



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

https://www.add-furnace.com E-mail: sales@add-furnace.com

SIEMENS

7⁵⁴⁶



Burner Management System

LMV37.4...

Burner control with integrated air / fuel ratio control for forced draft burners. The LMV37.4... are designed for intermittent operation with ionization probe or with optical detector QRA..., QRB... or QRC... Continuous operation is possible only when using an ionization probe.

The LMV37.4... and this Data Sheet are intended for use by OEMs which integrate the burner management system in their products!

Use

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

Supplementary documentation

User Documentation Modbus AZL2...	A7541
Environmental Product Declaration LMV2... / LMV3...	E7541
Operating Instructions PC software ACS410.....	J7352
Basic Documentation LMV37.4...	P7546
Product Range Overview LMV2... / LMV3...	Q7541



Warning notes



For additional safety notes, refer to the Basic Documentation of the LMV37.4... system (P7546)!

To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

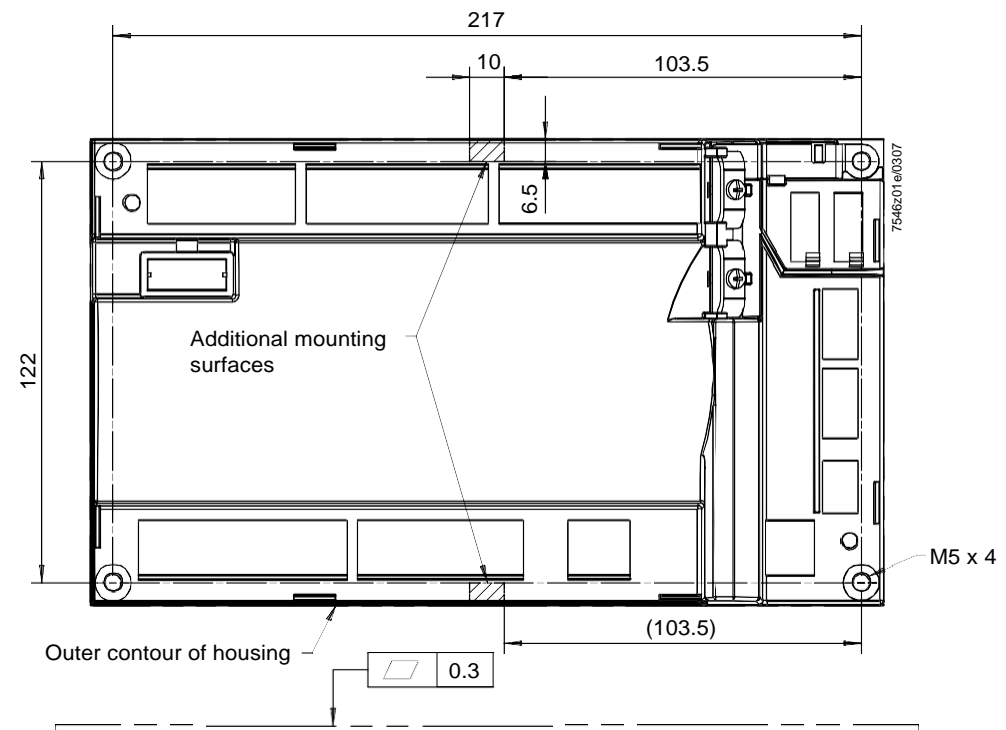
The LMV37.4... is a safety device! Do not open, interfere with or modify the unit. Siemens will not assume responsibility for any damage resulting from unauthorized interference!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's connection terminals
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring and parameters is in an orderly state
- Fall or shock can adversely affect the safety functions. Such units must not be put into operation, even if they do not exhibit any damage

Mounting notes

Ensure that the relevant national safety regulations are complied with

Mounting





Installation notes

- Always run high-voltage ignition cables separately while observing the greatest possible distance to the unit and to other cables
- Do not mix up live and neutral conductors (fire hazard, dangerous failures, loss of protection against electric shock hazard, etc.)
- Do not lay the connecting cable from the LMV37.4... to the AZL2... together with other cables

Electrical connection of the flame detectors

It is important to achieve practically disturbance- 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 maximum permissible detector cable lengths
- The ionization probe is not protected against electric shock hazard. It is mains-powered and must be protected against accidental contact
- Locate the ignition electrode and the ionization probe such that the ignition spark cannot arc over to the ionization probe (risk of electrical overloads)

Commissioning notes

- For display of the flame on the AZL2..., following general conditions apply:
 - Display is subject to various component tolerances so that deviations of $\pm 10\%$ can occur
 - Note that for physical reasons there is no linear relationship between flame display and detector signal values

Standards and certificates



Conformity to EEC directives

- Electromagnetic compatibility EMC (immunity)

2004/108/EC

- Directive for gas appliances

90/396/EEC

- Low-voltage directive

2006/95/EC



ISO 9001: 2000
Cert. 00739



ISO 14001: 2004
Cert. 38233



Type	
LMV37.400A1	---
LMV37.400A2	---
LMV37.420A1	x

- Identification code to EN 298 chapter 4

FT / M C L B B

Service notes

- If fuses are blown, the unit must be returned to Siemens



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

<https://www.add-furnace.com> E-mail: sales@add-furnace.com

Life cycle

Burner controls has a designed lifetime* of 250,000 burner startup cycles which, under normal operating conditions in heating mode, correspond to 10 years of usage (starting from the production date given on the type field). This lifetime is based on the endurance tests specified in standard EN298 and the table containing the relevant test documentation as published by the European Association of Component Manufacturers (Afecon) (www.afecor.org).

