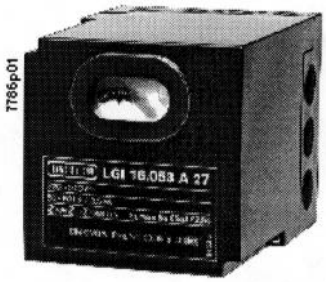
Burner Controls for Continuous Operation

for use on industrial furnaces

LGI16...

FM739

Supplementary Data Sheet 7712



LGI16 burner control
fitted to AGM15 baseplate

- **Self-supervising flame amplifier**
- **Fast start-up**
- **Single-stage operation with interrupted pilot burner or two-stage operation**
- **Flame supervision by UV detector or by ionization current detector electrode**
- **Common or separate ionization current detector and ignition electrodes (single- or double-electrode operation)**
- **Automatic restart (repetition) or lock-out after a flame failure during operation**
- **Without fan control and air pressure supervision**
- **Indication of program sequence**
- **Remote reset facility**
- **Programming mechanism in plastic casing; plugs into baseplate**

Summary of Types

	Type reference	
Burner control		
AC 220...240 V	**LGI16.053A27**	
AC 100...110 V	**LGI16.053A17**	
Baseplate Coded for use with LGI16	**AGM15**	see Data Sheet 7712
Flame detector	**QRA5...**	see Data Sheet 7712
Connecting cable	**AGM19**	see Data Sheet 7712
Adapter To mount flame detector	**AGG16.C**	see Data Sheet 7712
Measuring instrument to measure current of UV detector For measurements of short duration only[1)]	**KF 8832**[1)]	see Data Sheet 7712
Spare fuse for burner control	**4 519 1630 0**	

1) Not suitable for continuous operation. The KF 8832 disables self-supervision

Ordering

When ordering, please give name and type reference of the units required. Example:

Burner control for AC 220...240 V and/or	**LGI16.053A27**
Baseplate for LGI16	**AGM15**

These units are packed separately.

Application

Control and supervision of oil or gas burners for use on industrial furnaces operating continuously for long periods of time (>24 hours) without controlled shut-down. In Germany approved to DIN4788 and DIN4756 standards of DIN/DVGW and suitable for applications covered by DIN/DVGW Arbeitsblatt G610.

Design Features

- Programming mechanism with fixed settings
- Synchronous drive motor
- Lock-out relay that can be electrically reset from a remote location
- Self-supervising electronic flame signal amplifier with flame relay
- Indication of program in window by means of a disk fitted to the spindle of the program mechanism. Refer to «Control and Functional Program»
- Lock-out signal lamp in the window of the program indicator
- Reset after lock-out by slightly pressing on the window
- Built-in fuse and spare fuse
- Printed circuit boards with electronic components

Burner control is accommodated in an impact plastic casing. Compact unit which plugs into the baseplate.

Baseplate

Same design as the casing of the programming unit.
The baseplate is coded such that burner controls type LGI16... only can be plugged in.

UV detectors

For details refer to Data Sheet 7712.

Technical Data

LGI16 burner control

Operating voltage U_N	AC 220 V -15% ...240 V +10% AC 100 V -15% ...110 V +10%
Mains frequency	50 Hz -6% ...60 Hz + 6%
Power consumption	3.5 VA
External fuse	16 A max., slow
Unit fuse, built-in	T6.3H250 to IEC 127(5 x 20 mm)
Permissible input current at terminal 1	5 A
Permissible load on control terminals	4 A
Required switching capacity of switching devices connected to terminals 4 and 5	depending on load at terminals 16...19 1 A min., AC 250 V
Radio interference protection	N to VDE 0875
Mounting position	optional
Protection standard	IP 40

