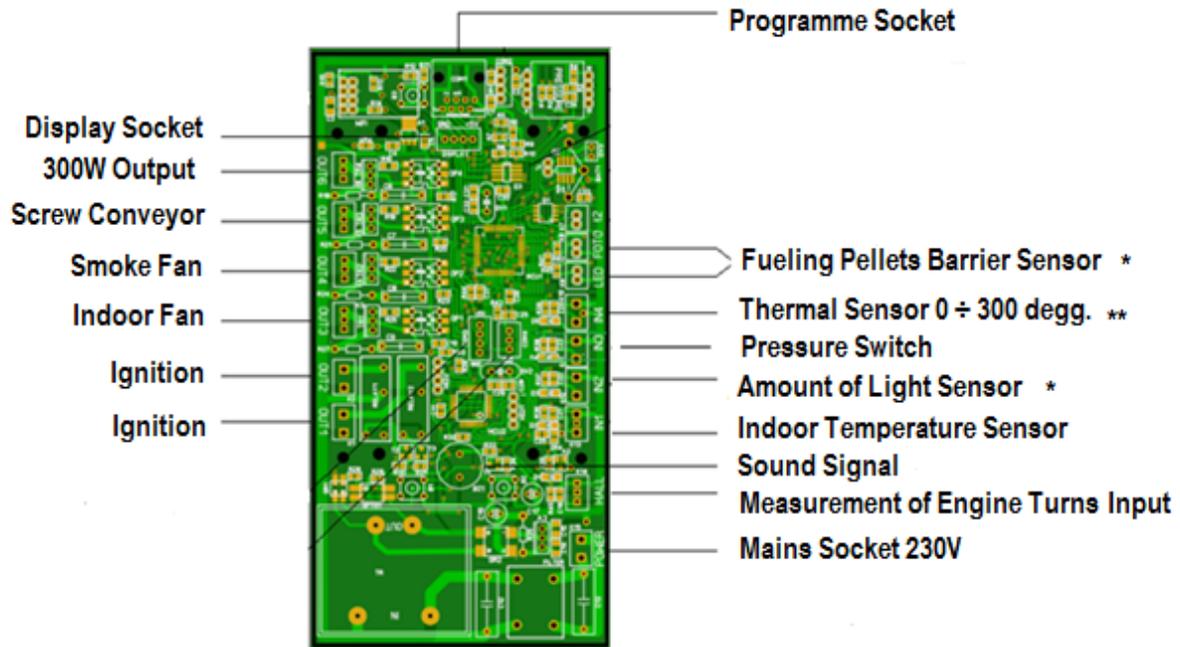


# *Fireplace and Burner Pellet Controller*



\* Sensors to integrate in the assembly of a Burner!

\*\* Sensors to integrate in the assembly of a Fireplace!

**Outputs:**

**OUT1- Ignition.**

**OUT2- Ignition.**

**OUT3- Indoor fan.**

**OUT4- Smoke fan.**

**OUT5- Screw conveyor**

**OUT6- Not applicable.**

**Inputs:**

**IN1- Indoor Temperature Sensor**

**IN2- Amount of Light Sensor (**Not applicable for fireplaces**).**

**IN3- Pressure Switch (**Not applicable for burners**).**

**IN4- Exhaust (smoke) Gas Sensor for Fireplaces/ Boiler Temperature Sensor for Burners.**

**POWER- Mains Socket 230V.**

**LED- Infrared Transmitter (**Applicable only for burners**).**

**FOTO- Infrared Receiver (**Applicable only for burners**).**

**T2- Thermocouple Input 0÷1024 degg. Not applicable.**

**HALL- Smoke Fan Turns Input.**

# **Controller Hardware Features**

## **1. Inputs**

### **1.1 Programme Socket**

- To programme and reprogramme the controller.

### **1.2 Indoor Thermal Sensor Wireless Radio Module**

- To secure wireless connection with an indoor thermal sensor, within 20m distance to the controller.

### **1.3 Vacuum Sensor 0 ÷ 300Pa.**

- To measure the exhaust gas pressure.

### **1.4 Flash memory.**

- to record events and **bell incidents**

### **1.5 Timer/ Date.**

- To secure real-time controller operational hour and date.