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

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

Disposal notes



The unit contains electrical and electronic components and must not be disposed of together with domestic waste. Local and currently valid legislation must be observed.

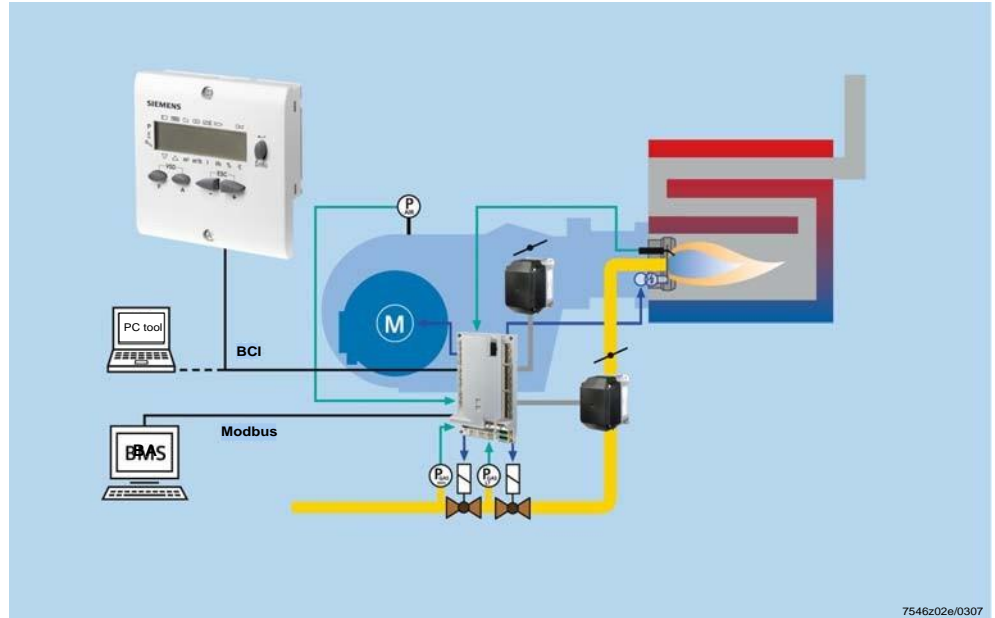


Mechanical design

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

The following system components are integrated in the LMV37.4... basic unit:

- Burner control with gas valve proving system
- Electronic air / fuel ratio control with a maximum of 2 actuators SQM3... or SQN1...
- Control frequency converter air fan
- Modbus interface



Example: Modulating gas burner

The system components (display and operating unit, actuators) are connected directly to the LMV37.4... basic unit. All safety-related digital inputs and outputs of the system are monitored by a contact feedback network (CFN).

For Europe

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

For North America

For intermittent operation in connection with the LMV37.4..., an ionization probe or optical flame detector type QRA4... is used. **Continuous operation is possible only when using an ionization probe.**

General

The burner management system is operated and parameterized with the help of the AZL2... display and operating unit or a PC tool. The AZL2... features an LCD and menu-driven operation, offering straightforward operation and targeted diagnostics. To simplify diagnostics, the display shows the operating states, the type of fault and the point in time the fault occurred. The different parameter setting levels for the burner / boiler manufacturer and the heating engineer are protected by passwords. There is also a communication interface COM from which higher level systems such as building automation (BA). Using the BCI and OCI410... interfaces, a PC with ACS410 software can be connected. Among other features, the software affords convenient readout of settings and operating states, parameterization of the LMV37.4..., and trend logging. The burner / boiler manufacturer can choose from a number of different fuel trains and has a wide variety of parameter setting choices (program times, configuration of inputs and outputs, etc.) to ensure optimum adaptation to the relevant application. The actuators are driven by stepper motors and offer high-resolution positioning. The characteristics and settings of the actuators are defined by the LMV37.4... basic unit.



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

<https://www.add-furnace.com> E-mail: sales@add-furnace.com

Type summary

Microprocessor-based burner control for single-fuel burners of any capacity, electronic air / fuel ratio control, up to 2 actuators, integrated gas valve proving system.

