

# User Manual

## Led display controller

### Fumis ALPHA



## Using Fumis ALPHA keyboard

### Fumis ALPHA keyboard with remote control

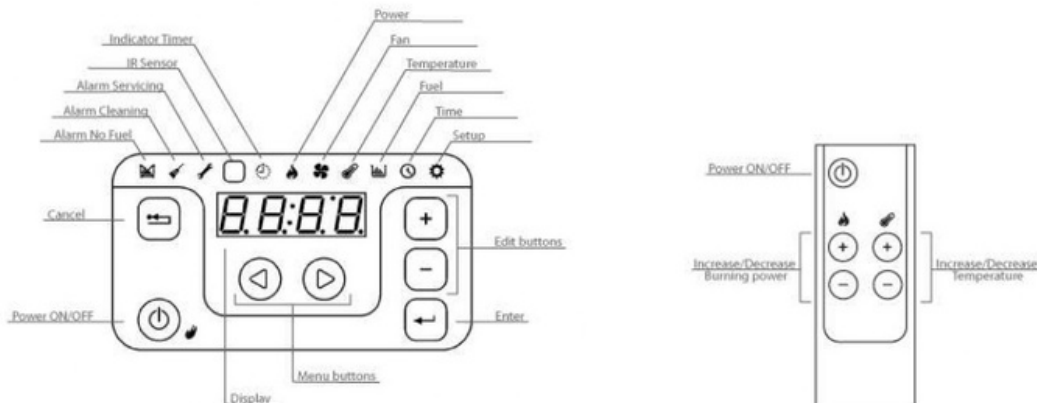


Figure 1: Fumis ALPHA keyboard and remote control

The Fumis ALPHA capacitive touch keyboard is designed intuitively. It enables users at home to operate with the Fumis ALPHA controller.

#### Note

For best performance keep the keyboard clean. Stains (for example, grease) on the buttons can send the signal that the button was pressed.



The Fumis ALPHA infrared remote control is intended for day-to-day use when the combustion system is fully configured and operational. It is used for modifying the burning power and temperature settings, and enables you to turn the combustion system on or off. The remote control unit is optional.

At the top of the Fumis ALPHA keyboard are located indicators for various alarms, timer mode operation, and menus. The IR sensor is used for remote control unit.

The display shows the set or current values for the currently selected menu option. With buttons you can navigate through the menu and control the operation of the Fumis ALPHA controller. Refer to the Table 1: Fumis ALPHA keyboard buttons on page 14 for descriptions of the buttons.

The Fumis ALPHA keyboard is also equipped with the beeper, which provides the keyboard feedback signals. The following sound signals are available:

- Short high tone: sounds when navigating the menu and editing the settings
- Long low tone: sounds in case of an invalid operation (wrong button pressed)
- Long high tone: in case of an alert, this tone sounds with the user defined loudness, and in case of an error, this tone sounds with 100% loudness. For description of alerts and errors, refer to chapter *Troubleshooting* on page 24.

Button	Description
	Power ON/OFF button is used for turning the combustion system on or off and for deleting errors/alerts. Press and hold the button for 1 second.
	Menu buttons (left and right buttons) are used for navigating the first level menu context. The currently





	selected menu context is indicated with the corresponding icon at the top. In addition, these buttons are used in the edit mode.
	Edit buttons (plus and minus buttons) are used for navigating the submenus and increasing/decreasing values in the edit mode, when the selected value blinks.
	
	Enter button is used for entering the edit mode and confirming the set values, or selecting the additional submenus.
	Escape/Cancel button is used for discarding the changes and returning up one level in the menu. If you press and hold this button for more than 3 seconds, the last error or alert code is displayed.

Table 1: Fumis ALPHA keyboard buttons

## Menu structure

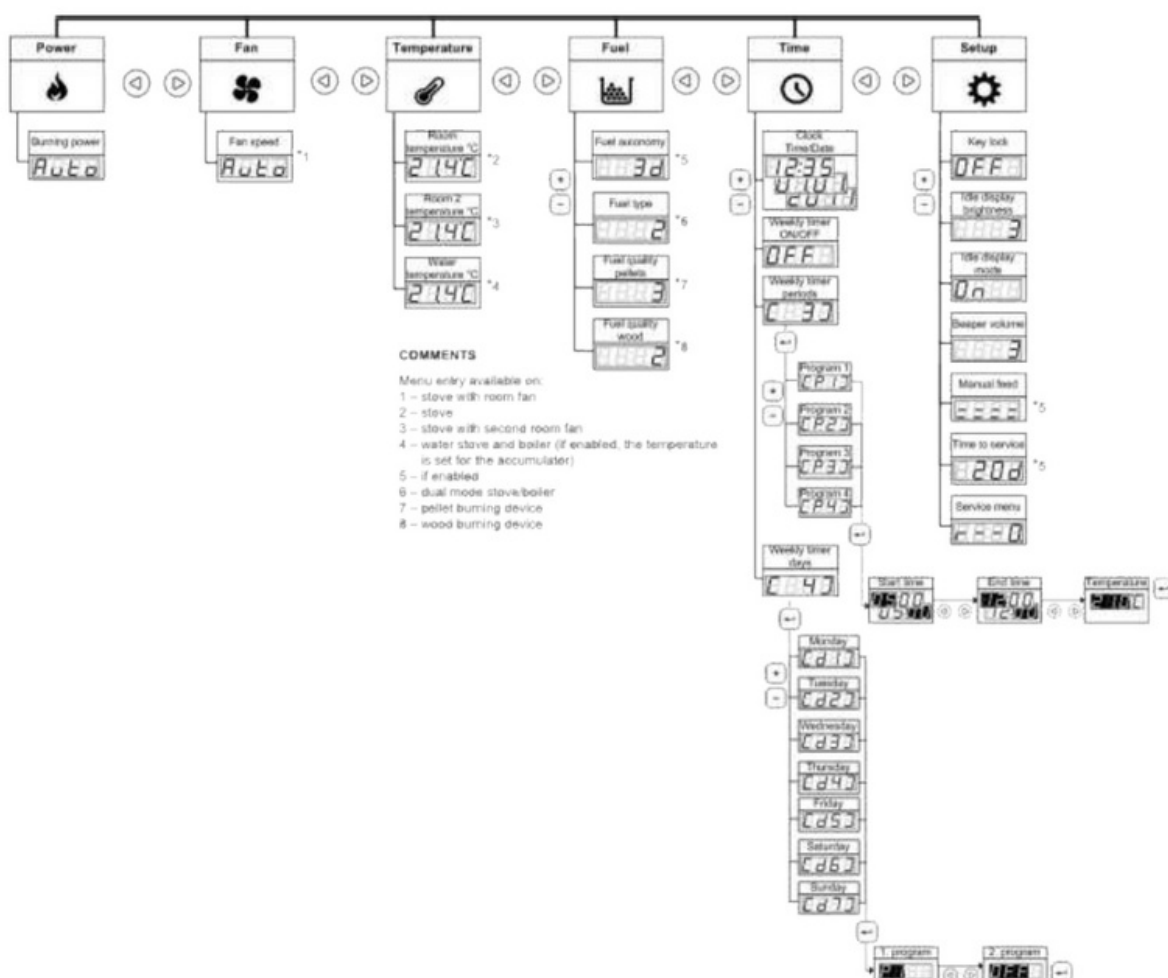


Figure 2: Menu structure

#### **Note**

The Fumis ALPHA menu structure depends on the configuration and options. The menu structure in Figure 35 shows all possible menu entries. Depending on the selected configuration, some entries are not available. In such cases the menu entry is not included and submenus are renumbered accordingly.

The display values are for representational purposes only and may differ from the actual display values.

### **Navigating the menu**

*To navigate the first level menu context use the left and right arrow buttons. The display shows the setting for the first submenu entry.*

*To navigate the second level menu (the submenu), use the plus and minus buttons to move up and down. The menu structure in the figure is inverted, so it may seem you are moving down the menu, but you are actually going up. For easier navigation through the second level menu, the corresponding entry number in brackets is displayed briefly.*

*To modify a setting in the menu, press the Enter button to enter the edit mode for the selected setting. The display value starts blinking. Use the plus and minus buttons to change the value. To move through the steps in the edit mode, use the left and right arrow buttons. When finished, press the Enter button to save the setting and exit the edit mode. The display returns to the menu entry you edited.*

*The display shows the set value, or the actual value, depending on the setting. For example, when you edit the temperature, you enter the desired room temperature. After you exit the edit mode, the display shows the actual temperature (which may differ from the set temperature). When you edit the fuel quality setting, the display shows the set value.*

*To enter the third level menu, press the Enter button and then use the plus and minus buttons to move between the entries. The procedure for modifying the settings is the same as in the second level menu.*

*To exit the edit mode without saving the changes, press the Cancel button. This button is also used for returning up one level in the menu. For example, if you are editing the Program 3 in the Weekly Timer Periods menu entry, press the Cancel button to discard the changes and return to Program 3. Pressing the Cancel button moves to Weekly Timer Periods, then to Clock, and then to Burning Power in the Power menu context.*

### **Setting the clock**

*The Fumis ALPHA keyboard enables you to set the current time and date.*

*To view the current time, press the menu button to enter the Time context. The current time is shown on display.*

*To set the time and date, in the Time context press the Enter button. The hour value is blinking. With the edit buttons set the desired hour. Then press the right menu button. The minute value is blinking. Set the desired minute. Press the right menu button and set the date in the same manner. The date is set in the format dd.mm.yyyy. Then press the right menu button and set the day of the week. Set the corresponding number between 1 (Monday) and 7 (Sunday). Confirm the time and date settings by pressing Enter.*

### **Setting the room temperature**

*With the Fumis ALPHA controller you have two options for setting the room temperature. You can:*

- Use weekly timer programs
- Set or modify the room temperature manually

*Using the weekly timer programs you can fully automate the operation of your combustion system and little or no user intervention is required. For more information refer to chapter Setting the weekly timer programs on page 16. You can also set or modify the room temperature manually. If you are using the weekly timer programs, this enables you to temporarily override the program settings. The program settings are reset when conditions, set with the timer, are met (for example, end time is reached and the combustion system turns off).*



To view the current room temperature, press the menu button to enter the Temperature context menu. The current room temperature value is shown on the display.

