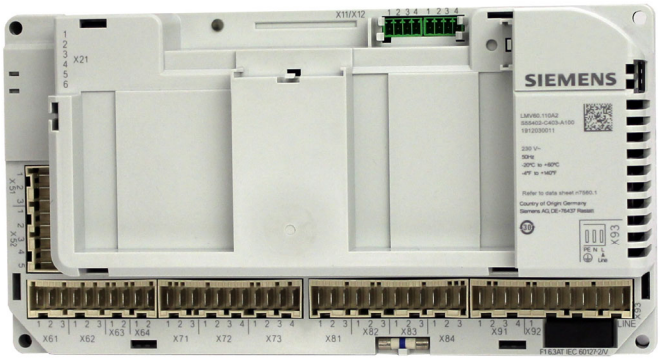
SIEMENS




# LMV60.110A2

## Burner management system for forced draft burners with the main functions:

- **Burner control**
- **Fuel-air ratio control**

## Installation Guide

**The LMV6 and this Installation Guide are intended for original equipment manufacturers (OEMs) using the LMV6 in or on their products.**

**Please note!**
**All the safety, warning, and technical notes given in the basic documentation for the LMV6 (P7560) also apply to this document in full. Failure to observe this poses a risk of damaging the safety functions and the risk of electric shock.**

CC1J7560en
4/21/2020

Smart Infrastructure

# Supplementary documentation

| Product type | Designation | Documentation type | Documentation number |
|---|---|---|---|
| LMV60.110A2 | Burner management system | User Documentation | A7560.1 |
| LMV6 | Burner management system | Environmental Declaration | E7560 *) |
| LMV60.110A2 | Burner management system | Parameter list and error code list | I7560 |
| LMV60.110A2 | Burner management system | Data Sheet | N7560 |
| LMV60.110A2 | Burner management system | Basic documentation | P7560 |
| LMV6 | Burner management system | Product Range Overview | Q7560 |

*) On request only

Note
This document only refers to the product type – not the *product designation*. See the table below for details.

| Product type | Product designation |
|---|---|
| AGG6.200A5 | 100 to 240 V~ power supply unit |
| AGG6.500 | Shielding plate |
| AGG6.635 | Ready-fitted CAN bus connecting cable |
| AGG6.641 | CAN bus connecting cable |
| AGG9 | Connector set |
| AZL66 | Display and operating unit |
| LMV6 | Burner management system |
| QRA2 | UV flame detector |
| QRA2M | UV flame detector |
| QRA4 | UV flame detector |
| QRA10 | UV flame detector |
| SKPx5 | Actuators |
| SQM45 | Actuators |
| SQM46 | Actuators |
| SQM47 | Actuators |
| SQM48 | Actuators |
| VGD | Double gas valves |
| VKP | Proportional controlling element |

# Contents

# 1 Installation notes

- Always run the high-voltage ignition cables separately from the LMV6 and other cables while observing the greatest possible distances
- Do not mix up phase and neutral (midpoint) conductors
- Install switches, fuses, and grounding in accordance with local regulations
- The connection diagrams show the LMV6 with earthed neutral conductor. It is essential to ensure that local regulations are complied with (e.g., protection against electric shock)
- Do not exceed the maximum permissible current rating of the connection terminals
- Ensure that the electrical wiring inside the burner complies with national and local regulations
- Do not feed external mains voltage to the control outputs of the LMV6. When checking the functions of the burner components controlled by the LMV6 (fuel valves or similar), the LMV6 must not be connected to the burner components
- Mains power may only be supplied via *L* and *N*. There must be no difference in potential between the neutral conductor *N* and protective earth *PE*
- Circuit breakers should have a characteristic “C” when operated with the LMV6
- Make certain that strain relief of the connected cables is in compliance with the relevant standards (e.g., as per DIN EN 60730 and DIN EN 60335)
- Ensure that spliced wires cannot come into contact with neighboring connections. Use suitable ferrules. Failure to observe this information poses a risk of loss of safety functions and a risk of electric shock
- Unused connections on the LMV6 must be fitted with a corresponding AGG9 connector by the burner manufacturer
- The AGG9 connectors on the connection cables for the LMV6 may only be removed or replaced when the plant is shut down (all-pole disconnection)
- The connection between the SQM4 and the controlling elements for fuel and combustion air, as well as any additional controlling elements, must be form-fitted
- The AZL66 must be used in a dry and clean environment
- Check the connection cables for the supervision switch inputs (e.g., the air pressure switch) for signs of a short circuit

## 1.1 Electrical connection of the flame detectors

It is important to achieve practically disturbance-free and loss-free signal transmission:

- Never run the detector cable together with other cables
  – Line capacitance reduces the magnitude of the flame signal
  – Use a separate cable
- Observe the permissible detector cable lengths; refer to the *Technical data*
- The mains-powered ionization probe does not offer protection against electric shock hazards. Protection against accidental contact must be ensured. Failure to observe this information poses a risk of electric shock
- Position the ignition electrode and the ionization probe in such a way that the ignition spark cannot arc over to the ionization probe (risk of electrical overloads) and adversely affect the ionization supervision process
- Insulation resistance
  – Must be > 50 mΩ between ionization probe and ground
  – Soiled detector holders reduce the insulation resistance, thus supporting creepage currents
- Earth the burner in compliance with the relevant regulations; earthing the boiler alone does not suffice