AGM15 baseplate

Terminals	No. off	Designation
• Connecting terminals	24	1...24
• Auxiliary terminals, galvanically separated	2	31, 32
• Earth terminals, linked by an earthing lug	3	earth symbol
• Neutral terminals, prewired to neutral input	3	N
• Knock-out entries		
• Threaded for Pg 11	6	
• Unthreaded 7.5 mm dia.	8 at the side 6 at the bottom	
19 mm dia.	2 at the bottom	

Detectors and flame supervision	**QRA5...**	**Ionization**
Operating voltage	280 V [1]	245 V [1]
Protection standard	IP 54	–
Min. required detector current	[2]	12 µA
Max. possible detector current	[2]	100 µA
Short-circuit current	–	approx. 300 µA
Max. length of detector lead, laid separately	[3]	60 m [4]
Mounting position	optional	–

Permissible ambient temperature

For all units	
– Operation	-20... + 60°C
– Transport and storage	-50... + 60°C

Weight

– LGI16	1000 g
– AGM15	165 g
– QRA5...	900 g

Identification code to EN298 A T/B L/C L X K

1) Alternating current, measured with no detector current at 220 V mains voltage. Internal resistance of measuring instrument is 10 MΩ. The shutter drive of the UV detector type QRA5... is connected to mains voltage.

2) Refer to specifications on the KF 8832 measuring instrument.

3) • Detector lead laid **in a minimum distance of 50 mm** from other mains carrying cable:
   – As a multi-core cable **50 m max.**
   – With 5 single wires **70 m max.**
   • Detector lead laid **directly adjacent to other mains carrying cable**:
   – With screened 3-core control cable connected to pins 3, 4 and 5 of the QRA5... ;
   A standard mains cable can be used for the mains connection (pins 1 and 2) **15 m max.**
   – With 3 screened 3-core coaxial cables (93 Ω, 45 pF/m) connected to pins 3, 4 and 5 of the QRA5... .
   A standard mains cable can be used for the mains connection (pins 1 and 2) **60 m max.**
   – If possible, connect screening of cable not only at one but at both ends of the cable!

4) When laying the detector lead to terminal 24 of the burner control while maintaining low capacities (especially against earthed wires), it is possible to cover longer distances.

Functions

Program sequence

When power is supplied to the burner control and the control loop (terminals 4-5) is closed, the unit will start the program sequence shown under «Control and Functional Program», the most important program steps being the following:

- **Waiting time**
  - No external function
  - Internal extraneous light test
- **Release of ignition**
- **Release of pilot gas valve or of gas valve stage 1**
- **Generation of pilot flame** in the 1st safety time t2
- **Generation of main flame in the 2nd safety time t9**
- **Burner operation**
  The burner control maintains its operating position and continually checks the presence of the flame
- **Shut-down of operation**
  This happens when the control loop between terminals 4-5 opens. The signal to the gas valves is immediately interrupted. During the time t20, the programming mechanism returns to the start position

Control program in the event of faults

- **Flame signal at start-up**
  Causes the burner control to go to lock-out
- **No flame signal at the end of the 1st or 2nd safety time**
  Causes the burner control to go to lock-out
- **Flame failure during operation**
  Wire link J, linking terminals 8-11 on the baseplate
  - With wire link fitted: Causes the burner control to go to lock-out
  - No wire link: Burner control initiates a **restart** (repetition)

Baseplate type AGM15 comes **with** wire link J fitted.

In the event of a **lock-out**, the signals to the gas valves will be cut off in less than 1 s and the burner control initiates lock-out. Resetting is always made manually by pressing one of the lock-out reset buttons EK1 or EK2. The buttons should be pressed for no more than 10 s.

In the case of **automatic restart** (repetition), the signals to the gas valves are also interrupted in less than 1 s. Then the programming mechanism will return to the start position to make a new start.

