



AZL66...

Display and operating unit for LMV6 burner management systems

User Manual

AZL66 and this User Manual are intended for original equipment manufacturers (OEMs) using the AZL66 in or on their products.



Caution!

This documentation is only valid in connection with the AZL66 Data Sheet N7562 and the documentation of the relevant LMV6!

Supplementary documentation

Product type	Type of documentation	Documentation number
AZL66	Environmental Conditions	E7562 *)
	Data Sheet	N7562
LMV6	Environmental Conditions	E7560 *)
	Data Sheet	N7560
	Parameter list and error code list	I7560
	Basic Documentation	P7560
	Product Range Overview	Q7560

*) On request only

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1 Safety notes for use of the AZL66



Caution!

Additional notes to be observed!

All the safety, warning, and technical notes given in the LMV6 Basic Documentation (P7560) and in the AZL66 Data Sheet (N7562) also apply to this document. To avoid injury to persons and damage to property or the environment, the following warning notes must be observed!

Caution!

The following information must be observed to prevent the risk of fire or explosion, damage to the heating plant or damage resulting from improper usage:

The AZL66 described in this documentation may only be used as specified and only in connection with the appropriate burner and heating plant. Failure to observe this information poses a risk of the safety functions being impaired.

The LMV6 with AZL66 and the associated heating control may only be installed and commissioning by authorized personnel. Failure to observe this information poses a risk of loss of safety functions and a risk of electric shock.



The AZL66 is designed for use in dry rooms only. Do not install the AZL66 outdoors and protect it from heat, frost, and liquids such as water, oil, and fuel oil. Failure to observe this poses a risk of electric shock.

The operating steps and settings instructions detailed in this documentation must be observed precisely. Certain settings may only be made by authorized personnel and these are clearly identified as such. Failure to observe this information poses a risk of the safety functions being impaired.

Only clean the AZL66 with a dry cloth when dirty or dusty.

Do not perform any maintenance or repair work on the AZL66 yourself. This type of work may only be performed by authorized personnel. Failure to observe this poses a risk of electric shock.

If you have any other questions relating to the AZL66, please contact your heating engineer or get in touch with Siemens at any of the addresses provided in this documentation.

2 Meaning of buttons



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Figure 1: Meaning of buttons

Graphics	Button	Function
None	Rotary knob TURN	<ul style="list-style-type: none"> • Navigate through tile views or list views • Can be turned clockwise to the right or down • Can be turned counterclockwise to the left or up • Change parameter values
None	Rotary knob PUSH	<ul style="list-style-type: none"> • Select a tile / menu item • Confirm a change to a parameter value • Acknowledge messages
	Back (Return)	Exit a tile / menu item / value adjuster without making further changes
	Menu	<ul style="list-style-type: none"> • Jump to the top level of the menu tree (possible from anywhere) • Access to additional functions (if available)

3 Meaning of symbols on the display

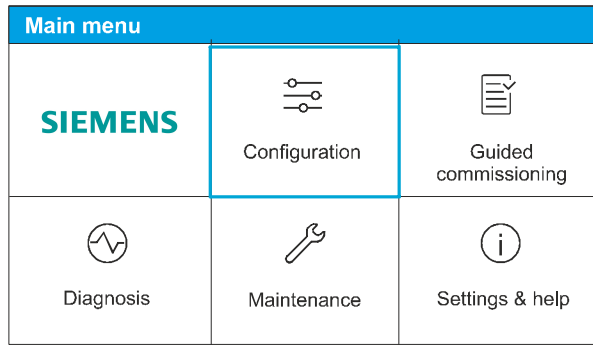




Figure 2: Main menu


3.1 Main menu


3.1.1 Configuration

 **Note!**
 “Configuration” tile!
 The “Configuration” tile is only visible if the user has the relevant access authorization.


Tile	Meaning / contents
 Configuration	<ul style="list-style-type: none"> • Changing the parameters • Entering burner-specific parameters Adaptation of programs and/or components/accessories to the LMV6 and adaptation of the LMV6 to its components/accessories.

3.1.2 Guided commissioning


 **Note!**
 “Guided commissioning” tile!
 The “Guided commissioning” tile is only visible if the user has the relevant access authorization.

Tile	Meaning / contents
 Guided commissioning	Central repository of all relevant parameters for commissioning


3.1.3 Diagnosis

Tile	Meaning / contents
 Diagnosis	<ul style="list-style-type: none"> • Storage of the error history • Storage of the process data • Burner identification

3.1.4 Maintenance

Tile	Meaning / contents
 Maintenance	<ul style="list-style-type: none">• Backup & restore• Hours run counter• Startup counter• Statistics and details for all system components

3.1.5 Settings & help

Tile	Meaning / contents
 Settings & help	<ul style="list-style-type: none">• Entering the password• Changing the language (default: English)• Modbus• Date and time• Display settings

4 AZL66 operating philosophy

Once the screen has been activated, the status page appears with the key information about the current status of the burner.

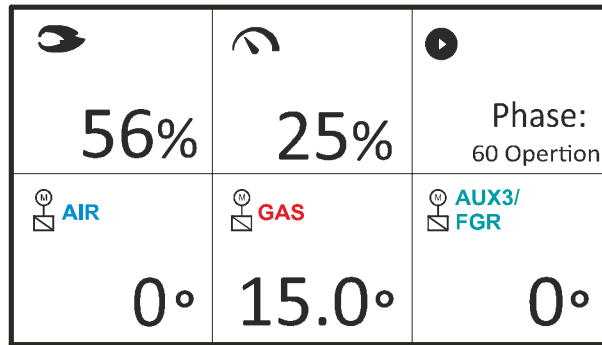


Figure 3: Status page

Symbol	Function / meaning
	Current flame signal in percent (%)
	Current load in percent (%)
	Current phase
AIR	Position of air actuator in degrees (°)
GAS	Position of gas actuator in degrees (°)
AUX1	Position of auxiliary actuator 1 in degrees (°)
AUX2	Position of auxiliary actuator 2 in degrees (°)
AUX3/ FGR	Position of auxiliary actuator 3 / FGR in degrees (°)

Pressing the Menu button takes the user to the main menu. From here, they can navigate to all of the available parameters in the menu tree.

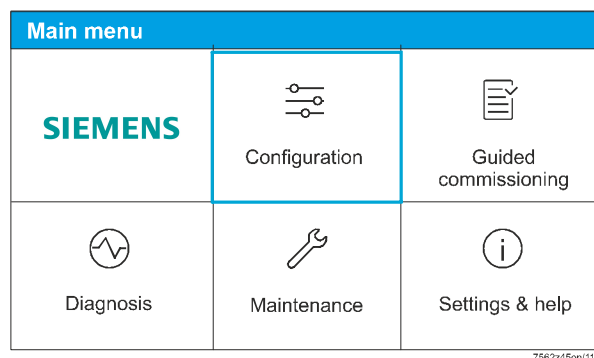


Figure 4: Main menu

The appearance of the main menu may vary depending on the user's access authorization. Both the status page and the main menu are displayed in the form of tiles. Pages below these levels are displayed as simple list views. Higher-level menus show the value range of the parameters below this level alongside the menu name.

1100 LMV6 burner control	
1101-1114 Times before ignition	>
1115-1124 Times after ignition	>
1125-1134 Times: Shutdown	>
1135-1139 Times general	>
1145-1159 LMV6 configuration	>

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Figure 5: List view

Individual parameters are displayed with the parameter number, parameter name and current value. The displayed value is updated at regular intervals.

1101-1114 Times before ignition	
1102 Fan run-up time	2.0 s
1103 Prepurge time	00:20 s
1105 Prepurge time without FGR	00:10 s
1106 Prepurge time with FGR	00:10 s
1107 Preignition time	2.0 s

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Figure 6: "Parameter" list view

4.1 Entering the password

Main menu → Settings & Help → Password → Enter password

The password is entered using the rotary knob on the AZL66. The user can navigate to the required letters and numbers by turning the rotary knob. Once the required character is highlighted, it is entered by pressing the rotary knob. The entered characters are displayed as dots in the password field.

