



ISO 9001



## Oil Burner Controls

## LOA44...

The LOA44... are designed for the supervision of single- or two-stage oil burners of direct-fired air heaters and of burners with an oil throughput of more than 30 kg / h.

The LOA44... and this data sheet are intended for OEMs which integrate the burner controls in their products.

### Use

- On burners with an oil throughput of more than 30 kg / h
- On stationary direct-fired air heaters (WLE to DIN 4794)
- On burners with oil pre-heaters or with heating of the adjustable head.  
Such heating devices are integrated into the burner control system in a way that they will be switched off should lockout occur
- Together with the KF8819 adapter in place of burner control type LAB15.1 or LAB16.3, without having to replace the plug-in base and without having to change the wiring. When using the adapter, the total height of the burner control and the position of the lockout reset button will not change

## Warning notes

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

- Before performing any wiring changes in the connection area of the LOA44..., completely isolate the burner control from the mains supply
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's terminals
- Check wiring and all safety functions
- Press the lockout reset button only manually, without using any tools or pointed objects
- Fall or shock can adversely affect the safety functions. In that case, the burner control may not be put into operation, even if there is no visible damage

## Engineering notes

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- Use the KF8840 or KF8885 service adapter for short periods of time only
- When using the electrical remote reset facility, the lockout reset button must be integrated such that **terminal 9 will be connected to the neutral conductor**

## Mounting notes

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The relevant national safety regulations must be complied with.

## Installation notes

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- Installation and commissioning work may only be carried out by qualified staff
- Observe the permissible lengths of the flame detector cables (refer to «Flame detectors»)
- Always run the ignition cables separately while observing the greatest possible distances to the unit and to other cables
- Do not mix up live and neutral conductors

## Service notes

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Do not press the lockout reset button «EK» for more than 10 seconds.

## Mechanical design

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LOA44...	<p>The oil burner controls are of plug-in design. They can be reset from a remote location and are suited for mounting on the burner, in control panels or on panel fronts. The program is controlled electronically.</p> <p>The housing is made of impact-proof and heat-resistant plastic and accommodates:</p> <ul style="list-style-type: none"><li>- The electronics</li><li>- The lockout warning lamp and the lockout reset button (splash-proof)</li></ul>
AGK11 plug-in base	Refer to data sheet 7201.
AGK65 cable gland holder	Refer to data sheet 7201.
AGK66 cable holder	Refer to data sheet 7201.
AGK67... cable holder	Refer to data sheet 7201.
QRB... photoresistive detectors	Refer to data sheet 7714.
QRC1... blue-flame detectors	Refer to data sheet 7716.

**Oil burner control** without plug-in base **LOA44.252A27**

**Plug-in base** **AGK11**  
 (refer to data sheet 7201)

**Cable gland holder** **AGK65**  
 (refer to data sheet 7201)

**Cable holder** **AGK66**  
 (refer to data sheet 7201)

**Cable holder** **AGK67...**  
 (refer to data sheet 7201)

**Pedestal** (empty housing) **AGK21**  
 To increase the overall height of the LOA... to that of the LAI...



**Adapter** **KF8819**  
 For replacing LAB15.1... and LAB16.3... by LOA44...  
 No rewiring of the plug-in base required



**Test adapter** **KF8840**


- With signal lamps for program indication
- With holes for checking the control voltages at the tabs of the LOA44...
- With 2 jacks for measuring the flame detector current
- With an on / off switch for simulating the flame signal



**Test adapter** **KF8885**

- With a switch for manual burner startup
- With a switch for simulating the oil pre-heater's release contact
- With 4 jacks for measuring the flame detector current

## Technical data

General unit data	Mains voltage	AC 220 V –15 %...AC 240 V +10 %
	Mains frequency	50...60 Hz ±6 %
	Primary fuse	max. 10 A (slow)
	Power consumption	3 VA
	Degree of protection	IP40
	Mounting orientation	optional
	Input current to	
	- Terminal 1	max. 5 A
	- Terminal 3	5 A
	incl. current drawn by the burner motor and oil pre-heater	
	Weight	approx. 140 g
	Terminal ratings	
	- Terminals 4, 5 and 6	max. 2 A
	- Terminal 8	max. 5 A
	- Terminal 10	max. 1 A
Environmental conditions	<b>Transport</b>	IEC 721-3-2
	Climatic conditions	class 2K2
	Temperature range	-50...+60 °C
	Humidity	< 95 % r.h.
	Mechanical conditions	class 2M2
	<b>Operation</b>	IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature range at Un	
	- AC 187...242 V	-20...+60 °C
	- AC 242...264 V	-20...+40 °C
	Humidity	< 95 % r.h.
	 <b>Condensation, formation of ice and ingress of water are not permitted!</b>	
	<b>CE conformity</b>	
	According to the directives of the European Union	
	Electromagnetic compatibility EMC	89 / 336 EEC incl. 92 / 31 EEC
Low voltage directive	73 / 23 EEC	

Flame detectors For measuring circuits and lengths of flame detector cables, refer to data sheets 7714 (QRB...) and 7716 (QRC...).

