



Burner Controls

LFL1...

Burner controls

- For gas, oil or dual-fuel forced draft burners of medium to high capacity
- For multistage or modulating burners in intermittent operation
- With checked air damper control
- Flame supervision
 - with UV detectors QRA2 / QRA4 / QRA10
 - and ionization probe

The LFL1 and this Data Sheet are intended for use by OEMs which integrate the burner controls in their products!

Use

- Control and supervision of forced draft burners of direct spark flame or interrupted pilot construction
- For medium to high capacity
- For intermittent operation (at least one controlled shutdown every 24 hours)
- For universal use with multistage or modulating burners
- For use with stationary air heaters (WLE)
- For use with dual-fuel burners
- Type-tested and approved in accordance with DIN EN 298

The flame supervision is ensured via a flame detector QRA2 / QRA4 / QRA10 or ionization probe. The difference between 01 series and 02 series is the duration of the safety time for the pilot burner of burners equipped with pilot gas valves. For atmospheric burners of high capacity, use the LFL1.638.

Supplementary documentation

Product type	Type of documentation	Documentation number
LGK16 (burner controls for continuous operation)	Data Sheet	N7785

Warning notes



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

Do not 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, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's connection terminals
- 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»
- Press the lockout reset button only manually (apply a force of no more than 10 N), without using any tools or pointed objects
- Do not press the lockout reset button on the unit or the remote lockout reset button (input 21) for more than 10 seconds since this damages the lockout relay in the unit
- 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
- For safety reasons – self-test of the flame supervision circuit, etc. – at least one controlled shutdown must take place every 24 hours
- In the case of flame supervision with UV detectors QRA2 / QRA4 / QRA10, it should be noted that sources of radiation such as halogen lamps, welding equipment, special lamps, ignition sparks, as well as X-rays and gamma radiation, can produce erroneous flame signals

Mounting notes

- Ensure that the relevant national safety regulations are complied with
- Connect the earthing lug inside the terminal base to burner ground using a screw with a lockwasher
- **An ignited UV tube is a source of UV radiation!** In case of flame supervision by means of flame detectors, the detectors must be placed such that there is **no direct visual contact** between them. If this is not observed, there is a risk of loss of safety functions

Installation notes

- Always run the high-voltage ignition cables separately while observing the greatest possible distance to the unit and to other cables
- Do not mix up live and neutral conductors
- Install switches, fuses and grounding in accordance with local regulations
- Risk of damage to the switching contacts!
If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LFL1 must be replaced
- Do not exceed the maximum permissible current rating of the connection terminals
- The insulation of internal wiring which is subjected to the mains voltage must be able to withstand the electrical loads occurring during proper use

Application notes



For use in applications in dual-fuel burners or oil burners, the oil supply must be equipped with two shutoff valves connected in series.

Observe the following:

EN 298:2012, Section 7.101.3.3 *Prepurge time for oil burner control systems and the corresponding application standards.*

Electrical connection of flame detectors

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

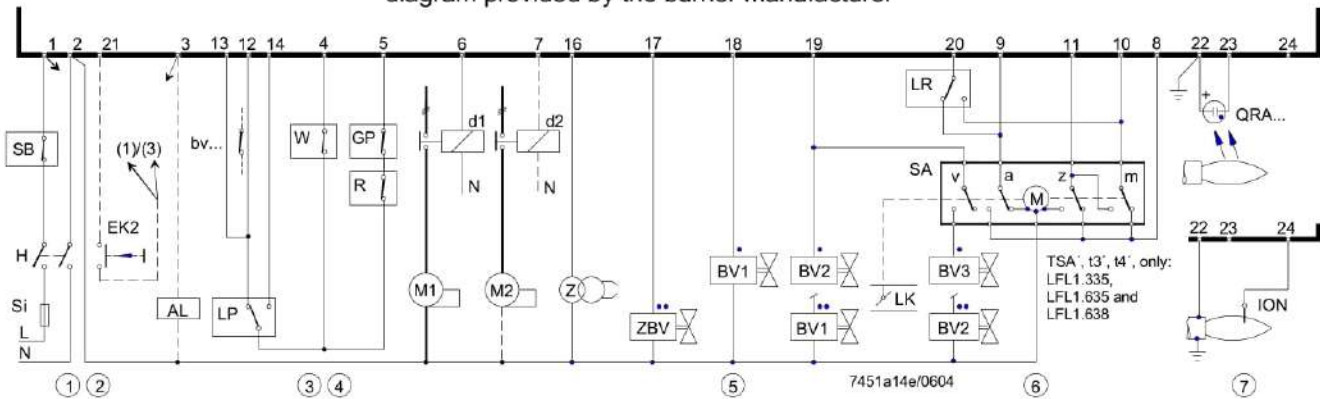
- Never run the detector cable together with other cables
 - Line capacitance reduces the magnitude of the flame signal
 - Use a separate cable
- Observe the maximum permissible detector cable lengths (refer to «Technical data»)
- 2 UV detectors QRA2 / QRA4 / QRA10 can be connected in parallel (observe the warning note)
- In connection with the QRA2 / QRA4 / QRA10, earthing of terminal 22 is mandatory
- The ionization probe is not protected against electric shock hazard
- Locate the ignition electrode and the ionization probe so that the ignition spark cannot arc over to the ionization probe (risk of electrical overloads) and that the ignition sparks cannot adversely affect the supervision of ionization
- Supervision with both ionization probe and UV detector QRA2 / QRA4 / QRA10 is possible, but for safety reasons – with the exception of the second safety time «t9» – only 1 flame detector may be active at a time. At the end of the second safety time, 1 of the detectors must be inactive, however, that is, the detected flame must have extinguished, e.g. by switching off the ignition valve via terminal 17