# 2 Assignment of connections

## 2.1 LMV60.110A2

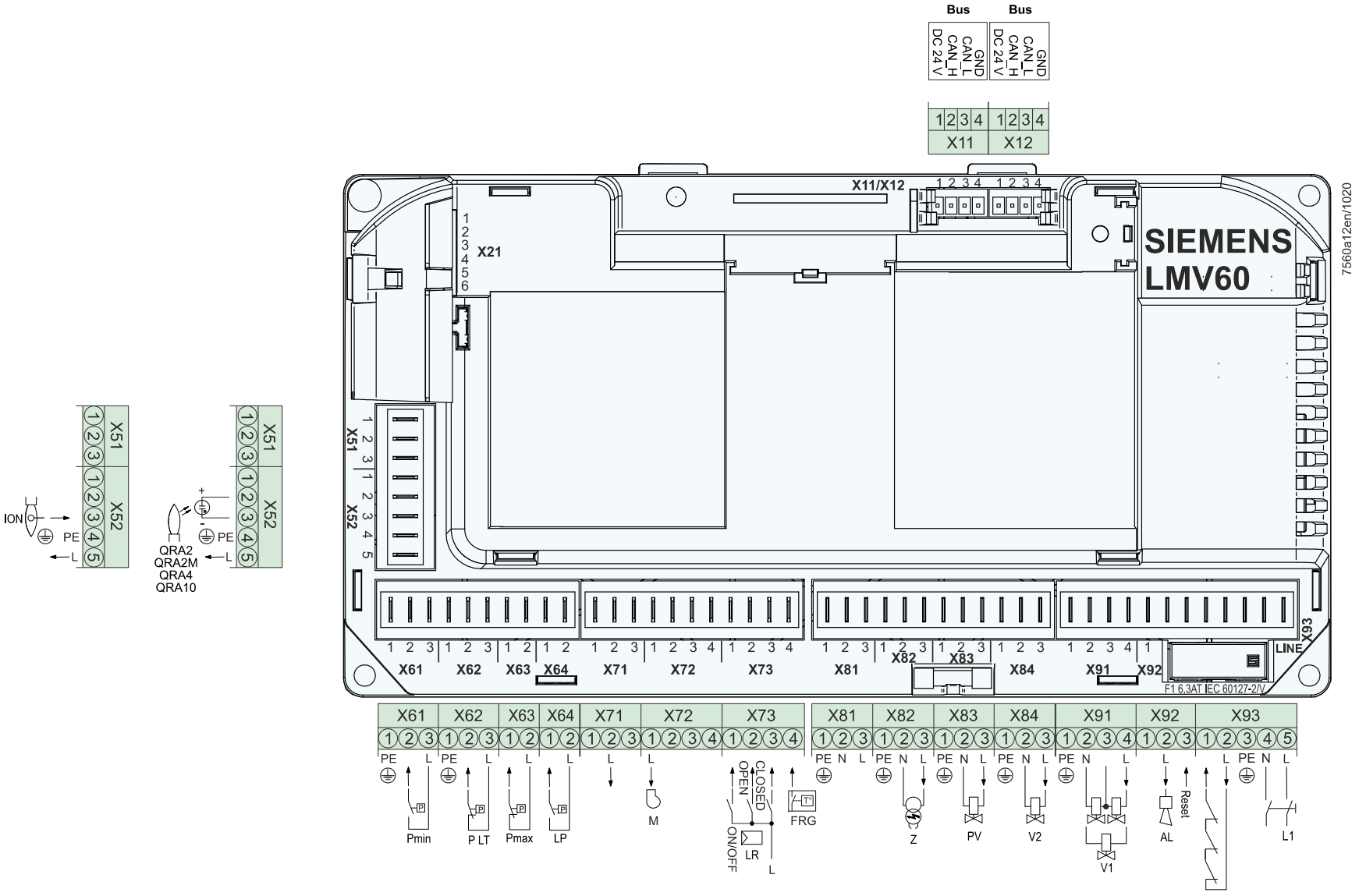



Figure 1: LMV60.110A2 connection assignment

## 2.2 Protection classes

### 2.2.1 LMV6

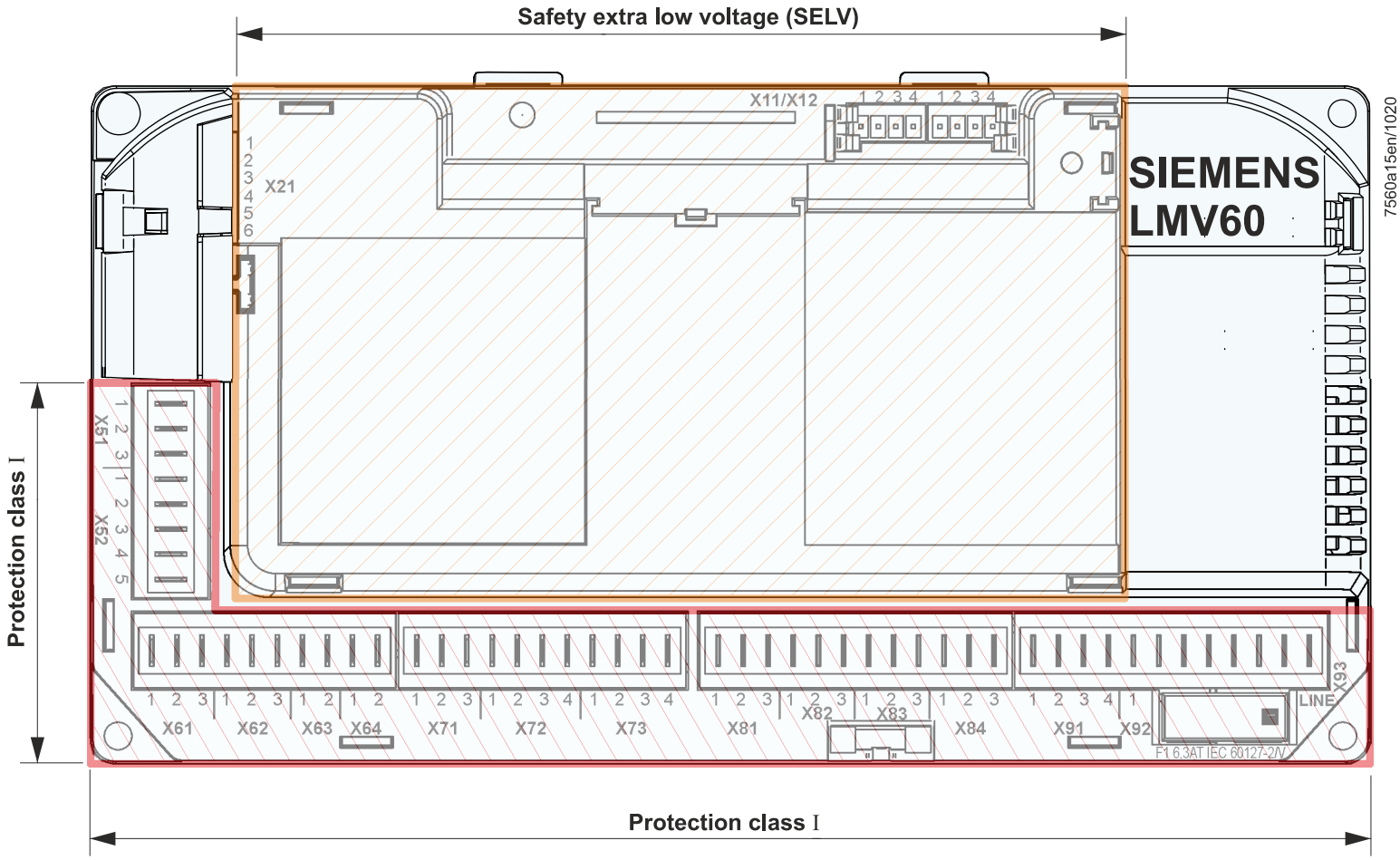



Figure 2: LMV6 protection classes

**Please note!**
**Degree of protection IP40!**
**The LMV6 offers degree of protection IP00. The burner or boiler manufacturer must ensure degree of protection IP40 for the LMV6 in accordance with DIN EN 60529 through adequate installation.**

## 2.2.2 AGG6.200

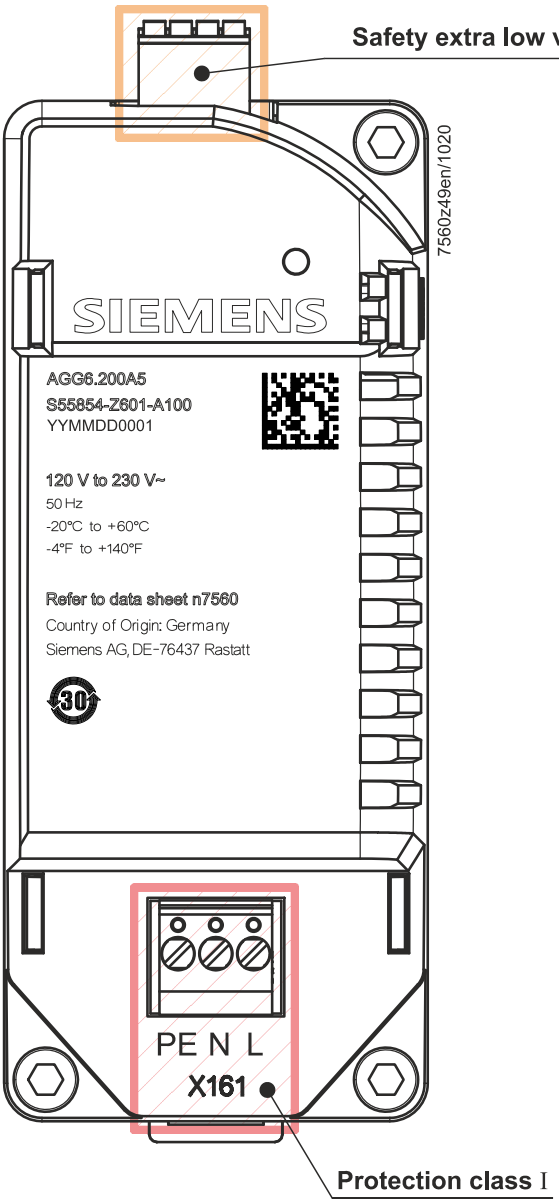



Figure 3: AGG6.200 protection classes

**Please note!**
**Degree of protection IP40!**
**The AGG6.200 offers degree of protection IP00. The burner or boiler manufacturer must ensure degree of protection IP40 for the AGG6.200 in accordance with DIN EN 60529 through adequate installation.**

# 3 Description of the terminals

Note!
AGG9 connector sets!
The AGG9 connectors of the connecting cables for the LMV6 may only be removed or replaced when the plant is shut down (all-pole disconnection)!

Key

| | |
|---|---|
| Terminal | Terminal markings on LMV6 housing |
| Coding | Plug-in space coding |
| Type (ASN) | Product designation for 200 packaging units |
| Pin | Connection pin number |
| Input | Input terminals |
| Output | Output terminals |
| Function | Function description |
| Current | Maximum permissible current rating (refer to *Technical Data*) |
| Parameter | Parameter number impacting the function or behavior of the inputs/outputs |

## 3.1 LMV6

### 3.1.1 Terminal X11, X12

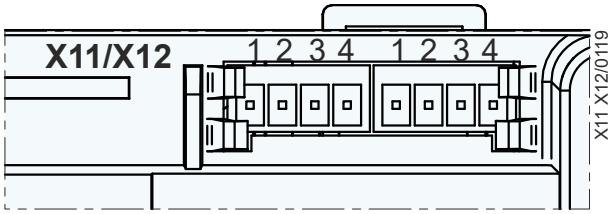



Figure 4: Description of terminal X11 / X12

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | | Electrical limit value |
|---|---|---|---|---|---|---|---|---|
| X11 | --- | | 1 | --- | • | DC power supply for system components | 24 V DC | Approx. 24 V DC<br>Max. 1.25 A |
| | | | 2 | --- | • | Communication signal | CAN_H | DC U ↔ 5 V, Rw = 120 Ω, Level according to ISO-DIS 11898 |
| | | | 3 | --- | • | Communication signal | CAN_L | DC U ↔ 5 V, Rw = 120 Ω, Level according to ISO-DIS 11898 |
| | | | 4 | --- | • | Signal reference | GND | --- |
| X12 | --- | | 1 | --- | • | DC power supply for system components | 24 V DC | Approx. 24 V DC<br>Max. 1.25 A |
| | | | 2 | --- | • | Communication signal | CAN_H | DC U ↔ 5 V, Rw = 120 Ω, Level according to ISO-DIS 11898 |
| | | | 3 | --- | • | Communication signal | CAN_L | DC U ↔ 5 V, Rw = 120 Ω, Level according to ISO-DIS 11898 |
| | | | 4 | --- | • | Signal reference | GND | --- |

### 3.1.2 Terminal X51 / X52

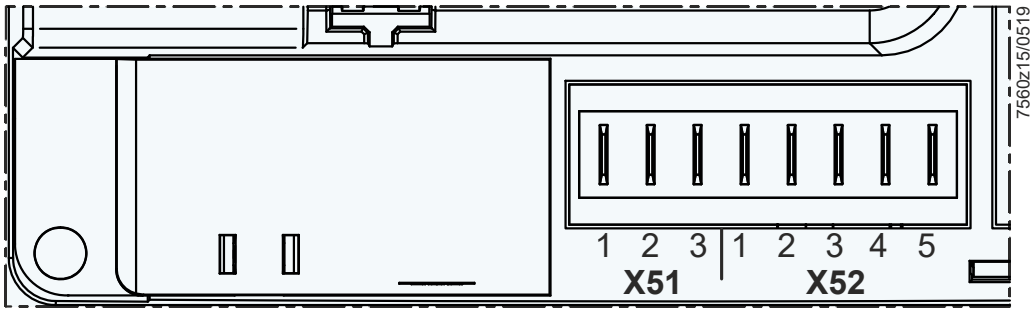



Figure 5: Description of terminals X51 / X52

**Flame supervision with QRA2 / QRA4 / QRA10**

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X51 | 03K80 | | 1 | --- | --- | --- | --- | --- |
| | | | 2 | --- | --- | --- | --- | |
| | | | 3 | --- | --- | --- | --- | |
| X52 | 05K53 | | 1 | --- | --- | --- | --- | 0901<br>0902<br>0903 |
| | | | 2 | --- | • | QRA+ | --- | |
| | | | 3 | • | --- | QRA- | --- | |
| | | | 4 | --- | --- | --- | --- | |
| | | | 5 | --- | --- | --- | --- | |

**Flame supervision with ionization probe**

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X51 | 03K80 | | 1 | --- | --- | --- | --- | --- |
| | | | 2 | --- | --- | --- | --- | |
| | | | 3 | --- | --- | --- | --- | |
| X52 | 05K53 | | 1 | --- | --- | --- | --- | 0901<br>0902<br>0903 |
| | | | 2 | --- | --- | --- | --- | |
| | | | 3 | • | --- | Ionization probe feedback | Imax. 60 µA | |
| | | | 4 | --- | --- | --- | --- | |
| | | | 5 | --- | --- | --- | --- | |

### 3.1.3 Terminal X61 / X62 / X63 / X64

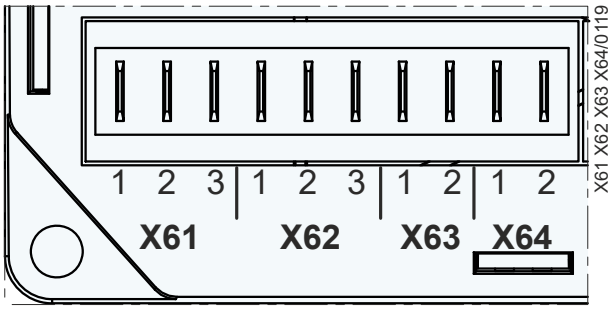



Figure 6: Description of terminal X61 / X62 / X63 / X64

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X61 | 03K54 | | 1 | --- | --- | Protective earth (PE) | --- | 1149 |
| | | | 2 | • | --- | Gas pressure switch-min | 230 V~ +10% / -15%<br>50 Hz<br>Imax 1.5 mA | |
| | | | 3 | --- | • | Power supply | 230 V~ +10% / -15%<br>50 Hz<br>Imax 100 mA | |
| X62 | 03K31 | | 1 | --- | --- | Protective earth (PE) | --- | 1201<br>1202<br>1203<br>1204<br>1205 |
| | | | 2 | • | --- | Pressure switch valve proving | 230 V~ +10% / -15%<br>50 Hz<br>Imax 1.5 mA | |
| | | | 3 | --- | • | Power supply | 230 V~ +10% / -15%<br>50 Hz<br>Imax 100 mA | |
| X63 | 02K43 | | 1 | • | --- | Gas pressure switch-max | 230 V~ +10% / -15%<br>50 Hz<br>Imax 1.5 mA | 1150 |
| | | | 2 | --- | • | Power supply | 230 V~ +10% / -15%<br>50 Hz<br>Imax 100 mA | |
| X64 | 02K02 | | 1 | • | --- | Air pressure switch | 230 V~ +10% / -15%<br>50 Hz<br>Imax 1.5 mA | 0920<br>1130 |
| | | | 2 | --- | • | Power supply | 230 V~ +10% / -15%<br>50 Hz<br>Imax 100 mA | |

