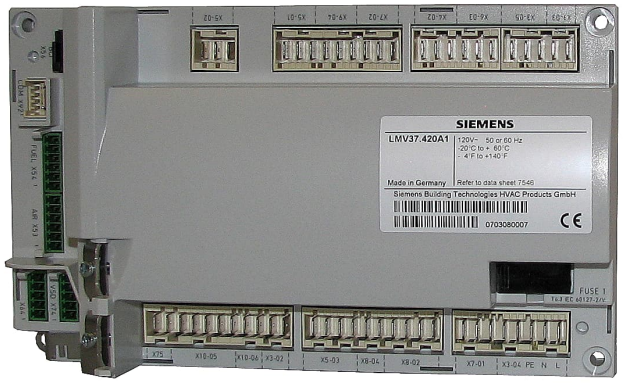
SIEMENS

7546



Basic unit with integrated air-fuel ratio control for forced draft burners

LMV37.400Ax LMV37.420Ax

The LMV37.4 burner management system is a microprocessor-based burner control with matching system components for control and supervision of forced draft burners of medium to high capacity.

The LMV37.4 and this Data Sheet are intended for OEMs which integrate the units in their products!

Use

Microprocessor-controlled LMV37.4 for single-fuel burners of any capacity, with electronic fuel-air ratio control, with up to 2 actuators, and with integrated gas valve proving.

The system components (AZL2 and actuators) are connected directly to the LMV37.4. All safety-related digital inputs and outputs of the LMV37.4 are supervised by a contact feedback network.

- Type-tested and approved in accordance with DIN EN 298
- Applications in accordance with EN 676: Automatic forced draft burners for gaseous fuels
- Applications in accordance with EN 267: Forced draft burners for liquid fuels

For Europe

For intermittent operation in connection with the LMV37.4, the ionization probe or the QRA, QRB or QRC optical flame detectors can be used. **Continuous operation is possible only when using an ionization probe.**

For North America

For intermittent operation in connection with the LMV37.4, the ionization probe or the QRA/QRC optical flame detector can be used. **Continuous operation is possible only when using an ionization probe.**

Features

The following items are integrated into the LMV37.4:

- Burner control complete with valve proving system
- Electronic air-fuel ratio control system for a maximum of 2 SQM3 or SQN1 actuators
- Control of VSD air fan
- Modbus interface
- BCI for connection a display or PC
- Unit parameter adjustable either via display or PC software ACS410

Notes



Warning!
All safety, warning and technical notes given in the Basic Documentation of the LMV37.4 (P7546) also apply to this document!

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Applied directives:

- Low-voltage directive 2014/35/EC
- Directive for pressure devices 2014/68/EU
- Gas Appliances Regulation (EU) (EU) 2016/426
- Electromagnetic compatibility EMC (immunity) *) 2014/30/EC

*) The compliance with EMC emission requirements must be checked after the burner management system is installed in equipment

Compliance with the regulations of the applied directives is verified by the adherence to the following standards / regulations:

- Automatic burner control systems for burners and appliances burning gaseous or liquid fuels DIN EN 298
- Safety and control devices for gas burners and gas burning appliances - Valve proving systems for automatic shut-off valves DIN EN 1643
- Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types DIN EN 12067-2
- Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements DIN EN 13611
- Safety and control devices for gas burners and gas-burning appliances - Particular requirements
  Part 1: Automatic and semi-automatic valves ISO 23552-1
- Automatic electrical controls for household and similar use
  Part 2-5:
  Particular requirements for automatic electrical burner control systems DIN EN 60730-2-5

The relevant valid edition of the standards can be found in the declaration of conformity!

Note on **EN 60335-2-102**
Household and similar electrical appliances - Safety - Part 2-102:
Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections. The electrical connections of the LMV37.4 comply with the requirements of EN 60335-2-102.

EAC Conformity mark (Eurasian Conformity mark)

ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007

China RoHS
Hazardous substances table:
http://www.siemens.com/download?A6V10883536

Type	cULus	CSA	FM	DIN	DVGW	TÜV	AGA
LMV37.400A2	---	---	---	●	●	●	●
LMV37.420A1	●	●	●	●	●	●	●

Life cycle

The burner management system has a designed lifetime* of 250,000 burner startup cycles which, under normal operating conditions in heating mode, correspond to approx. 10 years of usage (starting from the production date given on the type field). This lifetime is based on the endurance tests specified in standard DIN EN 298. A summary of the conditions has been published by the European Control Manufacturers Association (Afecor) (www.afecor.org).

The designed lifetime is based on use of the LMV37.4 according to the manufacturer's Data Sheet and Basic Documentation. After reaching the designed lifetime in terms of the number of burner startup cycles, or the respective time of usage, the LMV37.4 is to be replaced by authorized personnel.

* The designed lifetime is not the warranty time specified in the Terms of Delivery

Supplementary documentation

User Documentation Modbus AZL2 ..... A7541

Environmental Product Declaration LMV2 / LMV3 ..... E7541 *)

