ISO 9001

Gas Burner Control LFL1.148

CE

Burner control for atmospheric gas burners with intermittent operation.
For safety reasons - self-test of the flame supervision circuit, etc. - at least one controlled shutdown is required every 24 hours.

The LFL1.148 and this data sheet are intended for use by OEMs which integrate the burner controls in their products.

Use

The LFL1.148 is used for the supervision of single- or two-stage atmospheric gas burners of medium to high capacity.
The gas burner control has a connection facility for an auxiliary fan or flue gas fan.
Example: condensing boilers.
Flame supervision is ensured by means of ionization current detector electrodes; one electrode is used for the first stage and one for the second stage.
Changeover takes place automatically after release of the second fuel valve.

Mechanical design

The mechanical design of the LFL1.148 corresponds to that of the standard units of the LFL... range (refer to data sheet 7451).

Technical data

For technical data - with the exception of the switching times of the switching mechanism and the detector cable length - refer to data sheet 7451.

Environmental conditions	
Transport	IEC 721-3-2
Climatic conditions	class 2K2
Temperature range	-40...+60 °C
Humidity	< 95 % r.h.
Mechanical conditions	class 2M2
Operation	IEC 721-3-3
Climatic conditions	class 3K5
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.

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

Identification code to EN 298	
LFL1.148	**A T L L X N**
All other types	**F B L L X N**

Max. perm. length of detector cable	
- Normal cable, laid separately	50 m
- Shielded cable, shielding connected to terminal 22	
e.g. high frequency cable	100 m

CE conformity
According to the directives of the European Union
Electromagnetic compatibility EMC 89/336 EEC incl. 92/31 EEC
Directive for gas appliances 90/396 EEC

Capacity
Output on startup:
→ Without fan assistance
Optional with gas-electric ignition < 120 kW
Nominal output optional

Warning notes

To avoid injury to persons, damage to property or 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 LFL1.148, the unit must be completely isolated from the mains supply!
- Check the wiring and all safety functions!

Mounting notes

- The relevant national safety regulations must be complied with!
- Locate and adjust the ignition and detector electrodes such that the ignition spark cannot arc over to the detector electrode!
  → Risk of electric overloads!
- Connect the earthing lug in the unit's terminal base to the burner ground using a screw with a lockwasher or similar

Installation notes

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

Function

In terms of control program and flame supervision (including test of the flame supervision circuit), the functions of the LFL1.148 correspond to those of the standard units of the LFL... range.
There is a difference, however, in the control of actuator «SA» and of load controller «LR», especially with regard to the air damper position on startup and the closing of the air damper during the controlled shutdown.
Supervision of the respective start position is accomplished via an auxiliary switch in the damper actuator whose contact must be included in the start control loop between terminals 4 and 5.
It must be ensured that the current path between terminals 4 and 5 remains closed until controlled shutdown takes place.
During the controlled shutdown, the air damper is driven to the fully closed position via contact «Vlb» of the switching mechanism.
Since the switching mechanism of the burner control does not continue to run until changeover of limit switch «z» in the air damper actuator occurs, the running time of actuator «SA» is optional.

The pilot flame is supervised by detector electrode «FE1», the main flame by detector electrode «FE2».

On completion of the ignition safety time «TSA», a flame signal must be present at terminal 23 (FE1).
On completion of the second safety time «t9», a flame signal must also be present at terminal 24 (FE2).

Control program

In the event of fault and lockout indication

◀ **No start**
For example: start control loop interrupted via «SA»!

■ **Lockout,** due to a fault in the flame supervision circuit.

▼ **Abortion of startup sequence**, because the auxiliary switch in actuator «SA» has cut the start control loop.

1 **Lockout**, because no flame signal was present on completion of the ignition safety time «TSA».

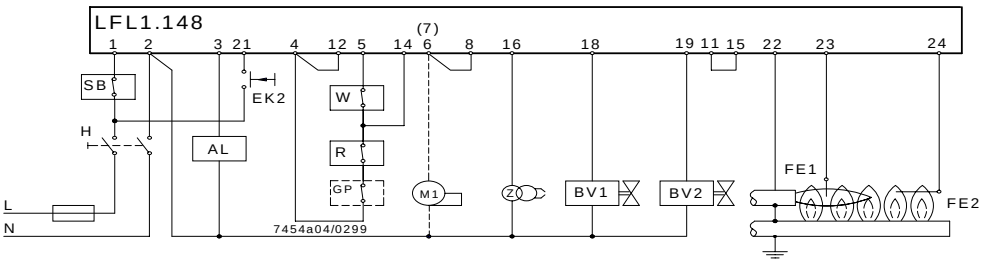
2 **Lockout**, because no flame signal was present on completion of the second safety time.