### 3.1.4 Terminal X71 / X72 / X73

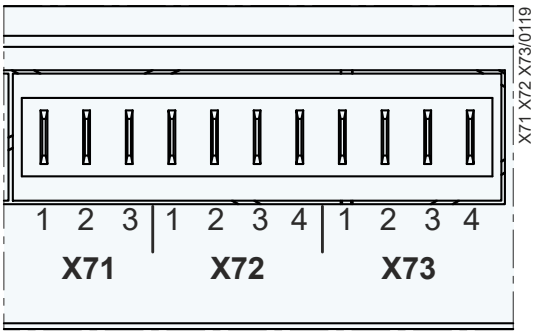



Figure 7: Description of terminal X71 / X72 / X73

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X71 | 03K48 | | 1 | ● | --- | --- | --- | --- |
| | | | 2 | --- | ● | --- | --- | |
| | | | 3 | ● | --- | --- | --- | |
| X72 | 04K01 | | 1 | --- | ● | Fan | 230 V~ +10% / -15%<br>50 Hz<br>Imax 2 A | 1102 |
| | | | 2 | --- | ● | --- | --- | |
| | | | 3 | --- | ● | --- | --- | |
| | | | 4 | --- | ● | --- | --- | |
| X73 | 04K42 | | 1 | ● | --- | Load controller ON/OFF | 230 V~ +10% / -15%<br>50 Hz | 1701<br>1702<br>1705<br>1740<br>1750 |
| | | | 2 | ● | --- | Load controller CLOSED | 230 V~ +10% / -15%<br>50 Hz | |
| | | | 3 | ● | --- | Load controller OPEN | 230 V~ +10% / -15%<br>50 Hz | |
| | | | 4 | ● | --- | Flue gas recirculation (FGR), thermostat contact | 230 V~ +10% / -15%<br>50 Hz | |

### 3.1.5 Terminal X81 / X82 / X83 / X84

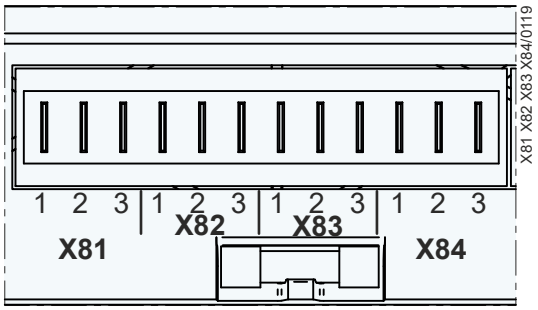



Figure 8: Description of terminal X81 / X82 / X83 / X84

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X81 | 03K30 | | 1 | --- | --- | Protective earth (PE) | --- | --- |
| | | | 2 | --- | --- | Neutral conductor (N) | --- | |
| | | | 3 | --- | • | --- | --- | |
| X82 | 03K66 | | 1 | --- | --- | Protective earth (PE) | --- | 1107 |
| | | | 2 | --- | --- | Neutral conductor (N) | --- | |
| | | | 3 | --- | • | Ignition transformer | 230 V~ +10% / -15%<br>50 Hz<br>2 A, cosφ 0.2 | |
| X83 | 03K10 | | 1 | --- | --- | Protective earth (PE) | --- | --- |
| | | | 2 | --- | --- | Neutral conductor (N) | --- | |
| | | | 3 | --- | • | Pilot valve PV | 230 V~ +10% / -15%<br>50 Hz<br>1 A, cosφ 0.4 | |
| X84 *) | 03K34 | | 1 | --- | --- | Protective earth (PE) | --- | --- |
| | | | 2 | --- | --- | Neutral conductor (N) | --- | |
| | | | 3 | --- | • | Fuel valve V2 | 230 V~ +10% / -15%<br>50 Hz<br>2 A, cosφ 0.4 | |

☞ *)

Note!
Valve proving via fuel valve circuit!
With activated valve proving via fuel valve circuit
- Rated current 1 A
- Load factor Cosφ ≥0.4

### 3.1.6 Terminal X91 / X92 / X93

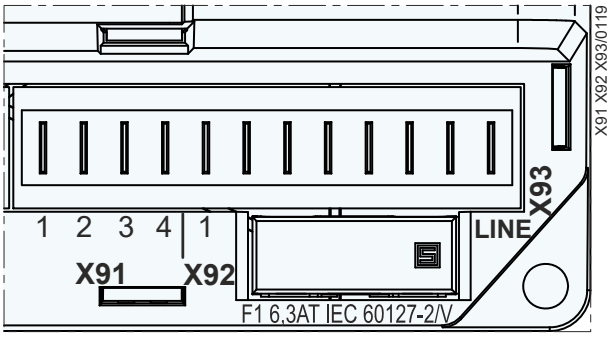


Figure 9: Description of terminal X91 / X92 / X93

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X91 *) | 04K77 | | 1 | --- | --- | Protective earth (PE) | --- | --- |
| | | | 2 | --- | --- | Neutral conductor (N) | --- | |
| | | | 3 | --- | --- | Auxiliary terminal | --- | |
| | | | 4 | --- | • | Fuel valve V1 | 230 V~ +10% / -15%<br>50 Hz<br>2 A, cosφ 0.4 | |
| X92 | 03K15 | | 1 | --- | • | --- | --- | --- |
| | | | 2 | --- | • | Alarm | --- | |
| | | | 3 | • | --- | Reset | --- | |
| X93 | 05K30 | | 1 | • | --- | Safety loop | 230 V~ +10% / -15%<br>50 Hz<br>max. 5 A | 0925 |
| | | | 2 | --- | • | Power supply safety loop | --- | |
| | | | 3 | --- | --- | Protective earth (PE) | --- | |
| | | | 4 | --- | --- | Neutral | --- | |
| | | | 5 | • | --- | Mains power supply | 5 A | |

*) Note!
Valve proving via fuel valve circuit!
With activated valve proving via fuel valve circuit
- Rated current 1 A
- Load factor Cosφ ≥0.4

Note!
Terminal X93 pin 1 or pin 2 and components of the safety loop!
The total current of all components connected to the LMV6 flows via terminal X93 pin 1 or pin 2 and components of the safety loop.

**Caution!**
**Contacts in the safety loop!**
**In the safety loop, temporarily switching (< 1 second) contacts, buttons or similar must not be wired.**

**Caution!**
**Terminal X92 pin 1!**
**Make sure that the voltage output on terminal X92 pin 1 is not connected to live parts. The terminal must not be connected. Failure to observe this information poses a risk of the safety functions being impaired.**

**Caution!**
**Terminal X92 pin 3!**
**Only a simple button may be connected to terminal X92 pin 3. Units that can perform an automatic reset are not permitted.**

## 3.2 AGG6.200A5

### 3.2.1 Terminal X13

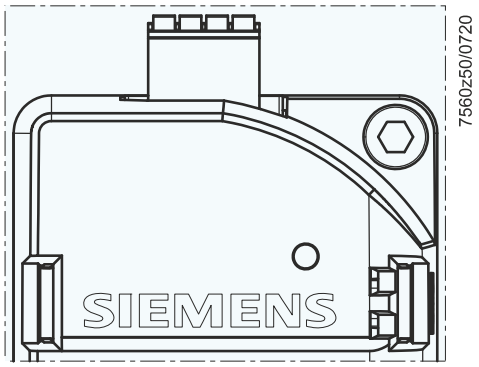



Figure 10: Description of terminal X13

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X13 | | | 1 | --- | • | DC power supply for the system components (24 V DC) | Approx. 24 V DC max. 1.25 A | --- |
| | | | 2 | --- | • | Communication signal (CAN_H) | DC U ↔ 5 V Rw = 120 Ω Level according to ISO-DIS 11898 | |
| | | | 3 | --- | • | Communication signal (CAN_L) | DC U ↔ 5 V Rw = 120 Ω Level according to ISO-DIS 11898 | |
| | | | 4 | --- | • | Reference ground (GND) | --- | |

### 3.2.2 Terminal X161

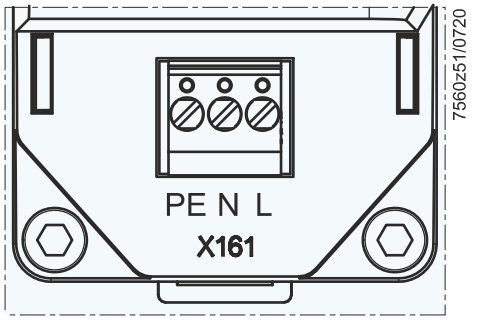



Figure 11: Description of terminal X161

| Terminal | Coding | Type (ASN) | Pin | Input | Output | Function | Electrical limit value | Parameter |
|---|---|---|---|---|---|---|---|---|
| X161 | 03K105 | | 1 | --- | --- | Protective earth (PE) | --- | --- |
| | | | 2 | --- | --- | Neutral | --- | |
| | | | 3 | --- | --- | Mains power supply | 5 A | |