### **1.6 Thermocouple 0 ÷ 1024 degg.**

- Input to connect Type K thermocouple. To measure the temperature immediately in the burning chamber.

### **1.7 Fueling Pellets Barrier Sensor.**

- To emit infrared light barrier, measuring the transfer of fueling pellets. Could serve as an overload protection.

### **1.8 Thermal Sensor 0 ÷ 300 degg.**

- To measure exhaust gas temperature.

*The input serves a general purpose.*

### **1.9 Indoor Temperature Sensor.**

- An NTC-10K Type Sensor – to measure the temperature up to 100 degg. Could be used to measure the boiler water.

*The input serves a general purpose.*

### **1.10 Volume of Light/ Available Fire Sensor**

- A photosensor to measure the volume of light coming from the burning chamber. Used to detect if there is any burning process.

*The input serves a general purpose.*

### **1.11 Power Input for a Smoke Sensor.**

- The input serves a general purpose as well as a special one. The special purpose serves to connect a Type MQ-2 Smoke Sensor to detect availability and volume of CO gas. Its being assembled in the pellet chamber could serve as involuntary bunker ignition prevention.

*Simultaneously, the input serves a general purpose so other types of sensors can be connected to it.*

### **1.12 Bell/ Sound Signaling.**

- Sound Signaling Feedback to serve as alert signal and start/ stop of the controller signal.

### **1.13 Engine Turns Measure Sensor Input.**

- To detect the turns of the smoke fan. The sensor, which can be linked to this input, is a Hall Effect Sensor.

### **1.14 PC connection.**

- a cable could be connected to this socket to link a PC to observe and supervise the control unit.

### **1.15 Remote Control Sensor Input.**

- an infrared sensor could be connected to this input to start or stop the control unit.

### **1.16 230V Power Supply Socket.**

- Input Mains of the Control Unit.

## **2. Outputs.**

### **2.1 Wifi Module.**

- a communication module to connect the device to the internet. Used to observe and supervise the fireplace/ burner via remote access.

### **2.2 Display Socket.**

- To connect the control unit to a touch-screen display and communicate between both.

### **2.3 300W Adjustable Output.**

- 4 pcs to regulate the turns of the Indoor and the Smoke Fan as well as fast switch between **inside and outside** screw conveyor.

### **2.4 Relay Output/ 800W.**

- 2 pcs to switch among consumers such as Water Pump or **Ignition**.

## **3. Software Features of the Control Unit!**

3.1. *Basic Processes Animation.*

3.2. *Easy/friendly access to the Control Unit settings.*

3.3. *Simple User Menu.*

**3.4. Important Settings Access Control via a password.**

- *settings access password for a service technician*

- *settings access password for an installer*

3.5. *Numerous variations of settings for all burning processes.*

3.6. *Immediate change of each type of setting through the display.*

3.7. *Record Store of all settings in a non-volatile memory.*

3.8. *Numerous alert events display.*

3.9. *Delay Start/ Stop of the Fireplace Timer.*

3.10. *Manual Modulation Selection Option.*

3.11. *Hour/ Date Display.*

3.12. *Basic Input Data Info Menu*

3.13. *Basic Temperatures Graphic Display.*

3.14. *Manual Screw Conveyor Fuel Option via a touch button on the display.*

3.15. *Operation Mode Menu Option for restricted user access.*

3.16. *Cold Mode Output Test. An opportunity to test the outputs in Ready Mode.*

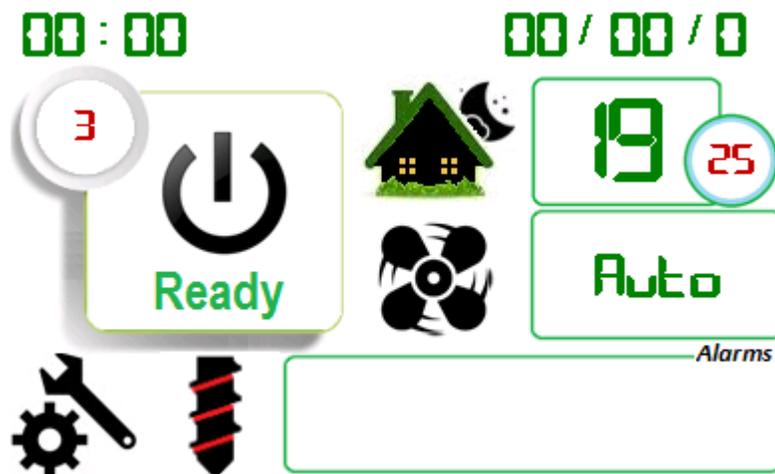
3.17. *Change of Language. The Control Unit supports two basic languages: Bulgarian and English.*