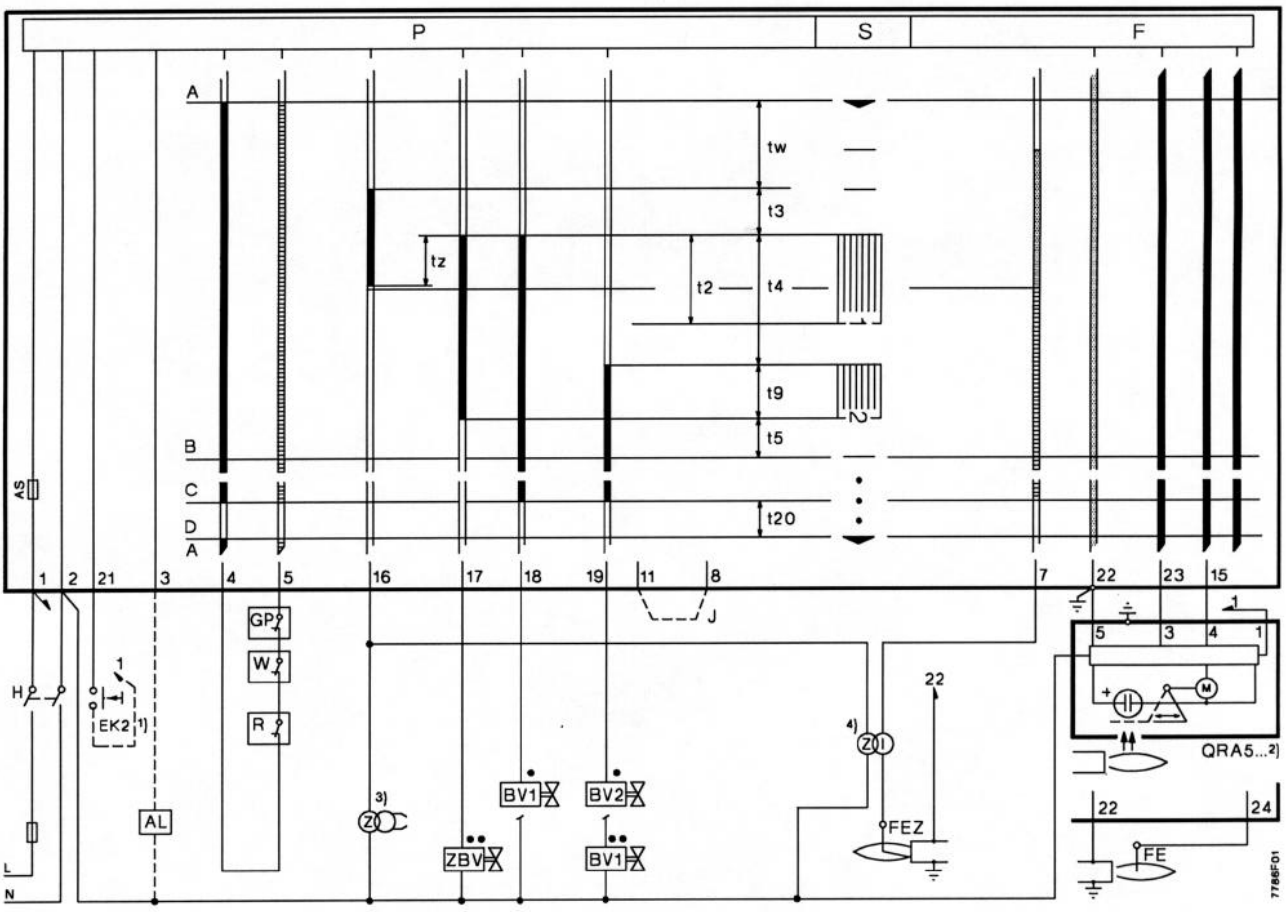
Common ignition and ionization electrode

(Single electrode operation, ionization current detector electrode connected to terminal 7)

In the period between the ignition time tz and the end of the 1st safety time t2, the secondary side of the ignition transformer is switched from earthing to the flame signal amplifier.