Type reference	Mains voltage	Parameter set	Type of flame detector
LMV37.400A1	AC 120 V	Europe	QRA2... / QRA4... (US) / QRA10... / QRB... / QRC... / ION
LMV37.400A2	AC 230 V	Europe	QRA2... / QRA4... (US) / QRA10... / QRB... / QRC... / ION
LMV37.420A1	AC 120 V	North America	QRA4... (US) / ION

**Technical data**

LMV37.4... basic unit	Mains voltage	
	- LMV37.400A1, LMV37.420A1	AC 120 V -15 % / +10 %
	- LMV37.400A2	AC 230 V -15 % / +10 %
	Mains frequency	50 / 60 Hz \pm 6 %
	Power consumption	<30 W (typically)
	Safety class	I, with parts according to II and III to DIN EN 60730-1
	Degree of protection	IP00
	Note:	The burner or boiler manufacturer must ensure degree of protection IP40 to DIN EN 529 for burner controls by adequate installation of the LMV37.4...
Terminal loading «Inputs»	• Perm. mains primary fuse (externally)	Max. 16 AT
	• Unit fuse F1 (internally)	6.3 AT (DIN EN 60127 2 / 5)
	• Mains supply: Input current depending on the operating state of the unit	
	Undervoltage	
	• Safety shutdown from operating position at mains voltage	
	- LMV37.400A1, LMV37.420A1	Approx. AC 93 V
	- LMV37.400A2	Approx. AC 186 V
	• Restart on rise in mains voltage	
	- LMV37.400A1, LMV37.420A1	Approx. AC 96 V
	- LMV37.400A2	Approx. AC 195 V
	Status inputs: Status inputs (with the exception of the safety loop) of the contact feedback network (CFN) are used for system supervision and require mains-related input voltage	
	• Input safety loop	refer to «Terminal loading outputs»
	• Input currents and input voltages	
	- UeMax	UN +10 %
	- UeMin	UN -15 %
	- IeMax	1.5 mA peak
	- IeMin	0.7 mA peak
	• Contact material recommendation for external signal sources (LP, GPmin, GPmax, 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, the contact must stay closed or open)
	• UN	
	- LMV37.400A1, LMV37.420A1	AC 120 V
	LMV37.400A2	AC 230 V
	• Voltage detection	
	- On	
	- LMV37.400A1, LMV37.420A1	AC 90...132 V
	- LMV37.400A2	AC 180...253 V
	- Off	
	- LMV37.400A1, LMV37.420A1	<AC 40 V
	- LMV37.400A2	<AC 80 V



Technical data (cont'd)

Terminal loading
«Outputs»

Total contact loading:

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

Individual contact loading:

Fan motor contactor

- Nominal voltage
 - LMV37.400A1, LMV37.420A1 AC 120 V, 50 / 60 Hz
 - LMV37.400A2 AC 230 V, 50 / 60 Hz
- Nominal current
 - LMV37.400A1, LMV37.420A1 2 A
 - LMV37.400A2 1,6 A pilot duty load declaration to UL372
- Power factor Cosφ >0.4

Alarm output

- Nominal voltage
 - LMV37.400A1, LMV37.420A1 AC 120 V, 50 / 60 Hz
 - LMV37.400A2 AC 320 V, 50 / 60 Hz
- Nominal current 1 A
- Load factor Cosφ >0.4

Ignition transformer

- Nominal voltage
 - LMV37.400A1, LMV37.420A1 AC 120 V, 50 / 60 Hz
 - LMV37.400A2 AC 230 V, 50 / 60 Hz
- Nominal current
 - LMV37.400A1, LMV37.420A1 2 A
 - LMV37.400A2 1.6 A pilot duty load declaration to UL372
or
250 VA ignition load declaration to UL372
- Power factor Cosφ >0.2

Fuel valves

- Nominal voltage
 - LMV37.400A1, LMV37.420A1 AC 120 V, 50 / 60 Hz
 - LMV37.400A2 AC 230 V, 50 / 60 Hz
- Nominal current
 - LMV37.400A1, LMV37.420A1 2 A
 - LMV37.400A2 1.6 A pilot duty load declaration to UL372
- Power factor Cosφ >0.4

Operation display

- Nominal voltage
 - LMV37.400A1, LMV37.420A1 AC 120 V, 50 / 60 Hz
 - LMV37.400A2 AC 230 V, 50 / 60 Hz
- Nominal current 0.5 A
- Power factor Cosφ >0.4

**Technical data (cont'd)**

Cable lengths	• Mains line	Max. 100 m (100 pF/m)
	• Display, BCI	For used outside the burner cover or the control panel Max. 3 m (100 pF/m)
	• Load controller LR	Max. 20 m (100 pF/m)
	• External lockout reset button	Max. 20 m (100 pF/m)
	• Other lines	Max. 3 m (100 pF/m)

Specification as per EN 60730-1

Type of shutdown or interruption of each circuit

Shutdown with microswitch 1-pole

Mode of operation Type 2 B

Cross-sectional areas

The cross-sectional areas of the mains power lines (L, N, and PE) and, if required, the safety loop (safety limit thermostat, water shortage, etc.) must be sized for nominal currents according to the selected external primary fuse.

The cross-sectional areas of the other cables must be sized in accordance with the internal unit fuse (max. 6.3 AT).

