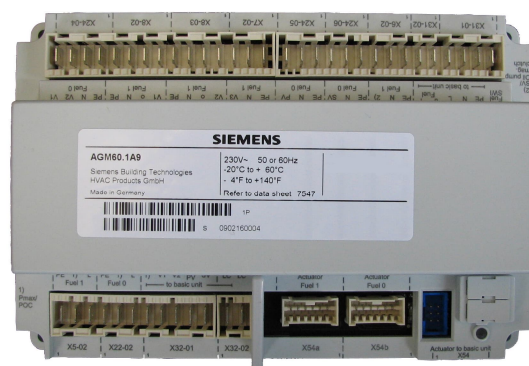




AGM60.1A9

**Switch unit for switching the valve control or feedback signals of both fuels**      **AGM60.1A9**

## 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 and actuators) are connected directly to the LMV26 / LMV36. All safety-related digital inputs and outputs of the LMV26 / LMV36 are supervised by a contact feedback network.

The AGM60 dual fuel switch unit connected to the LMV26 / LMV36 is used for switching the fuel valve control and the feedback signals of both fuel actuators.

- 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

### **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 only possible when using an ionization probe and without an AGM60.

## Features

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The following items are integrated into the LMV26 / LMV36:

- Burner control 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

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### **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 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 fuel switches, which – under normal operating conditions in heating mode – corresponds to approx. 10 years of service (starting from the date of manufacture on the type label).                                                                                                                                                                                                                                                                                                                                                                                                                        |
| General       | <p>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) (<a href="http://www.afecor.org">www.afecor.org</a>).</p> <p>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.</p> <p>* The designed lifetime is not the warranty time specified in the Terms of Delivery</p> |

## Supplementary documentation

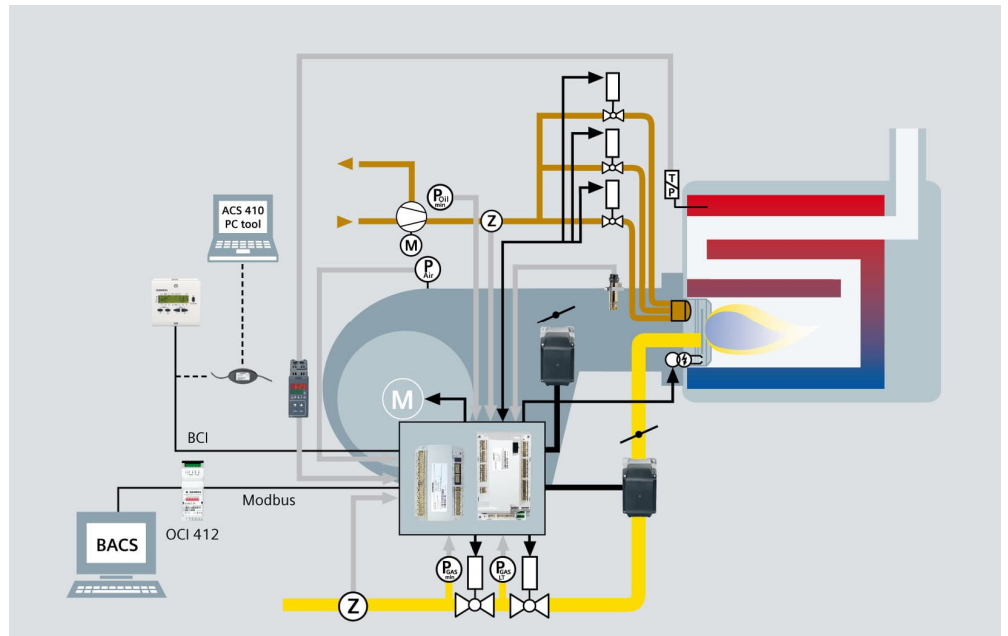
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|                                                                  |          |
|------------------------------------------------------------------|----------|
| User Documentation Modbus AZL2.....                              | A7541    |
| Environmental 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    |

\*) On request

## System overview

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



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 to 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**

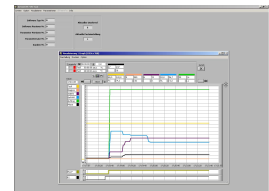
Device serving as an interface between the LMV26 / LMV36 and a Modbus system, such as a building automation and control system (BACS). The Modbus interface is based on the RS-485 standard.  
See Data Sheet N7615.



