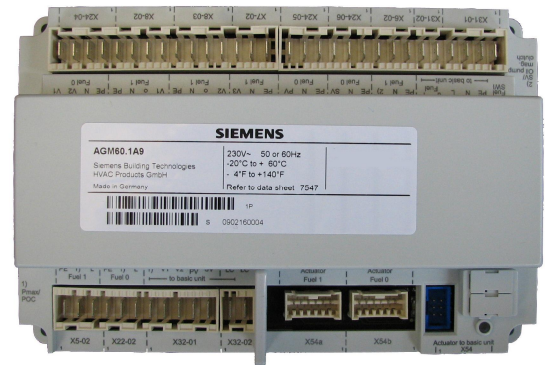




Example: LMV26.300



AGM60.1

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

LMV26.300A2

Basic unit for continuous operation and intermittent operation, with integrated fuel-air ratio control for forced draft burners

LMV36.300A2

Switch unit for switching the valve control or feedback signals of both fuels

AGM60.1A9

The LMV26 / LMV36 with AGM60 are a microprocessor-based burner control with matching system components for the control and supervision of forced draft burners of medium to high capacity.

For using of dual fuel with 2 fuel actuators, AGM60 dual fuel switch unit is required.

The LMV26 / LMV36 / AGM60 and this Data Sheet are intended for use by OEMs which integrate the actuators in their products!

Use

Microprocessor-controlled LMV26/LMV36 for single-fuel burners of any capacity for intermittent operation, with electronic fuel-air ratio control, up to 2 actuators, integrated gas valve proving, and VSD control.

The system components (AZL2, actuators) are connected to operating on a single fuel directly to the LMV26 / LMV36. All safety-related digital inputs and outputs of the LMV26 / LMV36 are monitored by 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

The AGM60 dual fuel switch unit connected to the LMV26 / LMV36 serves for changeover of valve control or for feedback signals and the actuators from the 2 types of fuel.

For Europe

LMV26 / LMV36:

For intermittent operation in connection with the LMV26 / LMV36 / AGM60, the ionization probe or the QRA..., QRB... or QRC... optical flame detector can be used.

LMV36:

Continuous operation is possible only when using an ionization probe and without AGM60...

Features

The following components are integrated in the basic unit of the LMV26 / LMV36:

- Burner management system complete with valve proving system
- Electronic fuel / air ratio control system for a maximum of 2 actuators SQM3... or SQN1...
- Control of VSD for 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 LMV26 / LMV36 (P7547) also apply to this document!



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 DIN 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 LMV26 / LMV36 and the AGM60 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>



Life cycle

LMV26 / LMV36 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).

AGM60... The AGM60... dual fuel switch unit has a designed lifetime* of 5,000 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).

General This lifetime is based on the endurance tests specified in standard 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 LMV26 / LMV36 / AGM60 according to the manufacturer's Data Sheet and Basic Documentation. When reaching the designed lifetime in terms of the number of burner startup cycles or time of usage, the LMV26 / LMV36 / AGM60 must be replaced by authorized personnel.

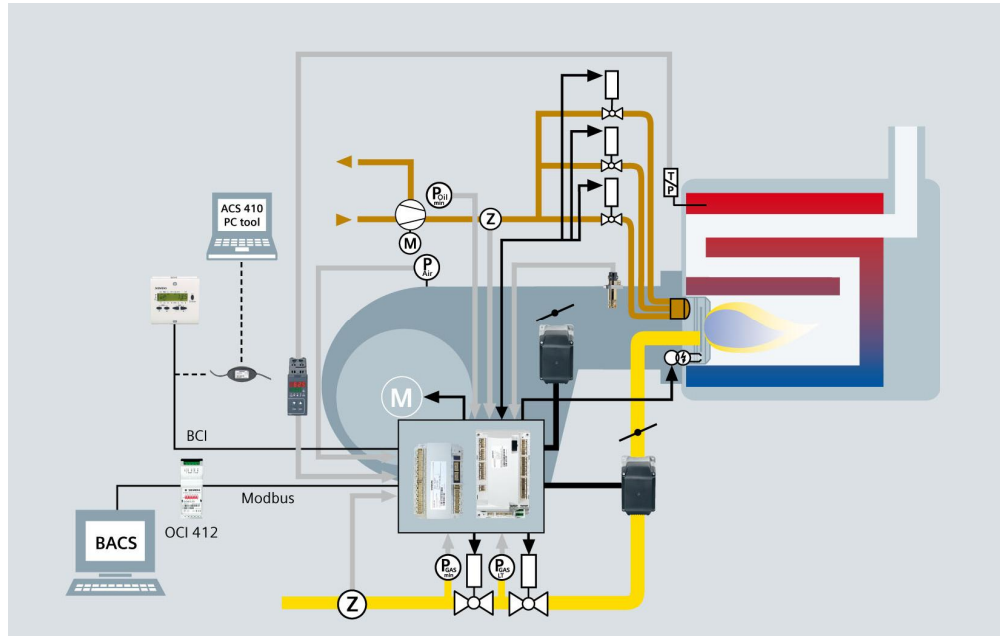
* The designed lifetime is not the warranty time specified in the Terms of Delivery