▮ **Lockout**, because the flame signal was lost during burner operation.

◀ **Lockout** on completion of the control programm, due to extraneous light or a faulty flame signal.
For example: flame not extinguished!

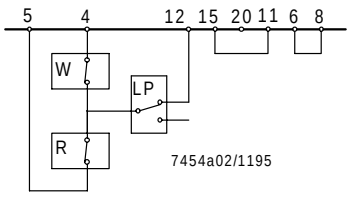
After the reset, the burner control's switching mechanism first returns to the start position and then initiates a burner restart.

Connection diagram

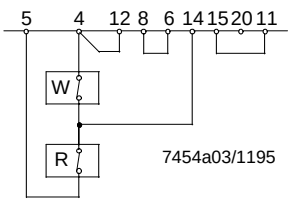


Connection examples

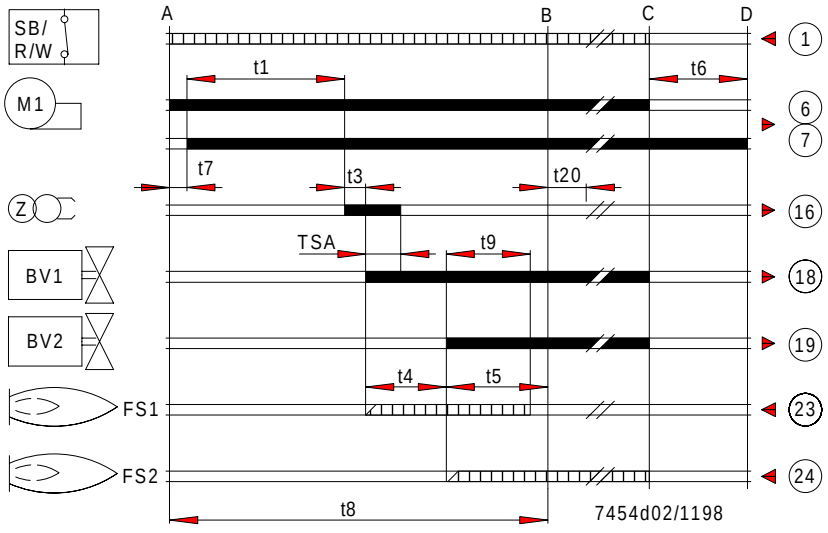
Two-stage forced draught gas burner without load controller «LR» and without actuator «SA».



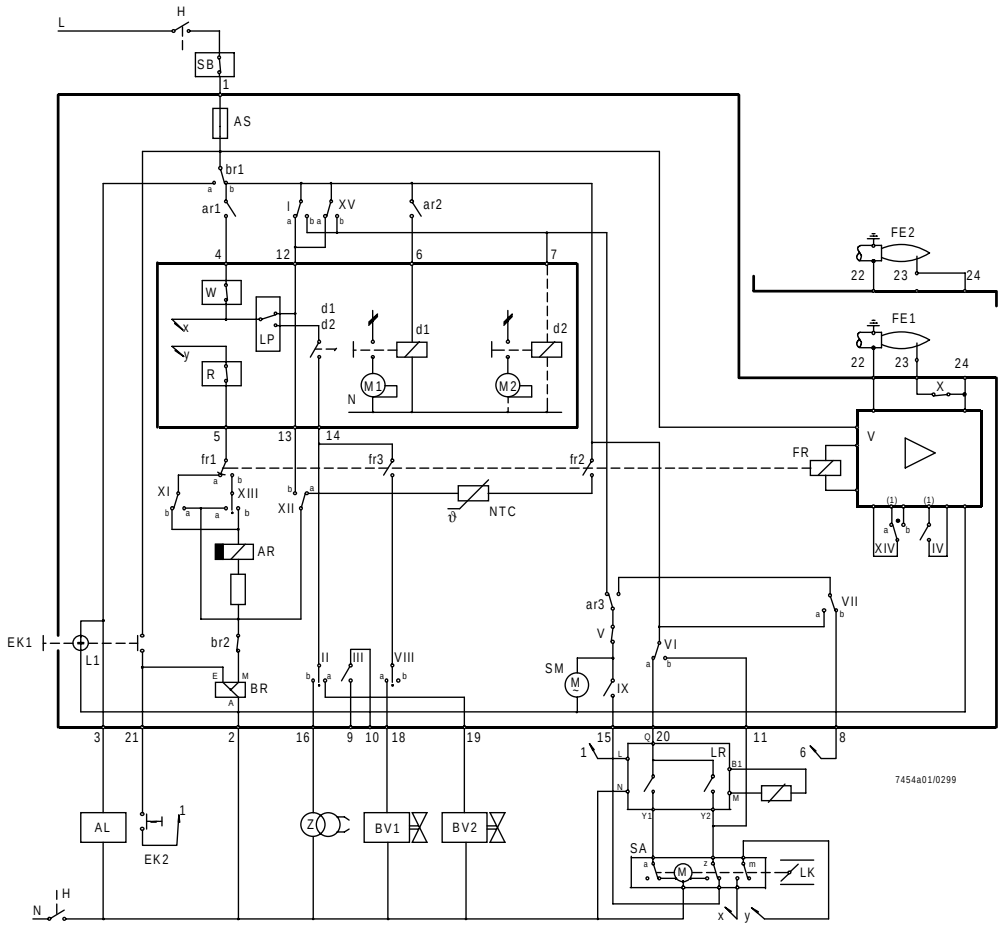
Atmospheric gas burner without fan assistance, load controller «LR» and actuator «SA».



