminals (*) are not required.



SQN7...244 / 2-stage control

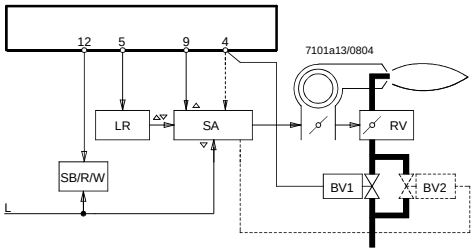

NT
µC control
EK
RESET
K1
K2/1
K2/2
K3
K4
FSV
12
2
10
3
7
4
5
9
6
11
8
1
R / W
T
GP
T
STB
HI
Si
L
N
AL
M
Z
BV1
BV2
SA
LP
pa
ION
Nur LME23...
12
2
1
br
bl
sw
QRC
EK
7101a02e/0606

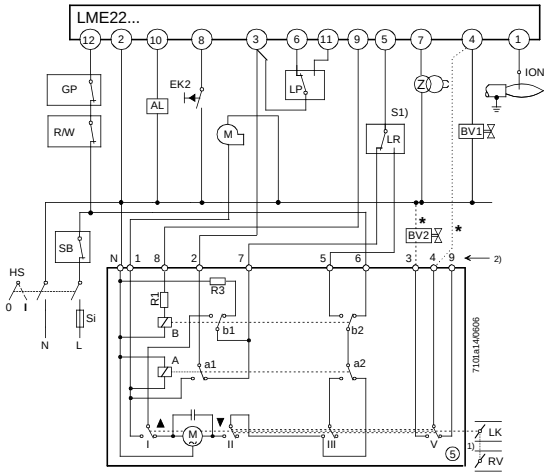

A
B
B´
C
D
SB / R
W / GP
AL
LK
M
Z
SA
BV1
(LR) BV2
LP
FS
EK2
I
12
10
3
7
9
4
5
6
11
1
8
t10
tw
t1
t12
t3
t3n
TSA
t4
t11
7101d02/0606

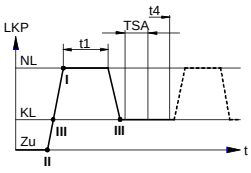
The suitable wiring schemes are merely examples which must be verified in the individual case depending on application!

Control of actuators of 2-stage or 2-stage modulating burners. Controlled prepurging «t1» with nominal load air volume.

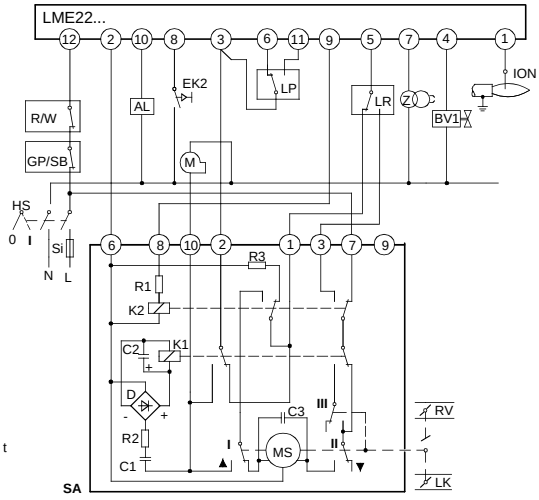
For information about actuators «SA»:
SQN3...: Refer to Data Sheet N7808
SQN7...: Refer to Data Sheet N7804
SQN9...: Refer to Data Sheet N7806





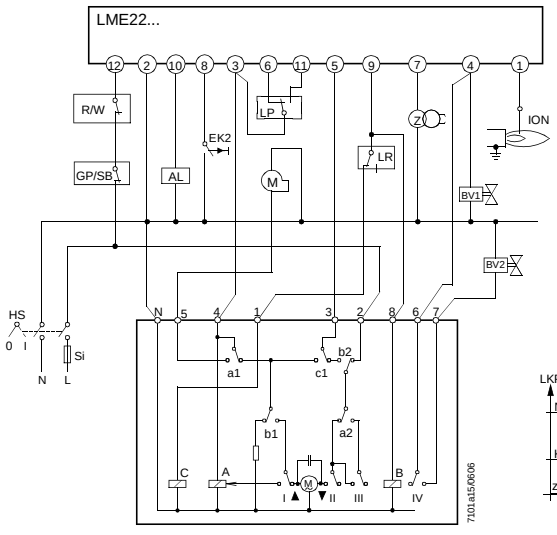


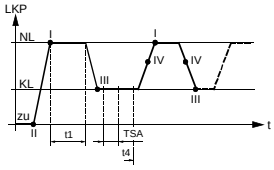
SQN3...151... or SQN3...251...