# 4 Block diagram inputs / outputs

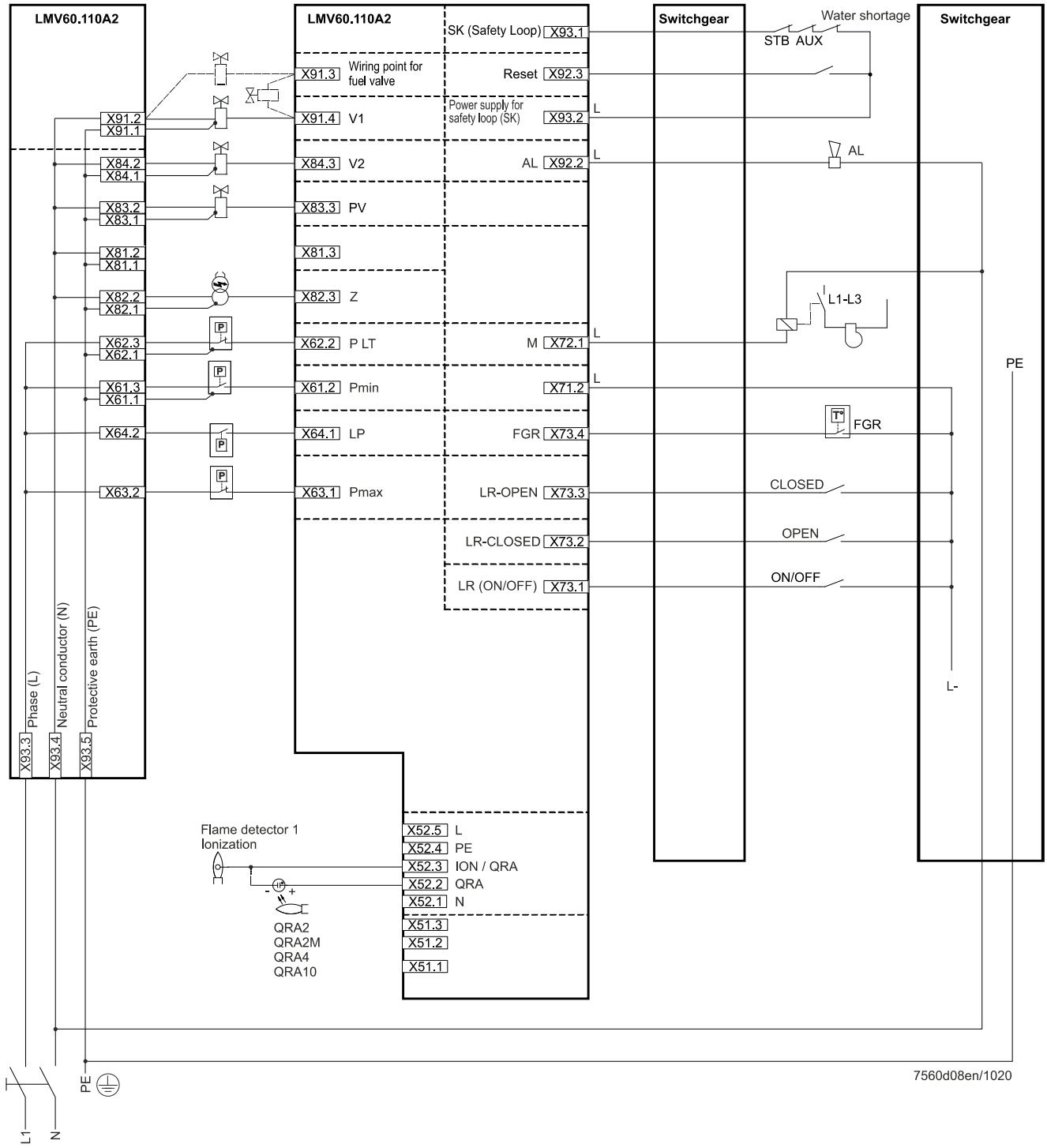



Figure 12: Block diagram inputs / outputs

# 5 AZL66 connection assignment

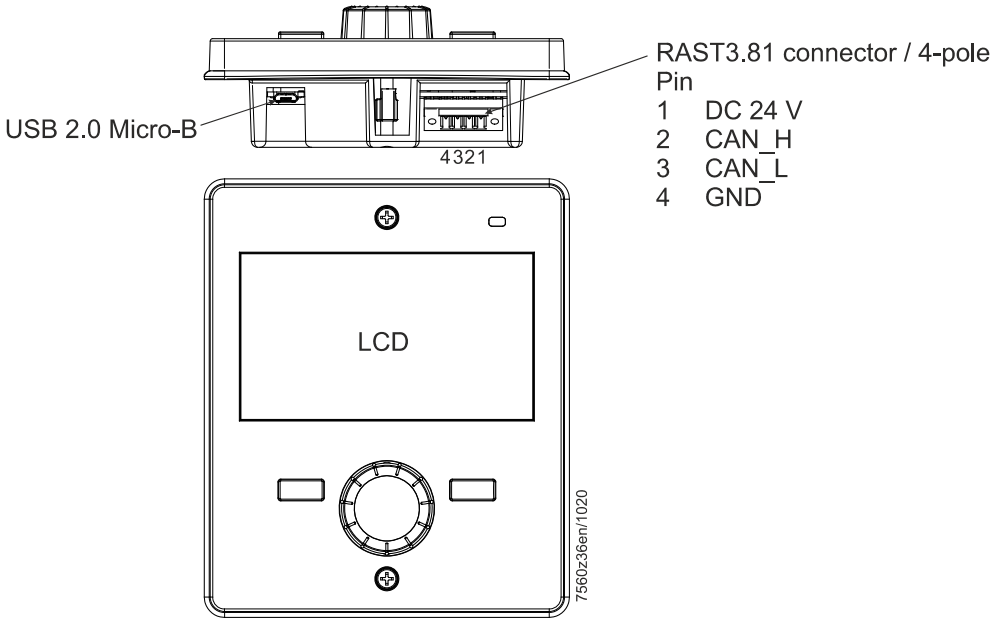



Figure 13: AZL66 connection assignment

# 6 SQM4 connection assignment

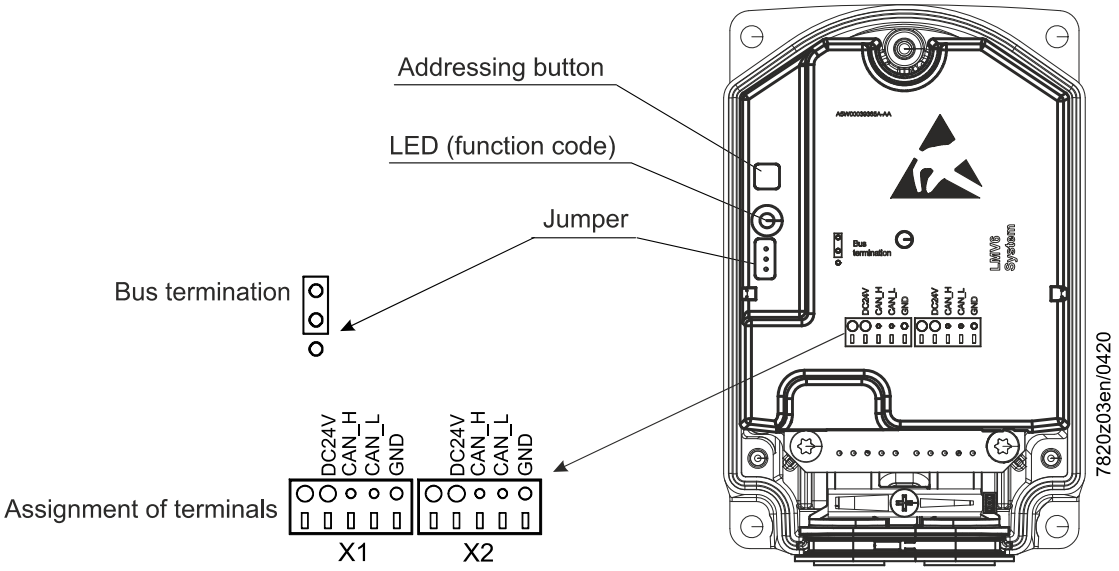



Figure 14: SQM4 connection assignment

# 7 AGG6.200A5 connection assignment

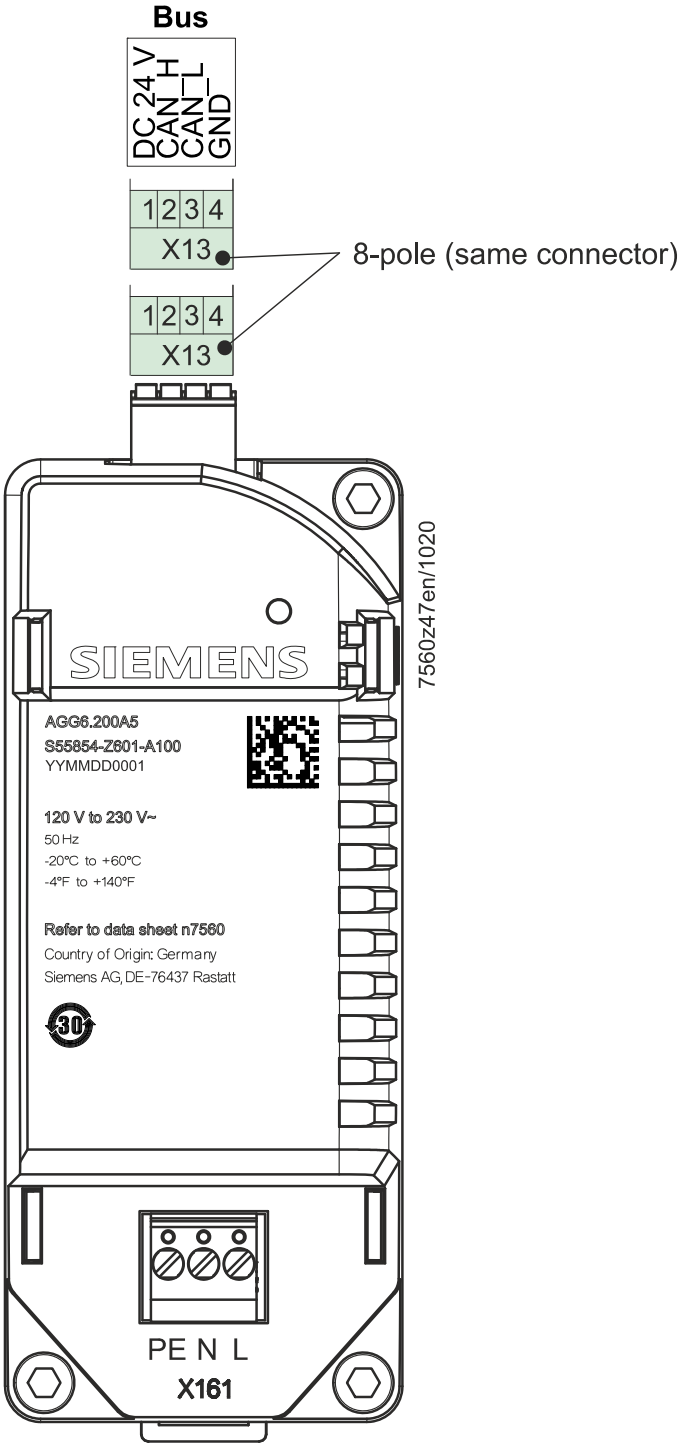



Figure 15: AGG6.200A5 connection assignment

# 8 Earthing and shielding of the LMV6

## 8.1 Earthing

The LMV6 has 2 different types of earthing:

- Protective earth **PE**
- Functional earth **FE**

### 8.1.1 Protective earth (PE)

The protective earth (PE) of the LMV6 must be connected.
The purpose of protective earth (PE) is to provide a protective conductor connection for all connected units/components. The protective conductor connection (PE) is also connected to the mounting plate via a short conductor.

## 8.1.2 Functional earth (FE)

The functional earth (FE) must be connected to a reference ground on the burner housing or in the control panel and is used to discharge interference current from the existing shielding. The functional earth (FE) connection can also be established via the AGG6.500.

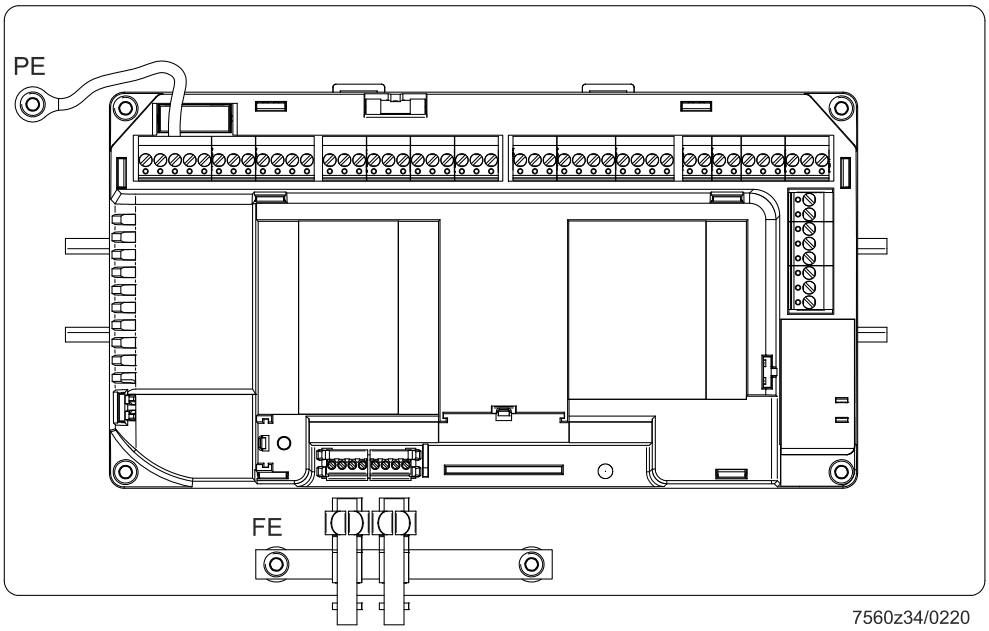



Figure 16: Connection of the protective earth (PE) / functional earth (FE) with the mounting plate

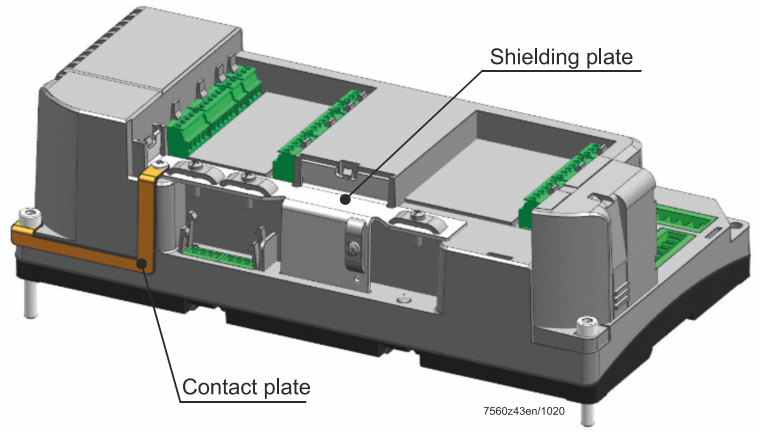



Figure 17: AGG6.500 shielding mechanism (optional)

Recommendation!
Establish short and low-resistance connections from the LMV6 to the mounting plate!