Commissioning notes

When commissioning the plant or when doing maintenance work, make the following safety checks:

	Safety check to be carried out	Anticipated response
a)	Burner start with flame detector darkened	Lockout at the end of «TSA»
b)	Burner start with flame detector exposed to extraneous light	Lockout after no more than 40 seconds
c)	Burner operation with simulated loss of flame; for that purpose, darken the flame detector in operation and maintain that state (not possible with ionization)	Lockout
d)	Burner startup with response from air pressure switch interruption	Start prevention / lockout during the prepurge time
e)	Burner operation with air pressure failure simulation	Immediate lockout

- Install switches, fuses, earthing, etc., in compliance with local regulations
- Risk of damage to the switching contacts!
If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LFL1 must be replaced
- Decisive for the connection of the valves and other plant components is the plant diagram provided by the burner manufacturer



- ① Connect safety limit thermostat in the line (manual reset, e.g. «SB»)
- ② Remote reset
When remote reset button «EK2» is connected between terminal 21 and
 - terminal 3, only remote reset is possible
 - terminal 1, both remote emergency shutdown and remote reset are possible
- ③ Required switching capacities
 - of the switching devices connected between terminals 12 and 4 (refer to «Technical data»)
 - of the switching devices connected between terminals 4 and 14 (refer to «Technical data»)
 - depending on the loads applied to terminals 16...19 (refer to «Technical data»)
- ④ Air pressure supervision
If the air pressure is not monitored with air pressure switch «LP», terminal 4 must be connected to terminal 12, and terminal 6 to terminal 14. Terminal 13 is not used.
Control contacts of the other devices in the burner installation – if series-connected – are to be connected as follows:
 - To terminal 4 or 5 → contacts which must be closed from startup to controlled shutdown → otherwise no start or shutdown
 - To terminal 12 → contacts which must only be closed on startup → otherwise no start
 - To terminal 14 → contacts which must be closed at the beginning of the preignition time at the latest, and which must stay closed until controlled shutdown occurs

 For use in oil applications, the oil supply must be equipped with two shutoff valves connected in series.

Observe the following:
EN 298:2012, Section 7.101.3.3 *Prepurge time for oil burner control systems and the corresponding application standards.*
- ⑤
 - Connection of fuel valves with direct spark flame burners. With 2-stage burners, «BV2» is connected in place of «BV3»
 - Connection of fuel valves with interrupted pilot burners
 Direct connection of a fuel valve to terminal 20 is only permitted
 - in plants with a main shutoff valve on the mains side (safety shutoff valve), which is controlled by terminal 18 or 19, and
 - if 2-stage valves are used, provided they fully close when the first stage, controlled by terminal 18 or 19, is switched off
- ⑥ For additional examples of air damper control, refer to «Connection examples». In the case of actuators with no end switch «z» for the fully CLOSED position of the air damper, terminal 11 must be connected to terminal 10 → otherwise no burner start.
- ⑦ Simultaneous use of ionization and UV supervision is possible
For the permissible length and laying of detector cables, see *Flame supervision*