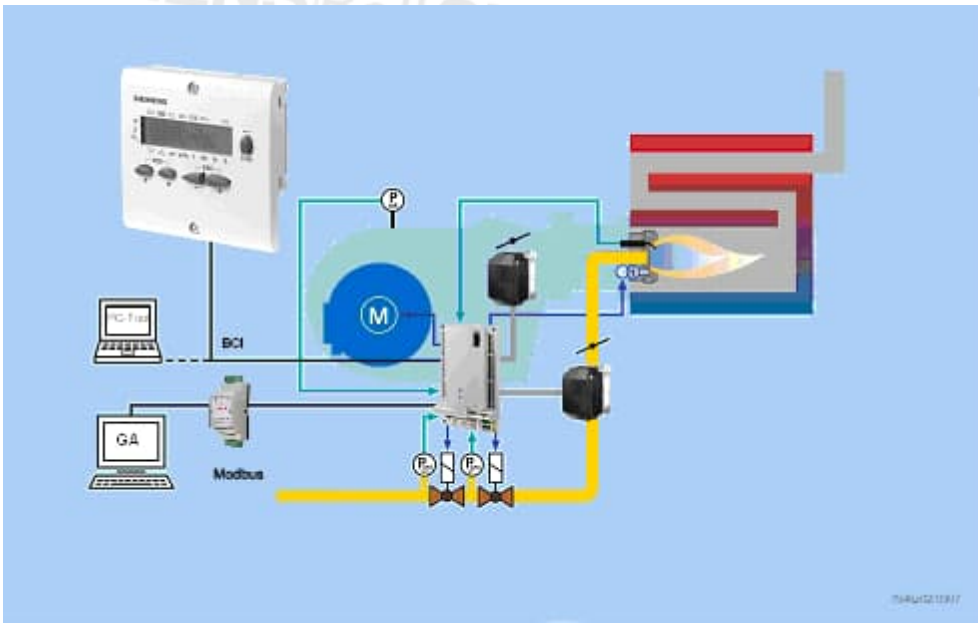
Installation and Operating Instructions PC Software ACS410 ..... J7352

Basic Documentation LMV37.4 ..... P7546

Product Range Overview LMV2 / LMV3 ..... Q7541

*) On request

System overview



The diagram shows the full scope of functions of the LMV37.4. The actual functions are to be determined based on the respective execution / configuration!

Ordering

Burner control

LMV37.4
The basic unit is the actual burner control featuring all-polar input / output terminals. No operating elements. Operation via detached ancillary units for wire-bound communication.
See Basic Documentation P7546.



Article no.	Type	Mains voltage	Parameter set	Detectors	TSA	
					Gas	Oil
BPZ:LMV37.400A2	**LMV37.400A2**	AC 230 V	Europa	QRA2 / QRA4 / QRA10 / QRB / QRC / ION	3 s	5 s
BPZ:LMV37.420A1	**LMV37.420A1**	AC 120 V	North America	QRA4 / QRB / ION	5 s	5 s

Service tools

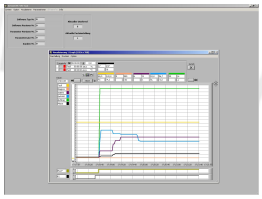
OCI410 interface between burner management system and PC
Article no.: **BPZ:OCI410**
Facilitates viewing, handling and recording setting parameters on site with the help of the ACS410 software package.
See Data Sheet N7616.



OCI412.10 Modbus interface
Article no.: **BPZ:OCI412.10**
Device serving as an interface between the LMV37.4 and a Modbus system, such as a building automation and control system (BACS). The Modbus interface is based on the RS-485 standard.
See Data Sheet N7615.



ACS410 PC software
Article no.: **BPZ:ACS410**
PC software for parameterization and visualization to the burner management system.
See Software Documentation J7352.



Display and operating units

AZL21.00A9
Article no.: **BPZ:AZL21.00A9**
Detached display and operating unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LMV37.4, degree of protection IP40.
See Data Sheet N7542.



AZL23.00A9
Article no.: **BPZ:AZL23.00A9**
Detached display and operating unit, choice of mounting methods, 8-digit LCD, 5 buttons, BCI for LMV37.4, degree of protection IP54.
See Data Sheet N7542.



Flame detectors

QRA2
Flame detector for use with Siemens burner controls, for the supervision of gas flames and yellow- / blue-burning oil flames as well as ignition spark checking. Plastic housing, metalized to prevent static charging caused by the air flow from the fan. For direct mounting on the burner. The detectors can be supplied with or without securing flange and clamp.
See Data Sheet N7712.



QRA4
Flame detector for use with Siemens burner controls, for the supervision of gas flames and yellow- or blue-burning oil flames as well as for ignition spark proving.
See Data Sheet N7711.



QRA10
Flame detector for use with Siemens burner controls, for the supervision of gas flames and yellow- / blue-burning oil flames as well as ignition spark checking. Die-cast aluminum housing with a 1 in. mounting coupling and connection facility for cooling air. The housing of this detector has a bayonet fitting which allows it to be secured either directly to the 1 in. mounting coupling or to the AGG06. The 1 in. mounting coupling can be screwed to a viewing tube or to the AGG07. The Pg cable gland can be removed and replaced, if some other detector cable shall be used.
See Data Sheet N7712.



QRB1
Photo resistive flame detector for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum. Especially suited for use with burner controls for small capacity burners in intermittent operation.
See Data Sheet N7714.



QRB3
Photo resistive flame detector for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum. Especially suited for use with burner controls for small capacity burners in intermittent operation.
See Data Sheet N7714.



QRB4
Yellow flame detector for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum. The QRB4 is used in connection with oil burner controls in intermittent operation.
Refer to data sheet N7720.



QRC
Blue-flame detector for use with Siemens burner controls, for the supervision of blue- or yellow-burning oil or gas flames. Especially suited for use with burner controls for small capacity burners in intermittent operation.
See Data Sheet N7716.

Frontal illumination:



Lateral illumination:



Actuators

SQM33.4
Rated torque 1.2 Nm (0.8 Nm holding torque when dead), running time 5 s, stepper motor, front mounting, D-type drive shaft.
See Data Sheet N7813.

SQM33.5
Rated torque 3 Nm (2.6 Nm holding torque when dead), running time 5 s, stepper motor, front mounting, D-type drive shaft.
See Data Sheet N7813.



SQM33.7
Rated torque 10 Nm (6 Nm holding torque when dead), running time 17 s, stepper motor, front mounting, D-type drive shaft.
See Data Sheet N7813.