	QRB...	QRC...
Min. detector current required (with flame) <sup>1)</sup>	58 µA	58 µA
Max. detector current permitted (without flame)	5.5 µA	5.5 µA

<sup>1)</sup> These values apply only under the following conditions:

- Mains voltage AC 230 V ±3 V
- Temperature 23 °C ±5 °C
- Detector cable length < 5 m

The highest possible intensity of illumination can only be detected by a slight increase of the detector current.

**Function**

Burners with no heating of the adjustable head

→ Wire link across terminals 3 and 8 fitted  
 When the control thermostat or pressurestat «R» of the heat source gives the start command, both burner motor «M» and ignition transformer «Z» will be switched on. For flame simulation purposes, the flame signal amplifier operates with a higher sensitivity during the pre-purge time. On completion of the pre-purge time of about 25 seconds, power is supplied to the first fuel valve. The safety time thus commences during which the burner must ignite. If not, the LOA44... will initiate lockout. About 5 seconds after the first fuel valve has opened, the LOA44... supplies power to the second fuel valve «BV2», thus completing the burner's startup sequence.

Burners with heating of the adjustable head

→ Release contact «OW» in the control loop between terminals 3 and 8  
 With these types of burner, the startup sequence given in the following table begins only when release contact «OW» of the heating device closes the control loop. On flame establishment, release contact «OW» is bridged by a contact of flame relay «FR» in the LOA44... so that opening of the release contact will not lead to shutdown.

Startup sequence

tw	Waiting time for pre-heating the oil	Depending on the type of heating device
t1	Pre-purge time	Approx. 25 s
t3	Pre-ignition time	Approx. 25 s
TSA	Ignition safety time	Max. 5 s
t3n	Ignition time after flame establishment	Approx. 2 s Depending on the time of flame establishment
t4	Interval «BV1-BV2»	Approx. 5 s Depending on the time of flame establishment
TSB	Safety time in the event of loss of flame during operation	< 1 s

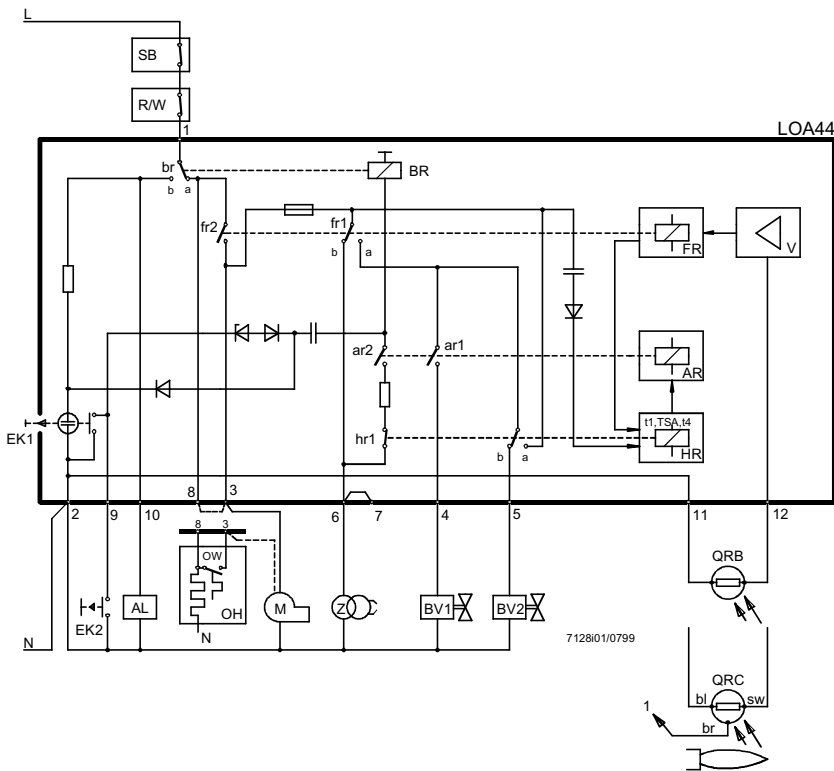
Control functions of the burner control in the event of fault

Lockout	<ul style="list-style-type: none"> <li>– <b>No flame signal</b> on completion of the safety time</li> <li>– Loss of flame signal during the post-purge time</li> </ul>
Lockout at the end of the pre-purge time provided the flame signal is still present at that time	– <b>Premature flame signal</b> during the pre-purge time
Repetition	– Loss of flame signal during operation
<ul style="list-style-type: none"> <li>• Automatic restart on power restoration</li> <li>• Unshortened program sequence</li> </ul>	– <b>Mains voltage failure</b> at any time of the startup sequence or during burner operation
<ul style="list-style-type: none"> <li>• Fuel valve «BV1» will be closed</li> <li>• «BV2» will close when flame signal is lost</li> </ul>	– <b>Undervoltage</b> < approx. AC 160 V