Notes

- **Press lock-out reset button EK for no more than 10 s**
- **When used in connection with the QRA5..., terminal 22 must be earthed**
- **Measuring instrument type KF8832 for the UV detector current is not suitable for continuous operation**
- **Follow instructions for the laying of detector leads. Refer to «Technical Data»**
- **For repetitive operation, remove wire link J between terminals 8 and 11 on the AGM15 baseplate**
- **In single-electrode operation, measurement of the ionization current is not possible during the ignition times, the ionization path is under high voltage.**



LGI 16...

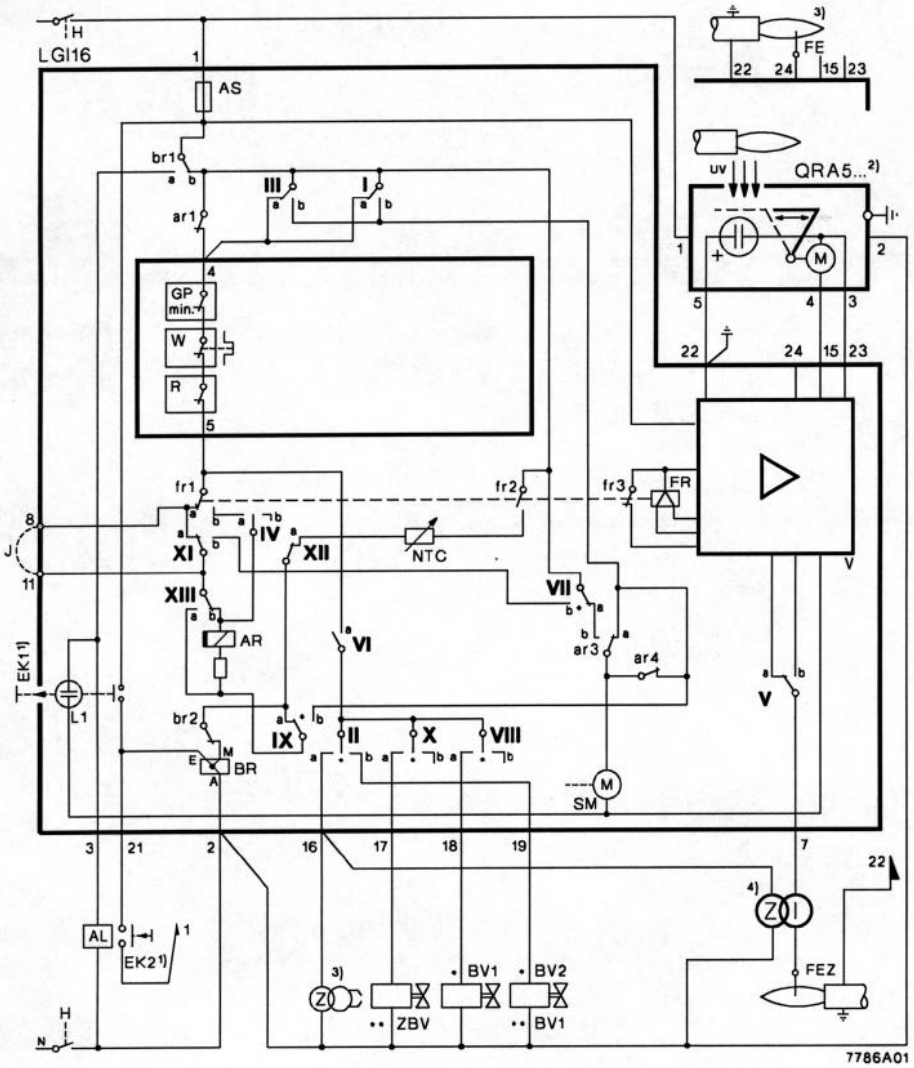
Program times

tw	Waiting time	min. 4.5 s
t3	Pre-ignition time	2.5 s
tz	Ignition time	2.5 s
t2	Safety time	5.0 s
t4	Interval between the start of the release of the valve at terminal 17 or 18 and the release of the valve at terminal 19	7.5 s
t9	Transfer ignition time from pilot burner to main burner	max. 2.5 s
	2nd safety time adds up t9 and the extinction safety time	max. 3.5 s
t5	Interval up to the self-shut-down of the programming mechanism during operation	2.5 s
t20	Running time back to the start-up position after a controlled shut-down	15.0 s