SQN1
Rated torque 1 Nm (0.2 Nm holding torque when dead), running time 5 s, stepper motor, front mounting, D-type drive shaft.
See Data Sheet N7803.



Ordering (cont´d)

Connector sets

AGG3.131
Article no.: **BPZ:AGG3.131**
Complete connector set RAST2.5 / RAST3.5 / RAST5 for gas / oil applications, single pack.
See Object List C7541 (74 319 0637 0).

Example: X5-02



AGG3.132
Article no.: **BPZ:AGG3.132**
Complete connector set RAST2.5 / RAST3.5 / RAST5 for gas- / oil applications, pack of 10.
See Object List C7541 (74 319 0637 0).

AGG3.131	AGG3.132	Connector type	Terminal	Description
1	10	RAST5	X3-02	Air pressure switch (LP)
1	10	RAST5	X3-03	Burner flange
1	10	RAST5	X3-04	Power supply (L, N, PE) for safety loop (SK)
1	10	RAST5	X3-05	• Alarm (AL) • Fan motor (M)
1	10	RAST5	X4-02	Ignition (Z)
1	10	RAST5	X5-01	• Gas pressure switch-min (Pmin) • Oil pressure switch-min (Pmin)
1	10	RAST5	X5-02	• Gas pressure switch-max (Pmax) • Oil pressure switch-max (Pmax)
1	10	RAST5	X5-03	External load controller (LR)
1	10	RAST5	X6-03	Safety valve (SV)
1	10	RAST5	X7-01	Fuel valve (V2)
1	10	RAST5	X7-02	Fuel valve (V3)
1	10	RAST5	X8-02	Fuel valve (V1)
1	10	RAST5	X8-04	• Reset • Operating mode display (B4)
1	10	RAST5	X9-04	• Gas pressure switch (Pmin/Pmax) • Pressure switch valve proving (P LT)
1	10	RAST5	X10-05	Flame detector ION, QRB, QRC
1	10	RAST5	X10-06	Flame detector QRA2/QRA4
1	10	RAST5	X75	Fuel meter
1	10	RAST3.5	X74	• Variable speed drive (VSD) • Load output (0–10 V)
1	10	RAST3.5	X64	• PWM fan • Input for the load controller (LR) (4–20 mA)
1	10	RAST2.5	X92	Modbus (COM)

AGG9
Single connectors
Packing unit 200 in total.

Example X5-03



Article no.	Type	Type of connector	Terminal	Description
BPZ:AGG9.203	**AGG9.203**	RAST5	X3-02	Air pressure switch (LP)
BPZ:AGG9.204	**AGG9.204**	RAST5	X3-03	Burner flange
BPZ:AGG9.206	**AGG9.206**	RAST5	X8-04	• Reset • Operating display
BPZ:AGG9.209	**AGG9.209**	RAST5	X10-06	Flame detector QRA2/QRA4/QRA10
BPZ:AGG9.217	**AGG9.217**	RAST5	X75	Fuel meter
BPZ:AGG9.303	**AGG9.303**	RAST5	X3-05	• Alarm (AL) • Fan motor (M)
BPZ:AGG9.304	**AGG9.304**	RAST5	X4-02	Ignition (Z)
BPZ:AGG9.306	**AGG9.306**	RAST5	X5-01	• Gas pressure switch-min (Pmin) • Oil pressure switch-min (Pmin)
BPZ:AGG9.307	**AGG9.307**	RAST5	X5-02	• Gas pressure switch-max (Pmax) • Oil pressure switch-max (Pmax)
BPZ:AGG9.309	**AGG9.309**	RAST5	X6-03	Safety valve (SV)
BPZ:AGG9.310	**AGG9.310**	RAST5	X7-01	Fuel valve (V2)
BPZ:AGG9.311	**AGG9.311**	RAST5	X7-02	Fuel valve (V3)
BPZ:AGG9.313	**AGG9.313**	RAST5	X9-04	• Gas pressure switch (Pmin/Pmax) • Pressure switch valve proving (P LT)
BPZ:AGG9.403	**AGG9.403**	RAST5	X5-03	External load controller (LR)
BPZ:AGG9.406	**AGG9.406**	RAST5	X8-02	Fuel valve (V1)
BPZ:AGG9.501	**AGG9.501**	RAST5	X3-04	• Power supply • Safety loop (SK)
BPZ:AGG9.504	**AGG9.504**	RAST5	X10-05	Flame detector ION, QRB, QRC
BPZ:AGG9.853	**AGG9.853**	RAST3.5	X64	• PWM fan • Load controller input (4–20 mA)
BPZ:AGG9.853	**AGG9.853**	RAST3.5	X74	• Variable speed drive (VSD) • Load output (0/0–10 V)

Accessories

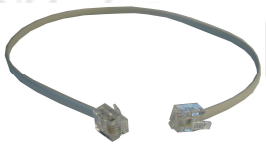
AGG5.310
Article no.: **BPZ:AGG5.310**
Accessories set speed control, for burner management systems, composed of sensor disk ∅ 50, sensor and mounting set.
See Mounting instructions M7550.1 (74 319 9322 0).



Ordering (cont´d)

Cables

AGV50.100
Article no.: **BPZ:AGV50.100**
Signal cable for AZL2, with RJ11 connector, length 1 m, pack of 10.



AGV50.300
Article no.: **BPZ:AGV50.300**
Signal cable for AZL2, with RJ11 connector, length 3 m, pack of 10.

Proportional controlling element with mounting plate

VKP
Proportional controlling element for mounting between threaded flanges in gas trains.
Refer to Data Sheet N7646.



