ISO 9001

Oil Burner Controls LOA44...

Oil burner controls designed for the supervision of single- or two-stage burners of direct fired air heaters and of burners with an oil throughput of more than 30 kg/h.
® Without air damper control; intermittent operation!

The LOA44... burner controls are tested and certified to EN 230.
They carry the CE mark in compliance with the directives for electromagnetic compatibility.

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

Use

– On stationary direct fired air heaters
  → WLE to DIN 4794
– On burners with an oil throughput of more than 30 kg/h
– In intermittent operation
  → This means at least one controlled shutdown every 24 hours
– On burners with oil pre-heaters or with heating of the adjustable head.
  Such heating equipment is integrated into the burner control system in a way that it will be switched off should lockout occur
– With KF8819 adapter in place of burner controls type LAB15.1 or LAB16.3, without replacing the base and without having to change the wiring.
  Thanks to the lower profile of the LOA44..., to total height of the burner control and the position of the lockout reset button will not change.

Ordering

Burner control without base	**LOA44.252A27**
Plug-in base with holes knocked out	**AGK11**
→ Refer to «Dimensions»	
Spacer to increase the overall height of the LOA... to that of the LAI...	**AGK21**
Cable gland holder	**AGK65**
Cable holder	**AGK66**
Adapter for replacing LAB1... and LAI...	**KF8819**
→ Refer to «Accessories»	
Test adapter	**KF8840**
Test adapter	**KF8885**

Warning notes

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

It is not permitted to open, interfere with or modify the unit!

- 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 by providing appropriate protection for the burner control's terminals!
- Check wiring and all safety functions!
- Press lockout reset button only manually, **without** using any tools or pointed objects!

Engineering notes

- Use the KF8840 and KF8885 test adapters for only short periods of time!
- 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

The relevant national safety regulations must be complied with!

Installation notes

- Installation and commissioning work may only be carried out by qualified staff!
- Observe the permissible length of the detector cables!
  → Refer to «Flame detectors»
- Always run ignition cables separate from the unit and other cables while observing the greatest possible distances!
- Before putting the burner control into operation, check wiring carefully!
- Do not mix up live and neutral conductors!

Service notes

- Do not press lockout reset button «EK» longer than 10 seconds!

Technical data

- **LOA44...**

Input current to	
- Terminal 1	max. 5 A
- Terminal 3	5 A
incl. power consumption of the burner motor and oil pre-heater	

Environmental conditions

Transport	IEC 721-3-2
Climatic conditions	class 2K2
Temperature range	-50...+60 °C
Humidity	< 95 % r.h.
Mechanical conditions	class 2M2
Operation	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.

Mains voltage	AC 220 V -15 %...AC 240 V +10 %
Nominal frequency	50...60 Hz ±6 %
Primary fuse	max. 10 A (slow)
Power consumption	3 VA
Degree of protection	IP40
Mounting orientation	optional

Weight	
- LOA44...	approx. 140 g
- AGK11 plug-in base	approx. 80 g
- AGK66 cable holder	approx. 12 g

Terminal ratings	
- Terminals 4, 5 and 6	max. 2 A
- Terminal 8	max. 5 A
- Terminal 10	max. 1 A

CE conformity

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

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 the flame detector cables, refer to data sheets 7714 (QRB...) and 7716 (QR

	QRB...	QRC...
Min. detector current required (with flame) – typically	70 µA	70 µA
Max. perm. detector current (without flame) – typically	5 µA	5 µA

Mechanical design

Provided with catches on the two narrow sides which audibly engage in the burner control's housing. To disengage, a screwdriver must be **slightly** tilted in the guiding slots; the burner control then slightly lifts

- **AGK65 cable gland holder**

– Insertable into the AGK11 plug-in base
– With 5 threaded knockout holes for **non-metallic** Pg11 cable glands, 3 on the front and one on each of the other sides

- **AGK66 cable holder**

– Insertable into the AGK11 plug-in base
– With 6 knockout holes for cable entry
→ Without cable tension relief
→ Each side 1 x 8.8 mm or 17 mm dia.
→ On the front 3 x 7 mm dia. and one elongated hole 6 x 20 mm

- **KF8819 adapter**

– For replacing LAB15.1... and LAB16.3... by LOA44...
– No rewiring of plug-in base required

- **KF8840 test adapter**

– With signal lamp for program indication
– With holes for checking the control voltages on the quick connectors of the LOA44...
– With 2 jacks for measuring the detector current
– With on / off switch for simulating the flame signal
→ Refer to «Accessories»

- **KF8885 test adapter**

– With a switch for manual burner start-up
– With a switch for simulating the oil pre-heater's release contact
– With 4 jacks for measuring the detector current
→ Refer to «Accessories»

- **QRB... photoresistive detectors**

→ Refer to data sheet 7714

- **QRC1... blue-flame detectors**

→ Refer to data sheet 7716

Function

- **Burners with no heating of the adjustable head**

→ Wire link across terminals 3 and 8

When the control thermostat or pressurestat «R» of the heat source gives the start command, both burner motor «M» and ignition transformer «Z» are switched on.