Supplementary documentation

User Documentation Modbus AZL2...	A7541
Environmental Product Declaration LMV2... / LMV3...	E7541
Environmental Product Declaration AGM60...	E7547
Installation and Operating Instructions PC Software ACS410	J7352
Basic Documentation LMV26 / LMV36 / AGM60	P7547
Product Range Overview LMV2... / LMV3...	Q7541

System overview

Operating mode	LMV26	LMV26 + AGM60	LMV36	LMV36 + AGM60
Continuous operation	---	---	<ul style="list-style-type: none"> • GAS only • Ionization only 	---
Intermittent operation	<ul style="list-style-type: none"> • GAS or OIL • All sensors 	<ul style="list-style-type: none"> • GAS and OIL • GAS and GAS • All sensors 	<ul style="list-style-type: none"> • GAS or OIL • All sensors 	<ul style="list-style-type: none"> • GAS and OIL • GAS and GAS • All sensors



The diagram shows the full scope of functions of the LMV26 / LMV36. The actual functions are to be determined based on the respective execution / configuration!

Ordering

Burner control

LMV26 / LMV36

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 P7547



Article no.	Type	Mains voltage	Parameter set	Detectors
BPZ:LMV26.300A2	LMV26.300A2	AC 230 V	Europe	QRA2 / QRA4 / QRA10 / QRB / QRC / ION
S55402-C201-A100	LMV36.300A2	AC 230 V	Europe	QRA2 / QRA4 / QRA10 / QRB / QRC / ION

Dual fuel switch unit

AGM60.1A9

Connected on the LMV26 / LMV36. Used for switching the valve control or feedback signals and actuators of both fuels. See Basic Documentation P7547



Article no.	Type	Mains voltage
BPZ:AGM60.1A9	AGM60.1A9	AC 230 V

Fuel selector

The fuel selector is **not** a component of the AGM60... and does **not** constitute part of the scope of delivery.

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 LMV26 / LMV36 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

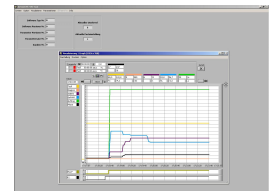


ACS410

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 LMV26 / LMV36, 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 LMV26 / LMV36, degree of protection IP54.

See Data Sheet N7542



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



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:



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 reference	Description
			RAST5
1	10	X3-02	Air pressure switch (LP)
1	10	X3-03	Burner flange
1	10	X3-04	Power supply - Safety loop (L, N, PE - SL)
1	10	X3-05	Alarm (AL), Fan motor (M)
1	10	X4-02	Ignition (Z)
1	10	X5-01	Gas pressure switch-min / Oil pressure switch-min (Pmin)
1	10	X5-02	Gas pressure switch-max / Oil pressure switch-max (Pmax)
1	10	X5-03	External load controller (LR)
1	10	X6-03	Safety valve (SV)
1	10	X7-01	Fuel valve (V2)
1	10	X7-02	Fuel valve (V3)
1	10	X8-02	Fuel valve (V1)
1	10	X8-04	Reset, Operating mode display (B4)
1	10	X9-04	Gas pressure switch (GP), Pressure switch valve proving (P LT)
1	10	X10-05	Flame detector ION, QRB, QRC
1	10	X10-06	Flame detector QRA2 / QRA4
1	10	X75	Fuel meter
			RAST3.5
1	10	X74	1 x 5-pin connector / Variable speed drive (FU)
1	10	X64	1 x 5-pin connector / Reserve
			RAST2.5
1	10	X92	Modbus (COM)

AGG3.151

Article no.: **BPZ:AGG3.151**

Connector set for AGM60.4A9 (US), RAST5, set of 10
AGM60.4A9

Example: X5-02



AGG3.151	Connector reference	Description
		RAST5
1	X5-02	Fuel 1: Pressure switch-max / POC
1	X6-02	Fuel 1: Safety valve / Magnetic clutch
1	X7-02	Fuel valve V3
1	X8-02	Fuel 1: Fuel valve V1
1	X8-03	Fuel 1: Fuel valve V2
1	X22-02	Fuel 0: Pressure switch-max / POC
1	X24-04	Fuel 0: Fuel valve V1 / Fuel valve V2
1	X24-05	Fuel 0: Pilot valve
1	X24-06	Fuel 0: Safety valve
1	X31-01	Power supply, Fuel selector switch
1	X31-02	Fuel selector switch
1	X32-01	Connecting plug for LMV26/ LMV36
1	X32-02	External load controller

AGG9...