Min. cross-sectional area	0.75 mm ² (single- or multi-core to VDE 0100)
---------------------------	---

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

Fuses used in the LMV37.4... basic unit

- F1	6.3 AT DIN EN 60127 2 / 5
------	---------------------------

Connecting cable display → BCI

Signal cable	Unshielded Conductor 4 x 0.141 mm ²
Supplier	Reference: Hütter http://www.huetter.co.at/telefonkabel.htm Order number: on request
Location	Under the burner hood (arrangements for SKII EN 60730-1 additional required)

Environmental conditions

Storage	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
Transport	DIN EN 60721-3-2
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-30...+60 °C
Humidity	<95 % r.h.
Operation	DIN EN 60721-3-3
Climatic conditions	Class 3K3
Mechanical conditions	Class 3M3
Temperature range	-20...+60 °C
Humidity	<95 % r.h.

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



Technical data (cont'd)

Flame detectors

Ionization probe

For continuous operation!

No-load voltage at ION terminal (X10-05 terminal 2)	Approx. U _{Netz}
--	---------------------------



Caution!

Protect the ionization probe against electric shock hazard!

Short-circuit current	Max. AC 1 mA
Required detector current	Min. DC 4 μ A, flame display approx. 30 %
Possible detector current	Max. DC 16...40 μ A, flame display approx. 100 %
Max. perm. length of detector cable (laid separately)	3 m (wire – ground 100 pF/m)

Note:

With increasing detector cable capacitance (cable length), the voltage at the ionization probe, and thus the 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.

Photoresistive detectors QRB...

No-load voltage at QRB... terminal (X10-05 terminal 3)	Approx. DC 5 V
Max. perm. length of QRB... 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 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 really required! Increased line capacitance between QRB... connection and mains live wire L has an adverse effect on sensitivity and increases the risk of damaged flame detectors due to overvoltage. Always run detector cables separately!

Threshold value flame supervision QRB... with LMV37.4...

Start prevention (extraneous light) with R _{QRB}	<400 k Ω Intensity >10 %
Operation with R _{QRB}	<230 k Ω Intensity >16 %
Short-circuit detection with R _{QRB}	<0.5 k Ω

Flame detectors
QRA2... / QRA4... (US)
/ QRA10...

Caution!

If flame detectors type QRA2... / QRA4... (US) / QRA10... are used for flame supervision with the LMV37.4..., it must be ensured that the detector is permanently connected to power (conforming to EN230), thus enabling the system to detect flame detector failures during startup.

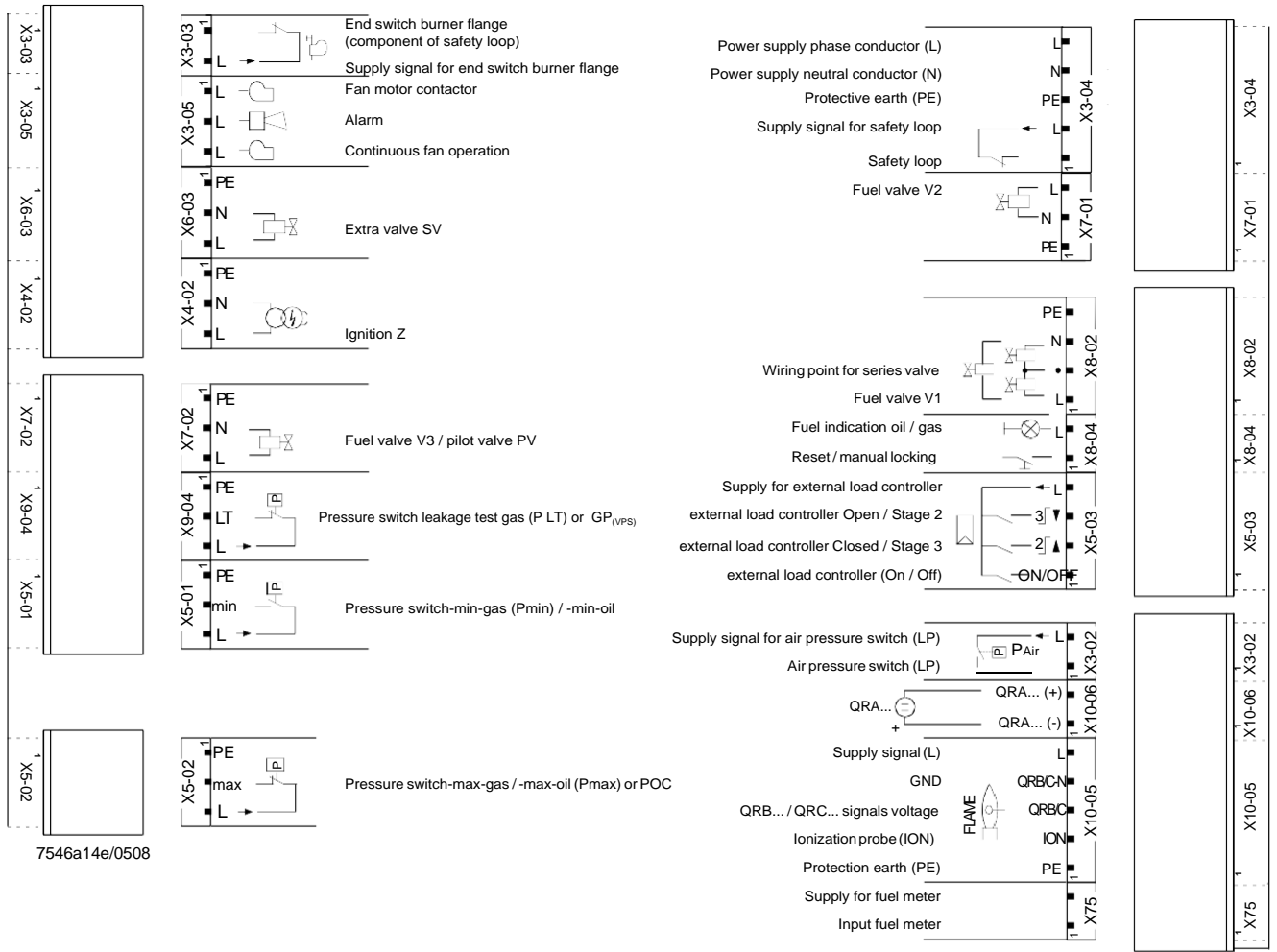
Blue-flame detectors
QRC...