*3.18. Energy Saving Mode is active if there is no user act on the display within 10 minutes.*

# Operation Manual

*On starting the Control Unit, the company logo appears, remains visible within 3 seconds and the display transfers to the Title Page.*

***Welcome to the Title Page of the Control Unit!***



This is the main User Panel. Elements and Functions Alignment is as follows:

# 1. Main User Control Panel

## 1.1 Date Display

- the sequence is **day/ month/ year**

## 1.2. Hour Display

the sequence is **hour: minutes**

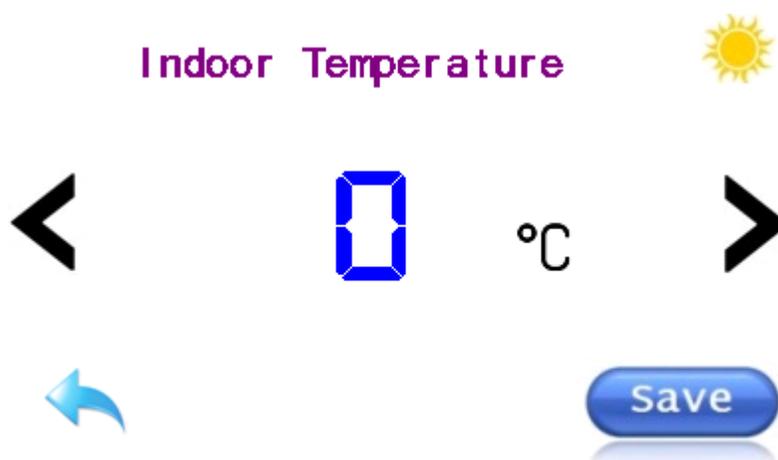
## 1.3. Indoor Temperature Display



The number in the rectangle denotes the current (momentary) indoor temperature. The number in the circle denotes the temperature, one has set to maintain in the room.

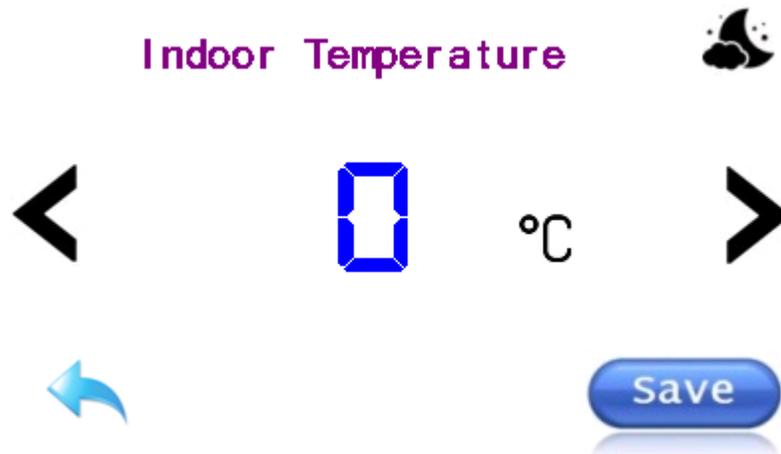
I would like to maintain 25 degg in the room – how do I set this?

One has to touch the icon with the number of the indoor temperature. An additional page would open, where one can set the temperature, they would like to.



If in the upper right angle a sun symbol displays, then the user sets the daily indoor temperature.

If a moon symbol displays, then the temperature to set is for the night part of the of twenty-four-hour period.



Major Special Features:

- the min possible temperature to set is 10 degg;
- the max possible temperature to set is 40 degg.

Entering the temperature is done through the **Left** and/ or **Right** icons. Saving the value is done with the **Save** Button. Pressing the button displays a green ribbon low down, which one should wait to fill up, and then it would disappear, in this case one can sure that the value has been saved correctly! Just in case, during the time of saving, access to the Back Icon is denied to prevent involuntary interruption of the save process. The latter would reappear after the process has finished.