The connection from the LMV6 to the mounting plate can be established directly on the burner plate using the contact plate (figure 7560z43) and a screw. If there is no contact plate (figure 7560z43), there is an option to establish a connection directly from the shielding plate to the burner plate using a separate cable.

The connection between the functional earth (FE) and the housing of the SQM4 should also be established via short and low-resistance connections. Siemens recommends equipping the SQM4 with a separate cable if necessary. These cables should be connected to the functional earth (FE) with the greatest possible cross section (min. 1.5 mm²).

### 8.1.3 EMC-compliant wiring

- Shielded cables must also be used in control panels for the bus connections between the LMV6, SQM4, and AZL66
- Each SQM4 connected to the LMV6 must be connected to the same functional earth (FE) or earthing point via a short cable or low-resistance housing connection as the LMV6
- Ensure that the SQM4 actuator housing is in perfect electrical contact with the functional earth (FE) (use toothed lock washers and galvanically conductive mounting plates)
- The mains cable and the bus cable must be laid separately in separate cable channels and as far apart as possible
- The cables to and from ignition equipment must be laid separately and as far as possible from the bus cables
- The high voltage cables from the ignition equipment must be short and lead directly to the ignition electrodes
- With 2-pole ignition equipment, the cables must be routed closely together in order to keep the radiation area as small as possible

## 8.1.4 Earthing and wiring of the LMV6

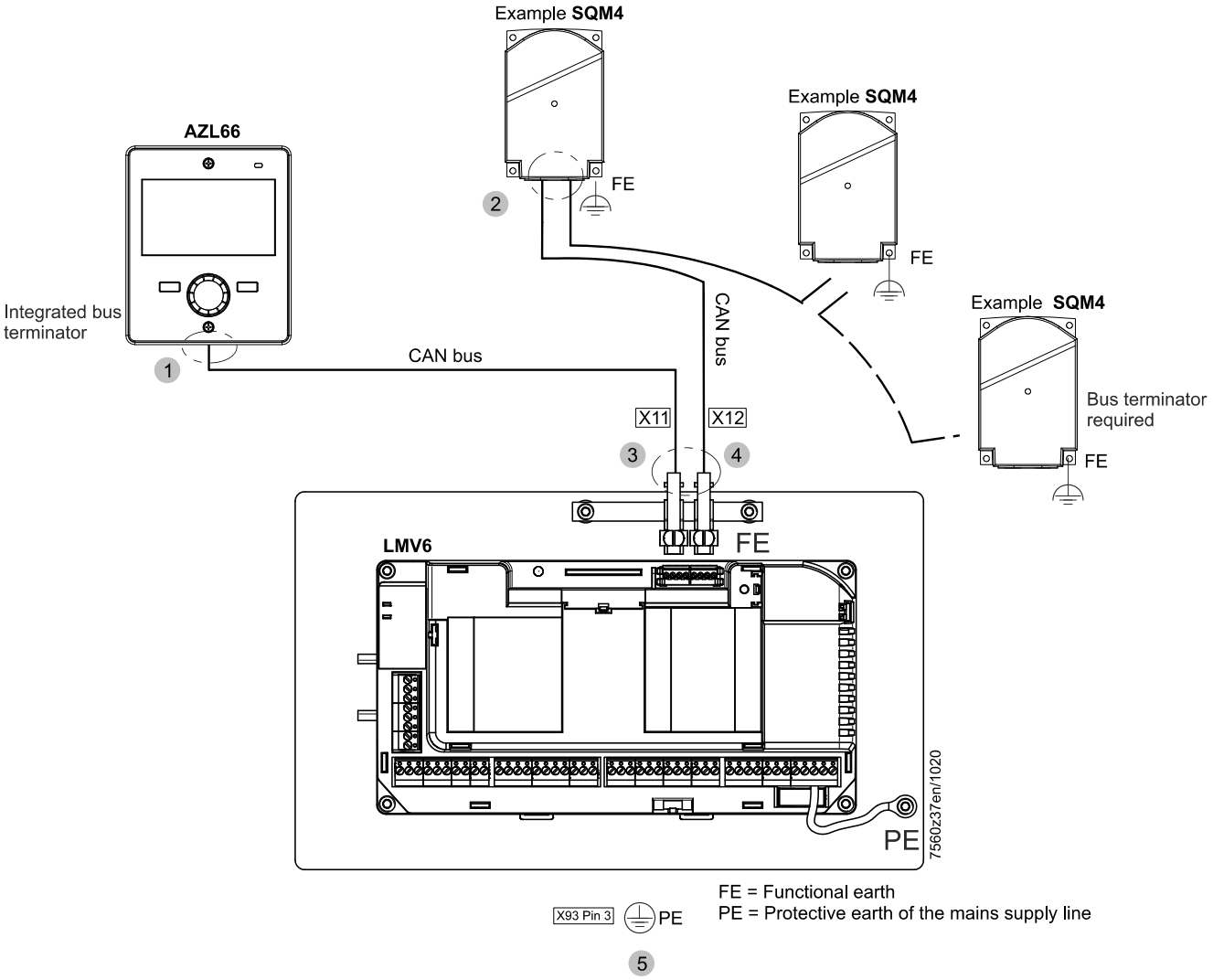
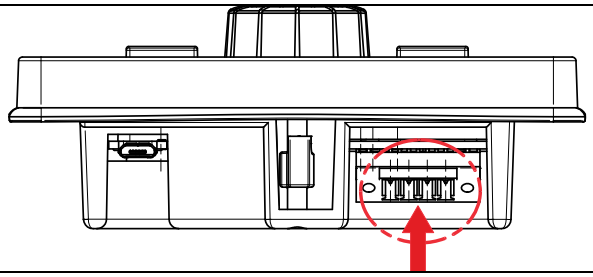
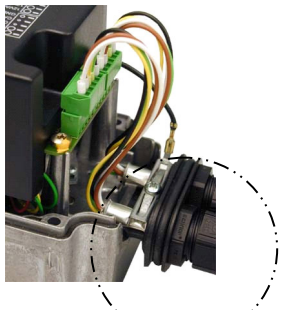
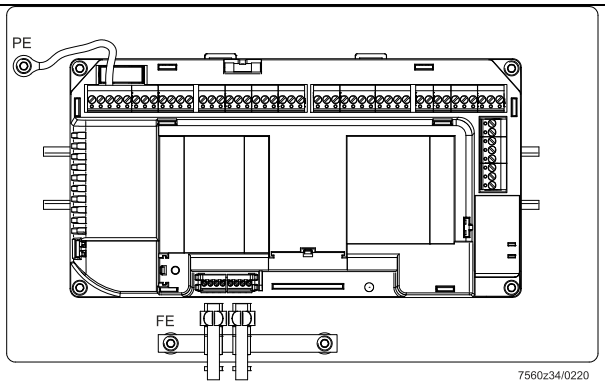
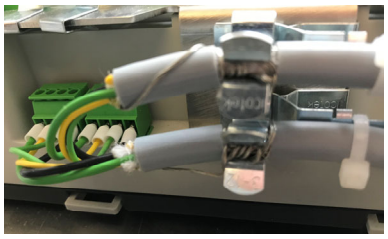
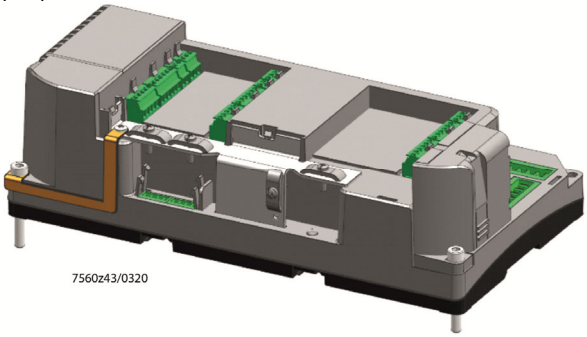



Figure 18: Earthing and wiring of the LMV6

| | | |
|---|---|---|
| 1 |  | No shielding on the AZL66.<br>A screw connection can be established to prevent the connecting plug on the AZL66 from being pulled out. |
| 2 |  <br>  <br>  <br>  | Connect the SQM4 housing with the functional earth (FE):<br>The connection between the SQM4 housing and the functional earth (FE) can be established by means of a low-resistance connection using the fixing screws or by means of an additional cable connection.<br><br>When wiring, the inner shield of the data cable and the outer shield of the cable should be enclosed in a sleeve if possible, and both cable shields should be connected to each other with the internal clamp.<br><br>The connection between the cable shielding and the SQM4 housing (functional earth (FE)) is established by means of an internal connection in the SQM4 between the clamp, the PCB, and the SQM4 housing.<br><br>**Ferrules without plastic collar:**<br><br>For **AGG6.641** cable<br>Osterrath<br>Type H35/18<br>Order number: 036890 |
| 3 + 5 |  | The mounting plate is connected to the protective earth connection (PE) of the LMV6 via a short cable. This earthing point of the mounting plate also serves as reference earth for connecting the functional earth (FE).<br><br>Connect the functional earth (FE) to the earthing point with a short cable. Connect the protective earth (PE) to the functional earth (FE) via the mounting plate or a low-resistance cable.<br><br>Connect the protective earth (PE) to terminal X93 pin 3. |

**Continued** “Earthing and wiring of the LMV6”

| | | |
|---|---|---|
| 4 | Electrical environment in which the cables run parallel:<br>Wiring of the bus cables at LMV6 terminal X11 and X12.<br>  <br>It is essential to ensure that the cables of the low voltage connections are laid separately from the mains cables, even over short distances.<br><br>Connection of the cable shield to functional earth (FE) via the AGG6.500:<br>  <br> | For all shielded cables that have to be earthed, the cable shield must be fixed by a shield clamp (e.g., Icotek) or the shield clamp provided on the AGG6.500. Keep unshielded cables as short as possible.<br><br>The cable shields of the low-voltage cables can be connected to the functional earth (FE) via the AGG6.500. For this purpose, the cable shields are contacted by means of terminals and connected to the functional earth (FE) via the AGG6.500. The functional earth (FE) and the AGG6.500 are connected via a screw connection on the LMV6 housing or via a separate cable connection (see Figure 17: *AGG6.500 shielding mechanism* (*optional*)). |

## 8.2 Earthing systems

### 8.2.1 TN earthing system

In a TN earthing system, one of the points on the generator or transformer is connected to earth. In a three-phase system, this is typically the star point.