ASK33.1
Article no.: **BPZ:ASK33.1**
Larger mounting plate required to replace existing mounting plate. Required for mounting the actuators SQM4 or SQM33.
Refer to Data Sheet N7646.



ASK33.2
Article no.: **BPZ:ASK33.2**
Additional mounting plate is required for mounting the actuator SQN13.
Refer to Data Sheet N7646.



Gas damper for mounting kit

VKF41.xxxC
Butterfly valves designed in intermediate flange design, for integration into gas trains.
Refer to Data Sheet N7632.





ASK33.4
Article no.: **BPZ:ASK33.4**
Mounting kit for mounting the actuators SQM33.5 on the butterfly valve VKF41.xxxC.
Refer to Data Sheet N7632.

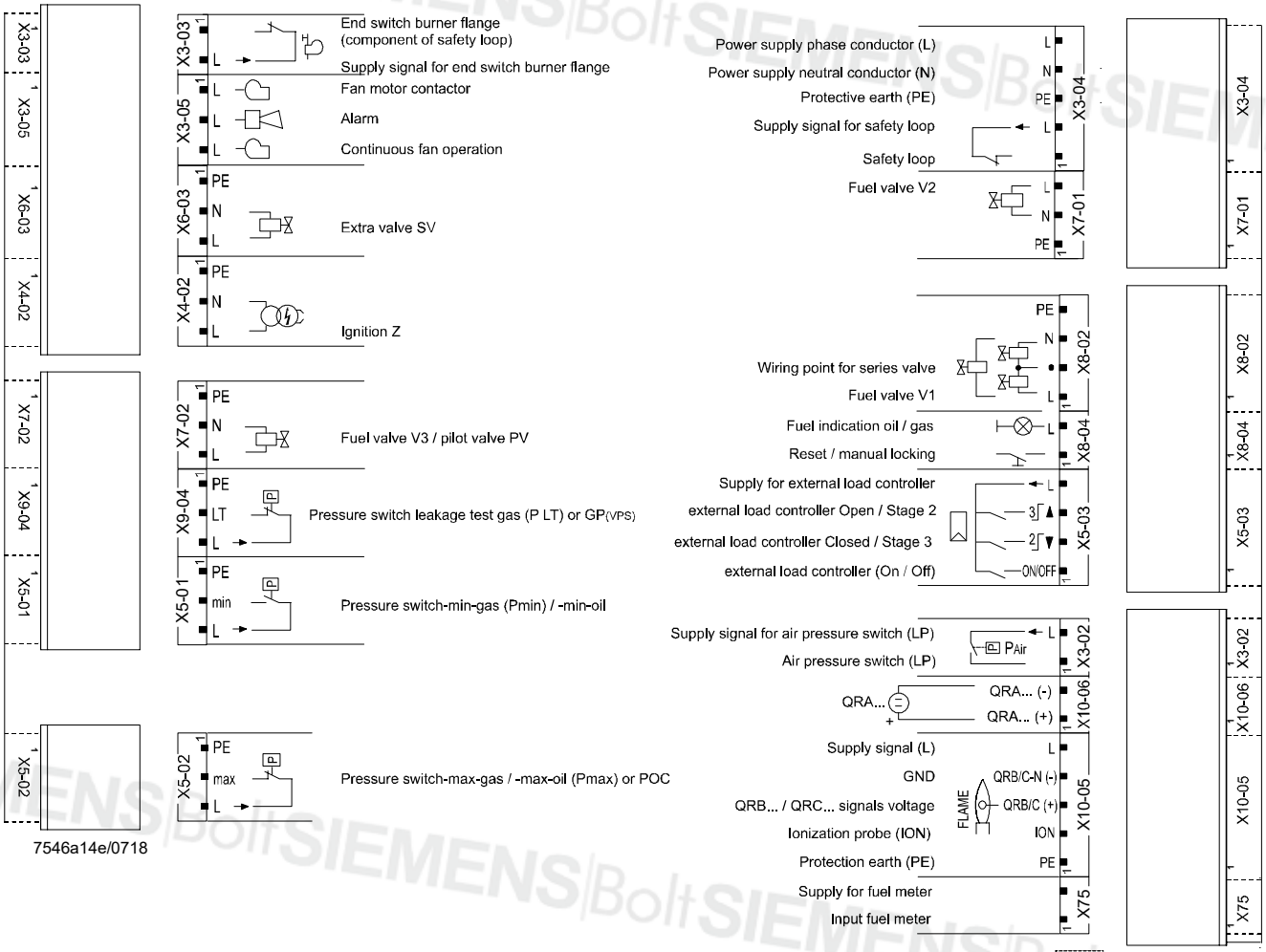


Transformer

A5Q20002669
Article no.: **BPZ:A5Q20002669**
Transformer to increase ionization voltage for AC 120 V devices.
See User Documentation A7541.2.



