

# SIEMENS







## Burner Controls Series LAL

- For gas, oil or dual-fuel forced draft burners of medium to high capacity
- For multistage or modulating burners in intermittent operation
- With checked air damper control
- Flame supervision
  - with UV detectors QRA...
  - and ionization probe
- Burner control for oil burners or gas burners conforming to EN 298: 2012
- Suitable for use with air heaters (WLE)

### Technical data

Mains voltage	AC 230 V –15 / +10 %
- With LAL1... / LAL2... / LAL3... incl.	AC 100 V –15 %...AC 110 V +10 %
Mains frequency	50...60 Hz ±6 %
Unit fuse (built-in)	T6,3H250V to DIN EN 60 127
Primary fuse (external)	max. 10 A (slow)
Weight	
- LAL...	approx. 1,000 g
- Plug-in base	approx. 165 g
Flame detectors:	
- QRB1...	refer to Data Sheet 7714
- QRC1...	refer to Data Sheet 7716
- RAR...	refer to Data Sheet 7713
Power consumption	approx. AC 3.5 VA
Mounting position	optional
Degree of protection	IP 40, when fitted, with the exception of the connection area (terminal base)
Safety class	II
Perm. input current at terminal 1	max. 5 A (peaks of 20 A / 20 ms)
Perm. current rating of control terminals 3, 6, 7, 9...11 and 15...20	max. 4 A (peaks of 20 A / 20 ms)
Required switching capacity of switching devices	
- Between terminals 4 and 5	1 A, AC 250 V
- Between terminals 4 and 12	1 A, AC 250 V
- Between terminals 12 and «LP»	1 A, AC 250 V
- Between terminals 4 and 14	5 A (peaks of 20 A)
- «LP»	5 A
Degree of protection	IP 00
Cable connection	screw terminal cross-sectional area of wire: 0.5...1.5 mm²
With stranded wires	use adequate ferrules
<b>Transport</b>	DIN EN 60 721-3-2
Climatic conditions	class 2K2
Mechanical conditions	class 2M2
Temperature range	-50...+60 °C
Humidity	< 95 % r.h.
<b>Operation</b>	DIN EN 60 721-3-3
Climatic conditions	class 3K5
Mechanical conditions	class 3M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.





## Valve Proving System for automatic Shutoff Valves Series LDU

- The LDU11... valve proving system is designed for use with shutoff valves in connection with gas burners and gas appliances. In the event of inadmissible leakage, the system prevents the burner from starting up.
- The LDU11... system conforms to the requirements of EN1643 covering automatic shutoff valves for use with gas burners and gas appliances to EN161.
- The LDU11... and this Data Sheet are intended for use by OEMs which integrate the valve proving system in their products.

### Technical data

Mains voltage	AC 230 V –15 / +10 % AC 115 V –15 / +10 %
Mains frequency	50...60 Hz ±6 %
Unit fuse (built-in)	T6.3H250V to DIN EN 60 127
Primary fuse (external)	max. 10 A (slow)
Weight	approx. 1,000 g
Power consumption	approx. AC 3.5 VA
Mounting position	optional
Degree of protection	IP 40, when built in, with the exception of the connection area (terminal base)
Safety class	II
Perm. input current at terminal 1	max. 5 A continuously (peaks 20 A / 20 ms)
Perm. load on control terminals 3, 6, 7, 9...11, 15...20	max. 4 A continuously (peaks 20 A / 20 ms)
Required switching capacity of switching devices	
- Between terminals 4 and 5	1 A, AC 250 V
- Between terminals 4 and 12	1 A, AC 250 V
- Between terminals 4 and 14	min. 1 A, AC 250 V depending on the load on terminals 16...19
Permissible length of the standard detector cable (laid separately)	See <i>Technical Data</i> , chapter <i>Flame supervision</i>
Capacity	
- Output on startup (without fan assistance)	Optional (with ignition <120 kW)
- Nominal output	Optional
<b>Storage</b>	DIN EN 60721-3-1
Climatic conditions	class 1K3
Mechanical conditions	class 1M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
<b>Transport</b>	DIN EN 60721-3-2
Climatic conditions	class 2K3
Mechanical conditions	class 2M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
<b>Operation</b>	DIN EN 60 721-3-3
Climatic conditions	class 3K3
Mechanical conditions	class 3M3
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.