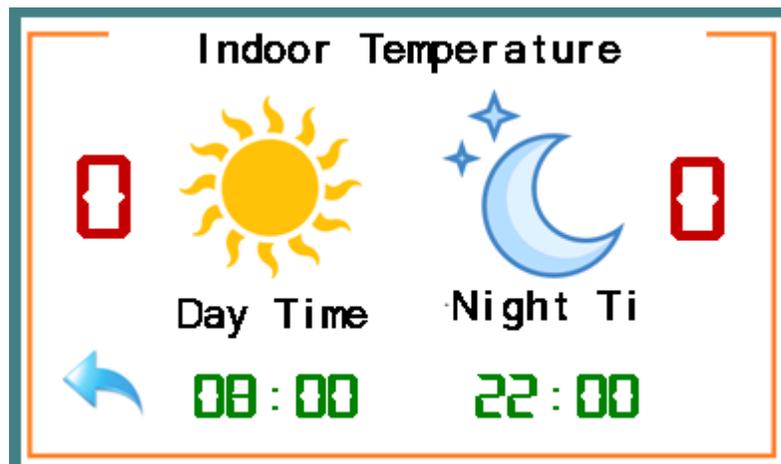
If - for more than **6 seconds** - there is no connection to the Control Unit, the value will not be saved!

How can I set (change) the day time and night time temperature?

To change these two temperatures, one has to touch the icon showing a house.



A page would display, where one can enter the necessary temperatures.



Pressing the Sun Symbol Icon one can change the day time temperature, where pressing the Moon Symbol Icon – the night time one.

How do I set the start time of day time and, respectively, night time temperature?

Pressing the hour displayed under the day time and night time temperature icon transfers to a new page, where one can change the time.

The day time hour would vary between 4am up to 5pm.

The night time hour would vary between 6pm up to 11pm.

#### **1.4. Indoor Fan. User Settings.**



Specific Features:

- if the fan is not operating, the icon would be static. On switching the fan on, it will get dynamic and start rotating.

How do I switch the fan off or to set it to operate on any of the three modulations?

- in the rectangle on starting there will be displayed the automatic operation mode of the control unit - **AUTO**. In this mode, the fan speed will automatically change depending on where in the programme cycle we are.

On pressing the field, the figures **1**, **2**, **3** would follow one after the other. Each one of them would denote which modulation we would like to the fan to operate on.

#### **1.5. Manual Fuel.**



- pressing the icon would start the screw conveyor and maintains this mode until the icon is released!

The icon would only be visible in Ready Mode, whereas, respectively, on starting of the fireplace it will disappear!

#### **1.6. Main Menu and Service Settings.**



**1.7. Types of modes displayed at the Control Unit.**

- The Ready Mode Icon is 

- The Start Mode Icon is 

- The Fuel Mode Icon is 

- The Ignition Mode Icon is 

- The  Set Fire Mode Icon is 

- The Modulation 3 Mode Icon is **P3**

- The Modulation 2 Mode Icon is **P2**

- The Modulation 1 Mode Icon is **P1**

- The Clean Mode Icon is 

## 1.8. Alert Notifications/ Messages.

Major Special Features:

- the Faulty Pressure Switch Icon is . It will get active, if the pressure switch remains open for a period of **20 seconds**! On triggering of the alert, the device would switch to Clean Mode and Ready Mode;

In Ready Mode this alert cannot be set active!

When set active, this alert would produce sound signal and display the given icon. The alert would automatically stop in 1 minute, but the icon would remain displaying, until released to clear! The icon will not delete until the problem is solved!

- the Exhaust Gas High Temperature Icon is . It will get active on reaching the temperature above **260 degg** of the exhaust gas! To delete it, the temperature must go down under this level;

- the Unsuccessful Ignition Icon is . It will display, if - during operation – the exhaust gas sensor detects the temperature has gone down under the preset one! In this case the device would switch to Clean Mode and Ready Mode;

- the Reset Control Unit Icon is .

- the Extinguished Fire Icon is . It will display if the fireplace turns off on a second try to ignite! In this case the device would switch to Clean Mode and Ready Mode;



- the Faulty Fan Icon is . It will display if the Turns Sensor detects a lack of signal from the fan for **20 seconds**;

- the Active Timer Icons are two:

The red one shows that the time has been set active and is waiting to stop at a

certain hour . The green one shows that the timer has been set active and is

waiting for the fireplace to start .