Single connectors

Packing unit 200 in total

Example X5-03



Article no.	Type	Type of connector	Terminal
BPZ:AGG9.203	AGG9.203	RAST5	X3-02
BPZ:AGG9.204	AGG9.204	RAST5	X3-03
BPZ:AGG9.206	AGG9.206	RAST5	X8-04
BPZ:AGG9.209	AGG9.209	RAST5	X10-06
BPZ:AGG9.217	AGG9.217	RAST5	X75
BPZ:AGG9.303	AGG9.303	RAST5	X3-05
BPZ:AGG9.304	AGG9.304	RAST5	X4-02
BPZ:AGG9.306	AGG9.306	RAST5	X5-01
BPZ:AGG9.307	AGG9.307	RAST5	X5-02
BPZ:AGG9.309	AGG9.309	RAST5	X6-03
BPZ:AGG9.310	AGG9.310	RAST5	X7-01
BPZ:AGG9.311	AGG9.311	RAST5	X7-02
BPZ:AGG9.313	AGG9.313	RAST5	X9-04
BPZ:AGG9.403	AGG9.403	RAST5	X5-03
BPZ:AGG9.406	AGG9.406	RAST5	X8-02
BPZ:AGG9.501	AGG9.501	RAST5	X3-04
BPZ:AGG9.504	AGG9.504	RAST5	X10-05
BPZ:AGG9.853	AGG9.853	RAST3,5	X64 and X74

Accessories

AGG5.310

Article no.: **BPZ:AGG5.310**

Accessories set speed control, for burner management systems, composed of sensor disk \varnothing 50, sensor and mounting set.

See Mounting instructions M7550.1 (74 319 9322 0)