## Burner Controls Series LFL

- For gas, oil or dual-fuel forced draft burners of medium to high capacity
- For multistage or modulating burners in intermittent operation
- With checked air damper control
- Flame supervision
  - with UV detectors QRA...
  - and ionization probe
- Burner control for oil burners or gas burners conforming to EN 298: 2012
- Suitable for use with air heaters (WLE)

### Technical data

Mains voltage	AC 230 V –15 / +10 % AC 115 V –15 / +10 %
Mains frequency	50...60 Hz ±6 %
Unit fuse (built-in)	T6.3H250V to DIN EN 60 127
Primary fuse (external)	max. 10 A (slow)
Weight	approx. 1,000 g
Power consumption	approx. AC 3.5 VA
Mounting position	optional
Degree of protection	IP 40, when built in, with the exception of the connection area (terminal base)
Safety class	II
Perm. input current at terminal 1	max. 5 A continuously (peaks 20 A / 20 ms)
Perm. load on control terminals 3, 6, 7, 9...11, 15...20	max. 4 A continuously (peaks 20 A / 20 ms)
Required switching capacity of switching devices	
- Between terminals 4 and 5	1 A, AC 250 V
- Between terminals 4 and 12	1 A, AC 250 V
- Between terminals 4 and 14	min. 1 A, AC 250 V depending on the load on terminals 16...19
Permissible length of the standard detector cable (laid separately)	See <i>Technical Data</i> , chapter <i>Flame supervision</i>
Capacity	
- Output on startup (without fan assistance)	Optional (with ignition <120 kW)
- Nominal output	Optional
<b>Storage</b>	DIN EN 60721-3-1
Climatic conditions	class 1K3
Mechanical conditions	class 1M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
<b>Transport</b>	DIN EN 60721-3-2
Climatic conditions	class 2K3
Mechanical conditions	class 2M2
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.
<b>Operation</b>	DIN EN 60 721-3-3
Climatic conditions	class 3K3
Mechanical conditions	class 3M3
Temperature range	-20...+60 °C
Humidity	< 95 % r.h.





## Gas Valve Actuator Series SQM

Article number	Type	Drive shaft 1)	Running time (min.) for 90°	Nominal output torque 3) 4) (max.)	Holding torque 2) 3) 4) (max.)	Radial bearing force (max.)
		no.	s	Nm	Nm	N
BPZ:SQM45.291A9	SQM45.291A9	1	10	3	1,5	190
S55451-D201-A100	SQM45.291B9	1	10	3	1,5	190
BPZ:SQM45.295A9	SQM45.295A9	5	10	3	1,5	190
S55451-D202-A100	SQM45.295B9	5	10	3	1,5	190
BPZ:SQM48.497A9	SQM48.497A9	7	30	20	20	420
S55451-D301-A100	SQM48.497B9	7	30	20	20	420
BPZ:SQM48.697A9	SQM48.697A9	7	60	35	35	800
S55451-D302-A100	SQM48.697B9	7	60	35	35	800

### Technical data

Operating voltage	2 x 12 V~ via bus cable from the basic unit or via a separate transformer
Drive motor	Stepper motor
Power consumption	
- SQM45...	9...15 VA
- SQM48...	26...34 VA
Angular adjustment	Max. 90°
Mounting position	Optional
Degree of protection	To EN 60529, IP54, provided adequate cable entries are used
Safety class	III according to DIN EN 60730 part 1 and part 2-14
External overload fuse	Max. 4 AT (slow) to DIN EN 60127-2/5
Cable entry	SQM45... / SQM48...: Insertable threaded cable glands for 2 x M16
Direction of rotation (when facing the shaft)	
• Standard	Counterclockwise
• Reverse	Clockwise
Torques and holding torques	Refer to «Type summary»
Running times	Refer to «Type summary» (can be selected on the basic unit)
Drive shaft	Supplied as standard, not replaceable
Weight	
• SQM45...	Approx. 1 kg
• SQM48...	Approx. 1.6 kg
Temperature of the mounting surface	Max. 60 °C
Life cycle	250,000 start cycles (CLOSE ⇒ OPEN ⇒ CLOSE) under load with the rated torque in the entire rotation angle range. 2,000,000 control cycles under load with 75% of rated torque in rotation angle range of 10°.
On time	50 %, max. 3 min. continuously
Electrical connections	RAST3.5 terminals (for details, refer to the basic unit)
Ferrules	Matching the dia. of the stranded wire
Direction of rotation	Can be selected on the basic unit
Reproducibility (typically in the show-room condition)	± 0.2° (when used with the basic unit LMV5...)