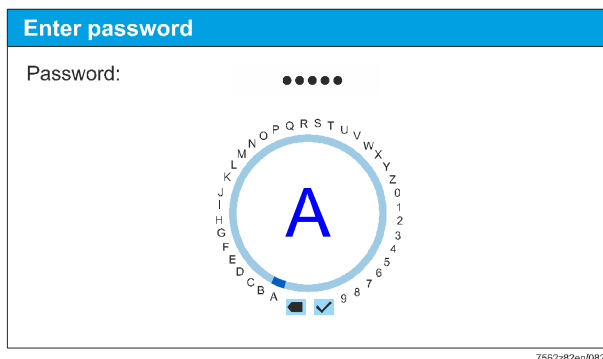


Figure 7: Entering the password

Once the password has been entered in full, the user must navigate to the “Check” symbol (✓). Incorrect characters can be deleted individually with the “Back” symbol (◀).

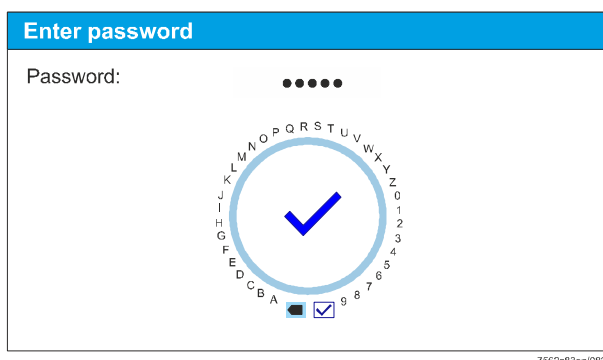


Figure 8: Confirming password entry

The password must be at least five digits long for each access level. The maximum length is 12 digits. Pressing the rotary knob sends the password to the LMV6 to be checked. If the password is correct, the main menu will open automatically. If the password is incorrect, an error message is displayed and the previous menu will open. The previous access level remains active. After 10 minutes of inactivity, the display switches off and the password previously entered is discarded. The password must now be entered again.

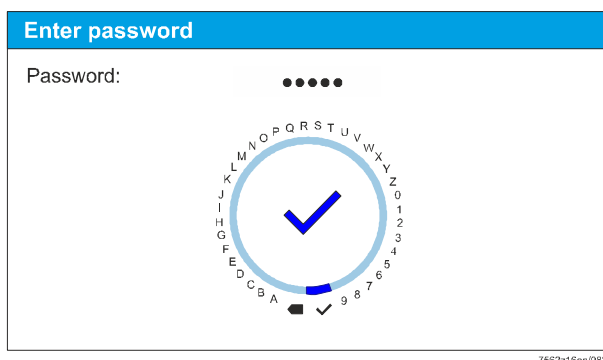


Figure 9: Re-entering the password

4.2 Changing the password

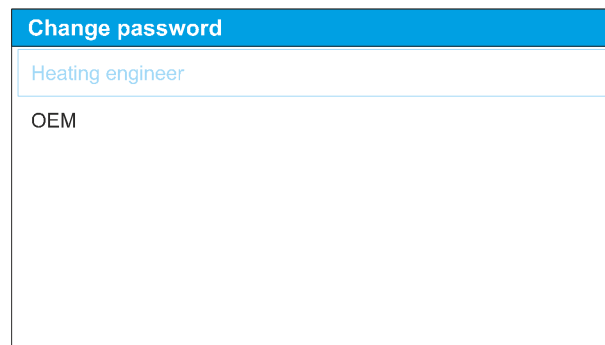
Note!

Protection against unauthorized access!



The parameterization level is protected against unauthorized access by means of a password. The OEM assigns individual passwords for the parameterization levels to which they have access. The default Siemens passwords must be changed by the OEM. These passwords are confidential and must only be shared with authorized persons.

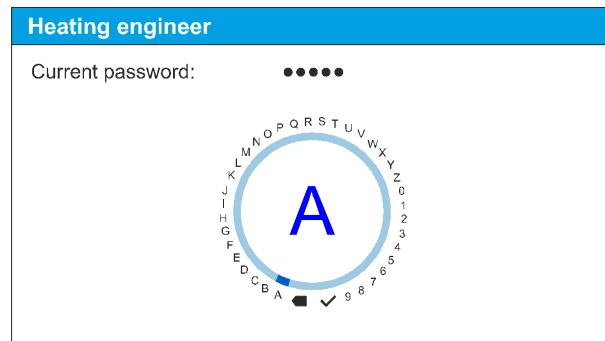
After logging into one of the access levels, the user can change the current password and the password for all access levels below this level. To do this, the user navigates to the level for which they want to change the password in the “Change password” menu.



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Figure 10: Changing the password

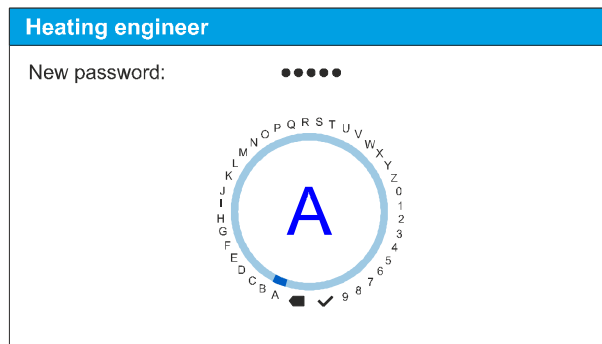
The user must first enter the password for the access level they are currently logged into for verification purposes.



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Figure 11: Entering the password

A new password can then be assigned. The password must be at least five digits long. The maximum password length is 12 digits.



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Figure 12: Entering a new password



Note

Forgotten the password?
Contact the OEM if a new password is required.

4.3 Setting numerical values

Main menu → Guided commissioning → 1650-1659 Actuator: Configuration

The bar at the top shows the parameter number and parameter name. The minimum and maximum parameter values are visible at the ends of the arc.

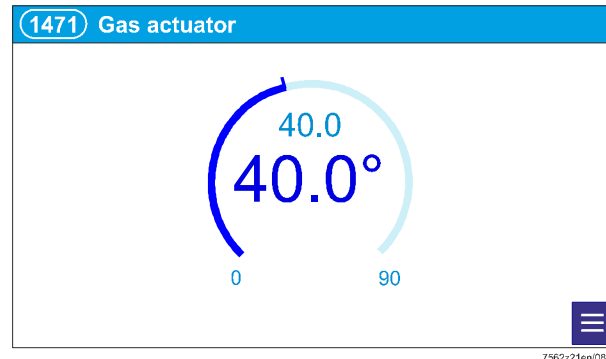


Figure 13: Setting numerical values

The top numerical value is the one that the AZL66 has read from the LMV6 as the current value. The numerical value and unit below represent the default setting, which can be changed using the rotary knob. This numerical value is sent to the LMV6 by pressing the rotary knob. The display indicates when a value has been changed successfully. If the new value has been transferred successfully, a white check appears in a green field.

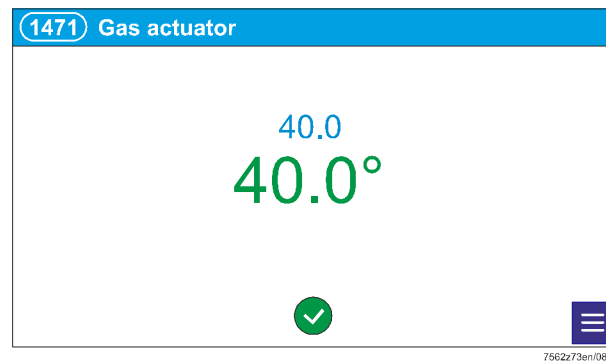
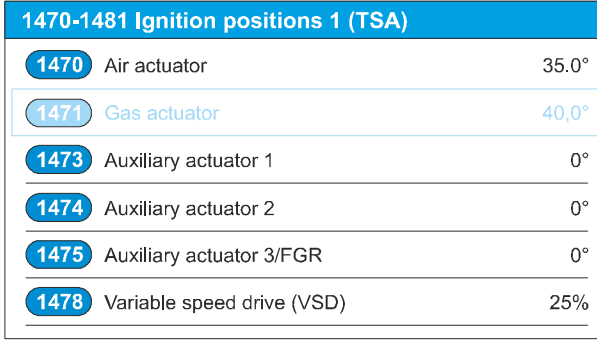


Figure 14: Numerical value 'successfully transmitted'

The numerical value can be changed by pressing the rotary knob. Press the Return button (↵) on the AZL66 to exit the parameter. The screen automatically returns to the list view. The new value can now be seen in the list view.