To set the desired room temperature, in the Temperature context menu press the Enter button. The display shows the set target temperature in the edit mode (the value is blinking). You can increase or decrease this value with the Edit buttons. When finished, press the Enter button to confirm the set temperature. The display shows the current room temperature.

**Note**

You can also use the remote control to set the desired room temperature.

In case your combustion system is equipped with the second room fan, you can also set the desired temperature for the second room.

**Note**

The decimal points for setting the temperature depend on the configuration.

### **Setting the output power**

The Fumis ALPHA controller regulates your combustion system for optimum performance. You can override these settings and modify the burning power to reach the desired room temperature faster, or conserve fuel. The burning power setting influences the fuel feeder and fan speed settings.

The burning power setting represents the maximum burning power the combustion system will use to heat up the environment. When the set temperature is reached, the burning power is decreased automatically. For example: if you choose burning power 3, the combustion system will only modulate between power 1 and 3 (based on desired temperature).

To view the current burning power, press the menu button to enter the Power context. The current burning power level value is shown on display.

For faster heating up to the desired room temperature you can increase the burning power setting. In the Power context press the Enter button. The display shows the burning power in the edit mode (the value is blinking). You can increase or decrease this value with the Edit buttons. When finished, press the Enter button to confirm the set burning power. Display shows the current burning power level. The fuel feeder is dosing the fuel faster and the heat exchange fan operates faster to increase the output power.

To conserve with fuel and energy, you can decrease the burning power setting. The fuel feeder and fan will operate slower and the set room temperature is reached slower.

**Note**

You can also use the remote control to set the desired burning power.

### **Setting the weekly timer programs**

The Fumis ALPHA controller enables you to set the weekly timer programs to automate the operation of the combustion system. You can set six different programs and select three programs for each day of the week. The program defines the start time, the end time, and the desired temperature.

To set a program, press the menu button to enter the Time context and then press the edit button to select the Weekly timer periods. The display shows (3). Press Enter to select Program 1, display shows (P1), and then press Enter again to access the edit mode for Program 1. The start time hour value is blinking. With the edit buttons set the desired start time hour. Then press the right menu button. The start time minute value is blinking. Set the desired start time minute. Press the right menu button and set the desired end time. Then press the right menu button to set the

desired room temperature for the selected time period. Confirm the program settings by pressing Enter. Repeat the procedure to set the programs.

Example:

Program 1		Program 2		Program 3		Program 4		Program 5		Program 6	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
5:30	7:30	8:00	11:30	12:00	23:00	17:00	23:00	20:00	22:30	4:00	7:00
16°C		18°C		19°C		18°C		17°C		15°C	

To set the programs for each day of the week, press the menu button to enter the Time context and then press the edit button to select the Weekly timer days. The display shows (4). Press Enter to select Monday, display shows (d1), and then press Enter again to access the edit mode for Monday. The 1. program value is blinking. With the edit buttons set the desired program. Then press the right menu button. The 2. program value is blinking. Set the desired program. Confirm the program settings by pressing Enter. Repeat the procedure to set the programs for all weekdays.

Example:

DAY/HOUR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
(d1) Monday							16°C												18°C					
(d2) Tuesday							16°C												18°C					
(d3) Wednesday							16°C												18°C					
(d4) Thursday							16°C												18°C					
(d5) Friday							16°C												18°C					
(d6) Saturday							15°C			18°C								17°C						
(d7) Sunday							15°C			18°C								19°C						

To enable or disable the operation of the combustion system with the weekly timer programs, press the menu button to enter the Time context and then press the edit button to select the Weekly timer ON/OFF. Press Enter and toggle the weekly timer on or off. If you disable the weekly timer operation, set the combustion system operation manually.

#### Example:

You can disable the weekly timer programs in the time of vacations.

Program overlapping:

If the programs overlap, the program with higher number assumes priority (for example: P2 assumes priority over P1; P4 over P3, P2 and P1; P6 over P5, P4, P3, P2 and P1).

The following figure shows the working of combustions system in case of P1, P2 and P3 programs overlapping.

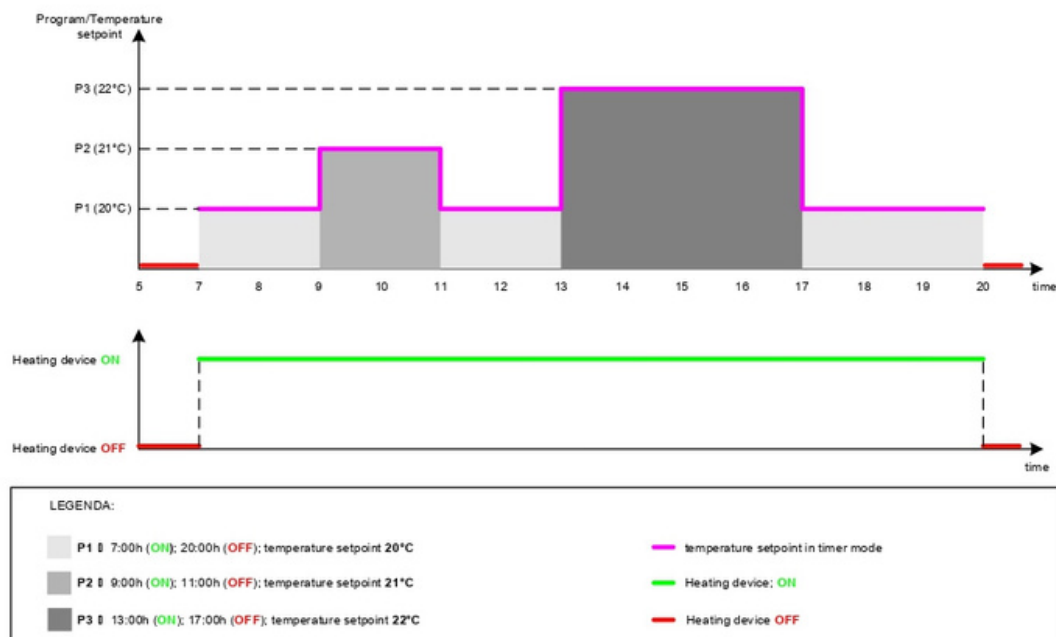


Figure 3:

Programs overlapping

### Setting the fuel options

The Fuel menu context shows the fuel autonomy and enables you to select the fuel quality. In the combined wood/pellet combustion systems, you can select the wood or pellet fuel type.

The Fuel autonomy value shows how much fuel is left in the container (in days or hours). For example, value 3d means there is enough fuel for three more days of operation. If you are using the pellet level sensor, the fuel autonomy is monitored automatically. You can also manually set the fuel autonomy. When you fill the empty container (up to full level in the magazine), set the fuel autonomy to FULL. The display shows how long the fuel in the container will last (in days or hours). When there is fuel for less than an hour left, the display shows LO (low). When the container empties, the Fuel autonomy sets to OFF and icon (no fuel) lights up on user interface. Fill the container and set the Fuel autonomy setting to FULL. If you refill the fuel container before it is completely empty, remember to reset the fuel autonomy to FULL. Be careful to fill up the fuel to the "full" level in the magazine, otherwise the fuel autonomy will not display properly.

#### Note

For the above-mentioned to work properly the combustion device has to support Fuel autonomy function.

With the combined wood/pellet combustion systems the burning can be performed manually, using the wood fuel, or automatically, using the pellet fuel. If wood mode is selected, the system burns on wood until the gases temperature in the burning chamber falls below the set threshold (the wood burns out). Then the combustion system switches to pellets automatically and operates in pellet mode (option). To switch back to wood mode, set the Fuel type option value to 2 to select the wood fuel type.

You can optimize the burning and feeder options based on the type and efficiency of the fuel used. With the Fuel quality options you can select the level of pellet and wood combustion efficiency, where low value stands for more humid fuel with less combustion efficiency, and high value stands for fuel with high combustion efficiency. You can select between values 1 to 3.



## Modifying the setup options

In the Setup menu context you can set the options for Key lock, Idle display brightness, Idle display mode, Beeper volume, Manual feed and view the Time to service (option, read only).

To modify the setup options, press the menu button to enter the Setup context. To move between the setup options, press the edit buttons to display the settings. To modify a setting, press Enter and use the edit buttons to increase/decrease the value. When finished, press the Enter button to confirm the set value.

The Key lock option enables you to lock the keyboard in order to prevent accidental changes of the settings. With the key lock enabled, you can navigate the menu to display current values, but you cannot edit any of the settings, except the Key lock itself. Note that this option does not disable the Fumis ALPHA remote control. The Key lock setting offers the following options:

- OFF: the Key lock is disabled, all buttons are available
- Lo: the edit mode is disabled (the Enter button is locked)
- Hi: the edit mode and the power on/off is disabled (the Enter button and the Power button are locked, only return to Lo or OFF option is enabled)

### Tip

We recommend you to use the Key lock option when cleaning the Fumis ALPHA keyboard or when children use the keyboard without adult supervision.