## Gas Valve Actuator Series SQN

- Electromotoric actuators for use with air dampers and control valves of oil or gas burners of small to medium capacity.

The SQN3... / SQN4... and this Data Sheet are intended for use by OEMs which integrate the actuators in their products!

### Technical data

#### General actuator data Actuator

Mains voltage	AC 220...240 V –15 % +10 % AC 100...110 V –15 % +10 %
Mains frequency	50...60 Hz ±6 %
Type of motor	synchronous motor
Power consumption	6.5 VA
Angular position	max. 160°
Mounting position	optional
Degree of protection	IP 40 to DIN 40050, provided adequate cable entries and fixing screws are used
Safety class	I to VDE 0631
Cable entry	threaded cable gland holder for 1 x Pg9 and 1 x Pg11, no locknut required  cable strain relief to be provided by the user (also refer to «Degree of protection»), Pg glands for all types are included in the delivery
Cable connections	screw terminals for wires having a cross-sectional area of 0.5 to 2.5 mm <sup>2</sup>
Ferrules	matching the dia. of the stranded wire
Direction of rotation	refer to «Type summary»
Torques and holding torques	refer to «Type summary»
Running times	refer to «Type summary»
Weight (on average)	approx. 800 g

#### End and auxiliary switches

Number of end switches	2
Number of auxiliary switches	refer to «Type summary»
Actuation	via camshaft, color-coded cams (refer to «Connection diagrams»)
Switching voltage	AC 24...250 V
Adjustment of cams in increments of	1°
Max. terminal rating at $\cos \varphi = 0.9$	<b>under load ON, with no load OFF</b> - starting current 14 A - operating current 2 A <b>under load ON...OFF</b> - starting current 7 A - operating current 1 A





## U.V. Sensor Series QRA 2

The flame detectors are designed for use with our burner controls, for the supervision of gas and oil flames.

The QRA... and this Data Sheet are intended for use by OEMs which integrate the flame detectors in their products.

### Type summary

Flame detectors

Type reference	Sensitivity	Flange and clamp	Terminal cover	Spare UV tube
QRA2	normal	without	black	4 502 1131 0
QRA2(1)		with		
QRA2.9 <sup>2)</sup>		without		
QRA2M	high	without	green	4 502 4065 7
QRA2M(1)		with		
QRA10.C	normal	---	---	4 502 1131 0
QRA10M.C	high			4 502 4065 7

Type reference	Sensitivity	Detector tube length	Mains voltage	Spare UV tube
QRA53.C27	normal	125 mm	AC 220...240 V	4 502 4065 7
QRA53.C17			AC 100...110 V	
QRA53.D27	high		AC 220...240 V	
QRA53.D17			AC 100...110 V	
QRA55.C27	normal	77 mm	AC 220...240 V	
QRA55.C17			AC 100...110 V	
QRA55.D27	high		AC 220...240 V	
QRA55.D17			AC 100...110 V	





## UV. Sensor Series QRA10

The flame detectors are designed for use with our burner controls, for the supervision of gas and oil flames.

The QRA... and this Data Sheet are intended for use by OEMs which integrate the flame detectors in their products.

### Technical data

General detector data	Average life of UV cell	approx. 10,000 hours <b>at max.</b> 50 °C, higher ambient temperatures reduce considerably the cell's life
	Perm. combustion chamber pressure	
	- QRA10...	max. 50 mbar
	- QRA10... + AGG03 or AGG02	max. 500 mbar
	Degree of protection	
	- QRA2...	IP 40
	- QRA10...	IP 54
	- QRA53..., QRA55...	IP 54
	Mounting position	optional
	Weight	
Environmental conditions	- AGG01	approx. 10 g
	- AGG02	approx. 10 g
	- AGG03	approx. 10 g
	- AGG05	approx. 170 g
	- AGG06	approx. 160 g
	- AGG07	approx. 1330 g
	- AGG16.C	approx. 650 g
	- QRA2...	approx. 60 g
	- QRA10...	approx. 740 g
	- QRA10... + AGG03	approx. 750 g
	- QRA53..., QRA55...	approx. 900 g
	Ignition cable (only QRA2...)	2 x 0.75 mm <sup>2</sup> ; 5.1 mm dia.
	<b>Transport</b>	DIN EN 60 721-3-2
	Climatic conditions	class 2K2
	Mechanical conditions	class 2M2
	Temperature range	-20...+60 °C
	Humidity	< 95 % r.h.
	<b>Operation</b>	DIN EN 60 721-3-3
	Climatic conditions	class 3K5
	Mechanical conditions	class 3M2
	Temperature range	-20...+60 °C
	Humidity	< 95 % r.h.
	<b>Condensation, formation of ice and ingress of water are not permitted!</b>	

### Function

With this type of flame supervision, the UV radiation emitted by gas or oil flames is used to generate the flame signal.