Check the flame intensity via AZL2...

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



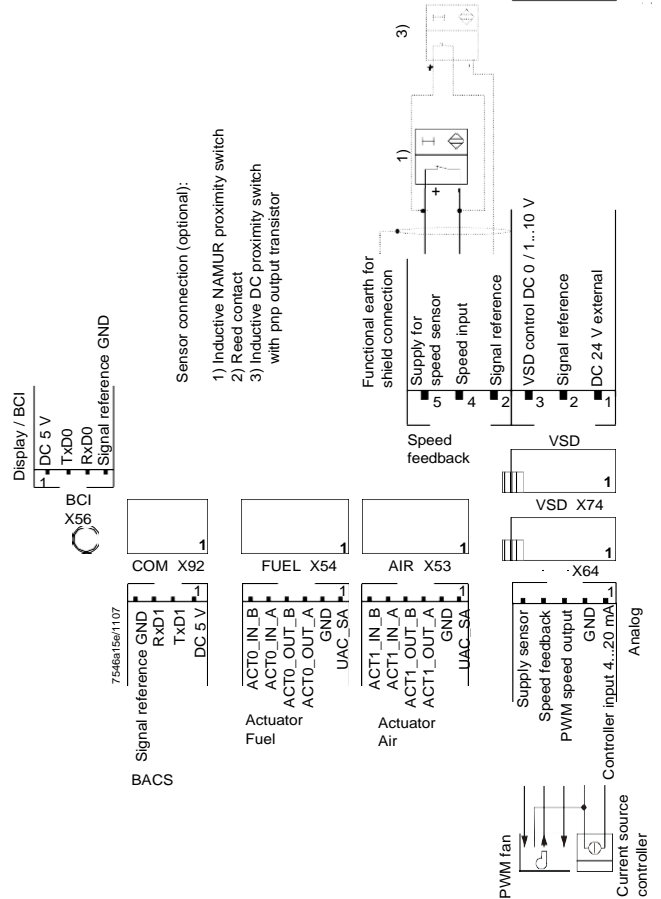
Inputs / outputs



Shielding:

For shielding the cables on the VSD, refer to:

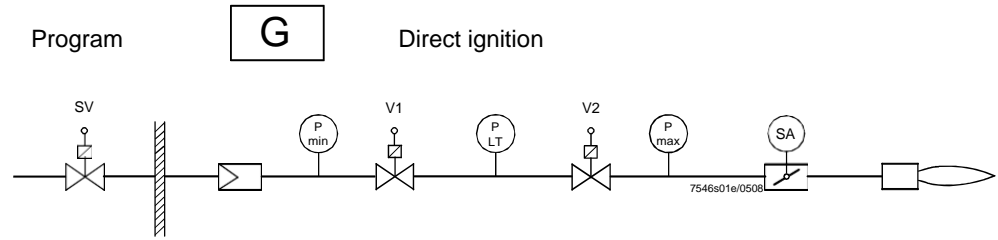
- Siemens *SED2* VSD Commissioning Manual (G5192) chapter 4 and chapter 7 or
- Danfoss Operation Manual *VL7 6000* (MG60A703) chapter «Installation»



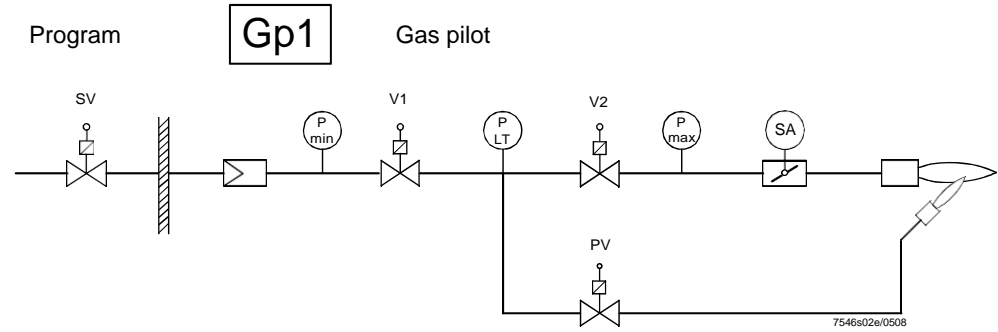


Fuel train applications (examples)