#### ACS410 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 LMV26 / LMV36, degree of protection IP40.

See Data Sheet N7542.



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#### **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.



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.



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**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.



## 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    | <ul style="list-style-type: none"> <li>Alarm (AL)</li> <li>Fan motor (M)</li> </ul>                                             |
| 1        | 10       | RAST5          | X4-02    | Ignition (Z)                                                                                                                    |
| 1        | 10       | RAST5          | X5-01    | <ul style="list-style-type: none"> <li>Gas pressure switch-min (Pmin)</li> <li>Oil pressure switch-min (Pmin)</li> </ul>        |
| 1        | 10       | RAST5          | X5-02    | <ul style="list-style-type: none"> <li>Gas pressure switch-max (max)</li> <li>Oil pressure switch-max (Pmax)</li> </ul>         |
| 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    | <ul style="list-style-type: none"> <li>Reset</li> <li>Operating mode display (B4)</li> </ul>                                    |
| 1        | 10       | RAST5          | X9-04    | <ul style="list-style-type: none"> <li>Gas pressure switch (Pmin/Pmax)</li> <li>Pressure switch valve proving (P LT)</li> </ul> |
| 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      | 1 x 5-pin connector / Variable speed drive (VSD)                                                                                |
| 1        | 10       | RAST3.5        | X64      | 1 x 5-pin connector / Reserve                                                                                                   |
| 1        | 10       | RAST2.5        | X92      | Modbus (COM)                                                                                                                    |

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

Connector set for AGM60.1A9 (US), RAST5, set of 10 AGM60.1A9.

Example: X5-02



| AGG3.151 | Connector type | Terminal | Description                                                                                      |
|----------|----------------|----------|--------------------------------------------------------------------------------------------------|
| 1        | RAST5          | X5-02    | Fuel 1: Pressure switch-max (Pmax) or POC                                                        |
| 1        | RAST5          | X6-02    | Fuel 1: Safety valve (SV) / magnetic clutch                                                      |
|          | RAST5          | X7-02    | Fuel valve (V3)                                                                                  |
| 1        | RAST5          | X8-02    | Fuel 1: Fuel valve (V1)                                                                          |
| 1        | RAST5          | X8-03    | Fuel 1: Fuel valve (V2)                                                                          |
| 1        | RAST5          | X22-02   | Fuel 0: Pressure switch-max (Pmax) or POC                                                        |
| 1        | RAST5          | X24-04   | Fuel 0: Fuel valve (V1) / fuel valve (V2)                                                        |
|          | RAST5          | X24-05   | Fuel 0: Pilot valve (PV)                                                                         |
| 1        | RAST5          | X24-06   | Fuel 0: Safety valve (SV)                                                                        |
| 1        | RAST5          | X31-01   | <ul style="list-style-type: none"> <li>• Power supply</li> <li>• Fuel selector switch</li> </ul> |
| 1        | RAST5          | X31-02   | Fuel selector switch                                                                             |
| 1        | RAST5          | X32-01   | Connecting plug for LMV26/ LMV36                                                                 |
| 1        | RAST5          | X32-02   | External load controller (LR)                                                                    |

### 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    | <ul style="list-style-type: none"> <li>Reset</li> <li>Operating display (B4)</li> </ul>                                         |
| 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    | <ul style="list-style-type: none"> <li>Alarm (AL)</li> <li>Fan motor (M)</li> </ul>                                             |
| BPZ:AGG9.304 | AGG9.304 | RAST5             | X4-02    | Ignition (Z)                                                                                                                    |
| BPZ:AGG9.306 | AGG9.306 | RAST5             | X5-01    | <ul style="list-style-type: none"> <li>Gas pressure switch-min (Pmin)</li> <li>Oil pressure switch-min (Pmin)</li> </ul>        |
| BPZ:AGG9.307 | AGG9.307 | RAST5             | X5-02    | <ul style="list-style-type: none"> <li>Gas pressure switch-max (Pmax)</li> <li>Oil pressure switch-max (Pmax)</li> </ul>        |
| BPZ:AGG9.309 | AGG9.309 | RAST5             | X6-03    | <ul style="list-style-type: none"> <li>Safety valve (SV)</li> </ul>                                                             |
| BPZ:AGG9.310 | AGG9.310 | RAST5             | X7-01    | <ul style="list-style-type: none"> <li>Fuel valve (V2)</li> </ul>                                                               |
| BPZ:AGG9.311 | AGG9.311 | RAST5             | X7-02    | <ul style="list-style-type: none"> <li>Fuel valve (V3)</li> </ul>                                                               |
| BPZ:AGG9.313 | AGG9.313 | RAST5             | X9-04    | <ul style="list-style-type: none"> <li>Gas pressure switch (Pmin/Pmax)</li> <li>Pressure switch valve proving (P LT)</li> </ul> |
| 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 (L, N, PE) for safety loop (SK)                                                                                    |
| BPZ:AGG9.504 | AGG9.504 | RAST5             | X10-05   | Flame detector ION, QRB, QRC                                                                                                    |
| BPZ:AGG9.853 | AGG9.853 | RAST3.5           | X64      | 1 x 5-pin connector / reserve                                                                                                   |
| BPZ:AGG9.853 | AGG9.853 | RAST3.5           | X74      | 1 x 5-pin connector / variable speed drive (VSD)                                                                                |

