SIEMENS

7785

Burner Controls

LOK16...
LGK16...

Burner controls

- **For gas, oil or dual-fuel forced draft burners of medium to high capacity**
- **For multistage or modulating burners in continuous operation**
- **With air pressure supervision for checked air damper control.**
- **Flame supervision**
  - **LOK16: With silicon detector RAR**
  - **LGK16: With flame detector QRA53/QRA55/ionization probe**
- **Burner control for oil burners or gas burners in accordance with EN 298:2012**
- **Suitable for use with air heaters (WLE)**
- **With self-checking flame signal amplifier**

The LOK16/LGK16 and this Data Sheet are intended for use by OEMs which integrate the burner controls in their products.

Use

Burner controls type LOK16/LGK16 feature a self-checking flame supervision circuit.

The flame supervision circuit initiates the safety actions in the case of... :

- ... premature or missing flame signal
- ... any kind of fault on the flame detector, the detector cables or the flame signal amplifier that could simulate a flame signal during burner operation

The burner controls are therefore suited for use in all types of oil- or gas-fired combustion plant where self-checking flame supervision systems are either mandatory or recommended.
For example:

- Burners that operate continuously
- Burners in intermittent operation that, in the case of great heat demand, may operate continuously for more than 14 hours, e.g. in plant using boiler sequencing
- Burners that need to comply with the German TRD 411 and TRD 412 regulations for steam boilers
- Burners in plant where, for specific safety requirements, supervision of the burner by a self-checking flame supervision system seems advisable
- The control sequence and connection circuitry of the LOK16/LGK16 burner controls are identical to those of the LAL2 and LFL1 respectively (with the exception of the LFL1.148), so that existing combustion plant can also be equipped with self-checking burner controls,
  - provided very good flame detector current values are measured in the plant supervised so far by the LFL1, and
  - provided the following types of flame detectors are either installed or can subsequently be fitted:

Flame supervision when using LOK16

- Photocell detector RAR9

Flame supervision when using LGK16

- Flame detector QRA53/QRA55
- Ionization probe
- Flame detector QRA53/QRA55 together with ionization probe, e.g. in the case of burners using a pilot burner (also see Data Sheet N7712)

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 (applying 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 reset button (input 21) for more than 10 seconds, since this would damage the lockout relay inside 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
- In the case of flame supervision with flame detectors QRA53 / QRA55, 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!**
  If the flame is monitored by several flame detectors, all detectors must be placed in a way that ensures there is **no direct visual contact** between them.
  If this is not observed, there is a risk of loss of safety functions

Upgrading existing plant

When equipping existing plants with LOK16 or LGK16, the existing plug-in base for LAL or LFL burner controls must be replaced with the matching plug-in base AGM17 for LOK16 / LGK16.

Start repetition in the event of loss of flame

By removing link (B) on the underside of the unit, the LOK16 can be switched to start repetition in the event of loss of flame during operation. In that case, the wire link must be cut off completely. However, it must be checked whether this is in compliance with national standards and regulations.

Note!
In applications involving air heaters (WLE), or in the case of oil burners with a maximum throughput of > 30 kW/h, removing wire link **B** is not permitted.

Installation notes

- Always run the high-voltage ignition cables separately while observing the greatest possible distance to the unit and to other cables
- Neutral conductors must not be interchanged
- 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 LOK16 / LGK16 must be replaced
- Make certain that the maximum permissible current rating of the connection terminals will not be exceeded
- The insulation of internal wiring that is exposed to the mains voltage must withstand the electrical stress occurring during correct use

Application notes

Note!
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 permissible detector cable lengths (see Technical data)
- It is not permitted to connect 2 flame detectors QRA53/QRA55 in parallel
- When using the QRA53/QRA55, earthing of terminal 22 is mandatory
- 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) and that it cannot adversely affect the supervision of ionization
- Supervision with ionization probe and QRA53/QRA55 flame detector is possible but, for safety reasons, both must not be active at the same time, with the exception of the second safety time (t9). At the end of the second safety time, one of the detected flames must extinguish, e.g. by shutting down the pilot gas valve connected to 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 startup with flame detector darkened	Lockout at the end of safety time
b)	Burner startup with simulated flame	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 leave it in that state	**LOK16** with wire link cut: Start repetition followed by lockout at the end of safety time **LGK16** and **LOK16** with wire link closed: Immediate lockout
d)	Burner startup with response of air pressure switch	Prevention of startup/lockout during prepurge time
e)	Burner operation with simulated air pressure failure	Immediate lockout