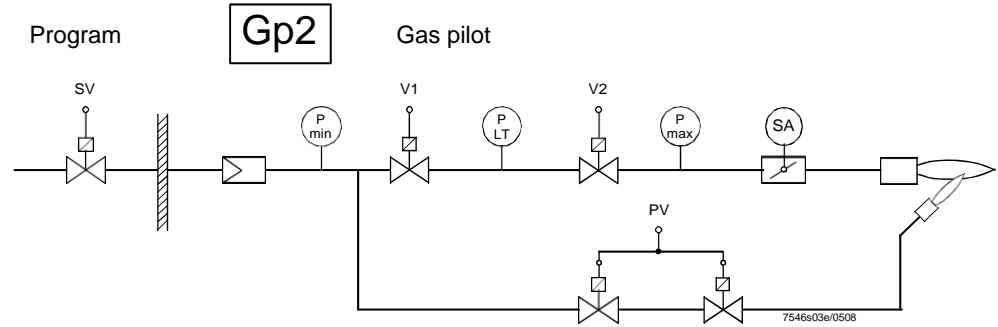
Direct gas ignition



Gas pilot ignition 1



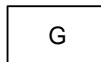
Gas pilot ignition 2



Fuel valve control

Gas (always modulating)

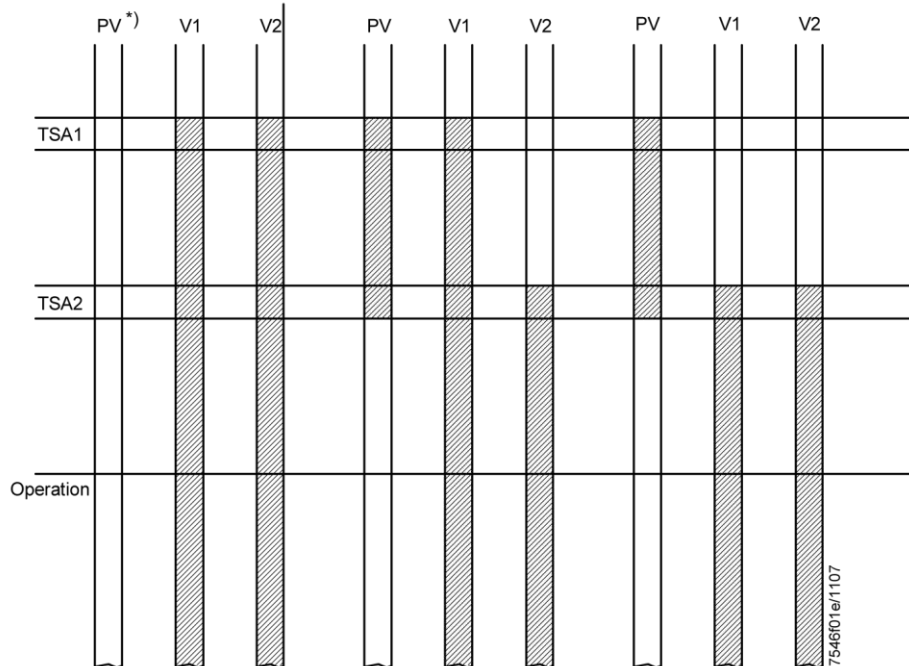
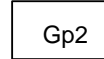
Direct transformer ignition



PILOT ignition 1



PILOT ignition 2



Legend for fuel trains:

- *) Not used
- 1) Series connection of two 115 V- valves (each requiring approx. 25 VA control power)

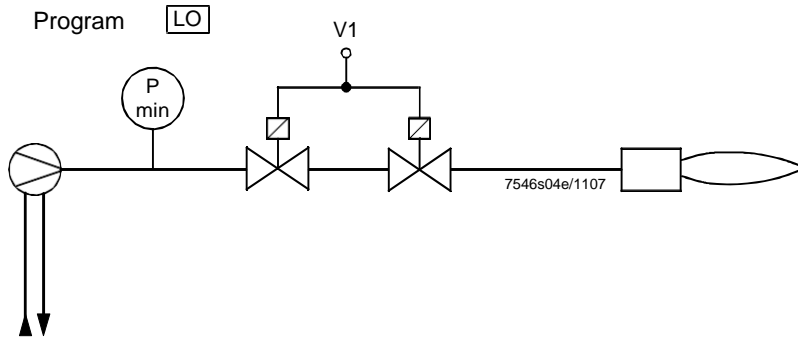
- LO Light fuel oil
- No Normally Open
- P LT Gas valve proving (leakage test)
- Pmax Pressure switch-max
- Pmin Pressure switch-min
- PV Pilot valve
- SA Actuator
- SV Shutoff valve (outside the building)
- TSA... Safety time
- V Fuel valve