## Ordering (cont'd)

### Accessories

#### **AGG5.310**

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

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

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

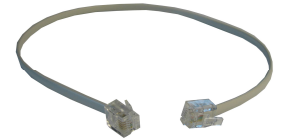


### Cables

#### **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**

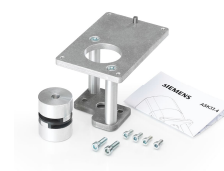
Butterfly valves designed in intermediate flange design, for integration into gas trains.  
Refer to Data Sheet N7632.



#### **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.



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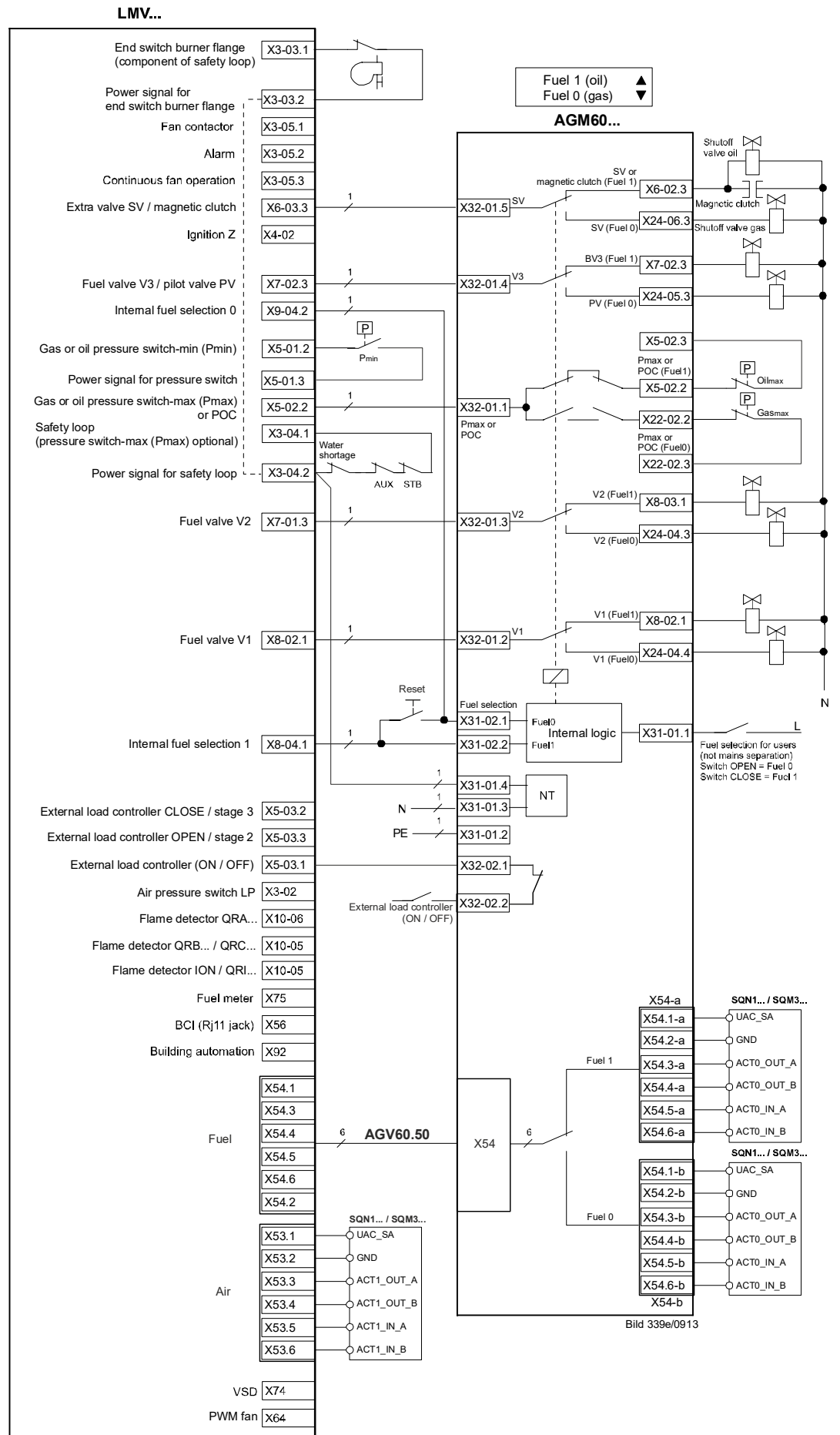
### Transformer