1470-1481 Ignition positions 1 (TSA)		
1470	Air actuator	35.0°
1471	Gas actuator	40.0°
1473	Auxiliary actuator 1	0°
1474	Auxiliary actuator 2	0°
1475	Auxiliary actuator 3/FGR	0°
1478	Variable speed drive (VSD)	25%



Figure 15: List view

4.4 Rotary knob features

The parameter value changes by the number of increments completed with each turn of the rotary knob. The level of change depends on the step size that is stored for the corresponding parameter.

To increase the step size of the change, the LMV6 must be temporarily set to a special mode. The LMV6 enters a special mode as soon as more than 5 change increments are detected within 250 ms. In this case, an increment no longer corresponds to the stored step size and larger jumps are carried out. This function allows larger ranges of values to be selected in a shorter time. If there is no user activity within 2 seconds, this special mode is automatically deactivated.

4.5 Additional properties

When parameters are selected, the menu icon  appears in the lower right area of the display. These parameters have additional properties which can be called up by pressing the Menu button  on the AZL66.

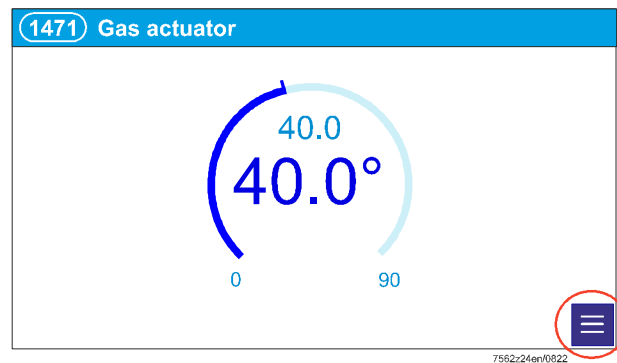


Figure 16: Additional properties

This parameter can assume an undefined value. This is visualized by the two dashes as a new value.

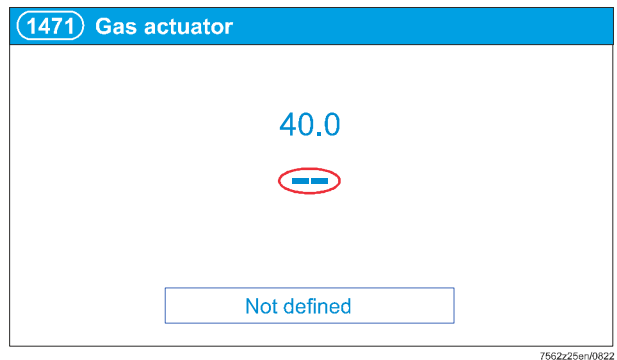


Figure 17: Undefined value

If the parameter is successfully set to 'Not defined', this is achieved by adding a white check mark to the green field.

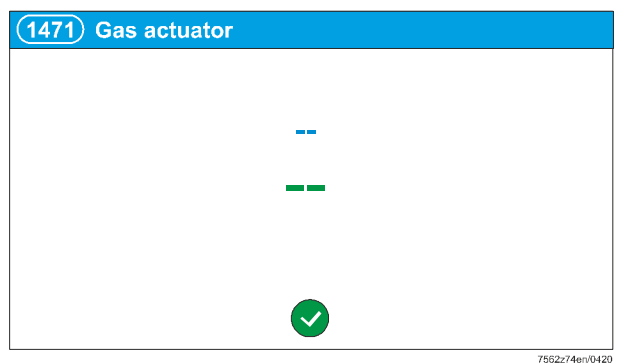


Figure 18: White check in green field

Values that are not defined can be replaced by a numerical value by turning the value adjuster until the desired value is reached.

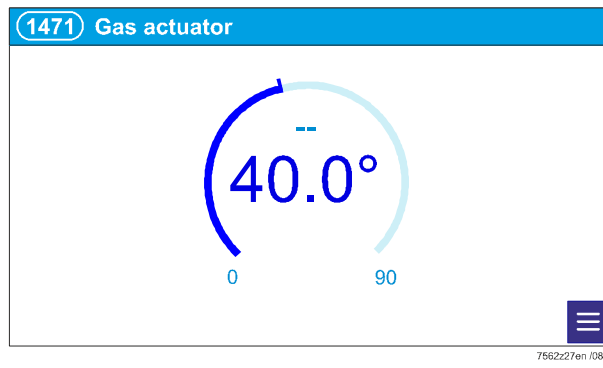


Figure 19: Replace undefined value

4.6 Selection options

The top bar of the display shows the parameter number (“1201” in this case) and the parameter name (“R: Valve proving – type and time” in this case). The various selection options are listed below this. You can navigate to the desired entry by turning the rotary knob. The desired entry is sent to the LMV6 by pressing the rotary knob. The successful change is confirmed visually and the screen can then be exited again with the Return button (↵).

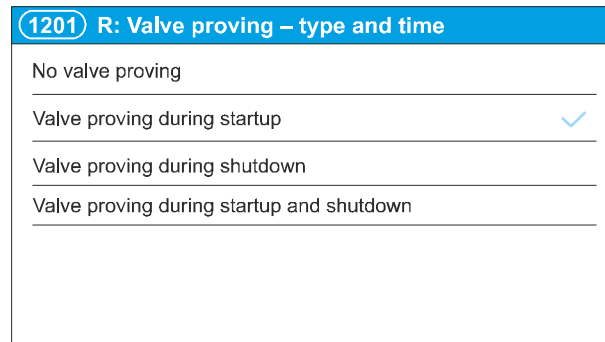


Figure 20: Selection options

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4.7 Warning indicators

4.7.1 Yellow screen

If a warning occurs, a yellow screen is displayed. The screen is composed of a symbol, a short text (see *Error code list*), a long text (see *Error code list*) and the interaction areas. You can leave the screen by pressing “Close”. “Display event log” takes you to the detailed error view from the error and fault history (see chapter 4.7.5 *Detailed error view*).

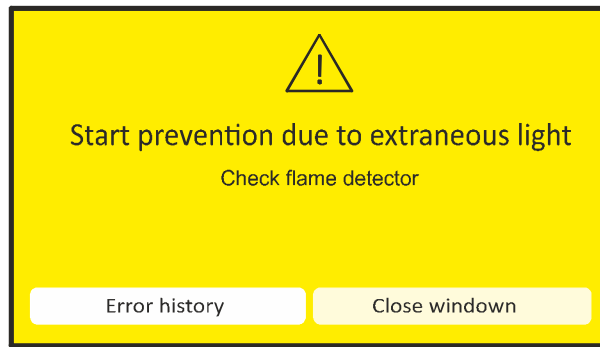


Figure 21: Yellow screen

4.7.2 Red screen

If an error occurs in the LMV6 which results in a locked lockout, a red screen is displayed. The screen is composed of a symbol, a short text (see *Error code list*), a long text (see *Error code list*) and the interaction areas. “Display error log” takes you to the detailed error view from the error and fault history (see chapter 4.7.5 *Detailed error view*). “Reset” allows you to reset the LMV6 in accordance with chapter 4.7.3 *Reset*. “Close window” closes the red screen and the LMV6 remains locked.

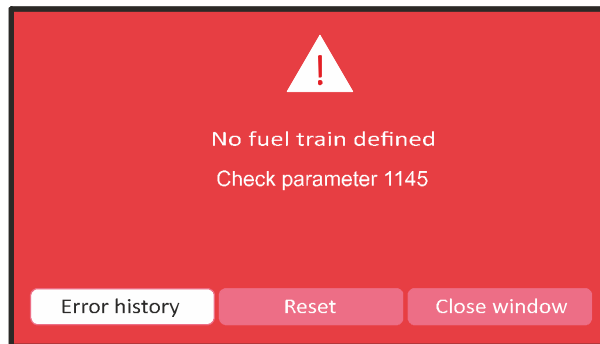


Figure 22: Red screen

4.7.3 Reset



Caution!
Internal errors!
In the event of internal errors, a safety check must be carried out following a reset. Failure to observe this information poses a risk of the safety functions being impaired.