For flame simulation test purposes, the flame signal amplifier operates with a higher sensitivity during the pre-purge time.

On completion of the pre-purge time of approximately 25 seconds, power is supplied to the first fuel value.

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 start-up sequence.

- **Burners with heating of the adjustable head**

→ Release contact «OW» in the control loop between terminals 3 and 8

With this type of burner, the start-up 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.

- **Start-up sequence**

tw	Preset time for 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 the flame is established
t4	Time interval «BV1-BV2»	Approx. 5 s Depending on the time the flame is established
TSB	Safety time in the event of loss of flame during operation	< 1 s

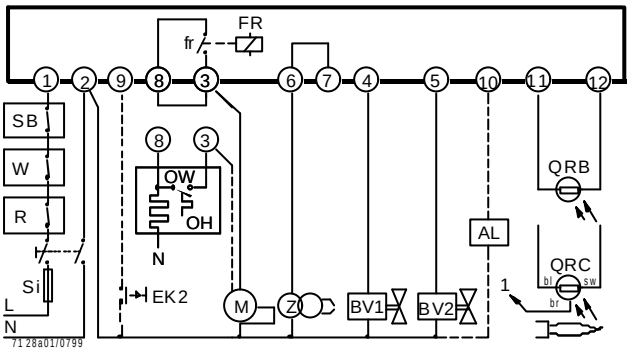
- **Control functions of the burner control in the event of faults**

Lockout	– **No flame signal** on completion of the safety time – Loss of flame signal during the post-purge time
Lockout at the end of the pre-purge time provided the flame signal is still available at that time	– **Premature flame signal** during the pre-purge time
Repetition	– Loss of flame signal during operation
• Automatic restart on power restoration • Unshortened program sequence	– **Mains voltage failure** at any time of the start-up sequence or during burner operation
• Fuel valve «BV1» will be closed • «BV2» will close when flame signal is lost	**Undervoltage** < approx. AC 160 V

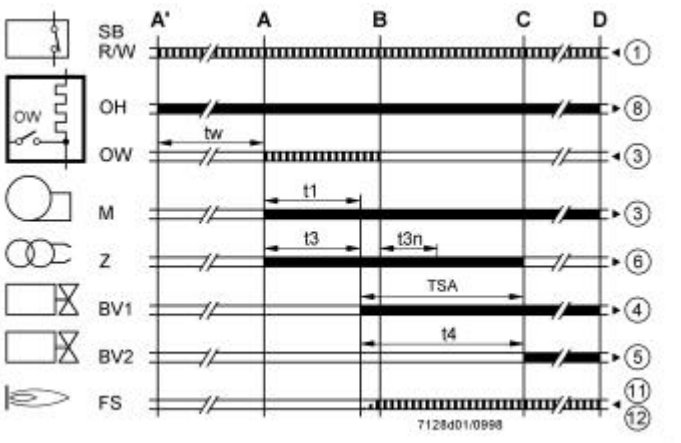
In the event of lockout, terminals 3 to 8 and terminal 12 will be de-energised in less than one second while power is supplied to terminal 10 for the remote indication of faults.