You can increase or decrease the display brightness in the idle mode to conserve energy. As soon as you touch the keyboard, the brightness of the display will increase to default value.

The Idle display mode setting offers the following options:

- OFF: The keyboard stays in the selected menu context. In case you were in the edit mode, the changes are discarded and the edit mode is exited.
- Option 1: the keyboard exits the current menu context and cycles between the current room temperature, fuel autonomy and clock. In case the *Fuel Autonomy* is set to OFF or the combustion system does not support Fuel autonomy option, this menu context is skipped.
- Option 2: The keyboard exits the current menu context and moves to the *Temperature* menu. The display shows the current room temperature.
- Option 3: The keyboard exits the current menu context and moves to the *Clock* menu. The display shows the current time.
- Option 4: The keyboard exits the current menu context and moves to the *Fuel autonomy* menu. In case the *Fuel Autonomy* is set to OFF, the keyboard exits this menu context and moves to the *Temperature* menu.

Beeper volume setting controls the loudness of the keyboard sound signals.

With the option Manual feed you can manually start the feeder. The feeder will operate for a short while and then stop. With this option you can clean or empty the feeder. You can use this option before the first ignition, when the feeder is empty.

The Time to service shows in days when you should contact the service personnel to perform regular maintenance of your combustion system. This value (in days) is read-only and can be modified by authorized personnel only.



## ***Servicing Fumis ALPHA controller***

---

*Basic servicing procedures of the Fumis ALPHA controller can be performed using the Fumis ALPHA keyboard. For additional options and advanced diagnostic procedures use the Fumis PC-PRO application.*

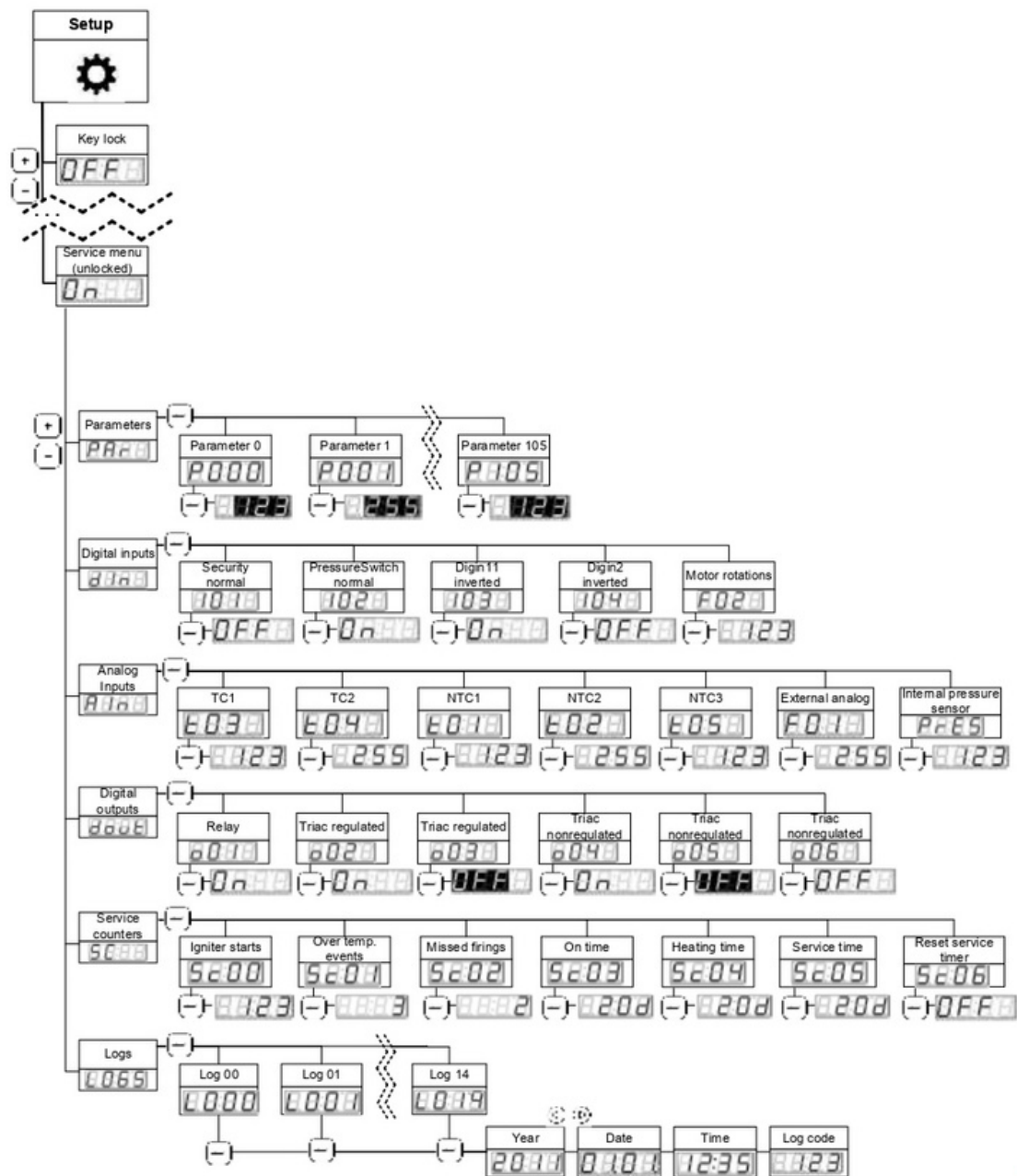
### ***Unlocking the service menu***

*To enable the service menu, in Fumis PC-PRO application configure the ServiceMenuKey (hidden parameter). If this parameter is set to 0, the service menu is not available in the Fumis ALPHA menu structure. The set ServiceMenuKey value is used for unlocking the service menu. The Service menu is locked for safety reasons.*

*To unlock the service menu, navigate to the Service menu entry and press the Enter button. The display shows the randomly generated number between 1111 and 9999. This four digit number is different every time. Add up the digits and then add the service menu key to the sum. Then press the Enter button to enter the edit mode (0 value is blinking). Use the edit buttons to enter the unlock code (the sum of the randomly generated digits and the service menu key) and press Enter button to confirm. The display shows On and you can navigate the service menu.*

*To lock the service menu, navigate to the Service menu entry (display shows On) and press the Enter button. The display shows the lock symbol and the service menu is not accessible. Note that the service menu locks automatically after 30 minutes of inactivity.*

## Service menu structure



4: Service menu structure

Figure

### Tip

For easier navigation through the service menu, you can move between the non-editable entries in the fourth level with the edit buttons.

## **Modifying the parameters**

*The Fumis ALPHA parameters are used to fine tune the operation of the combustion system with the Fumis ALPHA controller. Set the parameter values of the Fumis ALPHA controller, according to the selected configuration, to optimize the performance of the combustion system.*

*With the Fumis ALPHA keyboard you can modify the parameter values, but you cannot change the valid parameter range settings. The valid parameter range settings are set in the configuration procedure in the Fumis PC-Pro application.*

*Default range for a parameter is between 0-255, but this range can be further limited during the configuration procedure. With the Fumis ALPHA keyboard you can enter the parameter value within the set valid range.*

### **Note:**

*It is recommended to use the Fumis PC-PRO application for modifying the parameters.*

## **Input and output diagnostics**

*For the diagnostic purposes you can digitally test the inputs and outputs.*

*In the service menu you can view the state of the digital and analog inputs. The values are read-only and cannot be modified.*

*Additionally, you can view the state of the digital outputs. While the combustion system operates, the values are read-only. If the combustion system is off, the values can be modified.*

## **Viewing service counters**

*The Fumis ALPHA controller monitors the combustion system operation and provides different service counters. The values are read-only and cannot be modified.*

*The On time counter shows the total time the combustion system is plugged in the mains, and the Heating time and the Service time counters show the total time the combustion system is burning. The Service time counter can be reset.*

*The On time, Heating time and Service time entry values are displayed in hours or days. Up to 999 hours is displayed in hours (for example, 123h), over 999 hours is displayed in days (for example, 123d). Value over 999 days is displayed as Hi.*

*To reset the Service time counter, navigate to the Reset service timer entry and press the Enter button to enter the edit mode. The display shows Off. Press the right arrow menu button to display On and then press the Enter button to confirm. The Service time counter is reset.*

## **Viewing logs**

*Fumis ALPHA controller offers event and error logging and can store up to 15 logs. Logs are available in the service menu.*

*To view the logs, navigate to the Logs entry and press the Enter button. The menu lists all 16 logs. Each log contains the date and time of the event/error, log code and log data. To move between them use the left and right menu buttons. In case a log is empty, --- is displayed. When logs are full, they are overwritten from the oldest one up.*

## Setting the Time to service notification

Fumis ALPHA controller enables to set up the notification for regular maintenance. The Time to service shows when the regular service should be performed. It counts down in hours, and when this counter reaches zero, the Service icon starts blinking. Regardless, the combustion device still continues to operate.

To set up the notification define the service time period with the parameter PAR94. This value is used in connection with the Service time counter. With the PAR94 you define the service time period in days, but the Service time counter counts the hours. This means that if you set the PAR94=1 (day), the Service time counter displays 24 (hours).

Maximum value of the PAR94 is 255, which means 6120 hours ( $255 \times 24 = 6120$ ). The display can show up to 999 hours, value over 999 hours is displayed as Hi.