#### **A5Q20002669**

Article no.: **BPZ:A5Q20002669**

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



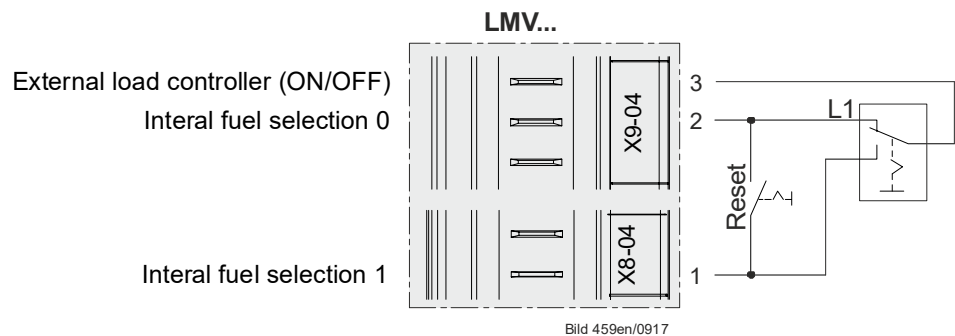


Shielding:

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 EN 60730-1:2016                                                                                                                            |
| Degree of protection                                                       | IP00 to DIN EN 60529:1991 + A1:2000 + A2:2013                                                                                                                                       |
|                                                                            | <b>Note</b><br>The burner or boiler manufacturer must ensure degree of protection IP40 for the LMV26 / LMV36 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 LMV26/LMV36 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                                                                                                                         | 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 (KRN) 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
  - Fuel 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  $\cos\varphi > 0.4$

##### Alarm output

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

##### Ignition transformer

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

##### Fuel valves

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

##### Operation display

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

##### Safety valve (magnetic clutch / oil pump)

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

##### 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 <sup>1)</sup>           | Max. 10 m (100 pF/m)                                           |
|               | VSD control <sup>2)</sup>           | 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)                                            |

<sup>1)</sup> Do not run the cable together with other cables. If not observed, hum voltage might cause electromagnetic interference

<sup>2)</sup> 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 mm <sup>2</sup> (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 (IEC 60127 2:2014) |
|------------------------------------------|---------------------------|

## 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<sup>2</sup>  
With RJ11-plug

#### Cable length

- AGV50.100

1 m

- AGV50.300

3 m

#### Location

Under the burner hood (extra measures required for SKII EN 60730-1:2016)

### 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 $\mu$ A, flame display approx. 30%                                                                                                     |
|                                                       | When the more sensitive flame supervision is activated, the required detector current is halved (see chapter <i>Flame detection sensitivity</i> ). |
| Possible detector current                             | Max. DC 12...30 $\mu$ A, flame display approx. 100%                                                                                                |
| Max. perm. length of detector cable (laid separately) | 3 m (wire-ground 100 pF/m)                                                                                                                         |