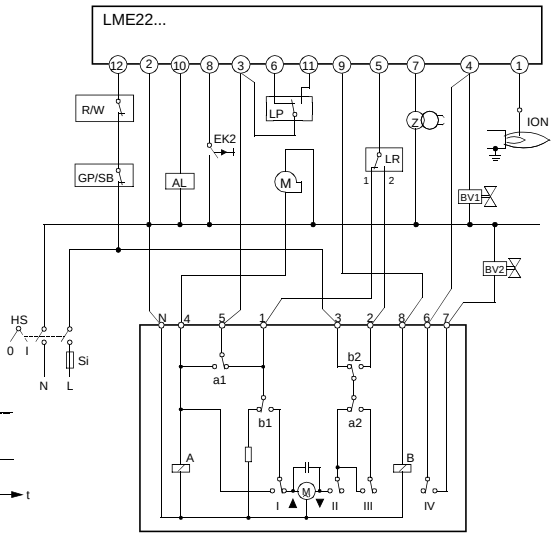
SQN90.220... / 2-stage modulating control

*** Note**
With 2-stage modulating burners (with gas regulation damper «RV»), «BV2» and the dotted connection between terminals (*) are not required.



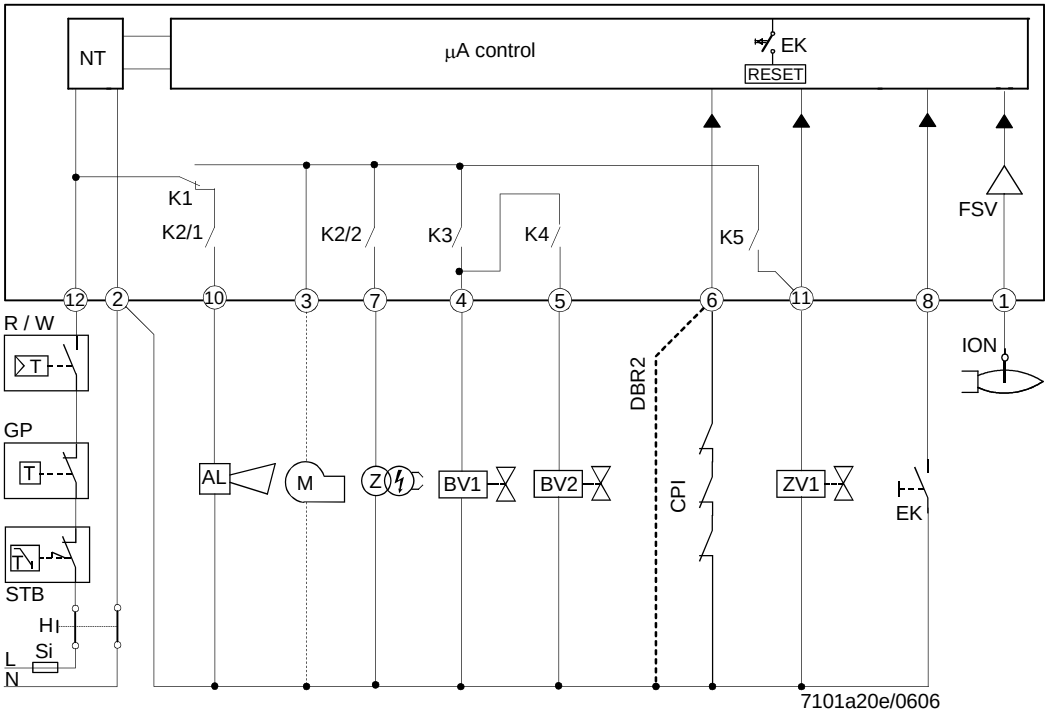


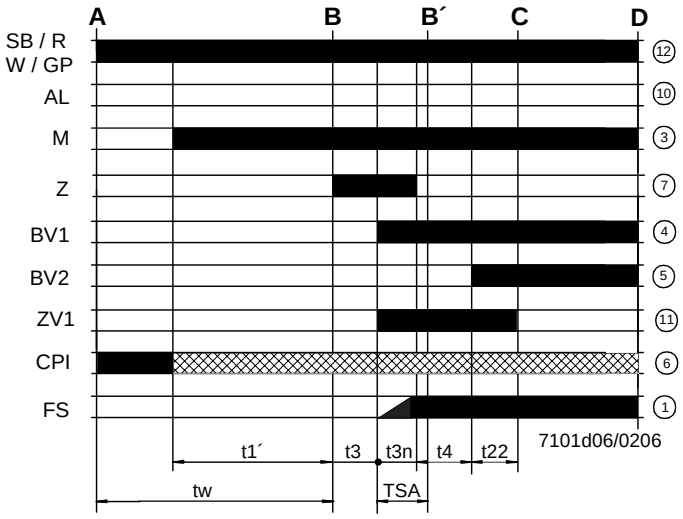
SQN7...454 / 2-stage control
1 wire control