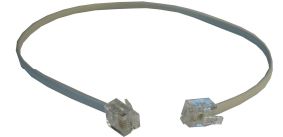


Cables

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

AGV61.100

Article no.: **BPZ:AGV60.50**

Connecting cable between LMV26 / LMV36 and AGM60, cable length 0.5 m

See Basic Documentation P7547



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

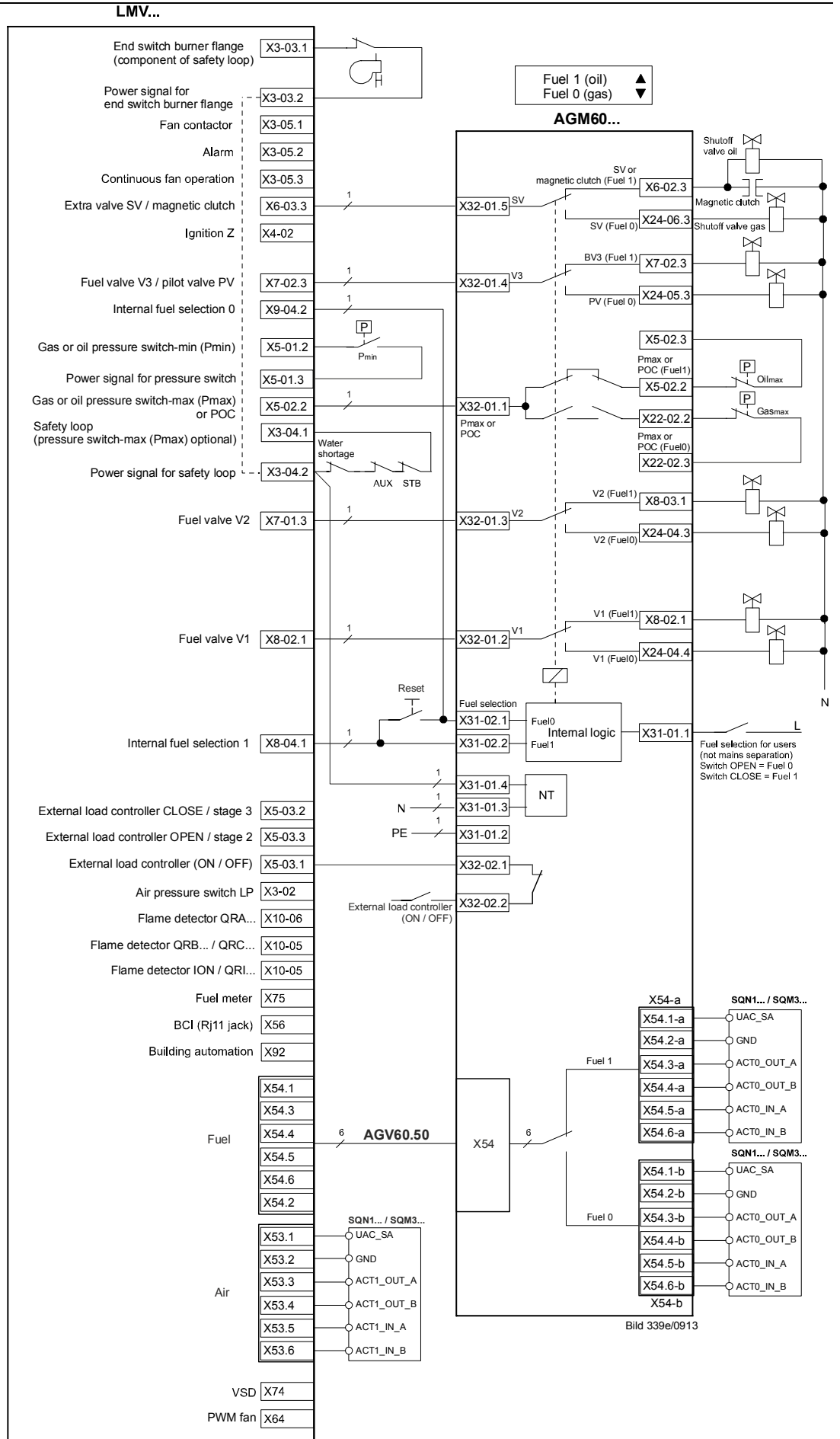
A5Q20002669

Article no.: **BPZ:A5Q20002669**

Transformer to increase ionization voltage for AC 120 V devices.
See User Documentation A7541.2



Connection and internal diagram LMV26 / LMV36



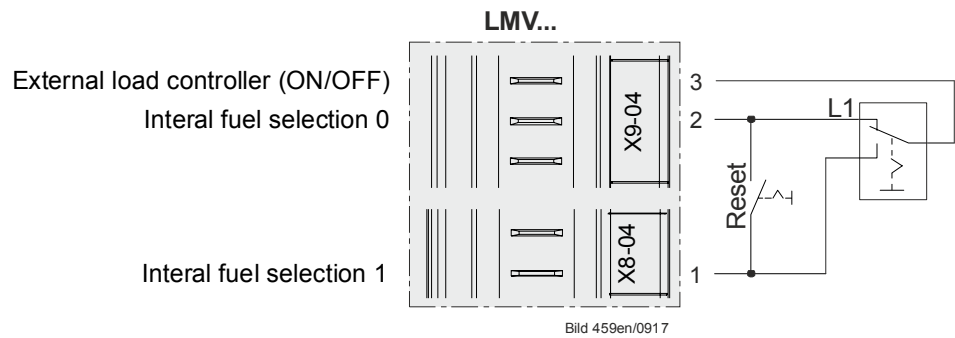
Connection and internal diagram LMV26 / LMV36 (cont'd)

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*

Switching between 2 ratio control curves



Technical Data

LMV26 / LMV36

General	Mains voltage	AC 230 V -15 % / +10 %
	Mains frequency	50 / 60 Hz \pm 6 %
	Power consumption	<30 W (typically)
	Safety class	I, with parts according to II and III to DIN EN 60730-1
	Degree of protection	IP00 to DIN EN 60529
		Note The burner or boiler manufacturer must ensure degree of protection IP40 for the LMV26 / LMV36 as per DIN EN 60529 through adequate installation
	Mode of operation	Type 2B in accordance with DIN EN 60730-1
	Rated surge voltage	In accordance with DIN EN 60730-1 chapter 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	Perm. mains primary fuse (externally)	Max. 16 AT
	Unit fuse F1 (internal)	6,3 AT (DIN EN 60127 2 / 5)
	Mains supply: Input current depending on the operating state of the unit	
	Undervoltage	
	• Safety shutdown from operating position at mains voltage	Approx. AC 190 V
	• Restart on rise in mains voltage	Approx. 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 <i>Terminal loading outputs</i>
	• 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	AC 230 V	
• Voltage detection		
- On	AC 180...253 V	
- Off	<AC 80 V	

Technical Data (cont'd)

Terminal loading
Outputs

Total contact loading:

- Rated voltage AC 230 V, 50 / 60 Hz
- Unit input current (safety loop) from: Max. 5 A
 - Fan motor contactor
 - Ignition transformer
 - Valves
 - Oil pump / magnetic clutch (optional via AGM60...)