TN−S earthing:
Protective earth (PE) and neutral (N) are separate conductors.
This system is currently used in most residential houses and commercial plants in North America and Europe.

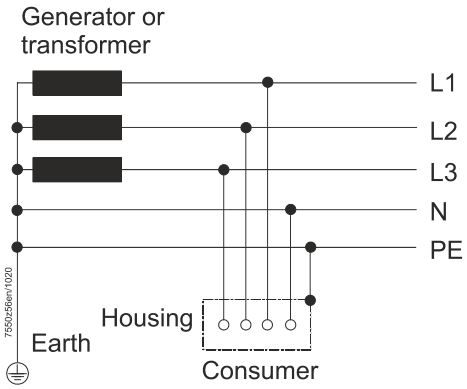



Figure 19: TN−S earthing

### 8.2.2 TT earthing system

In a TT earthing system (Terra–Terra), the protective earth connection for the consumer is provided by a local earth electrode and another earth electrode is independently installed at the generator. There is no earth cable between the two earth electrodes.

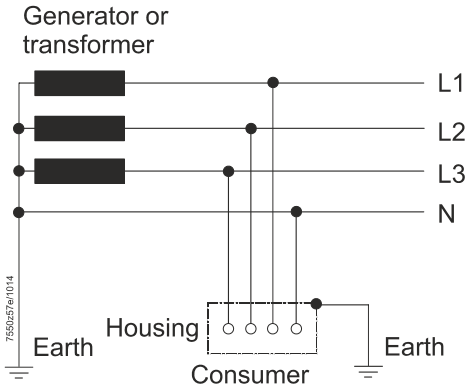



Figure 20: TT earthing

Note!
TN / TT earthing system.
For the LMV6, it is preconditioned that either a TN earthing system or a TT earthing system is used.

When using the TT earthing system, the special requirements for the design of the earthing resistors and the residual current protection circuit must be taken into account. It is essential to ensure that no impermissible potential differences arise between the earthing point and N.

## 8.3 Protective earth (PE) and functional earth (FE)

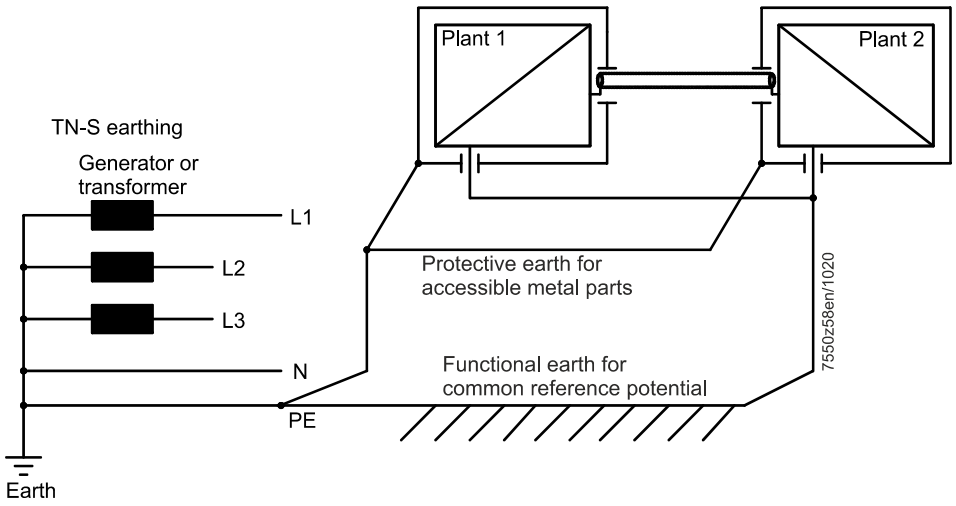



Figure 21: Protective earth (PE), functional earth (FE)

**P**rotective **E**arth (PE):
Protective earth (PE) is a device earthing conductor that avoids hazards by keeping the exposed conductive surfaces of a device at ground potential.

To avoid a potential voltage drop, there should be no current flowing through this conductor under normal circumstances.

**F**unctional **E**arth (FE):
Functional earth (FE) is not designed to protect against electric shock – it is used to establish a common reference potential.

# 9 Ignition

The ignition is a further strong source of interference. For this reason, please observe the following recommendations:

- Keep the cable loop/length in the high-voltage ignition circuit as short as possible
- Use a special EMC-compliant ignition cable
- Avoid capacitive and inductive coupling to other signal lines.
  Always run the high-voltage ignition cables separately from the burner housing and other cables while observing the greatest possible distances

  For example:
  Use an electrically insulating cable channel or distance spacer (made from plastic, for example) – see also the Appendix "*Example for wiring, earthing, and shielding of the LMV6*"
- Use a 2-pole ignition where possible (see drawings below)
- When using a 2-pole ignition, the cables should run close together to ensure that the emissions range is as small as possible

## 9.1 2-pole ignition: Recommended

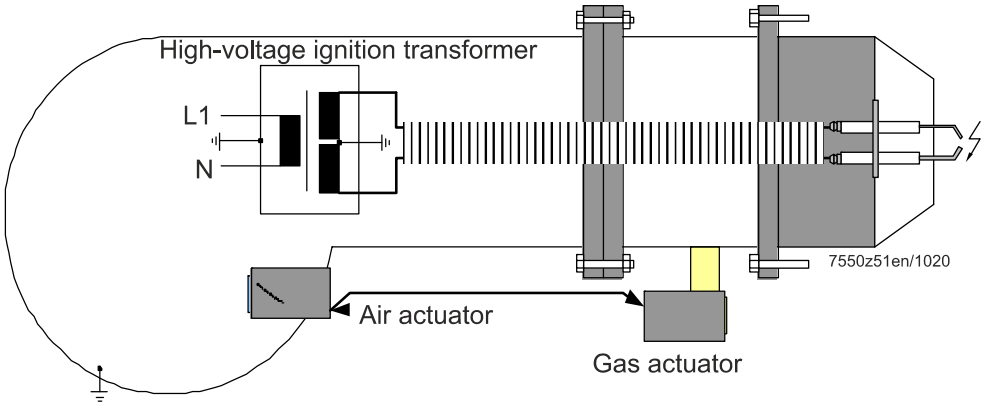



Figure 22: 2-pole ignition

## 9.2 1-pole ignition: Not recommended

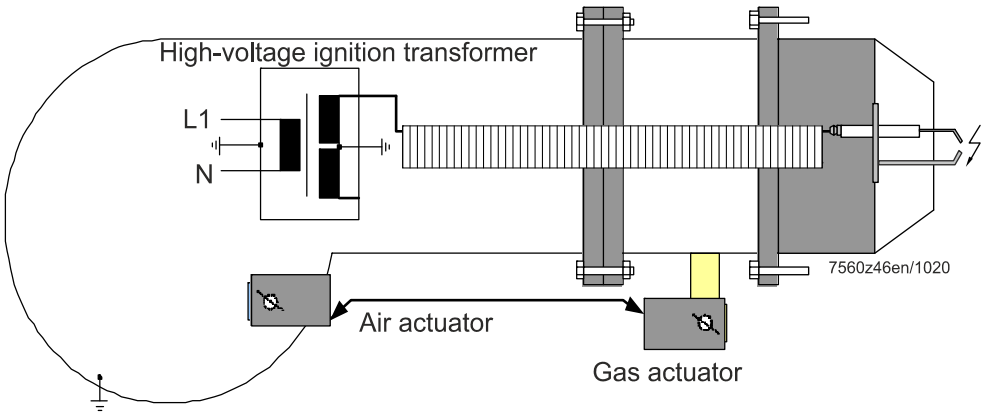



Figure 23: 1-pole ignition

**If a 1-pole ignition has to be used**, it is very important to have a low impedance at the mechanical connections (transitions) of the burner housing (no insulation material, e.g., no paint). Only then will you get a **good** current flow from the ignition spark back to the ignition transformer, resulting in **low** EM emissions (EMC):

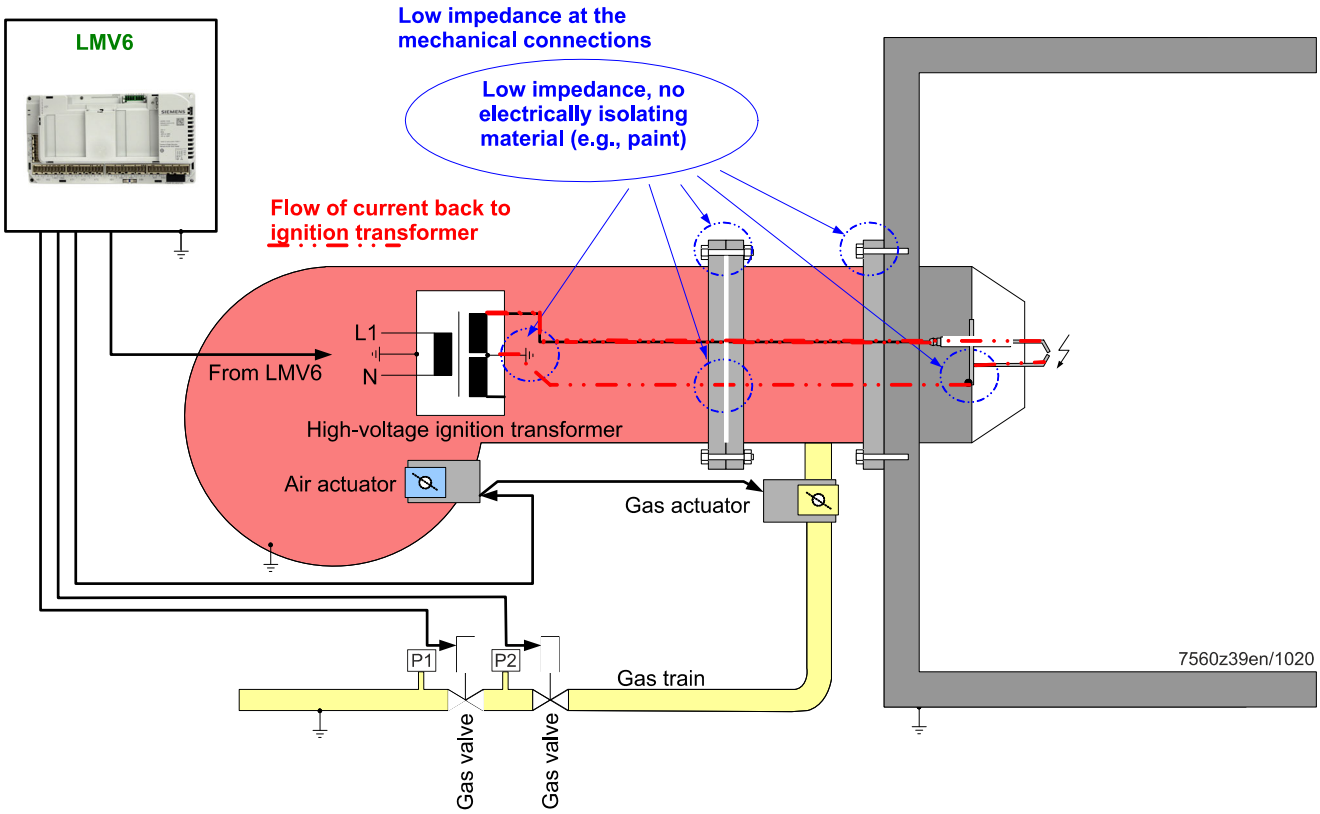



Figure 24: 1-pole ignition with low impedance at the burner housing

If the mechanical connections for the burner housing have a high level of impedance – e.g., due to paint – this causes multiple **poor** flows of current from the ignition spark back to the ignition transformer. These multiple current flows lead to **high** EM emissions (EMC).

