



ISO 9001



Gas Burner Controls

LGC22...

Gas burner controls for the startup, control and supervision of single-stage atmospheric gas burners in intermittent operation, with pilot burners ≤ 250 W and flue gas supervision conforming to EN 297.

The LGC22... and this Data Sheet are intended for use by OEMs which integrate the gas burner controls in their products!

Use

Typical field of use:

- Gas-fired heating boilers with or without d.h.w. heating conforming to EN 297

Flame supervision is accomplished with an ionization probe.

The demand for heat is visually indicated (on the top of the unit).

The following pieces of equipment are controlled:

- Pilot gas valve (pilot burners with a thermal load of ≤ 250 W)
- Main fuel valve
- External ignition equipment

Provided are connection facilities for:

- Flue gas temperature sensor QAK39...
- Safety fuel valve (especially for liquefied gas applications)
- Gas pressure monitor
- Remote reset facility / alarm output
- Output for operating data (e.g. for external hours run counter)

Warning notes



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

Do not open, interfere with or modify the unit!

- Before performing any wiring changes in the connection area of the LGC22..., 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 terminals
- Check wiring and all safety functions prior to commissioning and after changing a fuse
- Fall or shock can adversely affect the safety functions. Such units may not be put into operation, even if they do not exhibit any damage
- The maximum permissible current may not be exceeded. The use of components containing suppression condensers, electronic ignition modules, etc., is only permitted after consultation with Siemens HVAC Products Rastatt

Mounting notes

- Ensure that the relevant national safety regulations are complied with

Installation notes

- Installation work must be carried out by qualified staff
- Live and neutral conductor or protective earth may not be interchanged

Electrical connection of ionization probe and flame detector

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

- Never run the detector cable together with other cables
 - Line capacitance reduces the magnitude of the flame signal
 - Use a separate cable
- Observe the permissible length of the detector cables (refer to «Technical data»)
- The ionization probe is not protected against electric shock hazard
- Locate the ignition electrode and ionization probe such that the ignition spark cannot arc over to the ionization probe (risk of electrical overloads)
- Always run the ignition cables separately while observing the greatest possible distance to the unit and to other cables

Flue gas supervision
with flue gas temperature sensor

- Run the sensor cable completely separate from other cables
- Sensor cable and temperature sensor are not protected against electric shock hazard

Commissioning notes

- Commissioning and maintenance work must be carried out by qualified staff

Disposal notes

The unit contains electrical and electronic components and may not be disposed of together with household garbage.
Local and currently applicable legislation must be observed.

Type summary

Gas burner control with input for external flue gas temperature sensor (flue gas supervision)	LGC22.002C27x
Flue gas temperature sensor	QAK39...

Ordering

When ordering, please give the full type reference. For details, please contact Siemens HVAC Products Rastatt.

Technical data

Burner control	Mains voltage	AC 230 V +10 % / -15 %
	Mains frequency	50 Hz \pm 5 %
	Power consumption	max. 12 VA
	Degree of protection to IEC 529	IP 00
	- To be ensured after installation	min. IP 40
	Terminal rating	
	- Controller / limit thermostat	max. AC 2 A, $\cos \varphi > 0.4$
	- BV1, BV2, SBV	max. AC 0.5 A each, $\cos \varphi > 0.4$
	- Ignition transformer	max. AC 0.5 A, $\cos \varphi > 0.4$
	- Alarm	max. AC 0.5 A, $\cos \varphi = 1$
	Cable lengths	max. 3 m
	Connector system RAST5 with coding and locking	
	Unit fuses	
	- Internally	T4H250V
	- Externally	min. T6.3H250V
	Mounting position	optional
Weight	approx. 250 g	
Flame supervision	Switching thresholds (limit values)	
	- Switching on	0.9 μ A
	- Switching off	0.3 μ A
	Short-circuit current	max. AC 200 μ A
	Parasitic capacitance of ionization probe	max. 1 nF
	Required insulation resistance of ionization probe and cable against earthed burner components	> 50 M Ω
Flue gas supervision with flue gas temperature sensor QAK39...	Switching thresholds	
	- Switching on	55 °C (+7.5 °C / -4 °C)
	- Switching off	63 °C (+8.5 °C / -5 °C)
	Voltage	< DC 12 V
	Current	< 50 μ A
	Cable length	max. 3 m
Times	Waiting time «tw»	1.5...5 s
	Ignition time «tIGN»	max. «TSA»
	Interval «tl»	5...8 s
	Safety time «Pilot burner start» «TSA»	25...40 s
	Safety time «Operation» «TSE»	max. 5 s
	Flame stabilization time «tstab»	2..3 s
	(corresponding to a second safety time)	\leq 6 s
	Flue gas supervision delay time «t33»	approx. 13 min.

Norms and standards

Environmental conditions

Transport

Climatic conditions	IEC 60721-3-2 class 2K2
Mechanical conditions	class 2M2
Temperature range	-20...+70 °C
Humidity	< 85 % r.h.

Operation

Climatic conditions	IEC 60721-3-3 class 3K5
Mechanical conditions	class 3M2
Temperature range	0...+60 °C
Humidity	< 60 % r.h.



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

CE conformity

According to the directives of the European Union

Electromagnetic compatibility EMC	89 / 336 EEC
Directive for gas appliances	90 / 396 EEC

Function

For control sequence, refer to the sequence diagram.

Prerequisites for burner startup / operation

- Power supply must lie within the specified range
- Burner control must be reset
- Contacts of control / limit thermostat must be closed
- Correct flame signal must be present
- Contacts of gas pressure monitor must be closed
- Correct flue gas supervision signal must be present

If one of the required input signals is not present, the burner control will initiate lockout until all conditions for burner startup are satisfied..