When the Service time counter reaches the value, set with the parameter, the notification is triggered. When regular maintenance is performed (by authorized personnel only), the Service time counter must be reset. For instructions refer to chapter Viewing service counters on page 22.

## Replacing the battery

Fumis ALPHA controller switches to on-board battery during power failure or when disconnected from the mains power supply. The battery powers the internal clock and maintains the internal microprocessor memory.

When the battery is empty, the controller operates normally while connected to the main power supply. During power supply failure, the internal clock stops and the operation phase is not stored in memory. After power supply returns, the clock is reset, and the controller stays in OFF phase (Stove mode) or in Fire up phase (Boiler mode).

To replace the battery:

1. Disconnect the mains power supply.
2. Locate the battery on the PCB (see Figure 5)
3. With ISOLATED tweezers or similar tool remove the old battery from the holder. Take care not to bend the battery holder contacts.
4. Check the polarity orientation and insert the new battery (refer to Figure 5)
5. Reconnect the mains power supply.

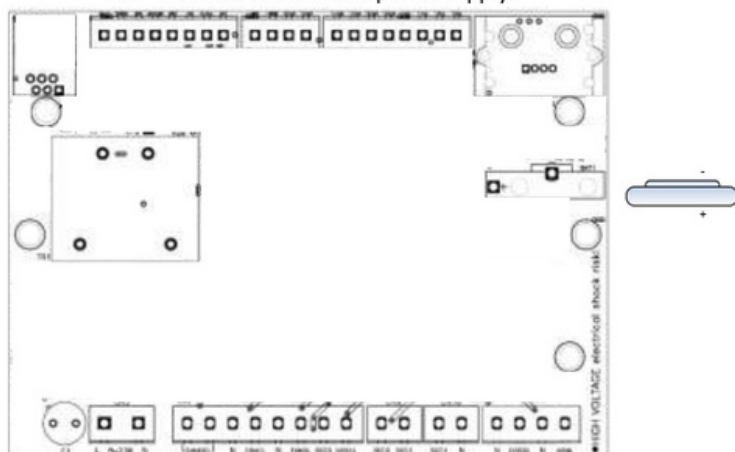


Figure 5: Replacing the battery



## Troubleshooting

---

The Fumis ALPHA keyboard provides notifications and warnings for alerts and errors, which can occur when using the Fumis ALPHA controller. The alarm icons indicate a problem. An alert notification is indicated with the blinking icons, errors are indicated with continuously lit icons. In case of an alert, the combustion system is still operational, in case of an error the combustion system is seriously malfunctioning and the service personnel should be contacted. Each alert and error has a code, which can be used to identify the problem. To display the code, press and hold the Escape button. In case there is no information on the alert/error code, the display shows ----.

### Low fuel

Indication: **Icon No fuel is blinking**

Code: A001

Cause: When the fuel in the container reaches the Low fuel level, the notification is triggered. This notification is available if you are using the Fuel autonomy option or your combustion system is equipped with the fuel level sensor.

Solution: Refill the fuel container. If you are using the Fuel autonomy option, reset this setting to Full by pressing the button ON/OFF on the user interface.

### No fuel

Indication: **Icon No fuel is on**

Code: ----

Cause: When the fuel in the container runs out, the notification is triggered. The combustion system turns off and cannot be restarted.

Solution: Refill the fuel container. If you are using the Fuel autonomy option, reset this setting to Full by pressing the button ON/OFF on the user interface.

### Burning chamber or chimney dirty

Indication: **Icon Cleaning is blinking**

Code: A003

Indication: **Icon Cleaning is on**

Code: ----

Cause: The burning chamber or chimney are dirty and require cleaning. There is too much ash or unburned pellets in the burning chamber, or chimney is getting congested with soot.

Solution: Check and empty the burning chamber or contact the service personnel to sweep the chimney.

### Low battery

Indication: **Icon Service is blinking**

Code: A004

Cause: The Fumis ALPHA controller battery is getting low. The combustion system is still operational.

*Solution: Contact the service personnel to change the Fumis ALPHA controller battery. Do not attempt to change the battery on your own.*

### ***Fan 1 speed sensor failure***

*Indication: **Icon Service is blinking***

*Code: A005*

*Cause: The fan 1 speed sensor malfunctioned. The combustion system is still operational.*

*Solution: Contact the service personnel.*

### ***Pressure sensor failure***

*Indication: **Icon Service is blinking***

*Code: A007*

*Cause: The pressure sensor malfunctioned. The combustion system is still operational.*

*Solution: Contact the service personnel.*

### ***Regular maintenance required***

*Indication: **Icons Cleaning and Service are blinking***

*Code: A002*

*Cause: The Time to service shows in hours when you should contact the service personnel to perform regular maintenance of your combustion system. The Time to service counter counts down in hours, and when this counter reaches zero, the Service icon starts blinking. This value (in hours) is read-only can be modified by authorized personnel only.*

*Solution: Contact the service personnel.*

### ***Burning chamber or fuel container door open***

*Indication: **Icons No fuel, Cleaning and Service are blinking***

*Code: A006*

*Cause: The combustion system is equipped with the door sensor switch. Burning chamber or fuel container door is open.*

*Solution: Check and close the burning chamber or fuel container door. In case this cannot be performed or does not work, contact the service personnel.*

### ***Remote control battery empty***

*Indication: **Fumis ALPHA remote control is not responsive***

*Cause: The battery of the Fumis ALPHA remote control is empty. The Fumis ALPHA remote control uses the CR2025 battery. You can also insert the CR2032 battery (recommended because of longer battery life-span).*

*Solution: Replace the battery. For instructions refer to the back side of the remote control unit.*

## Service is required

Indication: **Icon Service is on**

Cause: The combustion system malfunctioned and is not operational. This can be due to:

- Code E001: Keyboard error
- Code E002: IR communication error
- Code E003: RF communication error
- Code E004: MB communication error
- Code E101: Fire error or water overtemperature
- Code E105: NTC2 error
- Code E106: NTC3 error
- Code E107: TC2 error
- Code E108: Security switch error
- Code E109: Pressure switch error
- Code E110: NTC1 error
- Code E111: TC1 error
- Code E112: Fuel overtemperature
- Code E115: General error

Solution: Note the error code and contact the service personnel.

## LED indicators on controller

The Fumis ALPHA controller is equipped with two LED indicators, which show the operation of the controller. The table below describes the functions of the LED signals:

Signal	LED 2	LED 1
Function	Power supply check	Communication check
OFF	No power supply	Faulty or not programmed
Lit	Power supply OK	–
Fast blinking (5 blinks per second)	–	Communication OK
Slow blinking (2 blinks per second)	–	Unit not programmed with the Fumis PC-PRO application, only bootloader

## Power supply failure

During power supply fail, the Fumis ALPHA controller remains active due to internal battery. Internal status remains as it was before the power failure. Internal electronics runs in power saving mode consuming very low battery power (approx. 10nA) thus allowing very long battery life (10 years min).

In case of a power supply failure the Fumis ALPHA controller operates as follows:

Duration of power supply failure	Operation before the power supply failure	Operation after the power supply failure
Less than 2 minutes	Fire Up phase	The controller continues normally
	Burning phase	The controller checks the air/water temperature and continues in the Burning phase, or restarts in

		the Fire Up phase.
	OFF	OFF
More than 2minutes	Fire Up phase	The controller continues normally
	Burning phase	The controller checks the flue gases temperature. If the flue gases temperature dropped below PAR56, the combustion system restarts in the Fire Up phase, otherwise it continues in the Burning phase.
	OFF	OFF

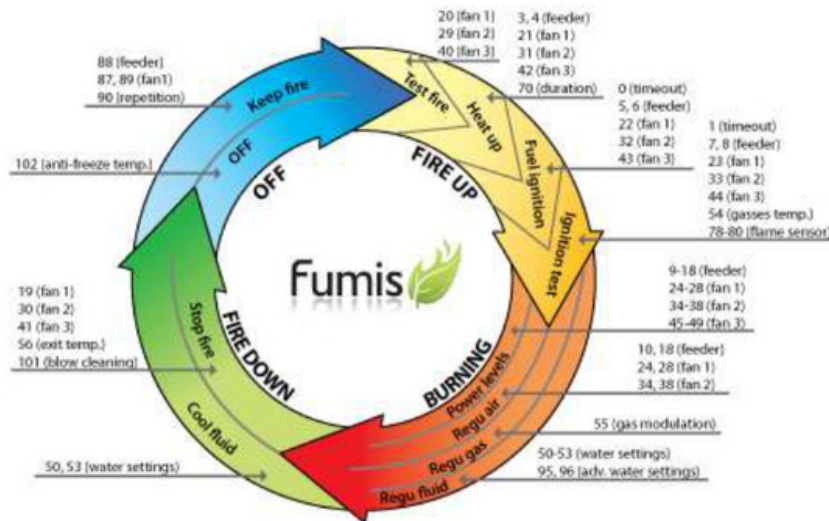
### ***Unspecific errors on Fumis ALPHA keyboard***

*Certain information stored in Fumis ALPHA controller is updated to Fumis ALPHA keyboard at startup (for example, configuration).*

*In case the Fumis ALPHA keyboard displays unexpected errors when making changes to the controller, disconnect and then reconnect the keyboard to reset the keyboard. Do not touch active buttons during calibration. As a result, data on the keyboard will be reset. If the problem persists, contact ATech for support.*