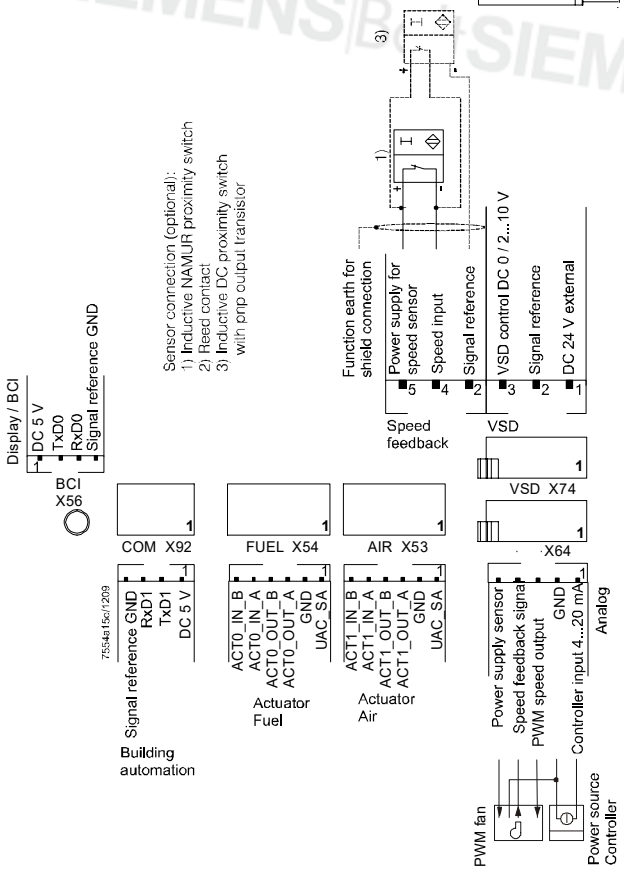
Connection and internal diagram LMV37.4



Shielding:

For shielding the cables on the VSD, refer to:

- Siemens *SED2* VSD Commissioning Manual (G5192), chapters 4 and 7, or
- Danfoss Operation Manual *VLT 6000* (MG60A703), chapter *Installation*



LMV37.4 basic unit

General

Mains voltage - LMV37.420A1 - LMV37.400A2	 AC 120 V -15% / +10% AC 230 V -15% / +10%
Mains frequency	50 / 60 Hz ±6%
Power consumption	<30 W (typically)
Safety class	I with parts according to II and III to EN 60730-1:2016
Degree of protection	IP00 to EN 60529:1991 + A1:2000 + A2:2013 Note The burner or boiler manufacturer must ensure degree of protection IP40 for LMV37.4, as per EN 60529:1991 + A1:2000 + A2:2013 through adequate installation.
Mode of operation	Type 2B in accordance with EN 60730-1:2016
Rated surge voltage	In accordance with EN 60730-1:2016, section 20 (OC III)
Voltage and current for the purposes of the EMC emitted interference tests	The emitted interference measurement test takes place with mains voltage and maximum power consumption

Terminal loading *Inputs*

Permissible primary fuse (Si) (external)	Max. 16 AT



Caution!
Risk of damage to the switching contacts!
If the external primary fuse (Si) is blown due to overload or short-circuit at the terminals, the LMV37.4 must be replaced.

Unit fuse F1 (internal)	6.3 AT (IEC 60127-2:2014))
Mains supply: Input current depending on the operating state of the unit	
Undervoltage	
• Safety shutdown from operating position at mains voltage	
- LMV37.420A1	Ca. AC 93 V
- LMV37.400A2	Ca. AC 186 V
• Restart on rise in mains voltage	
- LMV37.420A1	Ca. AC 96 V
- LMV37.400A2	Ca. AC 195 V
Status inputs: Status inputs (with the exception of the safety loop) of the contact feedback network are used for system supervision and require mains-related input voltage	
• Input safety loop	Refer to *Terminal loading outputs*
• Input currents and input voltages	
- UeMax	UN +10 %
- UeMin	UN -15 %
- IeMax	1.5 mA peak
- IeMin	0.7 mA peak
• Contact material recommendation for external signal sources (air pressure switch, pressure switch-min, pressure switch-max, etc.)	Gold-plated silver contacts
• Transition / settling behavior / bounce	
- Perm. bounce time of contacts when switching on / off	Max. 50 ms (after the bounce time, contact must stay closed or open)
• UN	
- LMV37.420A1	AC 120 V
- LMV37.400A2	AC 230 V
• Voltage detection	
- ON	
- LMV37.420A1	AC 90...132 V
- LMV37.400A2	AC 180...253 V
- OFF	
- LMV37.420A1	<AC 40 V
- LMV37.400A2	<AC 80 V

Terminal loading *Outputs*

Total contact loading:	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Unit input current (safety loop) from:	Max. 5 A
- Fan motor contactor	
- Ignition transformer	
- Fuel valves	
- Oil pump / magnetic clutch	

Individual contact loading:	
Fan motor contactor	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	
- LMV37.400A2	2 A
- LMV37.420A1	1,6 A pilot duty load declaration to UL372
• Power factor	Cosφ >0.4
Alarm output	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	1 A
• Power factor	Cosφ >0.4
Ignition transformer	
• Rated current	
- LMV37.400A2	2 A
- LMV37.420A1	1.6 A pilot duty load declaration to UL372 or 250 VA ignition load declaration to UL372
• Power factor	Cosφ >0.2
Fuel valves	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	
- LMV37.400A2	2 A
- LMV37.420A1	1.6 A pilot duty load declaration to UL372
• Power factor	Cosφ >0.4
Operation display	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	0.5 A
• Power factor	Cosφ >0.4
Safety valve (magnetic clutch / oil pump)	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	
- LMV37.400A2	2 A
- LMV37.420A1	1.6 A pilot duty load declaration to UL372
• Power factor	Cosφ >0.4

Connection for pressure switch	
• Rated voltage	
- LMV37.420A1	AC 120 V, 50 / 60 Hz
- LMV37.400A2	AC 230 V, 50 / 60 Hz
• Rated current	1,5 mA
• Power factor	---
Power supply for pressure switch-max / POC (X5-02 pin 3)	
• IaMax	<10 mA