Individual contact loading:

Fan motor contactor

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0.4$

Alarm output

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 1 A
- Power factor $\text{Cos}\varphi > 0.4$

Ignition transformer

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0.2$

Fuel valves

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0.4$

Operation display

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 0,5 A
- Power factor $\text{Cos}\varphi > 0.4$

Safety valve (magnetic clutch / oil pump)

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0,4$

Connections for pressure switch

- Rated voltage AC 230 V, 50 / 60 Hz
- Rated current 1.5 mA
- Power factor ---

Power supply for pressure switch-max / POC (X5-02 pin 3 or X22-02 pin 3)

- I_{aMax} <10 mA

Fuel feedback to LMV26 / LMV36 (X31-02 pin 1 or X31-02 pin 2)

- I_{aMax} <10 mA

Analog output / load
output X74 pin 3

Accuracy of output voltage $\pm 1 \%$

Technical Data (cont'd)

Cable lengths	Mains line 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 analog 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

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 mm ² (single- or multi-core as per VDE 0100)
---------------------------	---

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

Fuses (F1) used inside the LMV26 / LMV36	6.3 AT DIN EN 60127 2 / 5
--	---------------------------

Electrical connections of actuators

The ready connected actuator cables must not be extended.

Technical Data (cont'd)

AGV50... signal cable
AZL2... → BCI

Signal cable	Color white Unshielded Conductor 4 x 0.141 mm ² With RJ11-plug
Cable length	
- AGV50.100	1 m
- AGV50.300	3 m
Location	Under the burner hood (extra measures required for SKII EN 60730-1)

Environmental conditions

Storage	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
Transport	DIN EN 60721-3-2
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-30...+60 °C
Humidity	<95 % r.h.
Operation	DIN EN 60721-3-3
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!

Technical Data (cont'd)

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 (see chapter *Flame detection sensitivity*).

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!



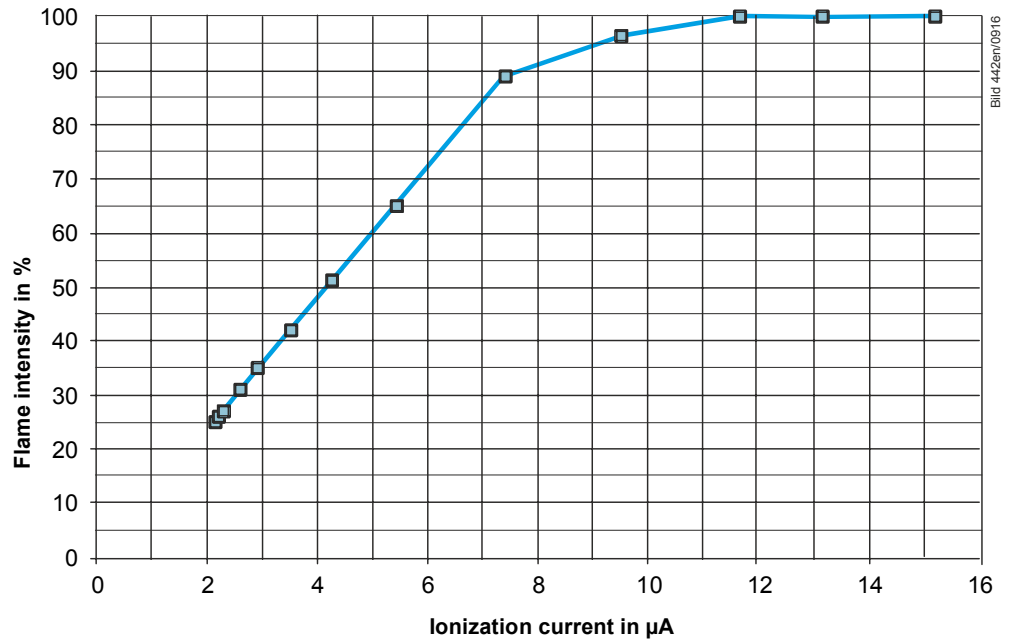
Note

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:

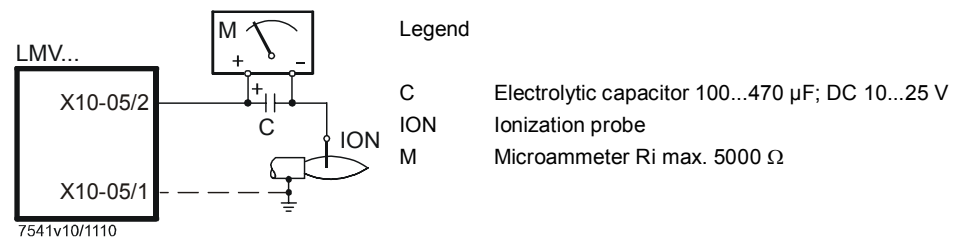
- Start prevention (extraneous light)	Flame intensity (parameter 954) $\geq 18\%$
- Operation	Flame intensity (parameter 954) $> 24\%$

Ionization input



Measuring circuit for detector current measurement

Ionization probe





Caution!

If QRA2-UV tubes / QRA4-UV tubes / QRA10-UV tubes are used for flame supervision on the LMV26 / LMV36, it must be ensured that the LMV26 / LMV36 is permanently connected to power (EN 298), thus enabling the LMV26 / LMV36 to detect flame detector failures during startup and shutdown.

Generally, the LMV26 / LMV36 works with QRA flame detectors in intermittent operation.

For technical data, refer to Data Sheet N7712 covering QRA2 / QRA10 UV flame detector!

For technical data, refer to Data Sheet N7711 covering QRA4 UV flame detector!

Operating voltage	Max. 350 V peak
Required detector current in operation	Min. 30 μ A
	When the more sensitive flame supervision is activated, the required detector current is halved (see chapter <i>Flame detection sensitivity</i>).
Possible detector current in operation	Max. 600 μ A
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)	Intensity of flame (parameter 954) \geq 18%
- Operation	Intensity of flame (parameter 954) $>$ 24%

Measuring circuit for detector current measurement

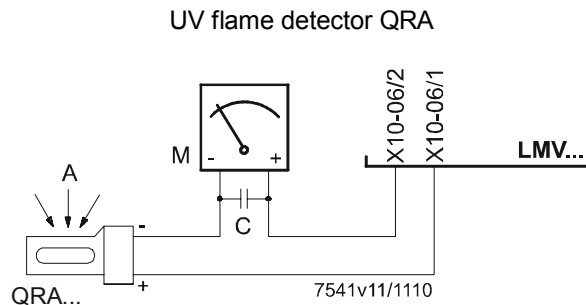


Figure 1: Measuring circuit QRA

Legend

- A Incidence of light
- C Electrolytic capacitor 100...470 μ F; DC 10...25 V
- M Microammeter R_i max. 5000 Ω



Warning!

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

Technical Data (cont'd)

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)



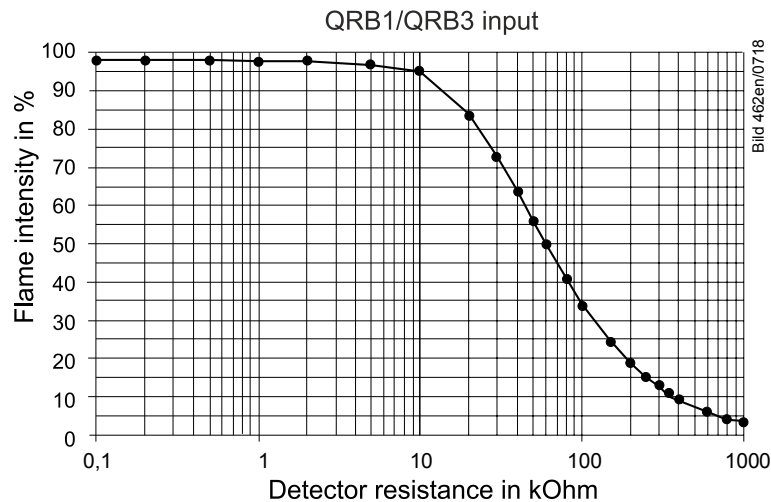
Note

A detector resistance of $R_F < 500 \Omega$ 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}	$< 400 \text{ k}\Omega$ Intensity of flame $\geq 10\%$
Operation with R_{QRB}	$< 230 \text{ k}\Omega$ Intensity of flame $> 16\%$
Short-circuit detection with R_{QRB}	$< 0.5 \text{ k}\Omega$



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

Technical Data (cont'd)

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) $\geq 10\%$

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... is limited to approx. 55%.