## Appendix A - Operation phases



Operation phase	Operation sequence	Parameters
OFF	OFF	PAR102 (anti-freeze temperature)
	Keep Fire	PAR88 (feeder), PAR87, PAR89 (fan 1), PAR90 (repetition)
FIRE UP	Test Fire	PAR20 (fan 1), PAR29 (fan 2), PAR40 (fan 3)
	Heat Up	PAR3, PAR4 (feeder), PAR21 (fan 1), PAR31 (fan 2), PAR42 (fan 3), PAR70 (duration)
	Fuel ignition	PAR0 (timeout), PAR5, PAR6 (feeder), PAR22 (fan 1), PAR32 (fan 2), PAR43 (fan 3)
	Ignition Test	PAR1 (timeout), PAR7, PAR8 (feeder), PAR23 (fan 1), PAR33 (fan 2), PAR44 (fan 3), PAR54 (temperature), PAR78, PAR79, PAR80 (flame sensor)
BURNING	Power levels 1-5 (Auto), High	PAR9-18 (feeder), PAR24-28 (fan 1), PAR34-38 (fan 2), PAR45-49 (fan 3)
	Regulation Air	PAR10, PAR18 (feeder), PAR24, PAR28 (fan 1), PAR34, PAR38 (fan 2)
	Regulation Gas	PAR55 (gas modulation)
	Regulation Fluid	PAR50-53 (water settings), PAR95, PAR96 (advanced water settings)
FIRE DOWN	Cool Fluid	PAR50, PAR53 (water settings)
	Stop Fire	PAR19 (fan 1), PAR30 (fan 2), PAR41 (fan 3), PAR56 (exit temperature), PAR101 (blow cleaning after Stop Fire)

## Appendix B - List of parameters

### Alarms Timeout

No.	Parameter	Description
0	Heat Up Timeout (Phase2)	Ignition Timeout (in minutes): Maximum wait time for successful firing in the Ignition phase.
1	Ignition Test Timeout (Phase3)	Test Fire Timeout(in minutes): Maximum wait time for flame detection with igniter off in the Test Fire sequence.

### Fuel mode

No.	Parameter	Description
2	Fuel Type	Select Fuel Mode: <b>1=Auto</b> – default pellets related feeder and fan parameters are used <b>2=User</b> – Pellets quality can be selected with PAR92. Based on this selection different feeder and/or fan 1 settings are calculated relatively to the default parameters, set with hidden parameters 53-58 <b>3=Wood</b> – switch to wood mode. Based on PAR93 one of the three preselected wood quality fan settings (set with hidden parameters 59-61) is loaded.

### Feeder 1 settings

Pellet feeder is working in ON/OFF mode. The ratio between ON and OFF times defines the amount of supplied fuel in the burning chamber. All parameter values are set in \*100msec (51 = 5.1 sec).

No.	Parameter	Description
Feeder: Heat Up		
3	Heat Up Feeder OFF Time	Heat Up sequence feeder OFF time: Defines the feeder pause (no dosing) during the Heat Up sequence.
4	Heat Up Feeder ON Time	Heat Up sequence feeder ON time: Defines the feeder dosing time during the Heat Up sequence.
Feeder: Fuel Ignition		
5	Fuel Ignition Feeder 1 OFF Time	Fuel Ignition sequence feeder OFF time: Defines the feeder pause during the Fuel Ignition sequence.
6	Fuel Ignition Feeder 1 ON Time	Fuel Ignition sequence feeder ON time: Defines the feeder dosing time during the Fuel Ignition sequence.
Feeder: Ignition Test		

7	Ignition Test Feeder 1 OFF Time	Ignition Test sequence feeder OFF time: Defines the feeder pause during the Ignition Test sequence.
8	Ignition Test Feeder 1 ON Time	Ignition Test sequence feeder ON time: Defines the feeder dosing time during the Ignition Test sequence.
Feeder: Burning		
9	Power 1 Feeder 1 OFF Time	Power 1 feeder OFF time: Defines the feeder pause at power level 1 in the Burning phase.
10	Power 1 Feeder 1 ON Time	Power 1 feeder ON time: <b>Normal regulation</b> - defines the feeder dosing time at power level 1. <b>Advanced regulation</b> - defines the MINIMUM dosing time for the PID regulator. Controller calculates the feeder dosing time for each power PID regulator output. Maximum number of steps is 1024.
11	Power 2 Feeder 1 OFF Time	Power 2 feeder OFF time: Defines the feeder pause at power level 2 in the Burning phase. NOTE: Not used when advanced regulation is selected.
12	Power 2 Feeder 1 ON Time	Power 2 feeder ON time: Defines the feeder dosing time at power level 2 in the Burning phase. NOTE: Not used when advanced regulation is selected.
13	Power 3 Feeder 1 OFF Time	Power 3 feeder OFF time: Defines the feeder pause at power level 3 in the Burning phase. NOTE: Not used when advanced regulation is selected.
14	Power 3 Feeder 1 ON Time	Power 3 feeder ON time: Defines the feeder dosing time at power level 3 in the Burning phase. NOTE: Not used when advanced regulation is selected.
15	Power 4 Feeder 1 OFF Time	Power 4 feeder OFF time: Defines the feeder pause at power level 4 in the Burning phase. NOTE: Not used when advanced regulation is selected.
16	Power 4 Feeder 1 ON Time	Power 4 feeder ON time: Defines the feeder dosing time at power level 4 in the Burning phase. NOTE: Not used when advanced regulation is selected.
17	Power 5 Feeder 1 OFF Time	Power 5 feeder OFF time: Defines the feeder pause at power level 5 in the Burning phase. NOTE: Not used when advanced regulation is selected.
18	Power 5 Feeder 1 ON Time	Power 5 feeder ON time: <b>Normal regulation</b> - defines the feeder dosing time at power level 5. <b>Advanced regulation</b> - defines the MAXIMUM dosing time for the PID regulator. Controller calculates the feeder dosing time for each power PID regulator output. Maximum number of steps is 1024.

### *Fan settings*

No.	Parameter	Description
-----	-----------	-------------

Fan 1		
19	Stop Fire Fan 1 Speed	<p>FAN1 speed in Fire Stop sequence:</p> <p>Defines the fan 1 speed during the Stop Fire sequence. Stop Fire is active when the heating device is turned OFF and flue gases are not cooled below PAR56.</p> <p>In BURNER configuration the Stop Fire runs until the Flame Sensor gives the NO FLAME signal (set with PAR79 and PAR80). Options:</p> <p><b>OPEN LOOP mode</b> (settings 0-255 are 0-100% applied voltage to the motor. Exact speed of the motor is not measured)</p> <p><b>CLOSED SPEED LOOP mode</b> (settings 0-255 are 0-2900 rpm of the motor. The motor speed is parameter value * 11.4)</p> <p><b>CLOSED PRESSURE LOOP mode</b> (parameters settings 0-255 are 0-16Pa differential pressure). This scaling can be customized according to air flow tube characteristics)</p>
20	Test Fire Fan 1 Speed	<p>FAN1 speed in Test Fire sequence:</p> <p>Test Fire is executed when the heating device is switched ON and 30 seconds after the temperature of flue gases is higher than PAR54 or the Flame Sensor reports the FLAME condition (in Burner mode). In this sequence, the controller starts the fan with the set speed. At the end of the sequence it checks if flue gases temperature rose for more than 3°C/min or if Flame Sensor gave the FLAME signal. If so, the Burning phase is started, if not, the test is repeated until timeout (set with PAR1).</p>
21	Heat Up Fan 1 Speed	<p>FAN1 speed in Heat Up sequence:</p> <p>Defines the fan speed in the Heat Up sequence.</p>
22	Fuel Ignition Fan 1 Speed	<p>FAN1 speed in Fuel Ignition sequence:</p> <p>Defines the fan speed in the Fuel Ignition sequence.</p>
23	Ignition Test Fan 1 Speed	<p>FAN1 speed in Ignition Test sequence:</p> <p>Defines the fan speed in the Ignition Test sequence.</p>
24	Power 1 Fan 1 Speed	<p>FAN1 speed at power 1:</p> <p><b>Normal regulation</b> - defines the FAN1 speed at power 1 (depends on the selected fan mode - open loop, closed speed loop or closed pressure loop).</p> <p><b>Advanced regulation</b> – defines the MINIMUM allowed FAN1 speed for the PID regulator. Controller calculates the FAN1 speed for each power PID regulator output. Maximum number of steps is 1024.</p>
25	Power 2 Fan 1 Speed	<p>FAN1 speed at power 2:</p> <p>Defines the FAN1 speed at power 2 (depends on the selected fan mode - open loop, closed speed loop or closed pressure loop).</p> <p>NOTE: Not used when advanced regulation is selected.</p>
26	Power 3 Fan 1 Speed	<p>FAN1 speed at power 3:</p> <p>Defines the FAN1 speed at power 3 (depends on the selected fan mode - open loop, closed speed loop or closed pressure loop).</p>