Analog output / load output X74 pin 3

Accuracy of output voltage	±1 %

Cable lengths

Mains line AC 120 V / AC 230 V	Max. 100 m (100 pF/m)
Display, BCI	For installation under the burner hood or in the control panel Max. 3 m (100 pF/m)
Load controller X5-03	Max. 20 m (100 pF/m)
Load controller X64 (24 mA)	Max. 20 m (100 pF/m)
Safety loop / burner flange (total)	Max. 20 m (100 pF/m)
External lockout reset button	Max. 20 m (100 pF/m)
Safety valve	Max. 20 m (100 pF/m)
Load output [1])	Max. 10 m (100 pF/m)
VSD control [1])[2])	Max. 3 m (100 pF/m)
Speed input	Max. 3 m (100 pF/m)
Fuel valve (V1 / V2 / V3)	Max. 3 m (100 pF/m)
Pilot valve	Max. 3 m (100 pF/m)
Ignition transformer	Max. 3 m (100 pF/m)
Other lines	Max. 3 m (100 pF/m)

[1]) Do not run the cable together with other cables. If not observed, hum voltage might cause electromagnetic interference

[2]) Shorter cable length due to closed control loop

Specification as per EN 60730-1:2016	
Type of shutdown or interruption of each circuit	
Shutdown with microswitch	1-pole
Mode of operation	Type 2 B

Cross-sectional areas

The cross-sectional areas of the mains power lines (L, N, and PE) and, if required, the safety loop (safety limit thermostat, water shortage, etc.) must be sized for rated currents according to the selected external primary fuse.
The cross-sectional areas of the other cables must be sized in accordance with the internal unit fuse (max. 6.3 AT).

Min. cross-sectional area	0.75 mm² (single- or multi-core as per VDE 0100)

Cable insulation must meet the relevant temperature requirements and environmental conditions.

Fuses (F1) used inside the LMV37.4	6.3 AT (IEC 60127 2:2014)

Electrical connections of actuators

The fixed connected actuator cables must not be extended.

Signal cable AGV50 from AZL2 → BCI	**Signal cable**	Color white Unshielded Conductor 4 x 0.141 mm² With RJ11 plug
	Cable length - AGV50.100 - AGV50.300	 1 m 3 m
	Location	Under the burner hood (extra measures required for SKII EN 60730-1:2016

Environmental conditions	**Storage**	EN 60721-3-1:1997
	Climatic conditions	Class 1K3
	Mechanical conditions	Class 1M2
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	Transport	EN 60721-3-2:1997
	Climatic conditions	Class 2K2
	Mechanical conditions	Class 2M2
	Temperature range	-30...+60 °C
	Humidity	<95 % r.h.
	Operation	EN 60721-3-3:1995 + A2:1997
	Climatic conditions	Class 3K3
	Mechanical conditions	Class 3M3
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	Installation altitude	Max. 2,000 m above sea level



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

Flame supervision with ionization probe

For continuous operation!

No-load voltage at ION terminal (X10–05 pin 2)	Approx. U_{Mains}

Caution!
The ionization probe must be protected against electric shock hazard (electric shock hazard)!

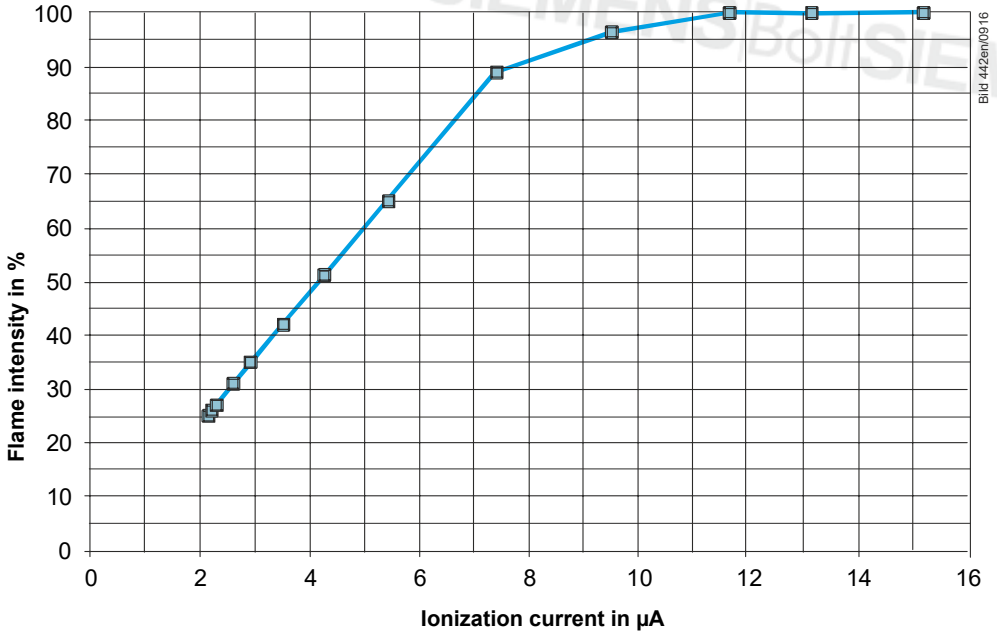
Short-circuit current	Max. AC 1 mA
Required detector current	Min. DC 2.3 µA, flame display approx. 30 % When the more sensitive flame supervision is activated, the required detector current is halved (refer to chapter *Flame detection sensitivity* in the Basic Documentation P7546).
Possible detector current	Max. DC 12…30 µA, flame display approx. 100 %
Max. perm. length of detector cable (laid separately)	3 m (wire–ground 100 pF/m)

Warning!
Simultaneous operation of QRA and ionization probe is not permitted!

Note
The higher the detector cable's capacitance (cable length), the more voltage at the ionization probe, and thus the detector current, drops. Long cable lengths plus very highly resistive flames might necessitate low-capacitance detector cables (e.g. ignition cable). In spite of technical measures taken in the circuitry aimed at compensating potential adverse effects of the ignition spark on the ionization current, it must be made certain that the minimum detector current required will already be reached during the ignition phase. If this is not the case, the connections on the primary side of the ignition transformer must be changed and / or the electrodes relocated.