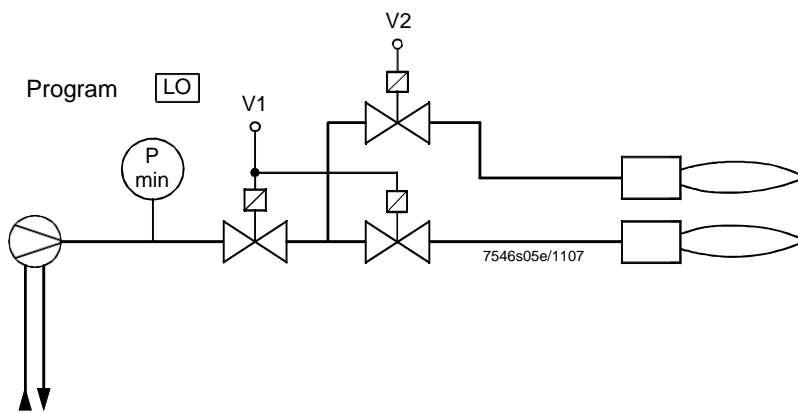
Fuel train applications (examples)

Direct ignition with light fuel oil, multistage

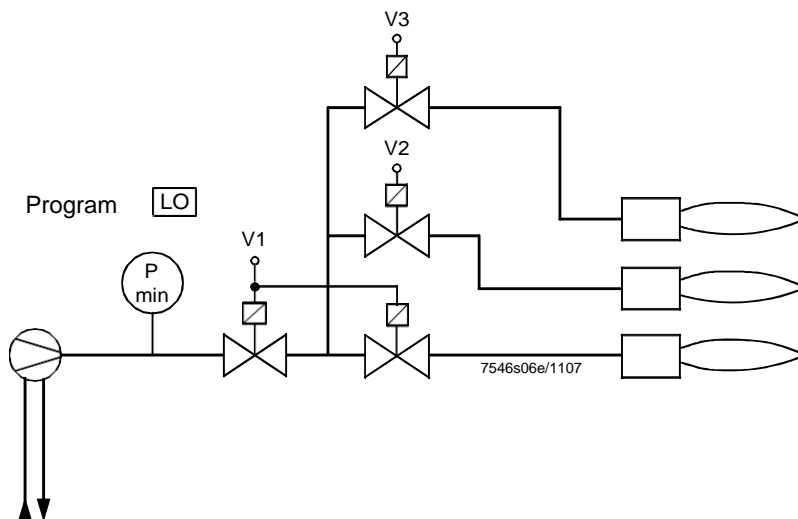
1-stage burner



2-stage burner



3-stage burner

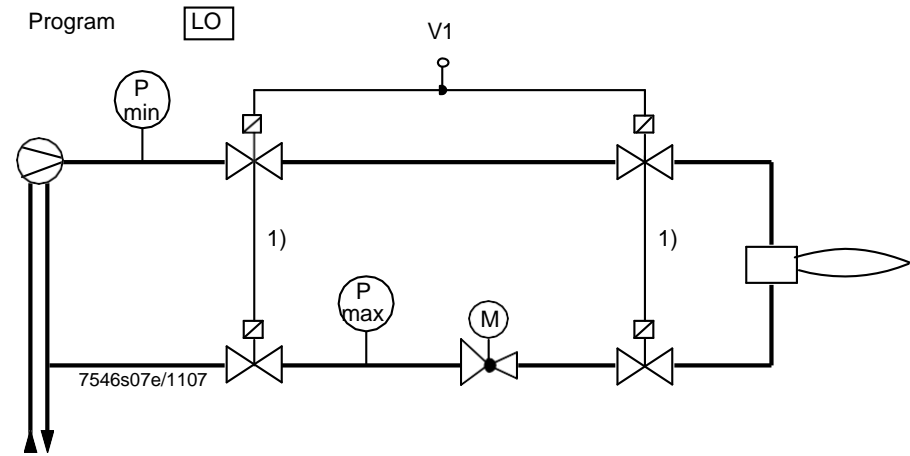




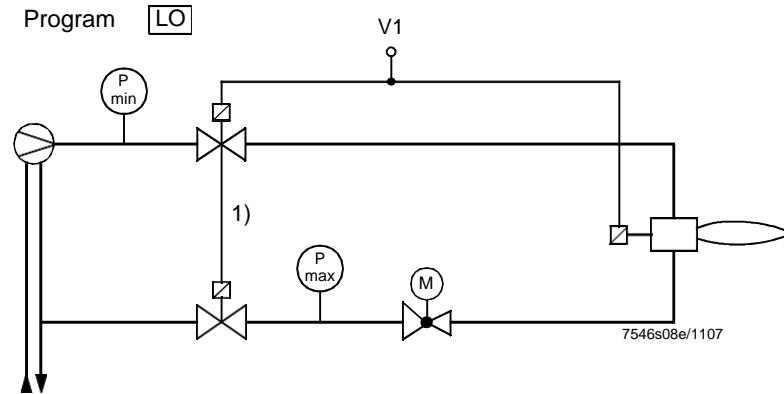
Fuel train applications (examples)

Direct ignition with light fuel oil, modulating

Modulating burner (without shutdown facility for adjustable head)