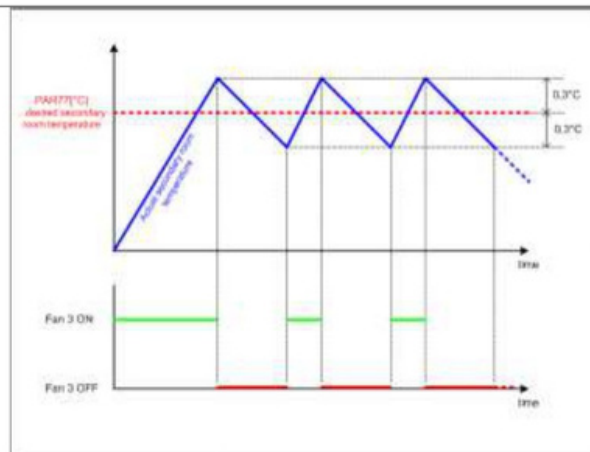


		NOTE: Not used when advanced regulation is selected.
27	Power 4 Fan 1 Speed	<p>FAN1 speed at power 4:</p> <p>Defines the FAN1 speed at power 4 (depends on the selected fan mode - open loop, closed speed loop or closed pressure loop).</p> <p>NOTE: Not used when advanced regulation is selected.</p>
28	Power 5 Fan1 Speed	<p>FAN1 speed at power 5:</p> <p><b>Normal regulation</b> – defines the FAN1 speed at power 5 (depends on the selected fan mode – open loop, closed speed loop or closed pressure loop).</p> <p><b>Advanced regulation</b> – defines the MAXIMUM allowed FAN1 speed for the PID regulator. Controller calculates the FAN1 speed for each power PID regulator output. Maximum number of steps is 1024.</p>
<p>Fan 2</p> <p>FAN2 can be used:</p> <ul style="list-style-type: none"> <li>- as ambient air fan (<i>FAN2 for Room Heating</i> option), usually used with stoves and other air to air heat exchanger devices</li> <li>- as chimney fan performing flue gas suction functions (<i>FAN2 As Chimney fan</i> option), usually used in burner applications where FAN1 is used as combustion fan, blowing air into the burning chamber, while FAN2 is sucking out of the burning chamber</li> <li>- for keeping constant underpressure in the burning chamber (<i>FAN2 As Chimney Fan + FAN2 Pressure Close Loop</i> option)</li> </ul>		
29	Test Fire Fan 2 Speed	<p>FAN2 speed in Test Fire sequence</p> <p>NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.</p>
30	Stop Fire Fan 2 Speed	<p>FAN2 speed in Stop Fire sequence:</p> <p>NOTE: If the flue gases temperature is below PAR58 in FAN2AsAmbient mode, FAN2 is switched off.</p>
31	Heat Up Fan 2 Speed	<p>FAN2 speed in Heat Up sequence</p> <p>NOTE: If the flue gases temperature is below PAR58 in FAN2 for Room Heating mode, FAN2 is switched off.</p>
32	Fuel Ignition Fan 2 Speed	<p>FAN2 speed in Fuel Ignition sequence</p> <p>NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.</p>
33	Ignition Test Fan 2 Speed	<p>FAN2 speed in Ignition Test sequence</p> <p>NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.</p>
34	Power 1 Fan 2 Speed	<p>FAN2 speed at power 1:</p> <p><b>Normal regulation</b> – defines the FAN2 speed at power 1 (depends on the selected fan mode – Fan 2 for Room Heating, Fan 2 As Chimney, or Fan 2 As Chimney used in closed pressure loop).</p> <p><b>Advanced regulation</b> – defines the MINIMUM allowed FAN2 speed for the PID regulator. Controller calculates the FAN2 speed</p>

		for each power PID regulator output. Maximum number of steps is 1024. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.
35	Power 2 Fan 2 Speed	FAN2 speed at power 2: NOTE: Not used when advanced regulation is selected. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.
36	Power 3 Fan 2 Speed	FAN2 speed at power 3: NOTE: Not used when advanced regulation is selected. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.
37	Power 4 Fan 2 Speed	FAN2 speed at power 4: NOTE: Not used when advanced regulation is selected. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.
38	Power 5 Fan 2 Speed	FAN2 speed at power 5: <b>Normal regulation</b> – defines the FAN2 speed at power 5 (depends on the selected fan mode – Fan 2 for Room Heating, Fan 2 As Chimney, or Fan 2 As Chimney used in closed pressure loop). <b>Advanced regulation</b> – defines the MAXIMUM allowed FAN2 speed for the PID regulator. Controller calculates the FAN2 speed for each power PID regulator output. Maximum number of steps is 1024. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.
39	Quickheat Fan 2 Speed	FAN2 speed at Quickheat power: Defines the FAN2 speed at Quickheat power in FAN2 for Room Heating mode. NOTE: If the flue gases temperature is below PAR58 [°C] in FAN2 for Room Heating mode, FAN2 is switched off.

### Fan 3

FAN3 is used to heat up external room with a separate fan or a separate damper for air flow redirection.



**Figure 6: Fan 3 operation**

40	Stop Fire Fan 3 Speed	FAN3 speed in Stop Fire sequence NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02. FAN3 only operates when FAN2 is working.
41	Test Fire Fan 3 Speed	FAN3 speed in Test Fire sequence NOTE: FAN3 does not operate in this sequence.
42	Heat Up Fan 3 Speed	FAN3 speed in Heat Up sequence NOTE: FAN3 does not operate in this sequence.
43	Fuel Ignition Fan 3 Speed	FAN3 speed in Fuel Ignition sequence NOTE: FAN3 does not operate in this sequence.
44	Ignition Test Fan 3 Speed	FAN3 speed in Ignition Test sequence NOTE: FAN3 does not operate in this sequence.
45	Power 1 Fan 3 Speed	FAN3 speed at power 1 NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02.
46	Power 2 Fan 3 Speed	FAN3 speed at power 2 NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02. FAN3 only operates when FAN2 is working.
47	Power 3 Fan 3 Speed	FAN3 speed at power 3 NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02. FAN3 only operates when FAN2 is working.

48 Power 4 Fan 3 Speed

FAN3 speed at power 4

NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02.

FAN3 only operates when FAN2 is working.

49 Power 5 Fan 3 Speed

FAN3 speed at power 5

NOTE: FAN3 operates in ON/OFF mode only. The valid settings for this parameter are 0 (FAN3 OFF) or 255 (FAN3 ON at maximum speed). You must also set the PAR77 and an air temperature sensor (NTC) must be connected to I/O T02.

FAN3 only operates when FAN2 is working.

### Water/Air temperature settings

Water related parameters set different working points for Water or Air regulation depending whether Stove, Boiler or Burner mode is used.