If the LMV6 is in a locked lockout, it can be reset via the AZL66. A further prompt appears which must be confirmed within 10 seconds. The AZL66 display then returns to the main menu.

To reset the LMV6, the rotary knob on the AZL66 must be turned until the “Reset” field no longer appears blue in the AZL66 display. Now press the rotary knob. The LMV6 has now been reset.

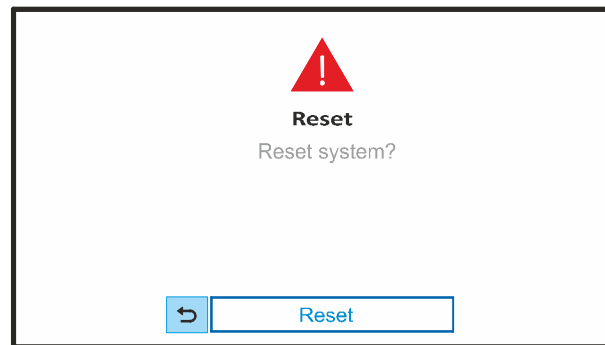








Figure 23: Reset

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4.7.4 Error list

The errors are listed in chronological order in the error list.

Each error comprises a symbol, a unique error number, a short text, and the startup counter value following the error in question. For active errors, the icon has a red or yellow background. If errors are no longer active, the icon has a gray background. A yellow or red bar still appears to the left of the icon to indicate the classification of the error. You can access the detailed view for a particular error by pressing the rotary knob.

Error history		
	5100 Manual lockout	16
	1009 Start prevention due to extraneous light	15
	5100 Manual lockout	15
	1042 Fuel 1: Restart counter elapsed: No flame ...	14
	1005 No flame in the first safety time (TSA1)	14
	1041 Restart counter elapsed: Extraneous light ...	13

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Figure 24: Error list

Color code	Meaning
Red	Error still active
Yellow	Warning still active
Gray	Error or warning no longer active

4.7.5 Detailed error view

Along with the information from the higher-level error list, the short text for the error and the additional error information are also provided:

- Time stamp
- Fuel
- Phase
- Load
- Error class
- Counter: Burner starts
- Running time (h)
- Error counter
- Error ID
- Diagnostics 1
- Diagnostics 2
- Error with the highest priority

Error history

3001 No fuel train defined

0

Check parameter 1145

Time stamp:

Fuel:	Gas
Phase:	12 Standby
Load:	0.0 %
Error class:	Lockout, local
Counter: Burner starts:	0

Error history

3001 No fuel train defined

0

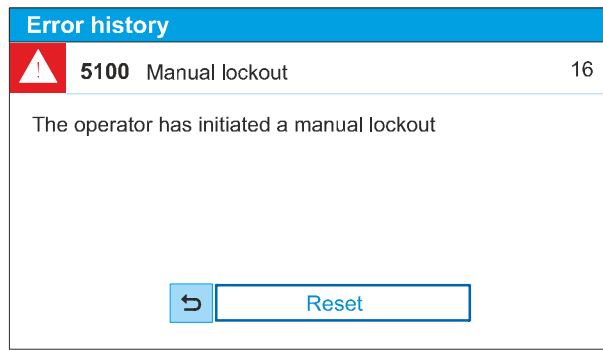
Error class:	Lockout, local
Counter: Burner starts:	0
Running time (h):	0.089 h
Error counter:	1
Error ID:	156
Diagnostics 1:	0x00000000
Diagnostics 2:	0x00000000
Highest priority error	1

7562z88en/0822

Figure 25: Error view

Note!
 Reset only possible via active errors!

In the case of an active error, when the LMV6 is locked, the menu symbol () appears in the display to indicate that special functions are available. To reset the LMV6, the Menu button () must be pressed on the AZL66.



756Zz49en/0822

Figure 26: Reset

“Reset” allows you to reset the LMV6 in accordance with chapter 4.7.3 *Reset*.

4.8 Settings & Help

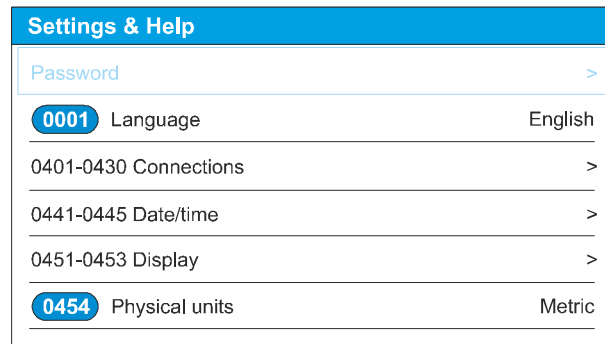


Figure 27: Settings & Help

4.8.1 Password

For a detailed description, refer to Chapter 4.1 „Entering the password“.

4.8.2 Changing the language

All available languages are listed in parameter 0001 in the respective national language and can be selected there. After leaving parameter 0001, language switching is active immediately.

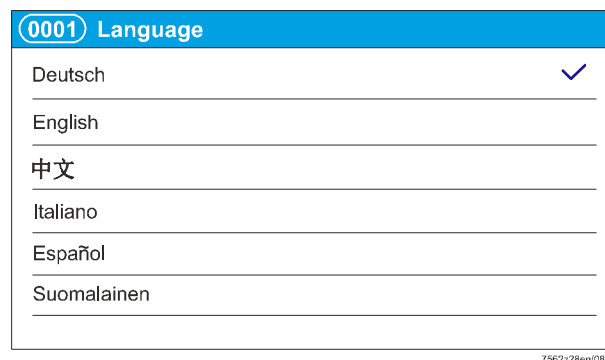


Figure 28: Changing the language

4.8.3 Connections

Users have access to the Modbus parameters via this menu item.

4.8.4 Date/time

This menu item can be used to set the date or time.

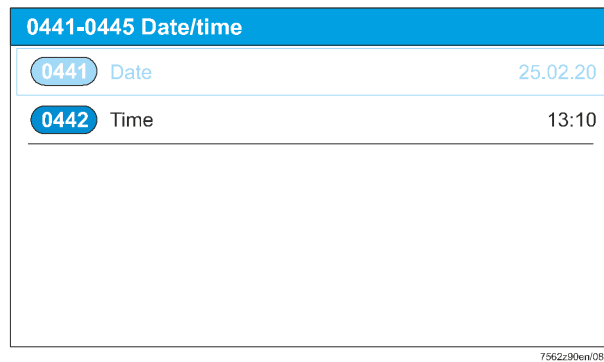


Figure 29: Date/time

4.8.5 Display

This menu item can be used to make changes to the display-specific parameters (e.g., the time without activity until the display switches off).

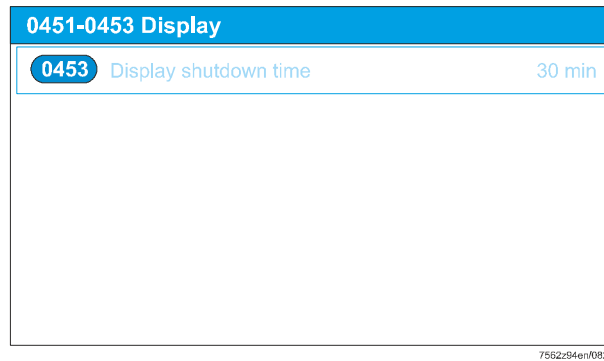


Figure 30: Display

4.8.6 Physical units

This menu item is used to switch between metric and imperial.