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

Start prevention (extraneous light) with IQRC	Ca. 15 μ A, display approx. 10 % Intensity of flame (parameter 954)
Operation with IQRC	Ca. 25 μ A, display approx. 16 % Intensity of flame (parameter 954)

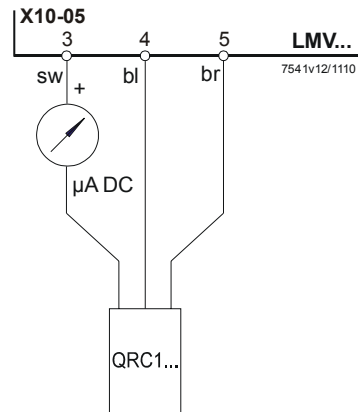
	Required detector current (with flame)	Permissible detector current (without flame)	Typical detector current (with flame)
QRC	Min. 35 μ A	Max. 5.5 μ A	100 μ A

The values given in the table above only apply under the following conditions:

- Mains voltage AC 230 V
- Ambient temperature 23 °C

Start prevention (extraneous light) with IQRC	Ca. 15 μ A, display approx. 10 %
Operation with IQRC	Ca. 25 μ A, display approx. 16 %


Measuring circuit for detector current measurement



Legend

- μ A DC DC microammeter with an internal resistance of $R_i = \text{max. } 5\text{k}\Omega$
- bl blue
- sw black
- br brown

Technical Data (cont'd)

Switch unit AGM60...	Mains voltage	AC 230 V -15% / +10%
	Mains frequency	50/60 Hz ±6%
	Power consumption	<5 W (typically) (without actuator supply)
	Safety class	I with parts according to II and III to DIN EN 60730-1
	Galvanic separation between mains voltage terminals and actuator signal lines and actuator supply lines	No
	Degree of protection	IP00
		 Note! The burner or boiler manufacturer (OEM) must ensure degree of protection IP40 to DIN EN 60529 for burner controls by adequate installation of the AGM60.
		The AGM60 together with the LMV26 / LMV36 is suited for installation under the burner hood or inside a control cabinet or control panel
	Detection time fuel changeover	<400 ms
	Switching frequency fuel changeover	Min. 3 s
Switching cycles fuel changeover	Max. 5'000	
Perm. mains primary fuse (externally)	Max. 6.3 AT Power must always be supplied via the LMV26 / LMV36 (refer to chapter <i>Inputs / Outputs</i>)	
Mains supply:		
Input current depending on the operating state of the unit		
Mains voltage is monitored by the LMV26 / LMV36		
Dimensions (W x H x D)	180.7 x 120.7 x 51.7 mm	
Mounting	Top hat rail to DIN EN 60715, 35 mm or screwed	

Terminal output *Inputs*

Status input: Fuel selection, pressure switch	
• 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 switching contact, transducer (pressure switch-max, POC)	Gold-plated silver contacts
• Transition / settling behavior / bounce	
- Perm. bounce time of contacts when switching on/off	Max. 50 ms (after the bounce time, the contact must stay closed or open)
• UN	AC 230 V
• Voltage detection	
- On	AC 90...132 V
- Off	<AC 40 V

Technical Data (cont'd)

Terminal output *Outputs*

Total contact output:

- Rated voltage AC 230 V, 50/60 Hz

Refer also *Total contact output* in chapter *Terminal output Outputs*

Individual contact loads:

Fuel valve

- Rated voltage AC 230 V, 50/60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0.4$

Safety valve (magnetic clutch / oil pump)

- Rated voltage AC 230 V, 50/60 Hz
- Rated current 2 A
- Power factor $\text{Cos}\varphi > 0.4$

Connections for pressure switch

- Rated voltage AC 230 V, 50/60 Hz
- Rated current 1.5 mA
- Power factor ---

Power supply for pressure switch-max / POC (X5-02 pin 3 or X22-02 pin 3)

- IaMax <10 mA

Fuel feedback to LMV26 / LMV36 (X31-02.1 or X31-02.2)

- IaMax <10 mA

Cable lengths

Mains line LMV26 / LMV36 → AGM60	Max. 3 m (100 pF/m)
Fuel valves	Max. 3 m (100 pF/m)
Other lines	Max. 3 m (100 pF/m)
Fuel selector	Max. 20 m (100 pF/m)
Load controller	Max. 20 m (100 pF/m)

Specification as per EN 60730-1

Type of shutdown or interruption of each circuit

Shutdown with microswitch Single-pole

Mode of operation Type 2 B

Cross-sectional areas

The cross-sectional areas of the power supply lines (L, N and PE) must be capable of carrying the rated currents according to the built-in unit fuse of the respective LMV26 / LMV36 (max. 6.3 AT).