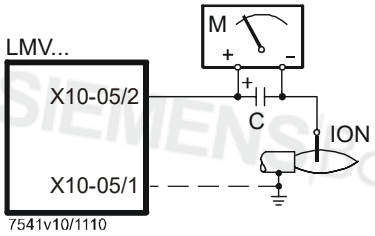
Threshold values when flame is supervised by an ionization probe:	
• Start prevention (extraneous light)	Flame intensity (parameter 954) ≥18 %
• Operation	Flame intensity (parameter 954) >24 %

Ionization input



Measuring circuit for detector current measurement

Ionization probe



Legend	
C	Electrolytic capacitor 100...470 µF; DC 10...25 V
ION	Ionization probe
M	Microammeter Ri max. 5000 Ω

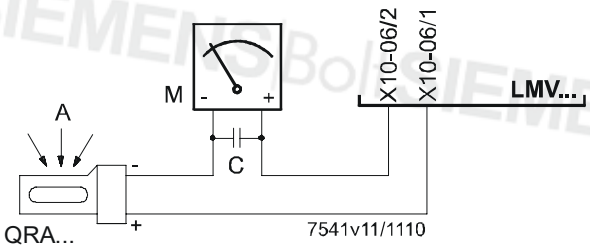
Flame supervision with QRA2 / QRA4 / QRA10

Warning!
If UV flame detectors QRA2 / QRA4 / QRA10 are used for flame supervision with the LMV37.4, it must be ensured that the LMV37.4 is permanently connected to power (conforming to DIN EN 298), thus enabling the LMV37.4 to detect flame detector failures during startup and shutdown. Generally, the LMV37.4 works with QRA flame detectors in intermittent operation.
***Technical Data* refer to Data Sheet N7712 covering UV flame detectors QRA2 / QRA10!**
***Technical Data* refer to Data Sheet N7711 covering UV flame detectors QRA4!**

Operating voltage	Max. 350 V peak
Required detector current in operation	Min. 30 µA When the more sensitive flame supervision is activated, the required detector current is halved (refer to chapter *Flame detection sensitivity* in the Basic Documentation P7546).
Possible detector current in operation	Max. 600 µA
Permissible length of flame detector cable - normal cable (laid separately)	Max. 6 m
Threshold values when flame is supervised by QRA:	
- Start prevention (extraneous light)	Flame intensity (parameter 954) ≥18 %
- Operation	Flame intensity (parameter 954) >24 %

Measuring circuit for detector current measurement

UV flame detector QRA



Legend

A	Incidence of light
C	Electrolytic capacitor 100...470 µF; DC 10...25 V
M	Microammeter Ri max. 5000 Ω

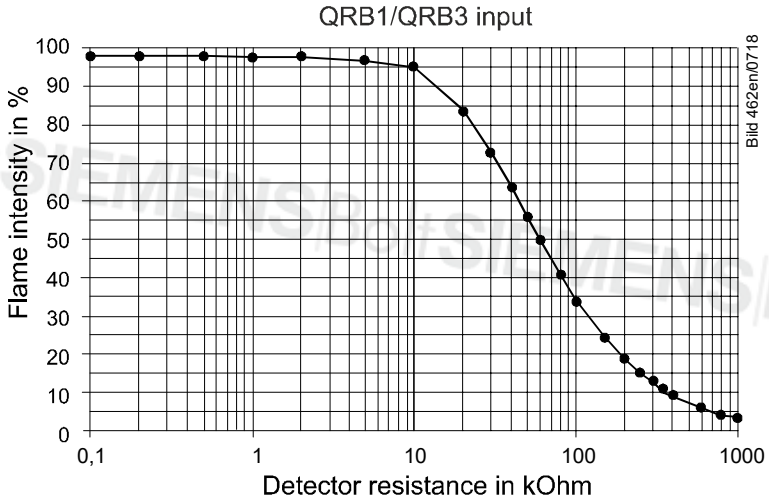
Warning!
- **Input QRA is not short-circuit-proof!**
  Short-circuits of X10-06/2 against earth can destroy the QRA input
- **Simultaneous operation of QRA and ionization probe is not permitted!**

Flame supervision with QRB1/QRB3	No-load voltage at QRB1/QRB3 terminal (X10–05 pin 3)	Approx. DC 5 V
	Max. perm. length of QRB1/QRB3 detector cable (laid separately)	3 m (wire – wire 100 pF/m)

Note
A detector resistance of RF <500 Ω is identified as a short-circuit and leads to safety shutdown in operation as if the flame had been lost.

For this reason, before considering the use of a highly sensitive photoresistive detector (QRB1B or QRB3S), it should be checked whether this type of flame detector is indeed required! Increased line capacitance between QRB1/QRB3 connection and mains live wire *L* has an adverse effect on the sensitivity and increases the risk of damaged flame detectors due to overvoltage. Always run detector cables separately!

Threshold values when flame is supervised by QRB1/QRB3:	
Start prevention (extraneous light) with **R**QRB	<400 kΩ Intensity of flame ≥10%
Operation with **R**QRB	<230 kΩ Intensity of flame >16%
Short-circuit detection with **R**QRB	<0.5 kΩ



A flame detector resistance of RF <500 Ω is identified as a short-circuit and leads to safety shutdown in operation, like in the case of loss of flame.

Note!
In the case of the QRB1/QRB3, the maximum intensity display is limited to approximately 40% due to the system.

Flame supervision with QRB4	Open-circuit voltage at terminal QRB4 (X10-05 pin 3)	Approx. 5 V DC
	Permissible length of QRB4 detector cable (laid separately)	3 m (wire to wire 100 pF/m)
	Threshold values when flame is supervised by QRB4	
	Start prevention (extraneous light)	Flame intensity (parameter 954) ≥10%
	Operation	Flame intensity (parameter 954) >16%

Note!
In the case of the QRB4, the maximum intensity display is limited to approximately 40% due to the system (parameter 954).