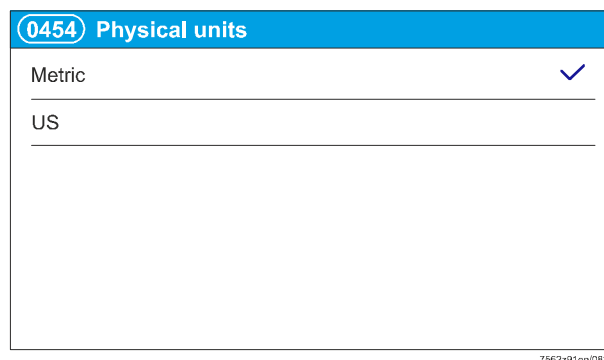


Figure 31: Physical units

4.9 Reset / Manual lockout of the LMV6

4.9.1 Reset

After a non-volatile lockout, a manual reset can be carried out. The LMV6 can be reset only when the cause of the fault or error has been rectified, all contacts in the line are closed, and there is no undervoltage.

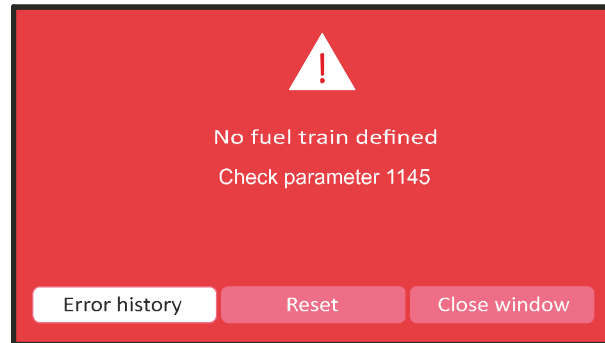


Figure 32: "Reset" error screen

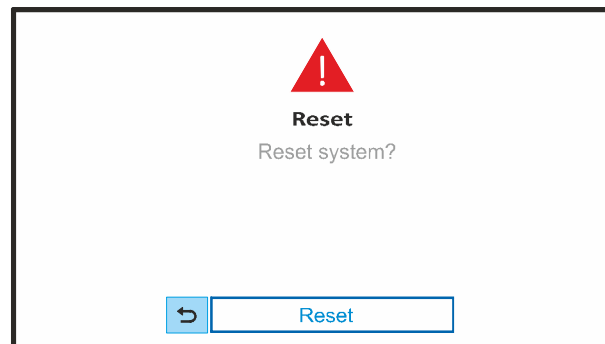


Figure 33: "Reset" confirmation prompt



The following actions are performed during a reset:

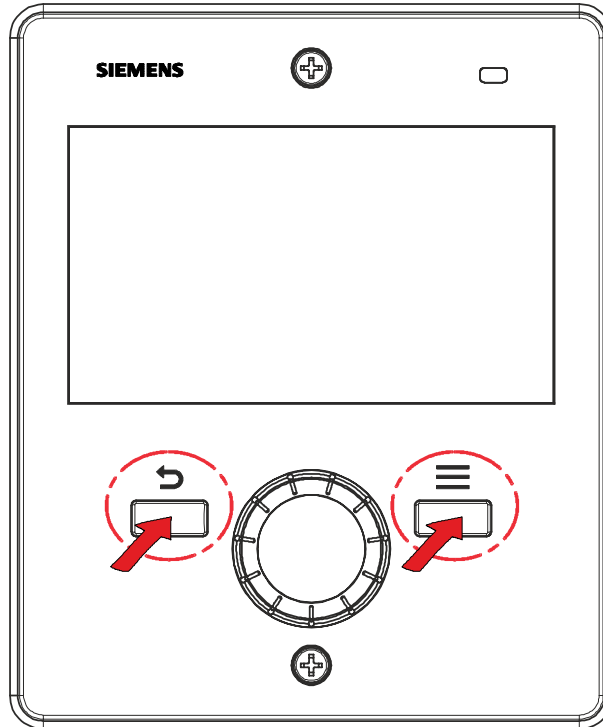
- The alarm relay and the fault display will be switched off
- The fault position will be canceled
- The LMV6 will perform a reset and then change to standby

There are 2 reset options available:

1. Via the AZL66
2. Via the external switching contact on the LMV6 (>1...3 s)

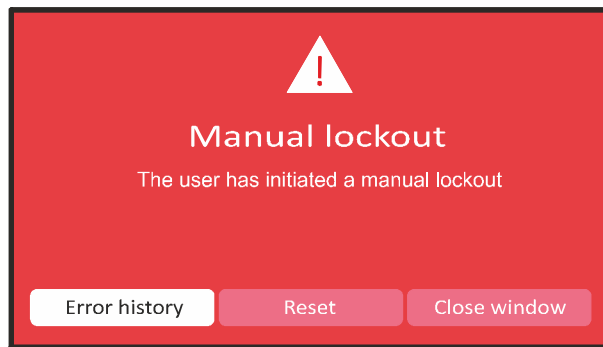
4.9.2 Manual lockout

The LMV6 can be locked manually by pressing 2 buttons (Menu button  and Return button ) on the AZL66 at the same time. This function allows you to lock the LMV6 from any operating level, i.e. trigger a non-volatile lockout. Due to the makeup of the LMV6, this is not an emergency stop function.



7562z30/1019

Figure 34: Manual lockout



7562z14en/0420

Figure 35: "Manual lockout" display

4.10 Backup

To create a backup, a USB stick first has to be connected to the AZL66. As soon as a USB stick is detected by the AZL66, this is shown on the display.

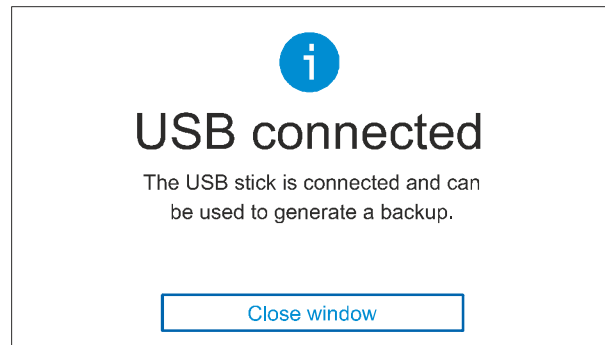


Figure 36: USB stick connected

The backup function can be found under the “Maintenance” tile.

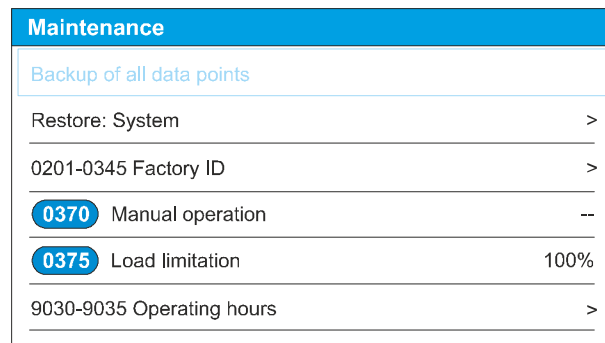


Figure 37: Backup

Prior to backing up, you must confirm the creation of the backup once again.

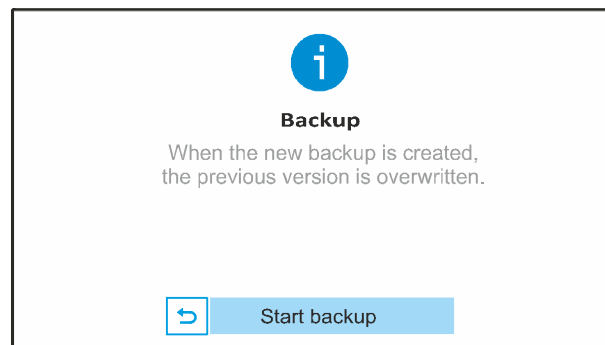
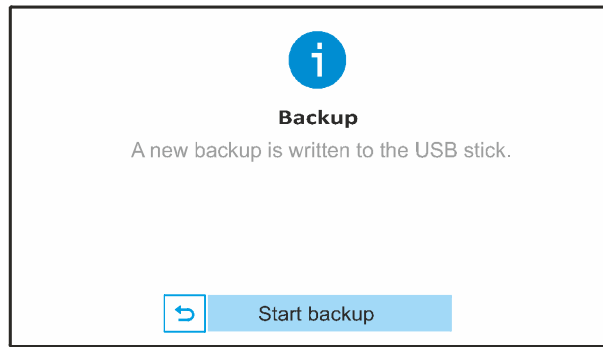


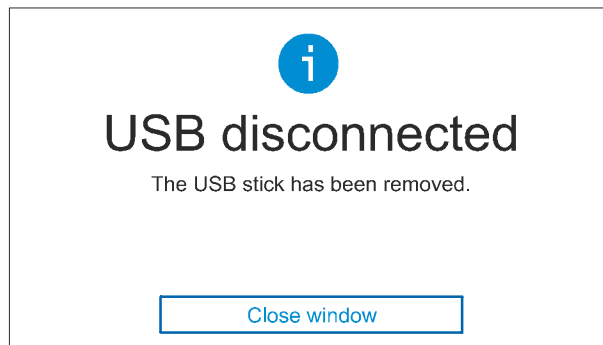
Figure 38: Create backup



7562z99en/0622

Figure 39: Create new backup

Once the backup is complete, the AZL66 automatically reverts to the "Maintenance" menu. As soon as the USB stick is removed from the AZL66, this is shown on the display.