Legend

A	Start of program, control loop, terminals 4-5 linked
A-B	Start-up program
B-C	Burner operation
C	Controlled shut-down, loop, terminals 4-5 not linked
C-D	Running back of programming mechanism
D	Ready for restart
P	Programming mechanism
S	Indication of program sequence in window
F	Flame signal amplifier
J	Wire link For explanation refer to «Connection Diagram and Internal Diagram»
▬▬	Control signals of burner control at nominal voltage
▥▥	Required input signal
▥▥	Terminal connected to earth
1)...4)	See «Legend» of «Connection Diagram and Internal Diagram»

Connection Diagram and Internal Diagram



Legend

AL	Remote lock-out warning device (alarm)
AR	Mains relay (load relay) with contacts «ar»
AS	Unit fuse
J	Wire link between terminals 8 and 11 on the baseplate of the LGI16. In the event of a flame failure during operation: **With** wire link fitted →Lock-out **No** wire link → Automatic restart (repetition)
BR	Lock-out relay with contacts «br»
BV...	Fuel valve
EK...	Lock-out reset button
FE	Ionization electrode
FEZ	Ignition and ionization current detector electrode
FR	Flame relay with contacts «fr»
GP	Gas pressure switch or monitor
H	Mains isolator
L1	Lock-out warning lamp on the burner control
QRA5...	UV detector
R	Start/stop signal source (controller)
SM	Synchronous motor of programming mechanism
V	Flame signal amplifier
W	Limit thermostat or pressurestat
Z	Ignition transformer for double-electrode operation
Z1	Ignition transformer for single-electrode operation
ZBV	Ignition fuel valve

● Valid for expanding flame burners

●● Valid for interrupted pilot burners (Burner with pilot burner)

1) **Press EK for no more than 10 s**

2) **When used in connection with the QRA5..., terminal 22 must be earthed**

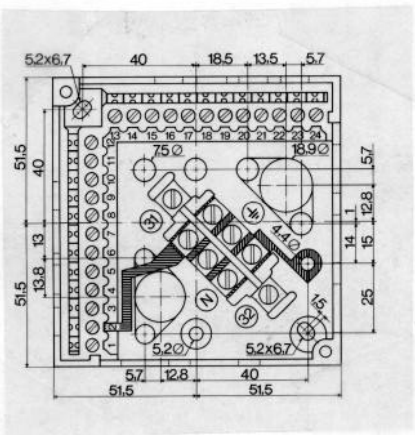
3) Connection for separate ignition and ionization current detector electrode (double-electrode operation)

4) Connection for common ignition and ionization electrode (single-electrode operation)

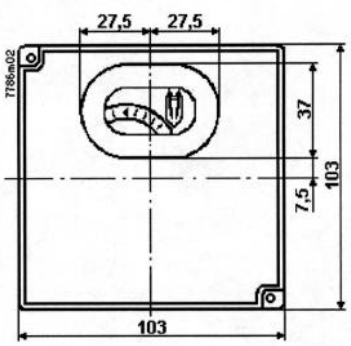
LGI 16...

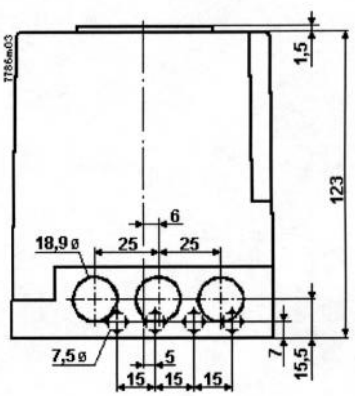
Dimensions Dimensions in mm

AGM15



LGI16 + AGM15





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