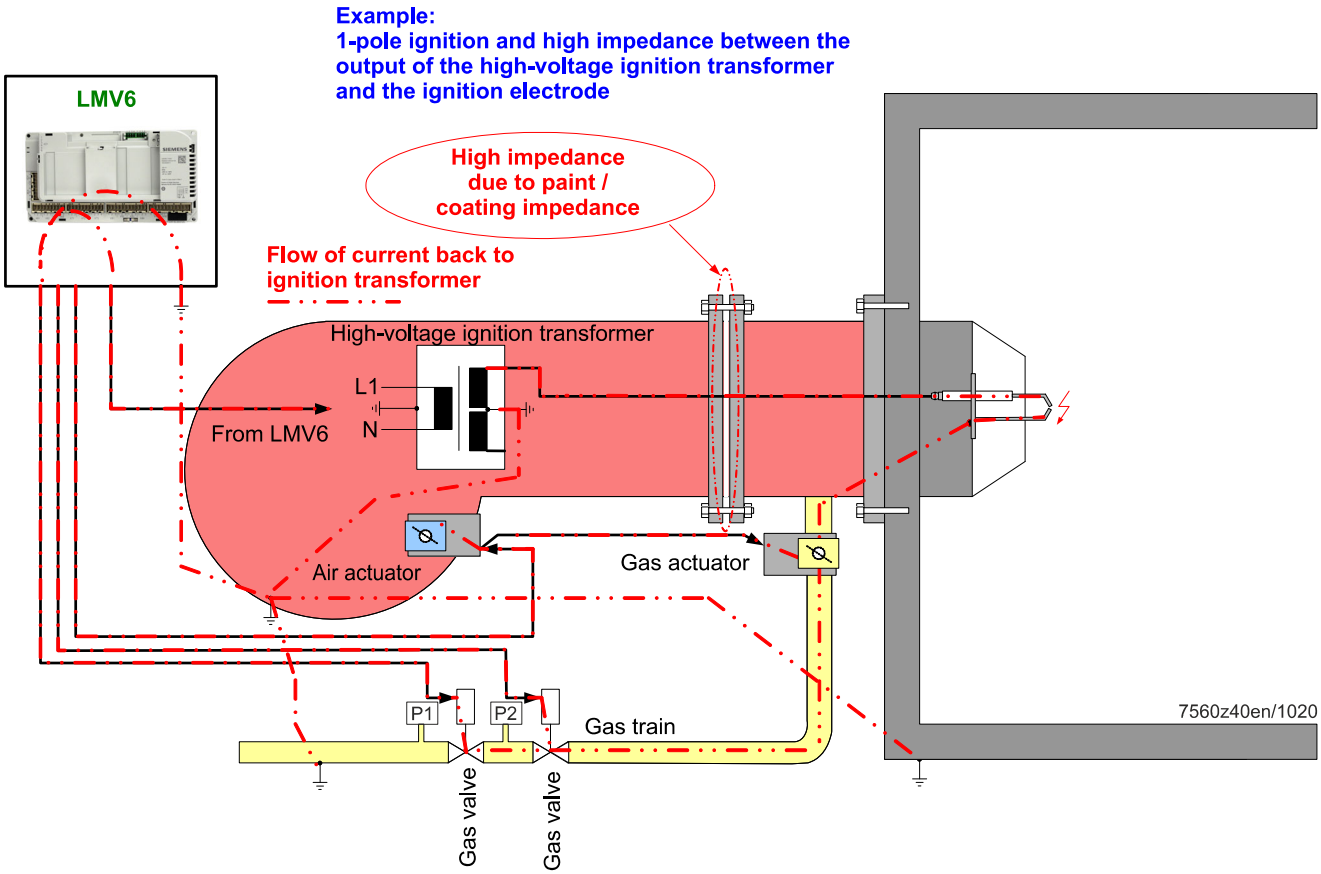



Figure 25: 1-pole ignition with high impedance of the burner housing

# 10 Wiring

Separate wiring is recommended for the following cables:

**Completely separate from all other cables**
- High-voltage ignition cable – see also chapter *Ignition*
- Cable for the flame detectors

**Together in cable channel 1 for low voltage, e.g.:**
- CAN bus cable

**Together in cable channel 2 for mains voltage, e.g.:**
- Cable for ignition transformer
- Cables for other mains voltage signals, e.g., gas pressure switch and air pressure switch.

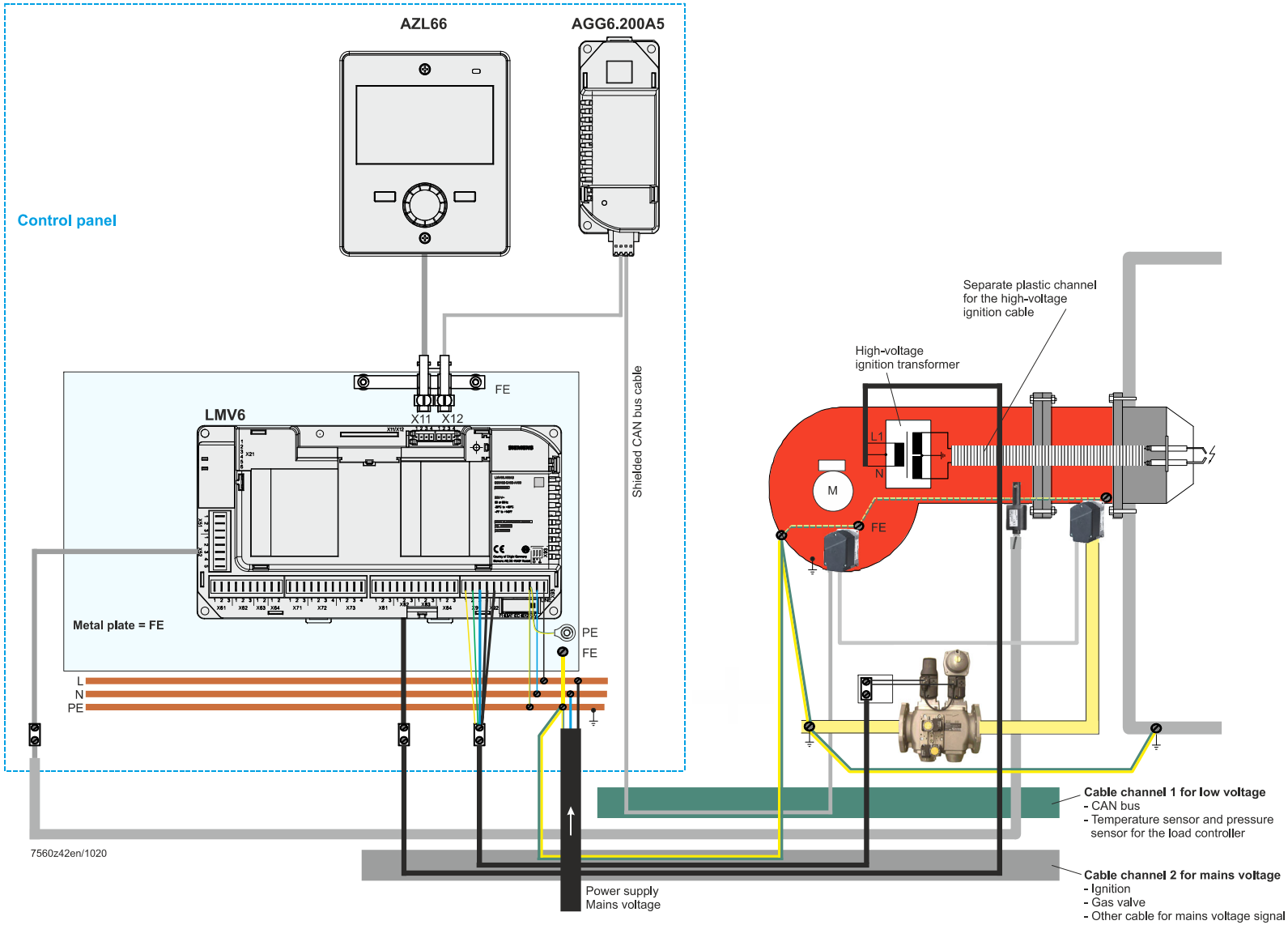



Figure 26: Example for wiring, earthing and shielding of the LMV6

# 11 LMV6 power supply

General

Power to the LMV6 is supplied via the internal power supply unit. This internal power supply unit supplies the internal assemblies, SQM4 and AZL66 via terminal X11/X12. Power to the bus users is supplied together with the communication lines in a common cable.
As the power load for the internal power supply unit is limited, an additional power supply unit is required when operating with more than two SQM45s and one SQM46 (or over greater distances). The bus topology is designed as a line structure and has a start and an end node.
The individual bus users are connected in series, whereby the respective end nodes are terminated by a bus terminating resistor. The LMV6 is a component of the communication line and is looped in between the AZL66 and the SQM4. In this arrangement, the AZL66 always assumes the function of a bus end node. The required bus terminator is already integrated.
With the SQM4, the last user becomes the bus end node (internal bus terminating resistor must be activated via a jumper). The other node users within the line structure are configured without terminating resistor.