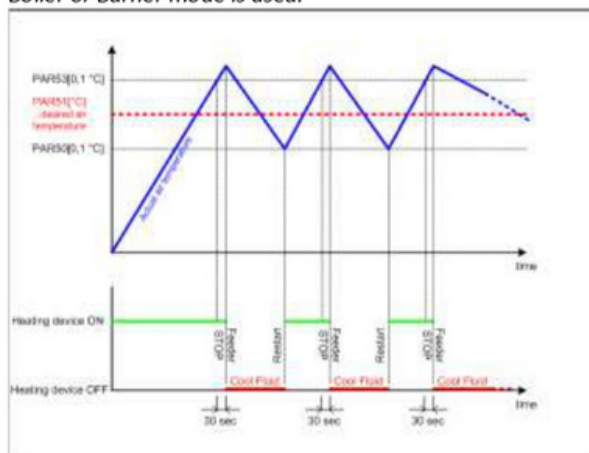


Figure 7: Cool Fluid exit temperature settings for stoves

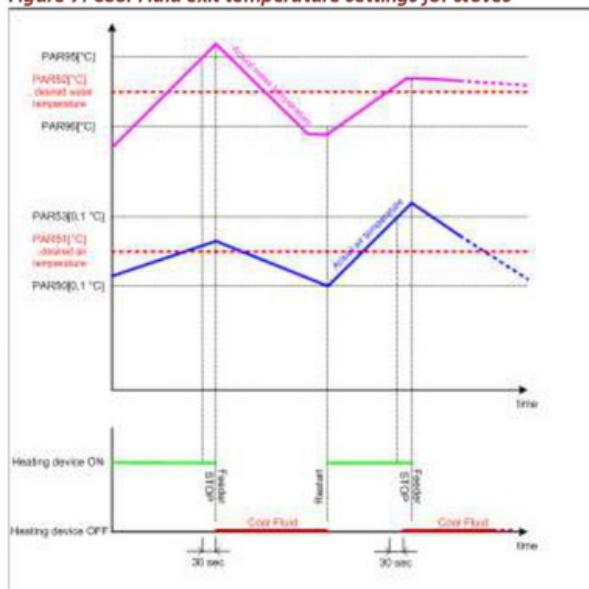


Figure 8: Cool Fluid exit temperature settings for stoves with water pump



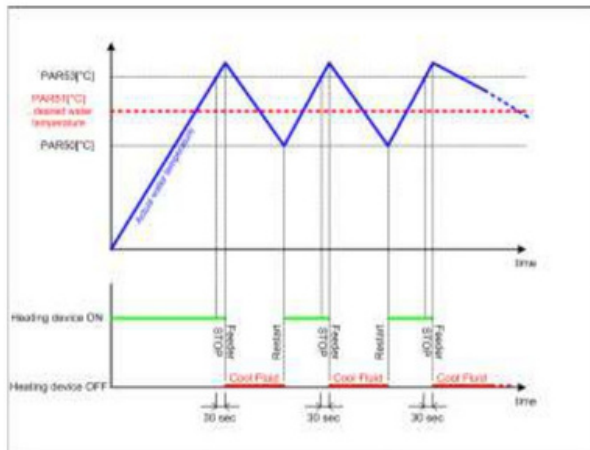


Figure 9: Cool Fluid exit temperature settings for boilers and burners

No.	Parameter	Description
50	Cool Fluid Exit Temperature Difference	<p>Cool Fluid exit temperature difference(in °C):</p> <p><b>In Stove mode:</b> the heating device restarts after room temperature drops below [PAR51-PAR50]. PAR50 is set in 0.1 degrees (10 equals 1.0°C), PAR51 is set in degrees (20 equals 20°C).</p> <p><b>In Stove mode with water pump:</b> the heating device restarts after air temperature drops below [PAR51-PAR50] in 0.1 degree resolution and water temperature drops below [PAR52-PAR96]. Note that PAR51 defines desired air temperature and PAR52 defines desired water temperature (for Stove mode with water pump only!).</p> <p><b>In Boiler/Burner mode:</b> the heating device restarts after air/water temperature drops below [PAR51-PAR50] in one degree resolution (value 60 equals 60°C).</p> <p>When accumulator is enabled in the Boiler/Burner mode, the accumulator restart temperature is [PAR84-PAR50] in one degree resolution (value 60 equals 60°C).</p>
51	Water/Air Temperature	<p>Desired Water/Air temperature (in °C):</p> <p><b>In Stove mode:</b> defines the desired air temperature in xx.x°C (maximum setting value is 51.0).</p> <p><b>In Stove mode with water pump:</b> defines the desired air (room) temperature in xx.x°C (maximum setting value is 51.0).</p> <p><b>In Boiler/Burner mode:</b> defines the desired water temperature in xx°C. In Boiler mode with accumulator, this parameter is calculated as [PAR84 + PAR86] in °C and cannot be modified manually.</p>
52	Water Temperature in Stove Mode	<p><b>In Stove mode with water pump:</b> this parameter defines the desired outbound water temperature in °C. Feeder slows dosing when water temperature nears PAR52 (in °C).</p> <p><b>Not used in Boiler/Burner mode.</b></p>
53	Cool Fluid Entry Temperature Difference	<p>Cool Fluid Entry temperature difference (in °C):</p> <p><b>In Stove mode:</b> if set to 0, the stove does not stop. In this case you can use the external thermostat (connected to I/O I03) for switching the stove ON/OFF. If set to &lt;&gt;0, the stove enters</p>

Cool Fluid when air temperature exceeds [PAR51 (in °C) +PAR53 (in 0.1°C)].

**In Stove mode with water pump:** The stop temperature based on the air temperature measurement is the same as above. The water stop temperature is defined with PAR95.

**In Boiler/Burner mode:** this parameter defines the stop level in xx°C.

### *Flue gases temperature settings*

No.	Parameter	Description												
54	Ignition Test Gases Temperature	Ignition Test gases temperature (in °C): Defines the temperature threshold in the Ignition Test sequence when the controller starts checking the flue gases temperature slope. If the temperature rises for at least 3 °C/min and the flue gases temperature exceeds PAR56, the device enters the Burning phase after 45 seconds.												
55	Modulation Start Gases Temperature	Gases modulation start temperature (in °C): Flue gases temperature threshold, when the controller begins to decrease the burning power. <b>IMPORTANT:</b> When setting this parameter the actual value is double the value, entered in PC-PRO or UI, except for stoves, where value in PC-PRO is the actual value, and value in UI is doubled. Example: <table><tr><th></th><th>Stoves</th><th>Other configurations</th></tr><tr><td>Value in PC-PRO</td><td>360</td><td>180</td></tr><tr><td>Value in UI</td><td>180</td><td>180</td></tr><tr><td>Actual parameter value</td><td>360°C</td><td>360°C</td></tr></table>		Stoves	Other configurations	Value in PC-PRO	360	180	Value in UI	180	180	Actual parameter value	360°C	360°C
	Stoves	Other configurations												
Value in PC-PRO	360	180												
Value in UI	180	180												
Actual parameter value	360°C	360°C												
56	Heating Device OFF Gases Temperature	Stop Fire exit temperature (in °C): In the Stop Fire sequence the FAN1 operates until the flue gases temperature falls below PAR56.												
57	Maximum (Error) Gases Temperature	Alarm triggering gases temperature (in °C): If the flue gases temperature exceeds PAR57, the Alarm Gases is reported and the controller switches off the system. <b>IMPORTANT:</b> When setting this parameter the actual value is double the value, entered in PC-PRO or UI, except for stoves, where value in PC-PRO is the actual value, and value in UI is doubled. Example: <table><tr><th></th><th>Stoves</th><th>Other configurations</th></tr><tr><td>Value in PC-PRO</td><td>400</td><td>200</td></tr></table>		Stoves	Other configurations	Value in PC-PRO	400	200						
	Stoves	Other configurations												
Value in PC-PRO	400	200												

		Value in UI	200	200
		Actual parameter value	400°C	400°C
58	Fan 2 as Ambient Minimum Gases Temperature	<p>FAN2 stop gases temperature (in °C):</p> <p>If Fan 2 As Chimney is enabled, this parameter is ignored.</p> <p>If Fan 2 for Room Heating is enabled, this PAR defines the threshold for FAN2 operation, regardless of the operating sequence. FAN2 starts when the gases temperature rises above PAR58, and stops when it drops below PAR58.</p>		
59	No Fuel (Error) Gases Temperature	<p>Temperature for No Pellets Alarm (in °C):</p> <p>Defines the flue gases temperature threshold for the No Pellets alarm in the Burning state.</p>		

### Cleaning

No.	Parameter	Description
60	Fan 1 Blow Cleaning Period	<p>Time between two blow cleanings (in minutes):</p> <p>During Burning the burning chamber is cleaned periodically. Every PAR60 minutes the FAN1 blows for PAR61 seconds at PAR62 speed. During blow cleaning the feeder stops dosing fuel.</p>
64	Chamber Cleaning Duration /Rot.	<p>Defines the number of blow cleanings before the heating device goes to FIRE STOP and performs the "Erato cleaning".</p>
65	Ash Extraction Auger Duration	<p>Ash extraction auger activation duration (in seconds):</p> <p>Defines the duration of the ash extraction auger cleaning period. The Ash extraction auger (connected to I/O 003) is active for PAR65 seconds every PAR66 minutes. The Ash and Chamber Cleaning configuration option must be set.</p> <p>NOTE: The ash extraction auger does not operate while the heating device is turned off. It operates only during normal operation of the heating device.</p>
66	Ash Extraction Auger Period	<p>Ash extraction auger activation period (in minutes):</p> <p>Defines the period for activating the ash extraction auger.</p> <p>NOTE: See also the description for PAR65.</p>

### Water pump settings

For detailed description of water pump operation refer to chapter **Error! Reference source not found.** on page **Error! Bookmark not defined..**

No.	Parameter	Description
67	ON Temperature	<p>Water pump turn on temperature (in °C):</p> <p>Defines the water temperature threshold when the water pump turns ON.</p>

68	OFF Temperature / T1-T2 for Max. Modul. Speed	Water pump turn off temperature (in °C): Defines the water pump turn off temperature threshold (MUST BE lower than PAR67 value).
69	Anti-Condensation Exit Temperature	Backwater temperature (in °C): Defines the backwater temperature threshold if a backwater temperature bypass pump is used.

### *Timings*

No.	Parameter	Description
70	Heat Up Duration	Heat Up sequence duration (in seconds)
71	Heat Up Temperature Check Samples	Not user definable
72	Heat Up Temperature Rise	Not user definable

### *factors PELLETS / WOOD IN USER FUEL MODE*

No.	Parameter	Description
73	User Fuel Feeder 1 ON Time Factor	User fuel mode feeder speed: Defines the relative feeder speed compared to the default feeder speed in pellets powered systems: <b>50</b> – the feeder in user fuel mode is 50% slower than the default feeder setting <b>100</b> - the feeder in user fuel mode has the same speed as the default feeder setting <b>150</b> - the feeder is 50 % faster This parameter is set according to the selected pellets type factory settings. It can be modified.
74	User Fuel Fan 1 Power Factor	User fuel mode FAN1 speed: Defines the relative FAN1 speed in user fuel mode (see PAR73). This parameter is set according to the selected pellets type factory settings. It can be modified.
75	Wood Fuel Fan 1 Power Factor	Wood fuel mode FAN1 speed: Defines the relative FAN1 speed in wood fuel mode. This parameter is set to 100 if the default wood type is used, or to different values if wood type other than default is used. It can be modified to further adjust the burning parameters.

### *Operation mode*

No.	Parameter	Description
76	Selected Configuration	Controller configuration set: Selects one of 12 predefined controller configurations. Configuration 13 is custom. We recommend locking this parameter in the Fumis PC-PRO application to prevent editing.



### External room temperatures

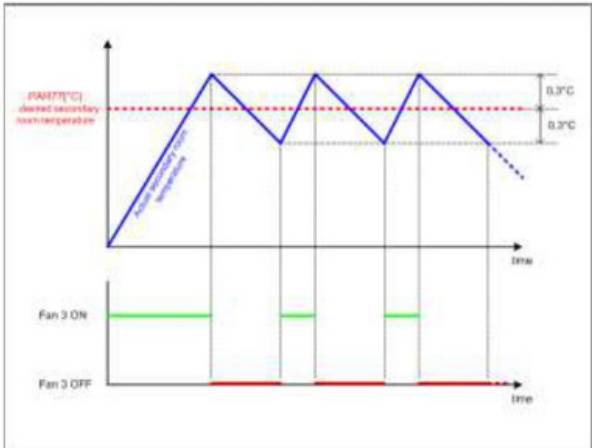
No.	Parameter	Description
77	2nd Room Temperature	<p>External Room Temperature (in °C): Defines the external room temperature, regulated with FAN3.</p> 

Figure 10: Fan 3 operation

### Flame sensors

In the Burner configurations the flame sensor is used to detect flame in the burning chamber.