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

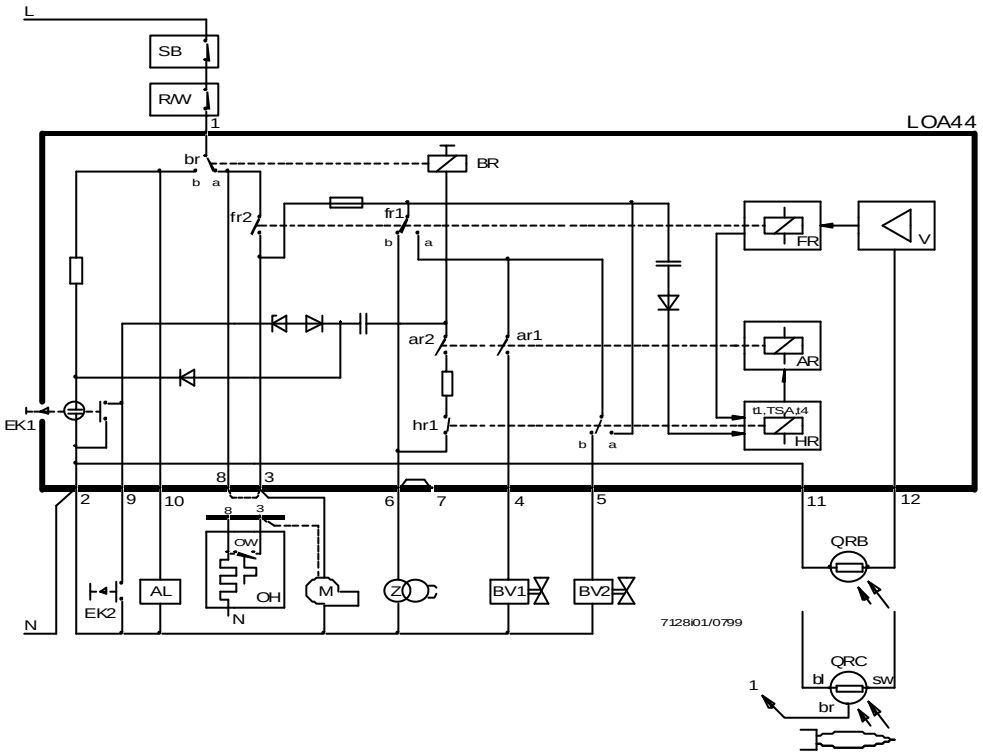
Connection diagram



Control sequence



Internal diagram



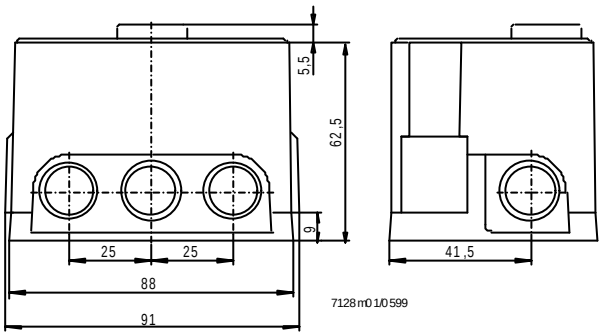
Legend	AL	Alarm device		QRB	Photoresistive detector
	AR	Main relay with contacts «ar...»		QRC	Blue-flame detector
	BR	Lockout relay with contacts «br...»			bl = blue
	BV...	Fuel valve			br = brown
	EK...	Lockout reset button			sw = black
	FR	Flame relay with contacts «fr»		R	Control thermostat or pressurestat
	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	Time interval «BV1-BV2»
	t3	Pre-ignition time		TSA	Ignition safety time
	t3n	Post-ignition time		tw	Pre-purge time for oil pre-heating
	A´	Beginning of start-up sequence with burners using an oil pre-heater		C	End of start-up sequence
	A	Beginning of start-up sequence with burners using no oil pre-heater		C-D	Burner operation
	B	Reception of flame signal		D	Controlled shutdown
	■	Control signals of LOA44...		▭	Required input signals

Accessories

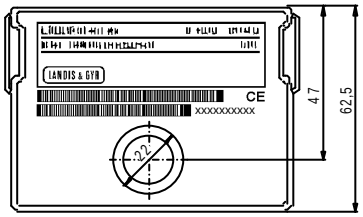
KF8819 KF8840 KF8885

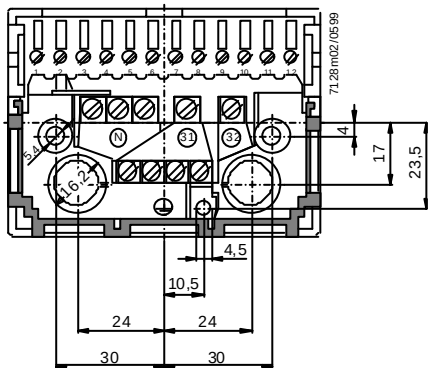
For a description of the adapters, refer to «Mechanical design».

Dimensions



LOA44... with AGK11 plug-in base and AGK65 cable gland holder; can be inserted into the plug-in base





AGK11 plug-in base

Hatched: position of insertable cable gland holder AGK65 or cable holder AGK66