Control sequence in the event of fault

Should a fault occur, both the gas valve and the ignition will be shut down. In the case of extraneous light during the waiting time, the burner will not be started up.

Restart will take place after loss of flame during automatic operation.

Lockout

Lockout occurs if the burner does not ignite when, at the end of the safety time «Pilot burner start», no flame signal is present.

The LGC22... permits indication of the lockout position and reset only when the contacts of the control / limit thermostat are closed. Lockouts are indicated by an external fault signal lamp (alarm).

Reset

After lockout, the LGC22... must be manually reset with the external reset button.

This must take place no earlier than 10 seconds after lockout, or else there will be no correct reset.

Flame supervision

Flame supervision is accomplished with an ionization probe.

The direct current (ionization current) flowing when a flame is present produces the flame signal which is fed to the input of the flame signal amplifier.

The amplifier is designed such that it responds only to the DC component of the flame signal. This ensures that a short-circuit between ionization probe and ground will not simulate a flame signal.

Flame stabilization phase

To ignore instabilities of the flame signal when switching from the pilot burner to the main burner, the safety time will be extended to the flame stabilization time.

Flue gas supervision

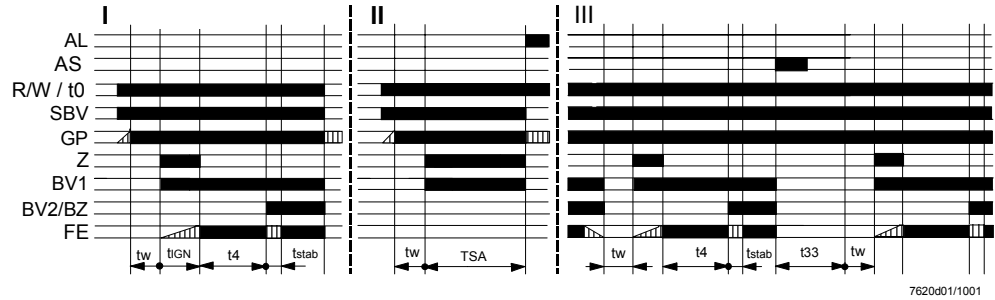
If the flue gas temperature falls below the switching threshold of the flue gas temperature sensor, the burner control will initiate lockout.

Automatic switching on will not take place until the flue gas supervision delay time has elapsed.

Reversed polarity protection

Live and neutral conductors must be correctly connected. If they are interchanged, lockout will occur at the end of the safety time «Pilot burner start».

Sequence diagram

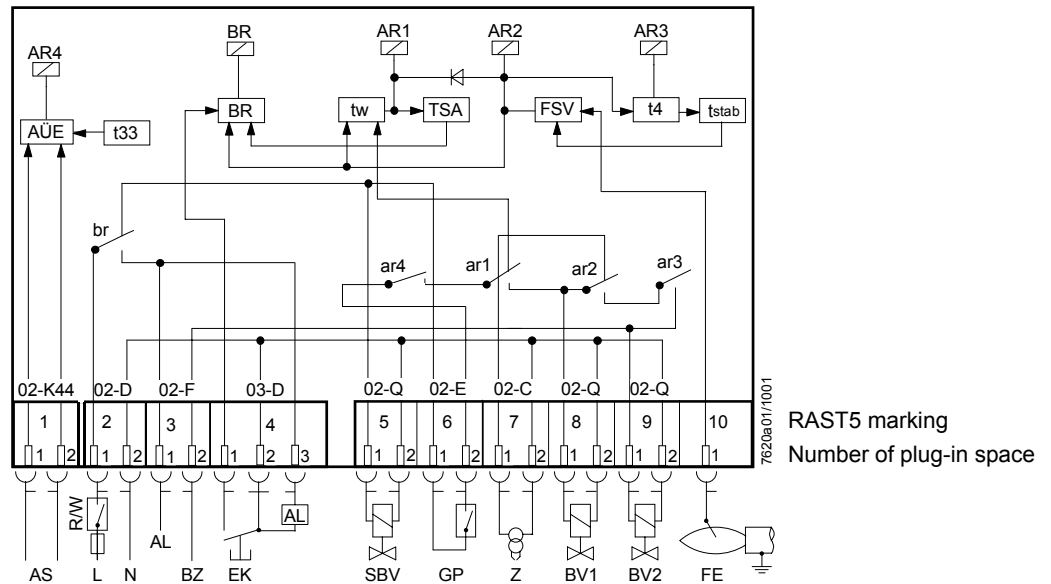


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- I Normal burner startup, operation and shutdown
- II No establishment of flame within «TSA»
- III Operation followed by loss of flame, restart and shutdown by flue gas supervision

- Signal must be present
- Signal may be present

Connection diagram



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 RAST5 marking
 Number of plug-in space

Legend

AL	Fault signal (alarm)	W	Temperature limiter or pressure monitor
AR..., ar...	Load relay	SBV	Safety fuel valve
AS	Flue gas temperature sensor	tw	Waiting time on burner startup
AÜE	Flue gas supervision equipment	tIGN	Interval from release of «BV1» to establishment of flame (always shorter than «TSA»)
BR..., br...	Locking relay	TSA	Safety time «Pilot burner start» (refer to «Technical data»)
BV1	Fuel valve 1 (pilot gas valve)	t4	Interval from establishment of flame and release of «BV2»
BV2	Fuel valve 2 (main fuel valve)	tstab	Flame stabilization time
BZ	Indication of operation	t33	Flue gas supervision delay time
EK	Lockout reset button	t0	Indication of heat demand
FE	Ionization probe	Z	Output for external ignition equipment
FSV	Flame signal amplifier		
GP	Gas pressure monitor		
R	Temperature or pressure controller		

Dimensions

Dimensions in mm