Cross-sectional area	Min. 0.75 mm ² (single- or multi-core to VDE 0100)
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Cable insulations must satisfy the relevant temperature requirements and environmental conditions.

Electrical connections of actuators

The fixed connected actuator cables must not be extended.

Technical Data (cont'd)

Environmental conditions

Storage	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+60 °C
Humidity	<95% r.h.
Transport	DIN EN 60721-3-2
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-30...+60 °C
Humidity	<95% r.h.
Operation	DIN EN 60721-3-3
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



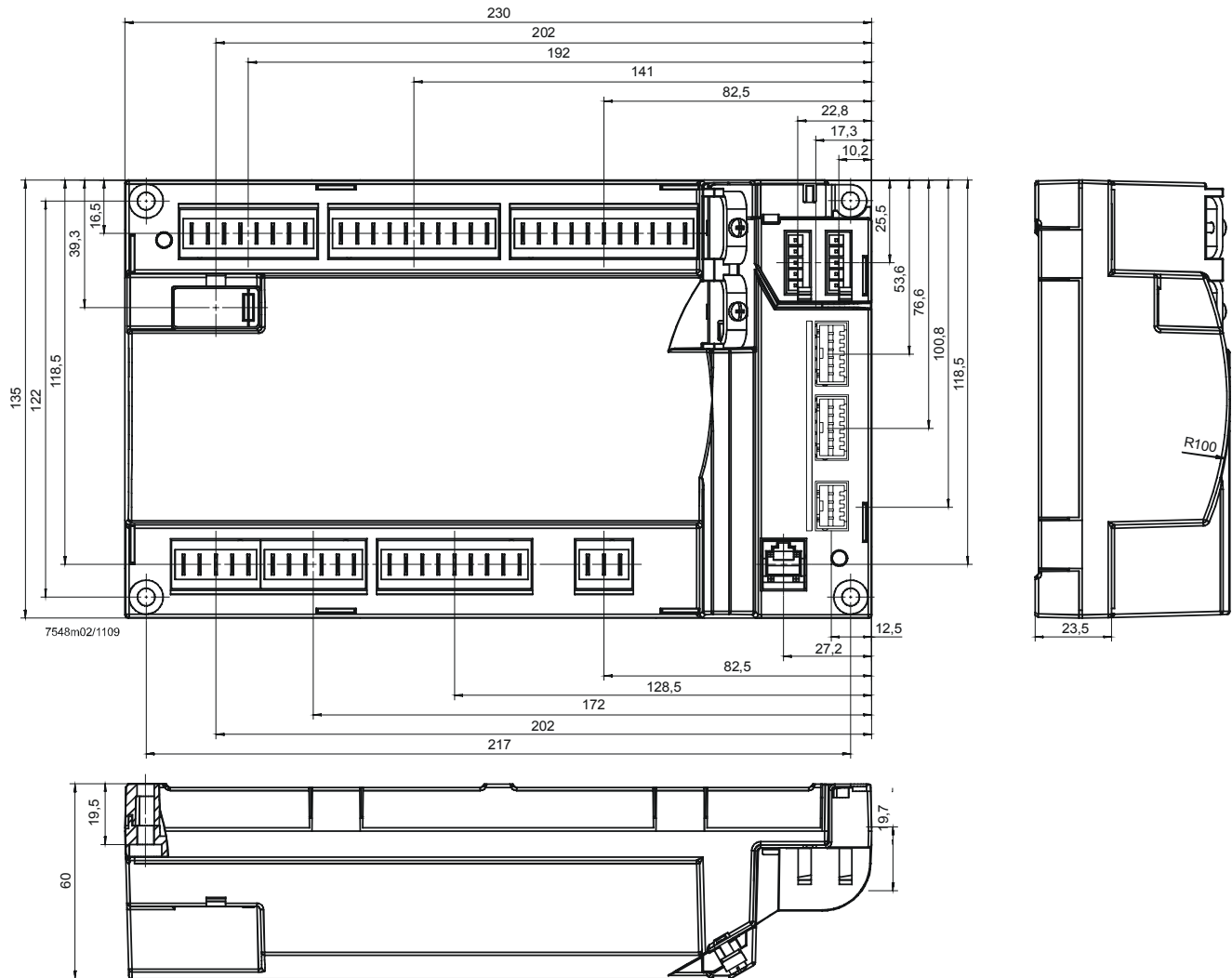
Caution!

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

Dimensions

Dimensions in mm

LMV26 / LMV36



Dimensions (cont'd)

Dimensions in mm

AGM60...