The radiation detector consists of a UV-sensitive cell with 2 electrodes, which ignite when illuminated with radiation in the 190...270 nm range of the spectrum, thereby triggering a current in the flame detector circuit.

The UV cell does not respond to glowing firebrick in the combustion chamber, daylight or light from the boiler room illumination.





## UV. Sensor Series QRB1, QRB3

The flame detectors are designed for use with our burner controls, for the supervision of gas and oil flames.

The QRA... and this Data Sheet are intended for use by OEMs which integrate the flame detectors in their products.

### Technical data

General detector data	Degree of protection	IP40
	Safety class	II
	Mounting position	Optional
	Detector cable	
	- QRB1	Cable included in scope of delivery! Stranded copper wire 2 x 0.75 mm <sup>2</sup> Jacket 5.2 mm dia., PVC Cable length according to «Type summary»
	- QRB3	Cable to be supplied by thirds. Recommended: H05VV-F 2 x 0.75 Application standards should be observed.
	Weight	
	- QRB1... (depending on type)	Approx. 20...35 g
	- QRB3... (without cable)	Approx. 35 g
Environmental conditions	<b>Storage</b>	DIN EN 60721-3-1
	Climatic conditions	Class 1K3
	Mechanical conditions	Class 1M2
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	<b>Transport</b>	DIN EN 60721-3-2
	Climatic conditions	Class 2K2
	Mechanical conditions	Class 2M2
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	<b>Operation</b>	DIN EN 60721-3-3
	Climatic conditions	Class 3K5
	Mechanical conditions	Class 3M2
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	Installation altitude	Max. 2,000 m above sea level





## Gas Valve Actuator Series SKP

- UL listed, FM approved, CSA certified for USA and Canada, and ISO 9001 certified. European, Australian and Japanese approved versions available.
- Certified as a ventless pressure regulator.
- Safety shut-off function and pressure regulating function in one compact unit.
- Proof of Closure with Over Travel (POC) versions.
- Optional NEMA 4 protection.
- Visual position indication.
- "Power on" indication light

### Technical data

#### Specifications, Continued

##### Physical characteristics

Specifications, Continued	Weight	3.5 lb (1.6 kg)
	Enclosure	NEMA 1, 2, 5 and 12 for indoor use NEMA 3, 3R, and 4 with optional AGA66 gasket
Physical characteristics	Dimensions	See Figure 3
	Specification for valve bodies	See <i>gas valve Technical Instructions</i> , P/N 155-512P25
Connections	Conduit connection	Two 1/2-inch NPSM threaded knock-outs
	Electrical connection	Spring loaded terminals for 14 AWG wires
	Gas connection	1/4" NPT
	Air connection	1/4" NPT
	Gas pressure test connection	Hose barb with close-off screw
Operating characteristics	Output force	100 lb (450 N)
	Maximum stroke	1 inch (26 mm)
	Opening time for maximum stroke	Varies with valve size, 14 seconds for max. stroke
	Closing time	< 0.8 seconds
Operation/installation	Outlet pressure spring range for SKP25.0... models	0" to 8.5" WC ( standard, unpainted spring, AGA29) 6" to 48" WC (yellow spring, AGA22) 40" to 100" WC (red spring, AGA23)
	for SKP25.411U1 models	1.5 to 10 psi (standard, yellow spring, AGA22) 8.5 to 20 psi (red spring, AGA23)
	With air pressure loading for SKP25.4... models or zero governor or for SKP25.611U1	± 0.6" WC bias (black spring AGA28) 0" to - 4" WC bias (white spring)
	Maximum sensing line pressure	20 psi
	Maximum sensing line vacuum	3 psi for SKP25.0... models
	Minimum sensing line diameter	1/4" inside diameter
	Minimum distance between sensing line and gas valve outlet	5 times the pipe diameter
	Minimum time required for high to low fire load changes	5 seconds
	Proof of closure switch	Non-adjustable
	Setting range of auxiliary switch	40% to 100% of stroke
Auxiliary features	Switch rating	6A/250 Vac resistive; 3A/120 Vac pilot duty