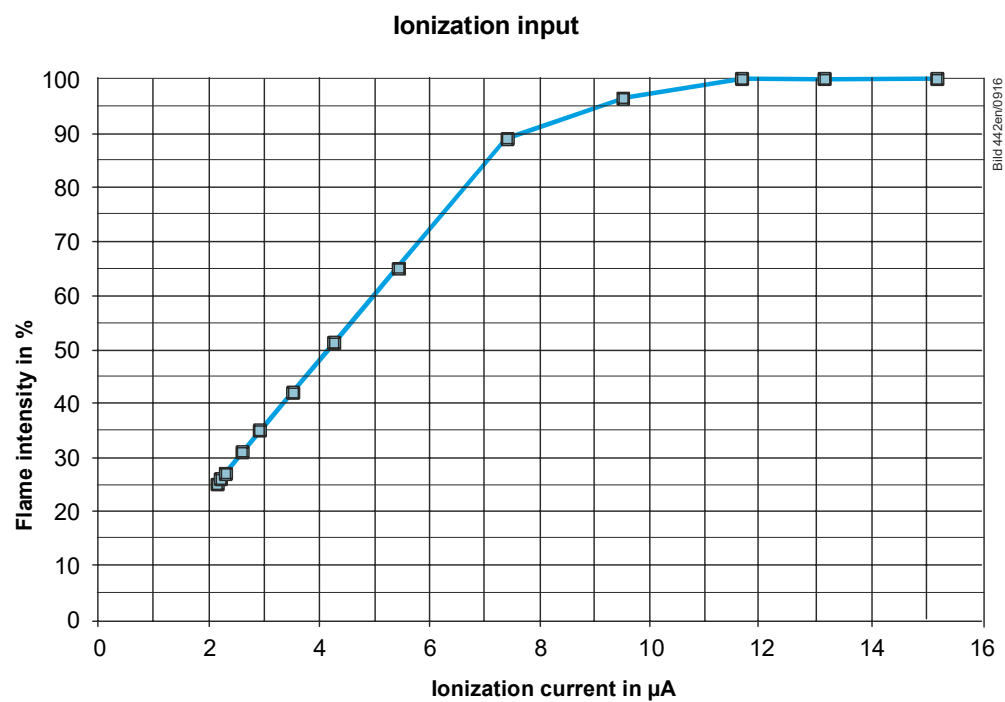
**Warning!**  
Simultaneous operation of QRA and ionization probe is not permitted!



**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.

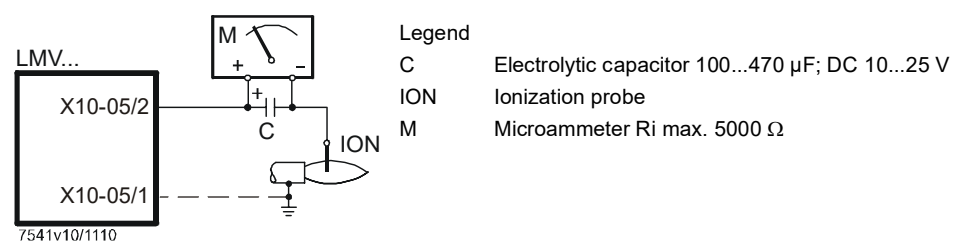
Threshold values when flame is supervised by an ionization probe:

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



Measuring circuit for  
detector current  
measurement

Ionization probe



## Flame supervision with QRA2/QRA4/QRA10



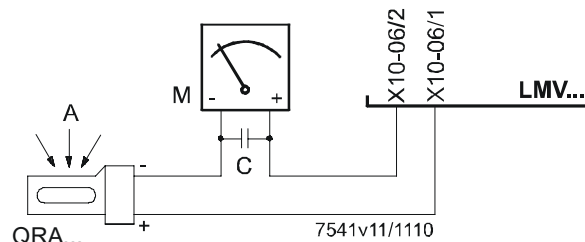
### Caution!

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 (DIN 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 µA                              |
| When the more sensitive flame supervision is activated, the required detector current is halved (refer to chapter <i>Flame detection sensitivity</i> in the Basic Documentation P7547). |                                         |
| 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)                                                                                                                                                   | Intensity of flame (parameter 954) ≥18% |
| • Operation                                                                                                                                                                             | Intensity of flame (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 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) |