Note!
Connection of QRB4 cables!
Blue cable of QRB4 to terminal X10-05 pin 4.
Black cable of QRB4 to terminal X10-05 pin 3.
Otherwise, the QRB4 will not work.

Flame supervision with QRC

Check the intensity of flame with the AZL2.

For system-specific reasons, the display of maximum flame intensity by the AZL2 of maximum intensity is limited to approx. 55 %.

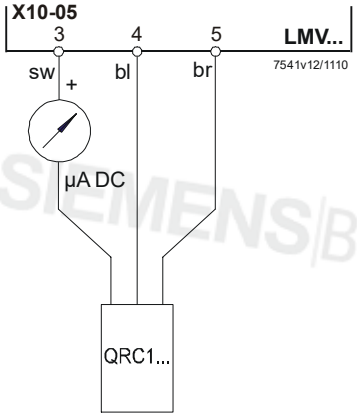
Warning!
Flame detectors QRC are only suited for AC 230 V operation.

Start prevention (extraneous light) with IQRC	Ca. 15 µA, display approx. 10 % Flame intensity (parameter 954)
Operation with IQRC	Ca. 25 µA, display approx. 16 % Flame intensity (parameter 954)

	Required detector current (with flame)	Permissible detector current (without flame)	Typical detector current (with flame)
QRC	Min. 35 µA	Max. 5,5 µA	100 µA

The values given in the table above only apply under the following conditions:
- Mains voltage AC 230 V
- Ambient temperature 23 °C

Measuring circuit for detector current measurement



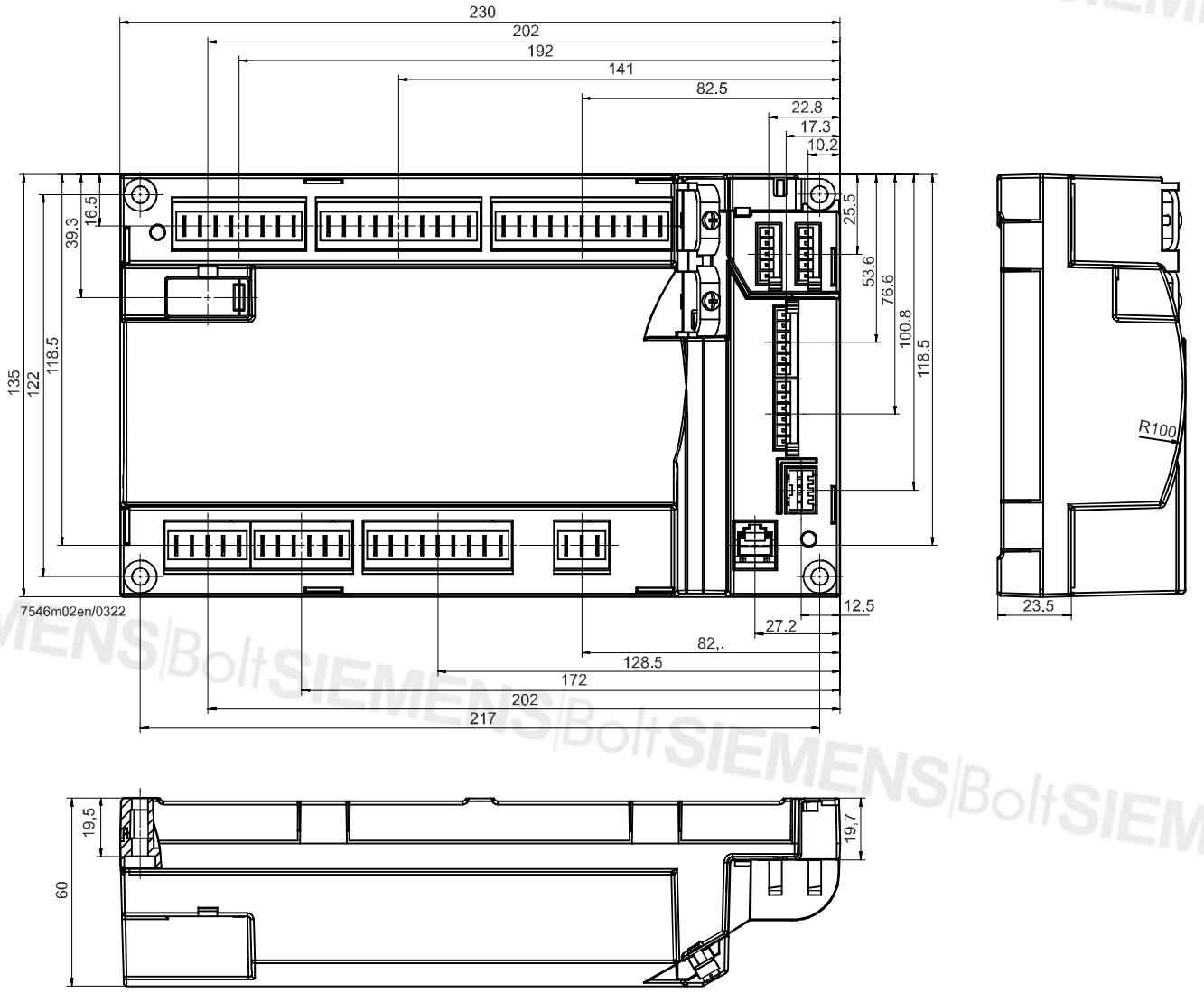
Legend

µA DC	DC-Mikroampèremeter an internal resistance of Ri = max. 5 kΩ
bl	blue
sw	black
br	brown

Dimensions

Dimensions in mm

LMV37.4



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Subject to change!