## 11.1 Example: “Operation with 3 actuators”

**Installation of all components in the burner: CAN bus cable “LMV6 ↔ last SQM4” < 20 m**

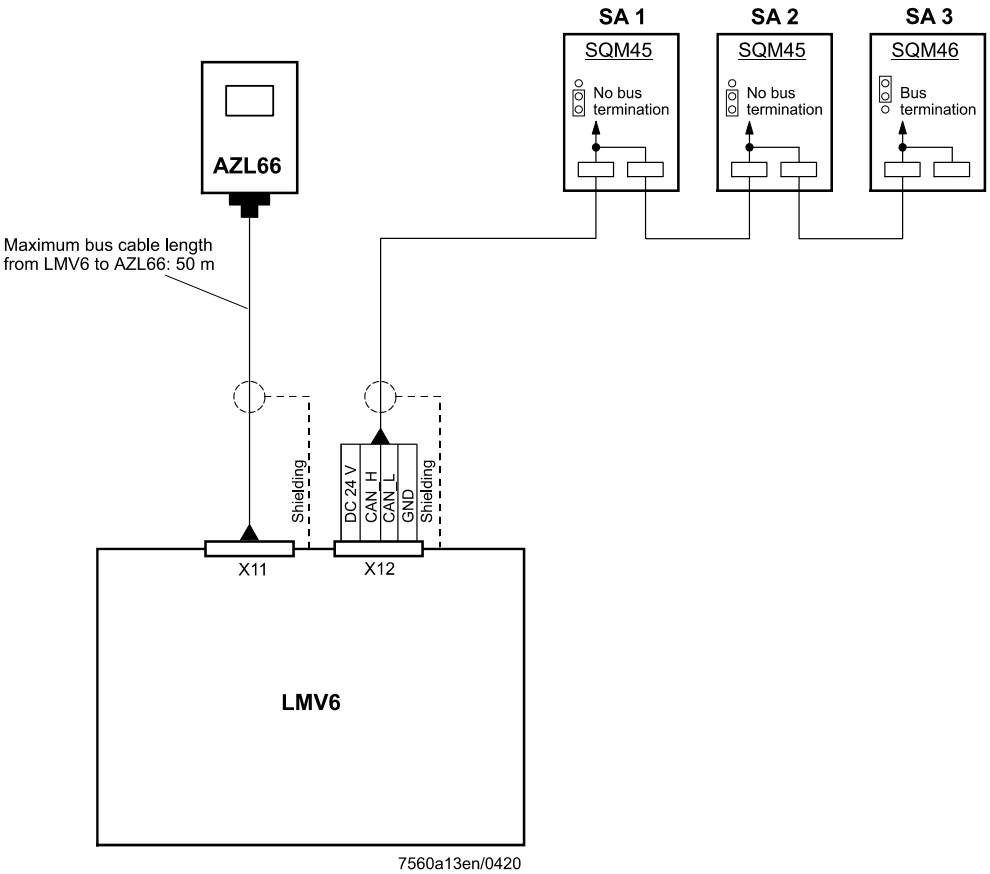



Figure 27: Installation of all components in the burner: CAN bus cable LMV6 ↔ last SQM4 < 20 m

Note on example
Total length of CAN bus cable ≤60 m

## 11.2 Cable types

AGG6.641 (cable type 1) LMV6 ↔ system components

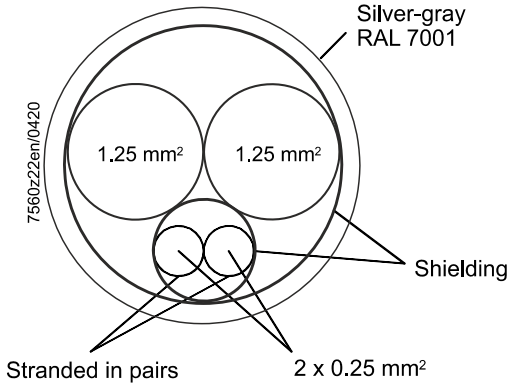



Figure 28: AGG6.641

| Connection | Color | Wire cross-section in mm² |
|---|---|---|
| 24 V DC | White | 1.25 |
| CAN_H | Yellow | 0.25 |
| CAN_L | Green | 0.25 |
| GND | Brown | 1.25 |

AGG6.635 (cable type 2) LMV6 ↔ AZL66

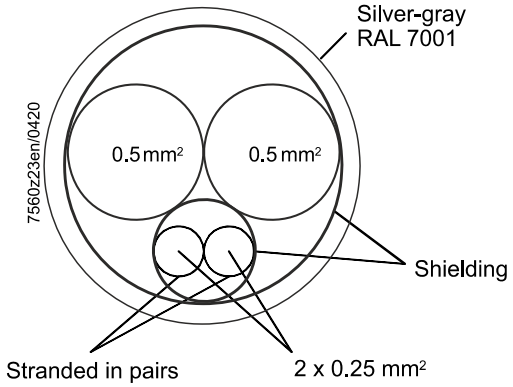



Figure 29: AGG6.635

| Connection | Color | Wire cross-section in mm² |
|---|---|---|
| 24 V DC | White | 0.5 |
| CAN_H | Yellow | 0.25 |
| CAN_L | Green | 0.25 |
| GND | Brown | 0.5 |

# 12 Commissioning

## 12.1 Parallel operation

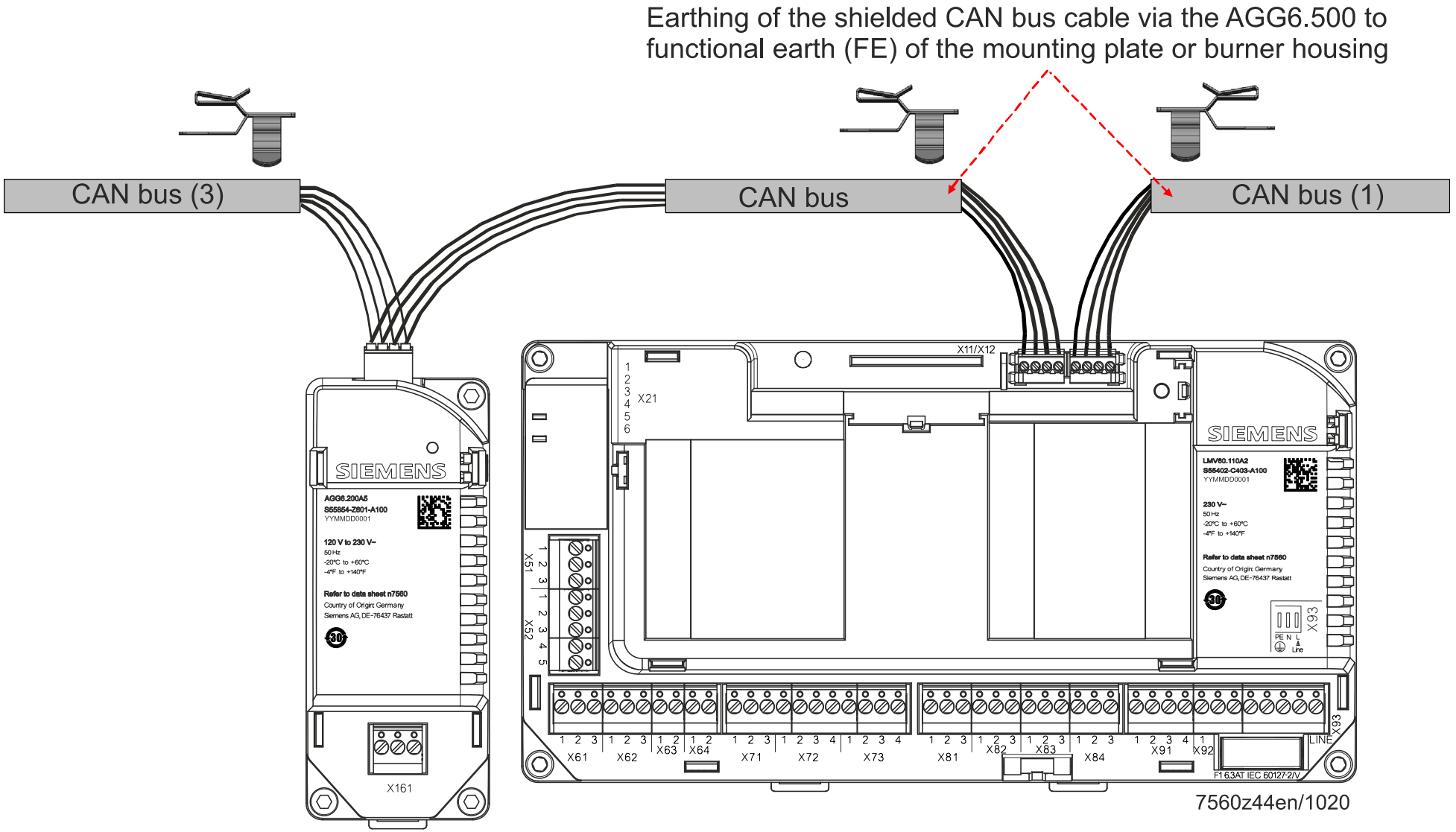



Figure 30: Parallel operation

# 12.2 Variant for parallel operation

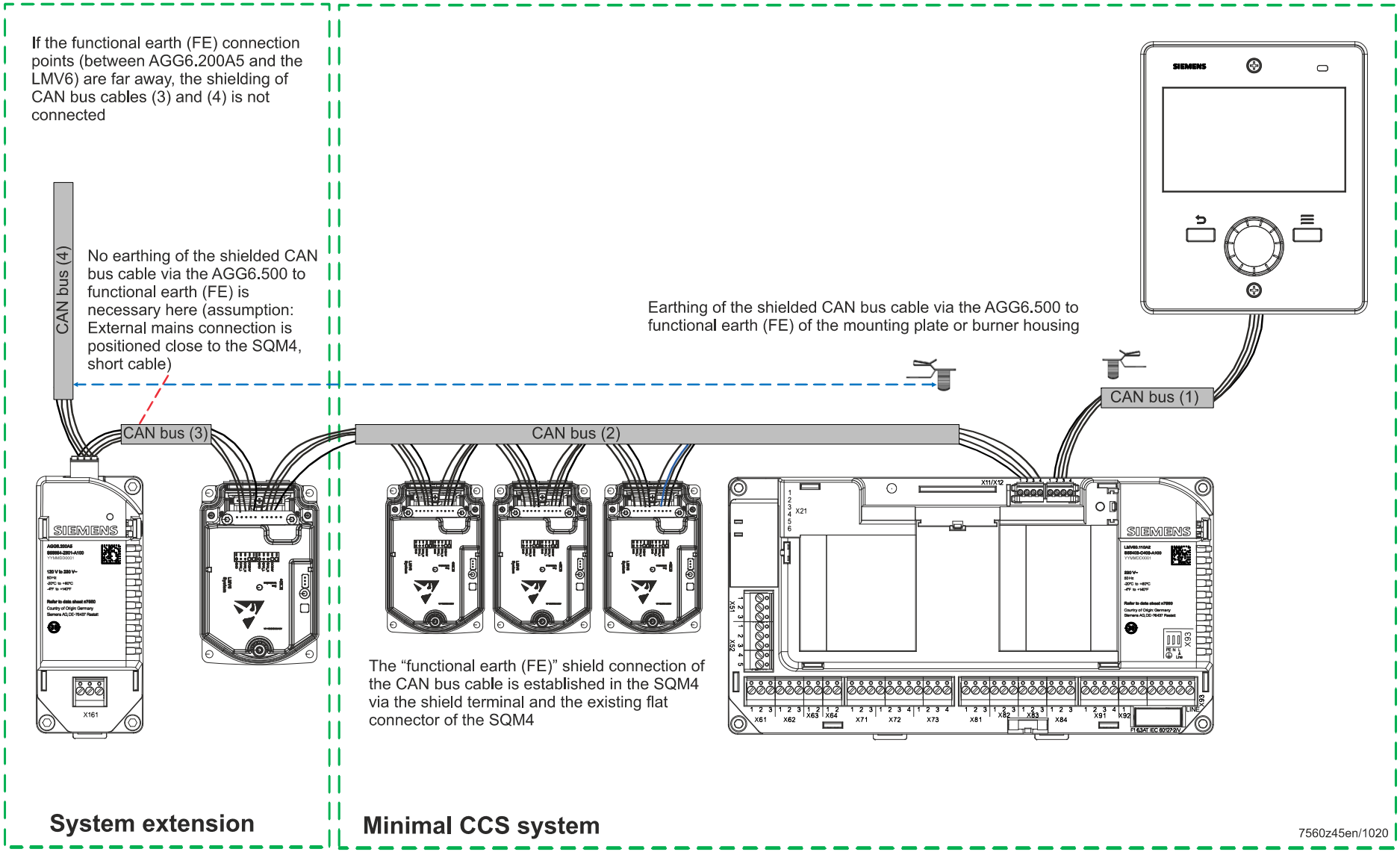



Figure 31: Variant for parallel operation

# 13 List of figures

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