Control program

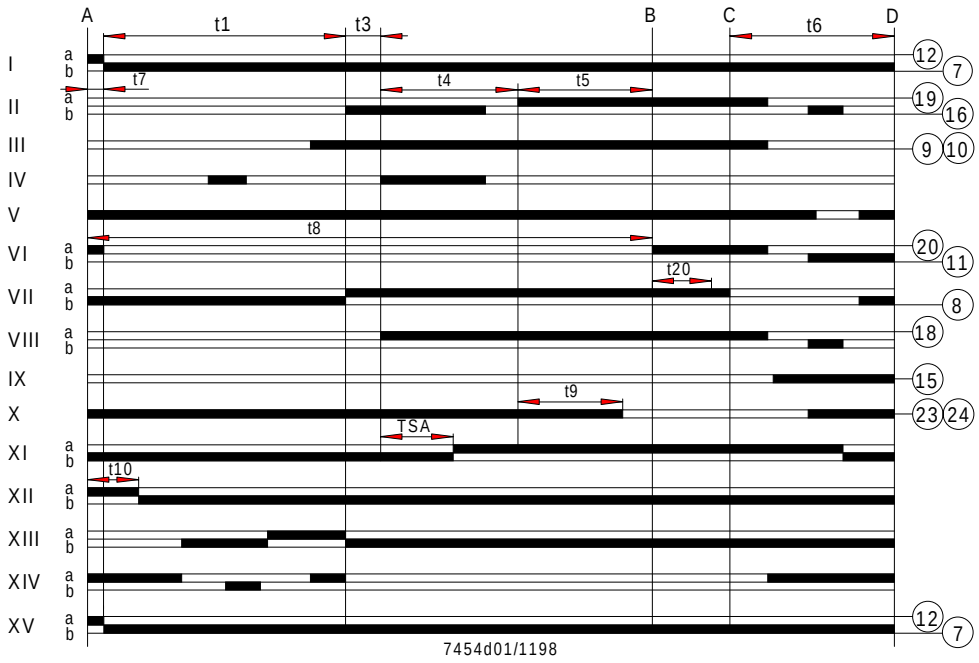


Basic diagram



Do not press EK... for more than 10 seconds!

Diagram of switching mechanism



Legend

AL	Remote lockout indication → Alarm	NTC	NTC resistor
AS	Unit fuse	R	Control thermostat or pressurestat
AR	Main relay with contacts «ar...» → Working relay	SA	Air damper actuator
		A	Changeover limit switch for actuator's OPEN position
BR	Lockout relay with contacts «br...»	Z	Changeover limit switch for actuator's CLOSED position
BV1/BV2	Fuel valve		
d1/d2	Contactor or relay	SM	Synchronous motor of sequence mechanism
EK1/EK2	Reset button	SB	Safety limit thermostat
FE1/FE2	Ionization current detector electrode	V	Flame signal amplifier
FR	Flame relay with contacts «fr...»	(1)	Input for forced energizing of the flame relay during the functional test of the flame supervision circuit (contact XIV) and during «TSA» (contact IV)
GP	Gas pressure monitor		
H	Main isolator		
L1	Lockout warning lamp		
LK	Air damper		
LP	Air pressure monitor	W	Limit thermostat or pressure monitor
LR	Load controller	Z	Ignition transformer
M1/M2	Fan or burner motor		