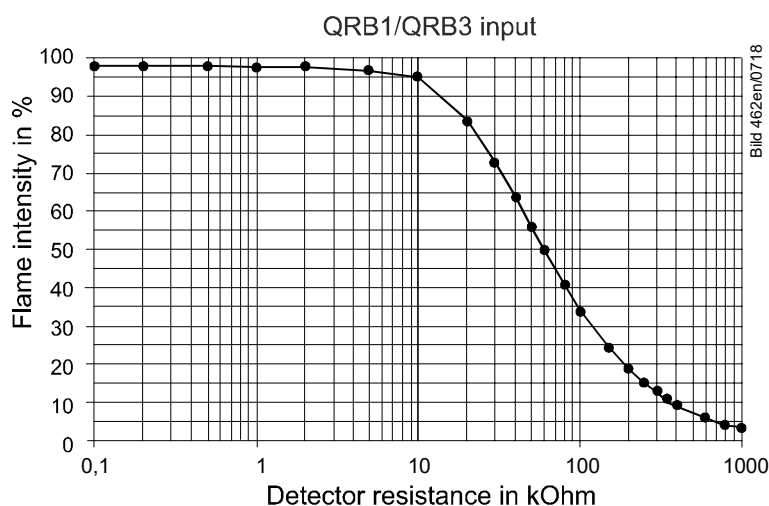
#### Note

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 <b>RQRB</b> | $< 400 \text{ k}\Omega$        |
| Operation with <b>RQRB</b>                           | Intensity of flame $\geq 10\%$ |
|                                                      | $< 230 \text{ k}\Omega$        |
|                                                      | Intensity of flame $> 16\%$    |
| Short-circuit detection with <b>RQRB</b>             | $< 0.5 \text{ k}\Omega$        |



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.



#### Note!

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

## 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.**

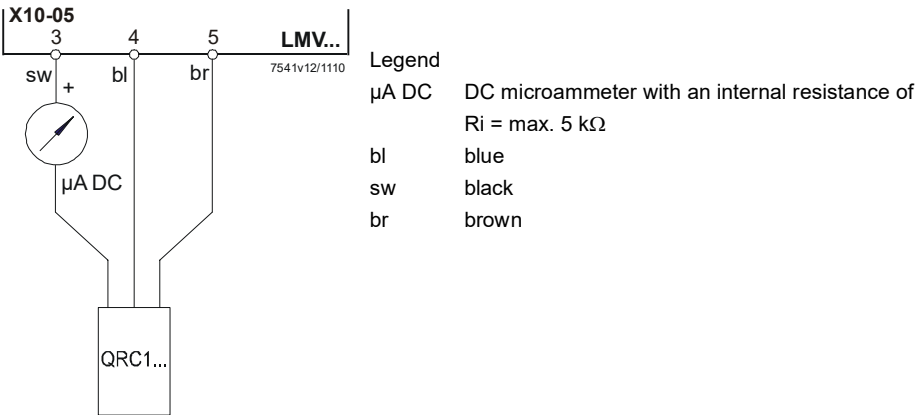
|                                               |                                                                        |
|-----------------------------------------------|------------------------------------------------------------------------|
| Start prevention (extraneous light) with IQRC | Ca. 15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

|            | Required detector current<br>(with flame) | Permissible detector current<br>(without flame) | Typical detector current<br>(with flame) |
|------------|-------------------------------------------|-------------------------------------------------|------------------------------------------|
| <b>QRC</b> | Min. 35 $\mu$ A                           | Max. 5.5 $\mu$ A                                | 100 $\mu$ A                              |

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



## Technical Data (cont'd)

### AGM60 dual fuel switch unit

|                                                                                                         |                                                         |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| 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 EN 60730-1:2016 |
| Galvanic separation between mains voltage terminals and actuator signal lines and actuator supply lines | No                                                      |
| Degree of protection                                                                                    | IP00 according to EN 60529:1991 + A1:2000 + A2:2013     |



#### Note!

The burner or boiler manufacturer (OEM) must ensure degree of protection IP40 to EN 60529:1991 + A1:2000 + A2:2013 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                                                                                                     |
| Permissible primary fuse (Si) (external) | Max. 6.3 AT<br>Power must always be supplied via the LMV26 / LMV36 (refer to chapter <i>Inputs / Outputs</i> ) |



#### 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 AGM60 must be replaced.**

|                                                            |                                                |
|------------------------------------------------------------|------------------------------------------------|
| 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 |

## Technical Data (cont'd)

### 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  $\cos\varphi > 0.4$

##### Safety valve (magnetic clutch / oil pump)

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

##### 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 (X31-02.1 or X31-02.2)

- $I_{aMax}$  <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 60730-1:2016