No.	Parameter	Description
78	Flame ON Level	<p>Flame present detection level: The flame sensor operates in range from 0 (no fire) to 255 (full fire). Defines the sensor input for valid flame detection.</p>
79	Flame OFF Level	<p>No flame detection level: Defines the lower sensor input level for no flame detection.</p>
80	Flame OFF Detection Delay	<p>Time delay before OFF detected (in seconds): Sensor signal is valid after certain time period expires. Defines the time threshold for OFF flame detection. The recommended value is 45-100 seconds, depending on combustion system size and construction.</p>

### Pressure/air flow

If the pressure sensor is not used as the air flow control, it can be used as the underpressure detector in the burning chamber. To activate this option set PAR81≠0.

No.	Parameter	Description
81	Underpressure Setpoint	<p>Desired constant underpressure: Defines the pressure level if FAN2 is used as the chimney fan in the <i>Fan2 Pressure Close Loop</i> mode. Both Fan 2 as Chimney Fan and Fan 2 Pressure Close Loop options must be enabled</p>
82	Min. (Error) Underpressure /	Pressure error threshold value:

	Airflow	If this parameter is $\leq 0$ , the underpressure/airflow error is enabled. If the underpressure in the burning chamber is lower than PAR82, the alarm is triggered after PAR83 seconds.
83	Underpressure / Airflow Error Delay	Time delay before triggering underpressure/airflow error (in seconds): Defines the time delay before the underpressure error is triggered.

### Heat accumulator settings

No.	Parameter	Description
84	Accumulator Temperature	Desired accumulator temperature (in °C): <b>Defines the desired water temperature in heat accumulator.</b> NOTE: <i>Heat Accumulator</i> configuration option must be set.
85	T1 - T2 for Water Pump OFF	Pump minimum difference (in °C): The minimum difference between the boiler temperature and the backwater temperature to stop the water pump.
86	Boiler to Accumulator Temperature Drop.	Minimum difference between T Boiler and T Acc (in °C): Sets the amount of heat loss that occurs between the boiler and heat accumulator. EXAMPLE: If PAR 84=60 (desired temperature in the heat accumulator) and PAR 86=5, water in the boiler is heated to 65°C (PAR51 will automatically be set to this value). If we assume that the heat loss is 5°C, we achieve 60°C in heat accumulator, which equals the desired temperature (PAR84). NOTE: The PAR51 value (desired temperature in the boiler) is automatically set as PAR84 + PAR86.

### Keep Fire settings

*In some under-feed boilers, firing is a challenge. That is why some minimum char is kept inside the burning chamber by periodically loading the chamber with pellets and starting the fan for a few seconds. This function is called Keep Fire. Keep Fire is activated only if boiler was switched OFF by the timer, by an external Thermostat or by Cool Fluid (stand-by mode). If the boiler is switched off manually, or by remote control, Keep Fire is NOT enabled.*

No.	Parameter	Description
87	Keep Fire Fan 1 Power	Keep Fire FAN1 speed
88	Keep Fire Feeder 1 ON Time	Keep Fire feeder dosing time (in milliseconds): Feeder is activated for [PAR88 *100msec]
89	Keep Fire Fan 1 Duration	FAN1 duration during Keep Fire (in seconds): Defines the time period for FAN1 operation during Keep Fire.
90	Keep Fire Period	Keep Fire repetition period (in minutes): If the boiler is in stand-by mode, Keep Fire is repeated every PAR90 minutes.

## Feeder 2 settings

Feeder 2 is usually used for dosing secondary fuel or as pellets transporter from the main storage. It can also be used for mixing different fuels (pellets and olive stones, for example) in fixed proportions (%).

For detailed description of feeder 2 operation refer to chapter **Error! Reference source not found.** on page **Error! Bookmark not defined..**

No.	Parameter	Description
91	Feeder 2 Delay / ON Time Factor	<p>Feeder2 dosing delay / activation time factor:</p> <p>Defines the feeder 2 operation time (in seconds) if <i>Fuel Level Sensor</i> configuration option is set and Feeder2 acts as pellets transporter from the main fuel storage to the stove pellets buffer.</p> <p>Defines the relative dosing to the main feeder if <i>Pellets Level Sensor</i> configuration option is not selected:</p> <p><b>50</b> – feeder 2 is 50% slower than the main feeder</p> <p><b>150</b> - feeder 2 is 50% faster than the main feeder</p> <p>NOTE: if PAR is set to 0, feeder 2 operates constantly (except when combustion system is turned off)</p>

## Fuel Quality

No.	Parameter	Description
92	Pellets Quality	<p>Defines one of the three pellets fuel quality types:</p> <p><b>1</b> - feeder and fan 1 operate according to the hidden parameters 53 (FeederFactorPelletsType1) and 54 (FAN1FactorPelletsType1) settings in %.*</p> <p><b>2</b> - feeder and fan 1 operate according to the hidden parameters 55 (FeederFactorPelletsType2) and 56 (FAN1FactorPelletsType2) settings in %.*</p> <p><b>3</b> - feeder and fan 1 operate according to the hidden parameters 57 (FeederFactorPelletsType3) and 58 (FAN1FactorPelletsType3) settings in %.*</p> <p>NOTE: Pellets quality (1, 2 or 3) can also be selected by end user through user interface.</p> <p>* compared to ONORM M7135 standard pellets</p>
93	Wood Quality	<p>Defines one of the three wood fuel quality types:</p> <p><b>1</b> - fan 1 operates according to the hidden parameter 59 (FAN1WoodType1) settings in %.</p> <p><b>2</b> - fan 1 operates according to the hidden parameter 60 (FAN1WoodType2) settings in %.</p> <p><b>3</b> - fan 1 operates according to the hidden parameter 61 (FAN1WoodType3) settings in %.</p> <p>NOTE: Wood quality (1, 2 or 3) can also be selected by end user through user interface.</p>

## Servicing

No.	Parameter	Description
94	Time to Service	Time to service warning level (in days):

	<p>Defines the service due time.</p> <p>This parameter is used in connection with the <i>Service time</i> counter. PAR94 defines the service time period in days, but the <i>Service time</i> counter counts the hours. This means that if you set the PAR94=1 (day), the <i>Service time</i> counter displays 24 (hours). Maximum value of the PAR94 is 255, which means 6120 hours (255x24=6120). The display can show up to 999 hours, value over 999 hours is displayed as Hi.</p> <p>To reset the <i>Service time</i> counter, navigate to the <i>Reset service timer</i> entry and press the Enter button to enter the edit mode. The display shows <i>Off</i>. Press the right arrow menu button to display <i>On</i> and then press the Enter button to confirm.</p>
--	--

### Advanced water settings

No.	Parameter	Description
95	Stove Cool Fluid Entry Temp. Diff.	<p><b>In Stove mode with water pump only:</b> defines the temperature threshold to switch off the stove (entering Cool fluid mode).</p> <p><b>Other modes:</b> PAR95 and PAR96 are not used.</p>
96	Stove Cool Fluid Exit Temp. Diff.	<p><b>In Stove mode with water pump only:</b> defines the restart level from Cool Fluid.</p> <p><b>Other modes:</b> PAR95 and PAR96 are not used.</p>
97	T1-T2 for Min. Modulation Speed	<p>Minimum temperature difference for modulation (in °C):</p> <p>When normal regulation is used, defines how many degrees before the desired temperature is reached the controller starts to decrease the burning power.</p> <p>NOTE: When modulation water pump is used.</p>

### Leveltronic settings (Monitoring Fuel autonomy with UltraSonic sensor)

An ultrasonic pellet level sensor can be used to detect the level of fuel in the container with the 5mm precision. User interface displays a warning (when fuel level reaches "low") or an alarm (when fuel level reaches "empty"), based on sensor detection. With advanced feeder settings (hidden parameters) LevelTronic data can also be used for automatic control of fuel autonomy function. In this case the user interface displays time to empty magazine level (in hours). If the magazine is re-filled at any time, fuel autonomy value is automatically reset, based on fuel level change, monitored by LevelTronic.

No.	Parameter	Description
98	Full Level	<p>Full magazine sensor signal (in cm):</p> <p>Defines the full magazine level.</p>
99	Low Level	<p>Warning level sensor signal (in cm):</p> <p>Defines the warning magazine level.</p>
100	Empty Level	<p>Empty Magazine sensor signal (in cm):</p> <p>Defines the empty magazine level. At this level the combustion device is turned off to prevent feeder emptying and thus enables faster restart (no need to wait for the feeder to refill).</p>

### Other settings



101	Blow Out Duration	Time for ash blow out at Stop Fire (in seconds): After the Stop Fire and Cool Fluid, the FAN1 will operate at maximum speed for PAR101 period.
102	Anti-Freeze Temperature	Minimum air temperature to keep (in °C): Only in stove mode and activated timer. OPERATION: The stove turns on when $T_{air}$ (PAR 51 [°C]) is for 0,1°C lower than PAR 102 [0,1 x °C]. The stove turns off when $T_{air}$ is at least for 0,1°C higher than PAR102 + PAR53 [°C].
103	Water Pump Minimum Speed	Water pump minimum speed (when modulation water pump is used)
104	Water Pump Maximum Speed	Water pump maximum speed (when modulation water pump is used)

### **Hidden Parameters**

*Fumis ALPHA hidden parameters directly control the operation and performance of the Fumis ALPHA controller. These parameters present the factory settings for the Fumis ALPHA controller. Hidden parameters for the Fumis ALPHA controller can be accessed and modified in Fumis PC-PRO application. Hidden parameters are available on request in a separate file, which is imported in the Fumis PC-PRO. For the file and additional instructions contact ATech.*