■	Output signals of burner control
▦	Required input signals

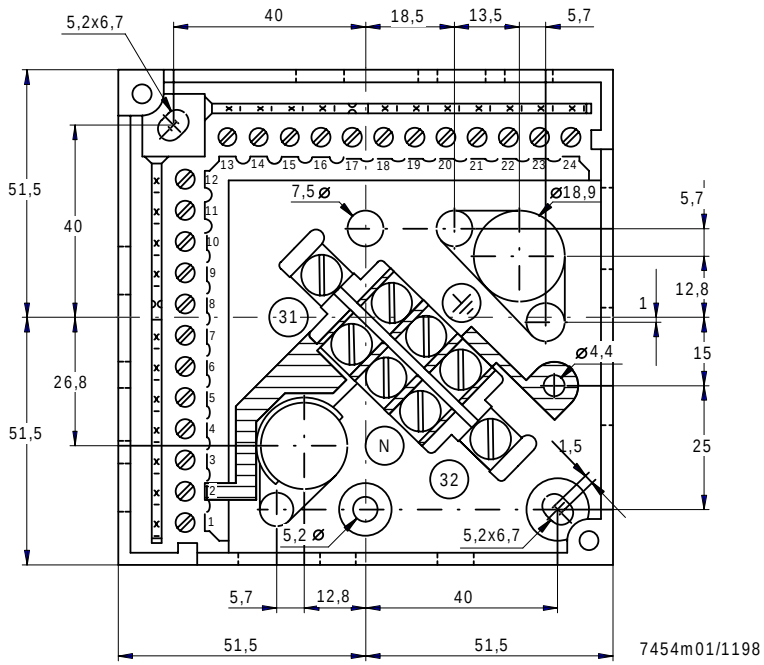
A	Start command given by the control thermostat	C	Controlled shutdown by «R»
		C-D	Sequence mechanism runs into end position after a controlled shutdown by «R»
A-B	Startup sequence		
B	Operating position of burner	D	End position of burner → Corresponding to the start position
B-C	Burner operation		

Switching times in seconds

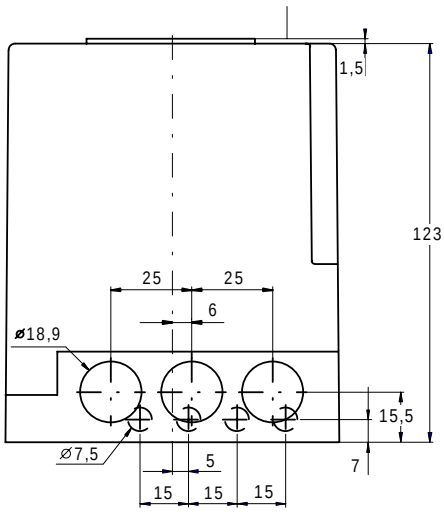
TSA	Ignition safety time	4 s	t7	Interval until voltage at terminal 7 is present	2 s
t1	Waiting time or pre-purge time	14 s	t8	Duration of startup program	36 s
t3	Pre-ignition time	2 s	t9	2nd safety time for 2nd stage	8 s
t4	Interval BV1-BV2	8 s	t10	Interval until air pressure check is started	
t5	Interval between release of the 2nd fuel valve and the load controller (if present)	10 s	t20	Steps of switching mechanism with no change in the program → Idle steps	26 s
t6	Post-purge time	10 s			

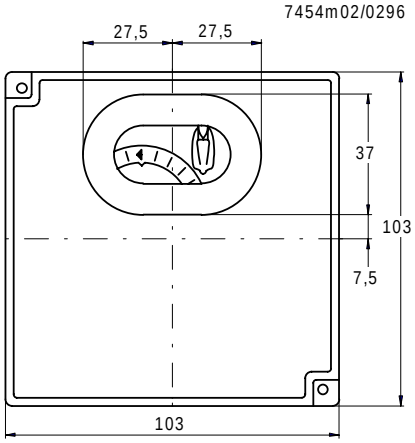
Dimensions

Dimensions in mm



Part no. of plug-in base: 4 104 9055 0





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