##### 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<sup>2</sup> (single- or multi-core to VDE 0100)

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

|                       |                              |
|-----------------------|------------------------------|
| <b>Storage</b>        | EN 60721-3-1:1997            |
| Climatic conditions   | Class 1K3                    |
| Mechanical conditions | Class 1M2                    |
| Temperature range     | -20...+60 °C                 |
| Humidity              | <95% r.h.                    |
| <b>Transport</b>      | EN 60721-3-2:1997            |
| Climatic conditions   | Class 2K2                    |
| Mechanical conditions | Class 2M2                    |
| Temperature range     | -30...+60 °C                 |
| Humidity              | <95% r.h.                    |
| <b>Operation</b>      | 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 |



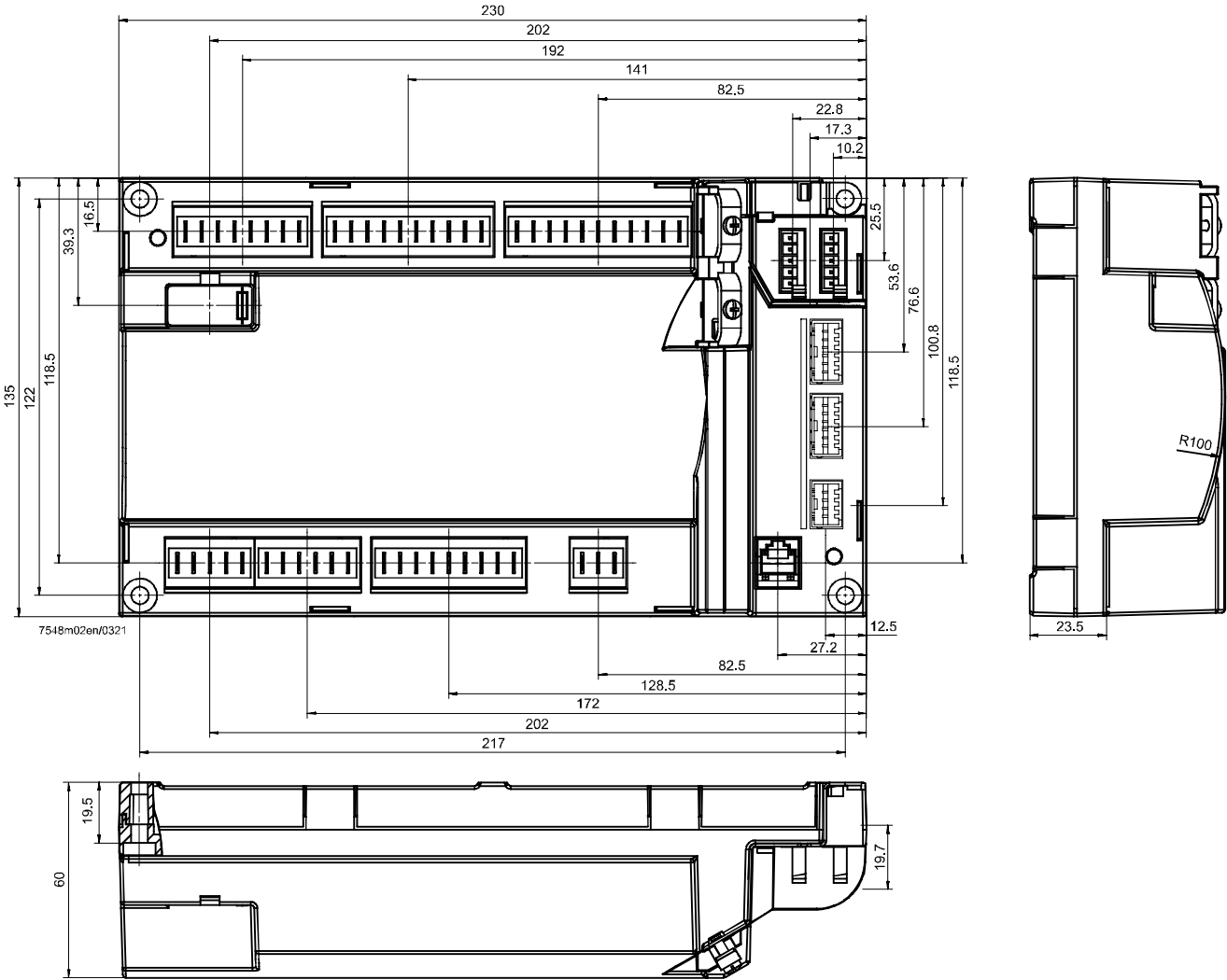
#### Caution!

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

Dimensions

Dimensions in mm

LMV26 / LMV36



Dimensions in mm

AGM60