7562z53en/0420

Figure 40: USB stick removed

5 Electronic ratio control

5.1 “Subsequent commissioning” function

Increasing and reducing the load along interpolated ratio control curves.

CAUTION!

“Subsequent commissioning” function!

In the “Subsequent commissioning” function, changes made by the user are adopted immediately by the LMV6. There is no confirmation prompt. To protect against unintentional entries, the special mode (refer to Chapter 4.4 ‘Rotary knob features’) is not activated in this function.

For the “Subsequent commissioning” function, the burner must be in phase 60 (operation). If phase 60 has not yet been reached, you will be informed via the following screen:

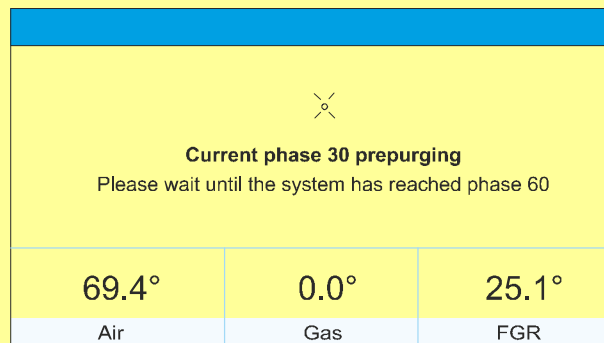


Figure 41: Phase 60 status

If the burner is locked, the “Non-subsequent commissioning” function is executed (see chapter 5.2 “Non-subsequent commissioning” function).

Note

Missing curve points!

If no curve points are available at the start of curve parameterization, users will be informed by means of a message in the display.

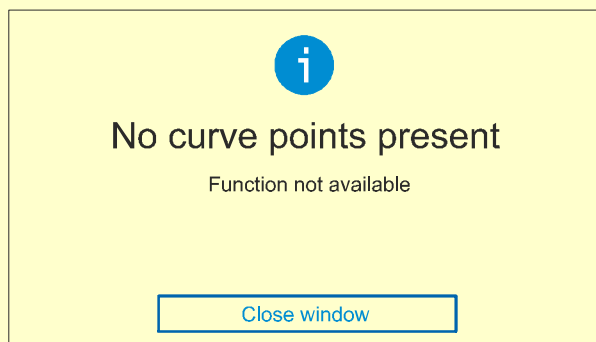
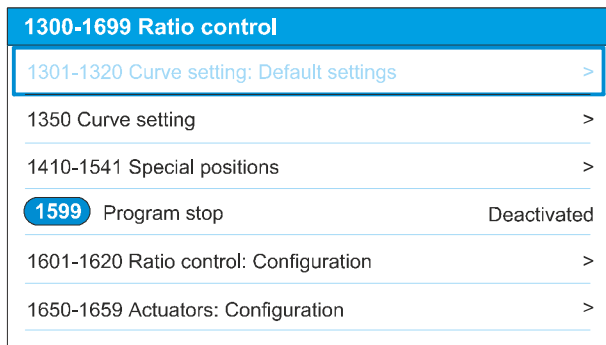


Figure 42: No curve points present

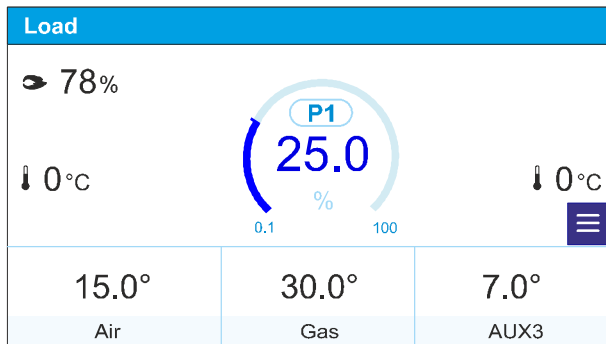
Select the menu item “1350 Curve commissioning”. You are now in the menu for setting the load. The load can be increased or decreased directly in manual mode via the rotary knob.



7562z55en/0822

Figure 43: Curve commissioning

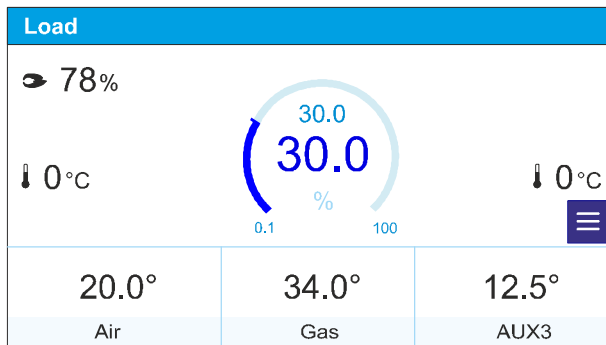
The start point is always the current plant load.



7562z55en/0822

Figure 44: Start point P1

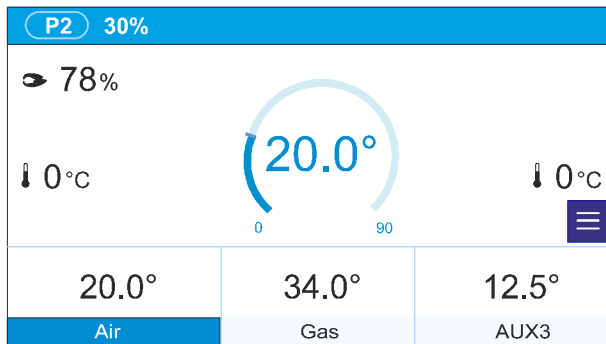
Gradually increase the load to a point where you want to change the air-gas mixture.



7562z57en/0822

Figure 45: Change the air-gas mixture

Pressing the rotary knob will take you to a screen where you can adjust the actuators. One actuator will be preselected ("air actuator" in this case).



7562z58en/0822

Figure 46: Adjusting the actuators

You can now use the rotary knob to increase or reduce the value of this actuator until the setting corresponds to the desired ratio.

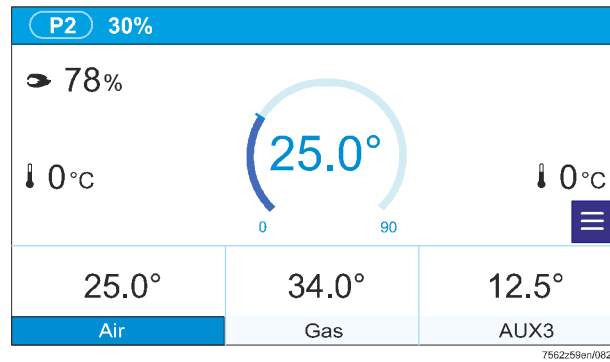


Figure 47: Increasing/reducing the actuator value

Pressing the rotary knob takes you back to the load setting. Changing one of the actuators will automatically create a new curve point. The new curve point (P2) is displayed above the load value ("30.0%" in this case).

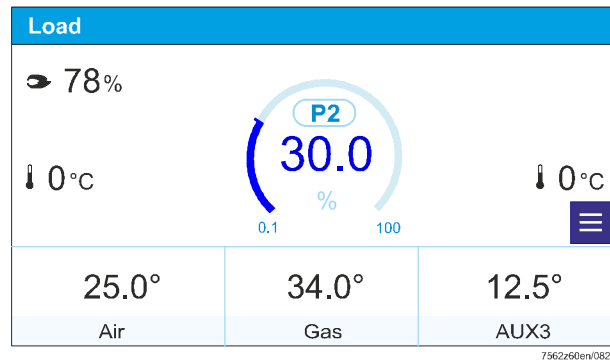


Figure 48: Displaying the new curve point

To change an actuator other than the preselected one ("air actuator" in this case), you need to switch to the actuators. Turn the rotary knob to any load point and press the rotary knob. The example shows the curve point P2 that has just been set for the air actuator.