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

Connection diagram and control sequence LME44…





Legend

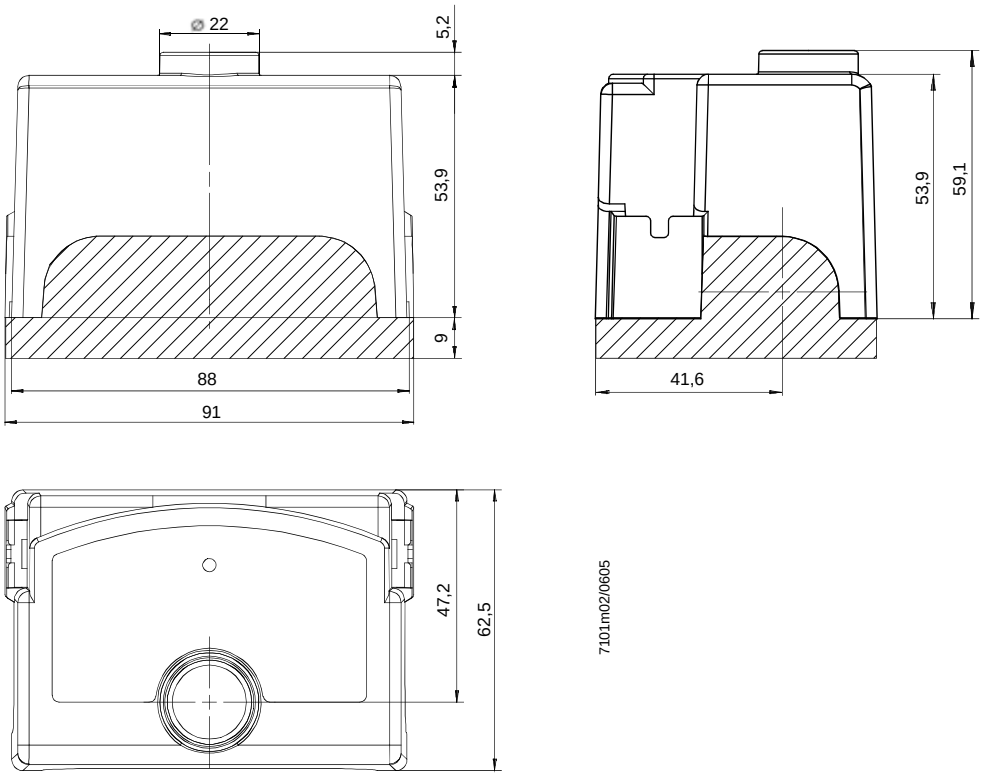
AGK25...	PTC resistor
AL	Error message (alarm)
BCI	Burner Communication Interface
BV...	Fuel valve
CPI	Closed Position Indicator
Dbr...	Wire link
EK...	Remote lockout reset button (internal)
EK2	Remote lockout reset button
ION	Ionization probe
FS	Flame signal
FSV	Flame signal amplifier
GP	Gas pressure switch
H	Main switch
HS	Auxiliary contactor, relay
ION	Ionization probe
K1...4	Internal relays
KL	Low-fire
LK	Air damper
LKP	Air damper position
LP	Air pressure switch
LR	Load controller
M	Fan motor
MS	Synchronous motor
NL	Nominal load
NT	Power supply
QRA...	Flame detector
QRC…	Blue-flame detector
	bl blue
	br brown
	sw black
R	Control thermostat / pressurestat
RV	Gas regulation damper
SA	Actuator SQN...
SB	Safety limit thermostat
STB	Safety limit thermostat
Si	External fuse
t	Time
W	Limit thermostat / pressure switch
Z	Ignition transformer
ZV	Pilot gas valve
A	Start command (switching on by «R»)
B-B´	Interval for establishment of flame
C	Operating position of burner reached
C-D	Burner operation (generation of heat)
D	Controlled shutdown by «R» • Burner will immediately be shut down • Burner control will immediately be ready for new startup
I	Cam I actuator
t1	Prepurge time
t1´	Purge time
t3	Preignition time
t3n	Postignition time
t4	Interval between ignition «Off» and release of «BV2»
t10	Specified time for air pressure signal
t11	Programmed opening time for actuator «SA»
t12	Programmed closing time for actuator «SA»
t22	2nd safety time
TSA	Ignition safety time
tw	Waiting time

Dimensions

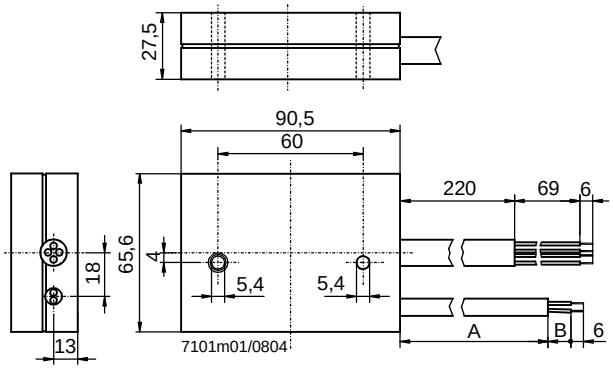
Dimensions in mm

LME...

Plug-in base AGK11... / AGK13...



Ancillary unit AGQ3...



Type reference	Dimensions	
	A	B
AGQ3.1A27	500	19
AGQ3.2A27	300	34

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Subject to change!