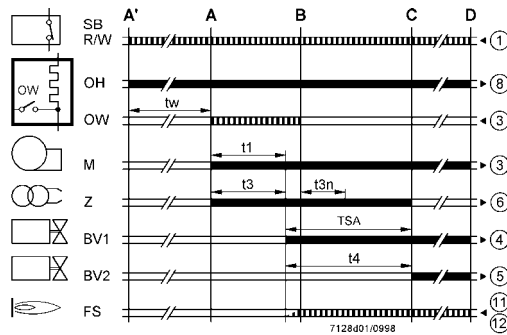
In the event of lockout, terminals 3 to 8 and terminal 12 will be de-energized in less than one second while power is supplied to terminal 10 for the remote indication of faults.

The LOA44... can be reset 2 seconds after lockout has occurred.

## Connection diagram and internal diagram



## Control sequence



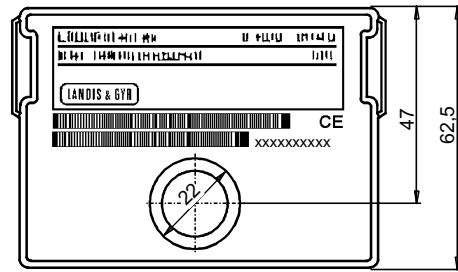
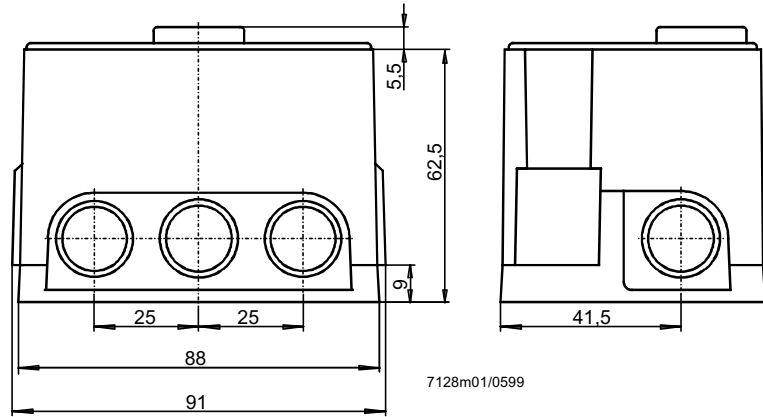
## Legend

AL	Alarm device	QRB	Photoresistive detector
AR	Main relay with contacts «ar...»	QRC	Blue-flame detector
BR	Lockout relay with contacts «br...»	bl = blue	
BV...	Fuel valve	br = brown	
EK...	Lockout reset button	sw = black	
FR	Flame relay with contacts «fr»	R	Control thermostat or pressurestat
FS	Flame signal	SB	Safety limit thermostat
HR	Auxiliary relay with contacts «hr...»	W	Limit thermostat or pressure monitor
M	Burner motor	V	Flame signal amplifier
OW	Release contact of oil pre-heater	Z	Ignition transformer
OH	Oil pre-heater		
t1	Pre-purge time	t4	Interval «BV1-BV2»
t3	Pre-ignition time	TSA	Ignition safety time
t3n	Post-ignition time	tw	Waiting time for oil pre-heating
A'	Beginning of startup sequence with burners using an oil pre-heater	C	End of startup sequence
A	Beginning of startup sequence with burners using no oil pre-heater	C-D	Burner operation
B	Reception of flame signal	D	Controlled shutdown
■	Control signals of the LOA44...	□	Required input signals

**Dimensions**

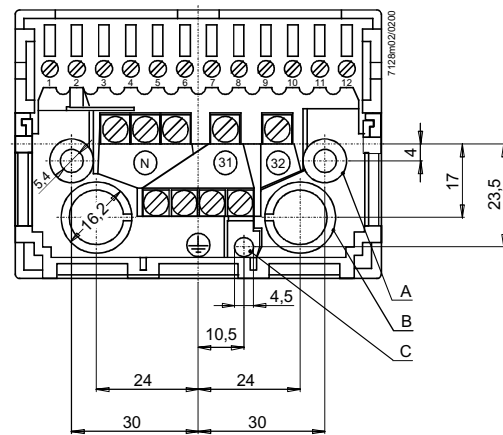
Dimensions in mm

LOA44...



**LOA44...** with AGK11 plug-in base and AGK65 cable gland holder

AGK11 plug-in base



Plug-in base with screw terminals

Hatched: position of cable gland holder or cable holder

«B»: holes for cable entry

«31 / 32»: auxiliary terminals

«N»: neutral terminals, connected to the neutral input (terminal 2)

Underneath: 4 earth conductor terminals, joining in a lug for earthing the burner (also refer to data sheet 7201).

**Mandatory:**

Connection of earthing lug «C» and of fixing screws in «A» to the burner's ground (using a metric screw with a lockwasher or similar).