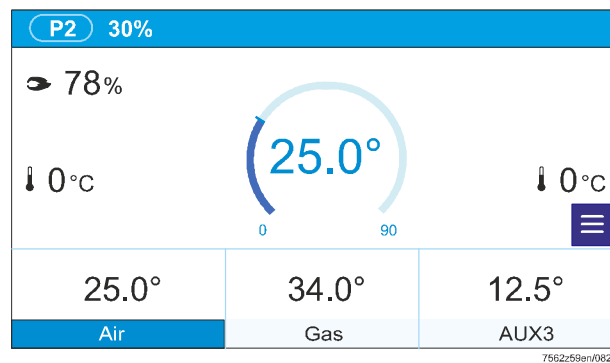

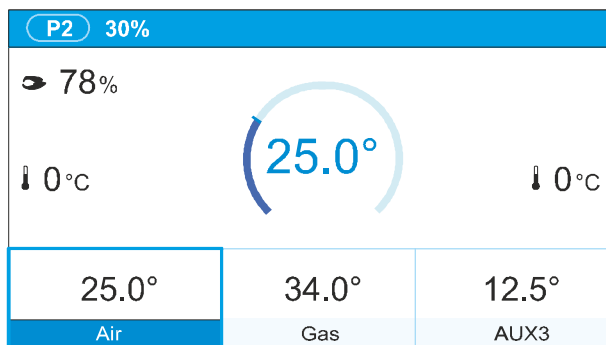


Figure 49: Displaying curve point P2

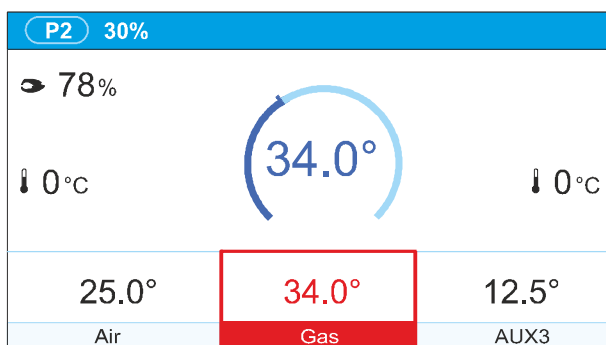
When you press the Menu button  on the AZL66, the selection in the display jumps to the tile for the air actuator. A frame appears around the air actuator tile.



7562z62en/0822

Figure 50: "Air actuator" tile

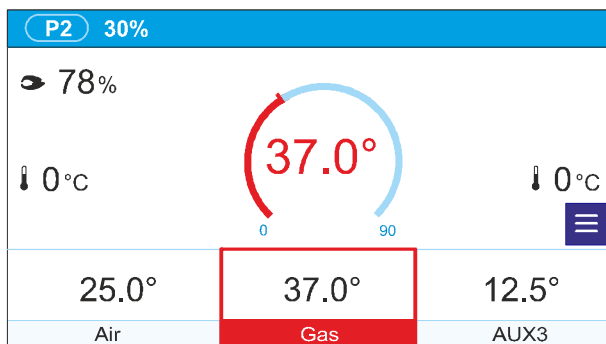
You can now move the frame to the desired actuator by turning the rotary knob.



7562z63en/0822

Figure 51: Selecting a different actuator

If you press the rotary knob on the AZL66, you can then change the position of the actuator by turning the rotary knob ("gas" in this case).



7562z64en/0822

Figure 52: Changing the actuator position

These steps can be applied to all available actuators. By pressing the Return button (↵) on the AZL66, you can leave the curve point with the current values and return to the load setting screen.

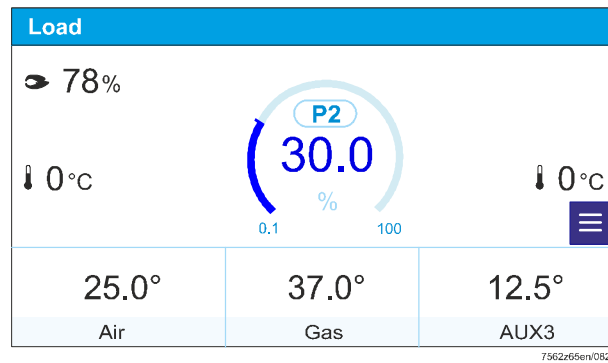


Figure 53: Load setting screen

You can keep increasing the load and working through all the desired load points in the same way until you reach the maximum load. If no further settings are required, the settings menu can be exited here by pressing the Return button (↵) on the AZL66. If you would like to fine-tune the startup settings, turn the rotary knob and move the position point along the previously created ratio control curves to a higher or lower load level. All curve points that have been created will be retained. New curve points can be added in any position or existing curve points can be amended. If one of the actuators is changed at any given load point (where there was not previously a curve point), a new curve point is set automatically. If the new curve point is between 2 existing curve points (e.g., between P2 and P3), the new curve point will be given the designation P3 and all curve points after this will be renumbered accordingly. The curve points are always sorted by the LMV6. A maximum of 16 curve points are permitted. When you leave the commissioning process, the LMV6 always starts in automatic mode; it is not possible to start in manual mode.

5.2 “Non-subsequent commissioning” function

The “Non-subsequent commissioning” function launches if the LMV6 is in lockout position. This is indicated by the text “Non-subsequent” on the display.

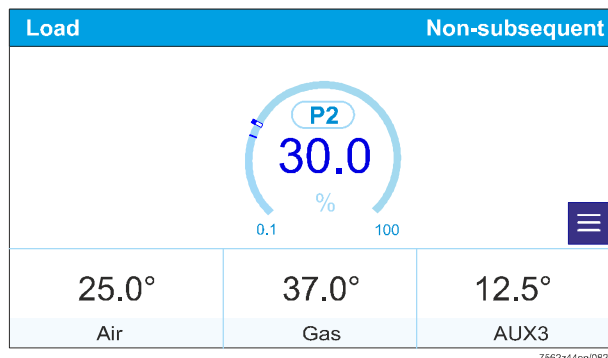


Figure 54: Non-subsequent commissioning

This means that the LMV6 remains locked rather than moving to the curve points. New curve points cannot be created in this mode. For more information, see chapter 5.1 “Subsequent commissioning” function.

5.2.1 Editing a curve point

Unlike in the “Subsequent commissioning” function, in this mode it is only possible to switch between existing curve points. Intermediate areas cannot be reached. The curve point can be edited by pressing the rotary knob.

5.2.2 Deleting a curve point

See chapter 5.5.1 *Deleting a curve point*.

5.2.3 Moving a curve point

See chapter 5.5.2

Changing a load value.

5.2.4 Non-subsequent commissioning

Refer to chapter 5.5.3 Switch between 'Subsequent commissioning' and 'Non-subsequent commissioning'.