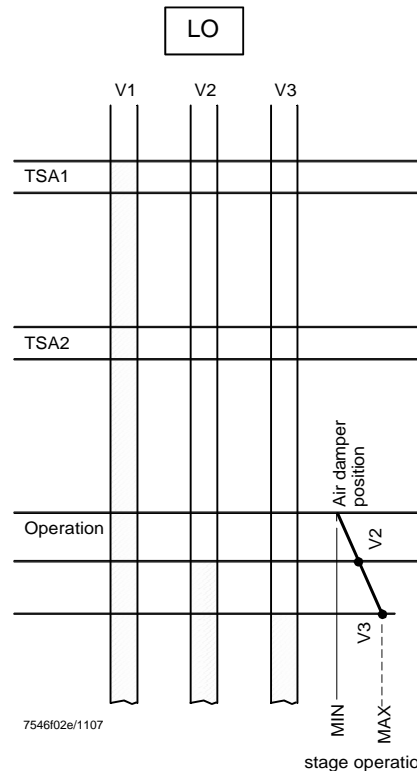


Modulating burner (with shutdown facility for adjustable head)



Fuel valve control

Light fuel oil (transformer direct ignition)





บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

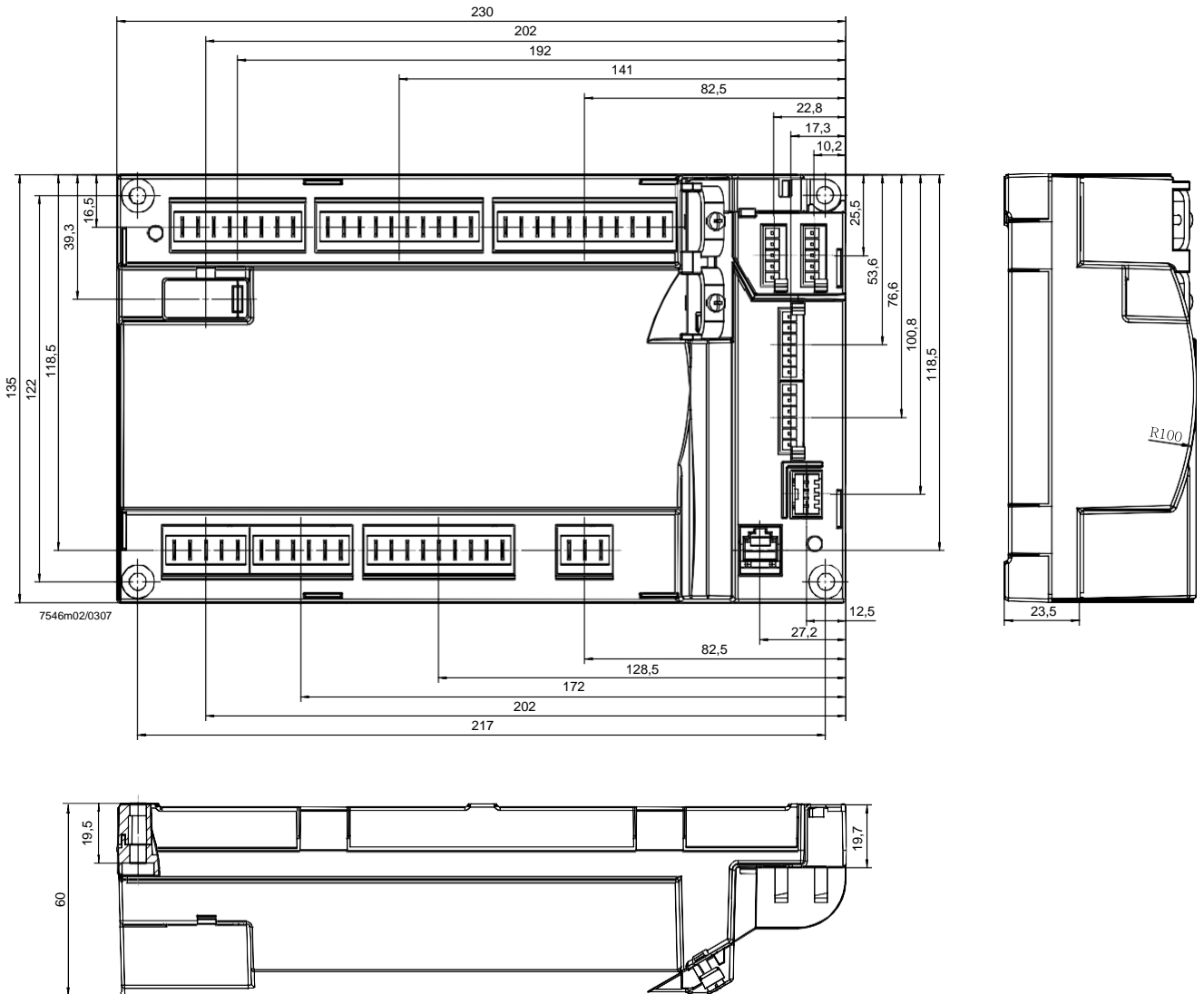
โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

<https://www.add-furnace.com> E-mail: sales@add-furnace.com

Dimensions

Dimensions in mm

LMV37.4...



♥2008 Siemens Building Technologies HVAC Products GmbH
Subject to change!

15/15