5.3 Allocation of colors for ratio control parameters

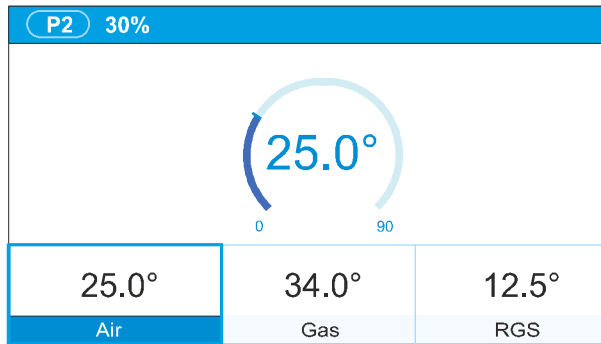


Figure 55: Air color display (dark blue)

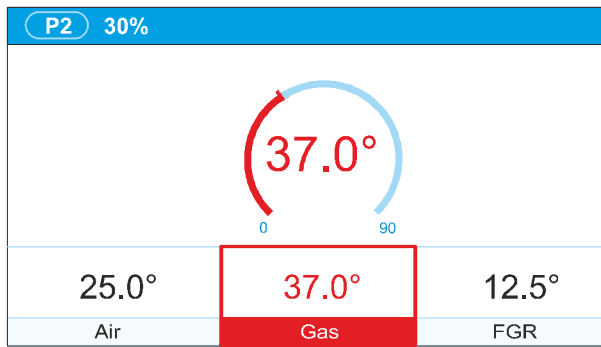


Figure 56: Gas color display (red)

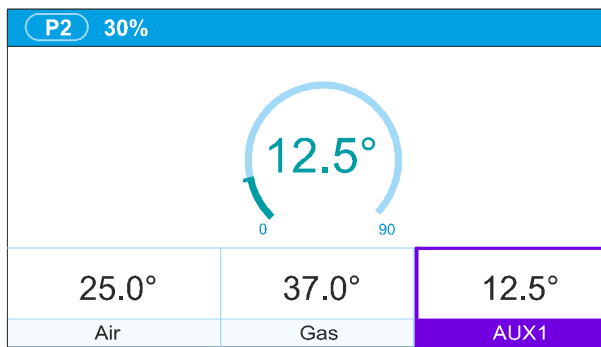


Figure 57: Color display for auxiliary actuator 1 (AUX1) (violet)

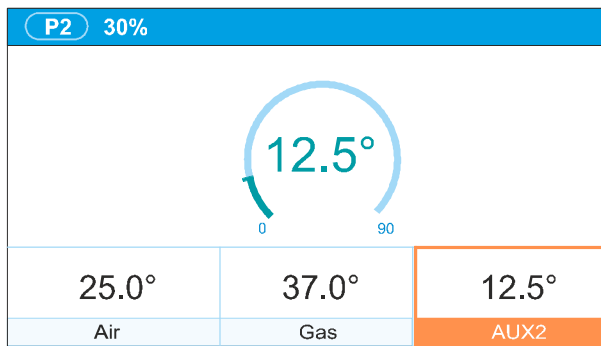


Figure 58: Color display for auxiliary actuator 2 (AUX2) (orange)

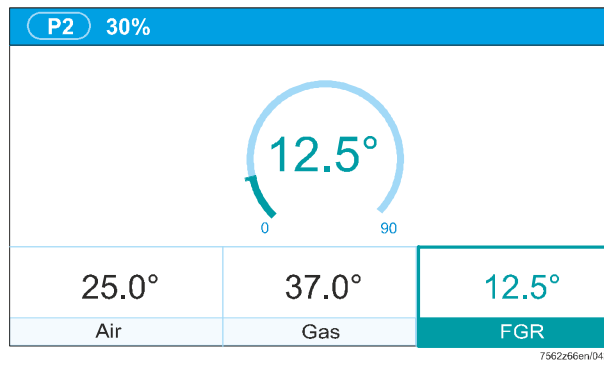


Figure 59: Color display for auxiliary actuator 3/FGR (turquoise)

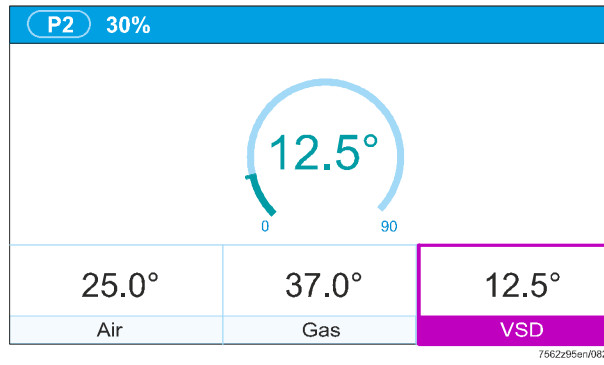


Figure 60: Color display of variable speed drive (VSD) (violet)

5.4 Number of tiles

The display of the tiles for the system components is dynamic. It only displays tiles with components (actuator / variable speed drive) that are also activated and connected. Between 2 and 6 tiles can be displayed.

5.5 “Curve points” menu (option)

The “Curve points” menu can only be accessed if you are located directly on an existing curve point during curve commissioning. The MENU symbol (☰) appears in the display (see red arrow in the figure) and indicates the availability of the option.

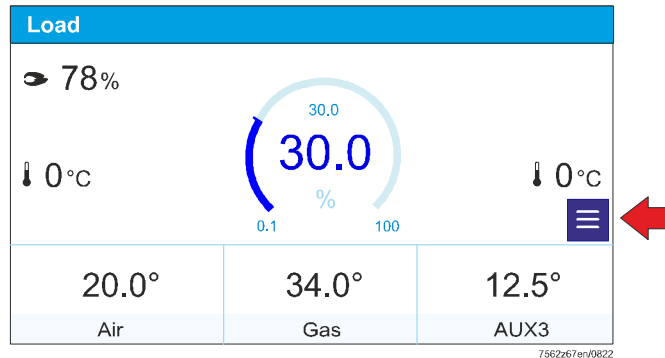


Figure 61: “Curve points” menu

Press the Menu button ☰ on the AZL66 to switch from the “Value adjuster” menu to the “Option” menu.

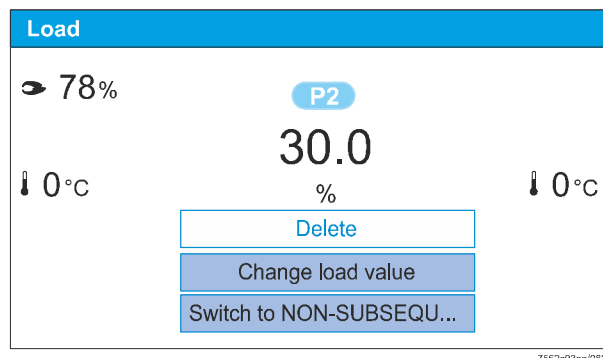


Figure 62: “Option” menu

The “Option” menu enables you to select various context-dependent additional functions for the selected curve point.

5.5.1 Deleting a curve point

You can use the “Delete curve point” function to delete the selected curve point completely. The LMV6 recalculates the ratio control curves on the basis of the next highest and next lowest curve point.

5.5.2 Changing a load value

You can use the “Change load value” function to change the load value for the curve point and, hence, move the curve point. If the curve point is moved to precisely the same place as an existing curve point, the original curve point is deleted automatically and replaced with the curve point that has been moved.

5.5.3 Switch between ‘Subsequent commissioning’ and ‘Non-subsequent commissioning’

This function can be used to switch between the two operating states ‘Subsequent’ and ‘Non-subsequent’ commissioning. With the ‘Subsequent commissioning’ function, the burner must be in operation and the LMV6 immediately starts up with the changes made. With the ‘Non-subsequent commissioning’ function, values of the ratio control curve can be changed although the burner is at another point of the ratio control curve or in standby.

Once the positions and values have been changed in the ‘Non-subsequent commissioning’ function, Siemens recommends an immediate check of the combustion values by approaching these curve points.

5.6 Current values

Up to 6 pieces of system information are displayed to the side of the value adjuster to assist the user with setting the ratio control curve.

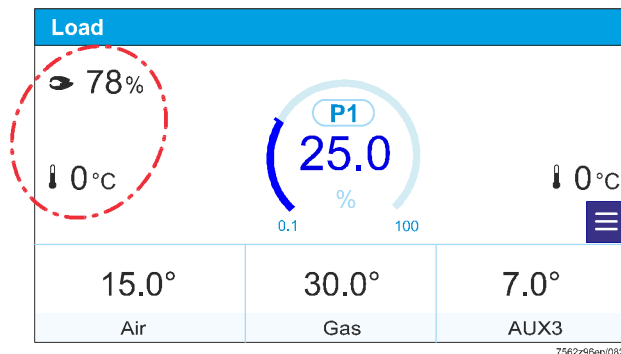


Figure 63: System information example

Symbol	Function/Meaning
	Flame signal strength
	Temperature
	Flue gas recirculation (FGR) temperature
	Stored temperature during flue gas recirculation (FGR)
	O2 value
	Pressure

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