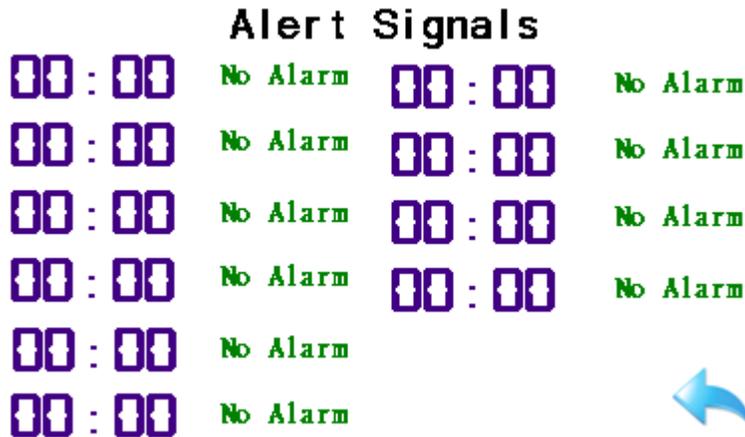
**Warning** pressing any of the alert icons leads to redirecting to the Alert Menu, where the hours and types of the alert are listed descending.

In the **Alert** Menu there can be up to 10 alert events in the process of operation of the system.

***The types of alerts are:***

- High Temp (Exhaust Gas Sensor High Temperature)
- Power Off (Control Unit Restart)
- Pressostat (The Pressure Switch has been deactivated)
- Fire extinct (Extinct Fire)
- No Fire (Unsuccessful Ignition)
- No Fan (A fault in the fan)

On restarting of the system this menu is deleted!



## ***2. Starting of the system and operation of the processes.***

To start the Control Unit, one needs to hold **the icon, showing the processes**, for at least **3 seconds**, which will produce a sound signal to announce the system's being started.

To stop the Control Unit, one needs to hold **the icon, showing the processes**, again for **3 seconds**, which will transfer the device into Clean Mode and Ready Mode.

On starting the Control Units, its first task will be to check the Exhaust Gas Thermal Sensor. If the temperature is above the set one, the device will transfer immediately to modulations, otherwise it will check if there has been any interruption in any of the modes; in case there has been some, the Alert Signal to start the unit will display and the device will go through the whole process of cleaning, fueling, ignition..!

If there has not been any unplanned interruption and the thermal sensor is below the set temperature, the title **READY** will switch to **START** and a countdown starts. In this mode, what happens is the so called initial clean, which lasts 60 seconds by default. The smoke fan is set on maximum speed to clean the ashtray. If we would like, we can change the time for initial clean in the **Clean Menu**.

When the time is over, the device transfers to Fuel Mode. In this mode there is a countdown as well, which is set to 70 seconds by default. Here the Smoke Fan will slow down the turns. The screw conveyor gets active and starts fueling on impulses within the following period – 2 seconds fuels/ 3 seconds rests.

The ignition (switch) is also active now.

In this mode one can regulate the operation time. Regulating it defines what quantity of pellets is released. Changing it is possible in the Ignition/ Initial Fuel Menu.

When the time is over, the device transfers to Ignition Mode. In this mode the ignition switch is still active, the screw conveyor can be set in time for fuel and rest, and will keep on operating.

Setting these parameters can be done in Ignition/ Fuel Screw Conveyor/ Screw Conveyor Menu

This mode is a transitory one, to transfer to the next mode the exhaust gas sensor needs to detect an increase in the temperature above the one, which has been preset, in the Ignition/ Flame Sensor Menu!

The increase must last at least 10 seconds!

If this requirement has not been met and the preset time is over, the device would make a second attempt to fuel; its time has been preset in the Ignition/ Second Fuel Menu.

If the requirement is met, the device will transfer to Set Fire Mode.

In this mode, the idea is to set the pellets on fire and get stable flame.

The settings of this mode can be found in the Set Fire Menu. When the time of the Set Fire Mode is over, the device will transfer to the Modulations Modes.

The first one to start is P3, followed by P2 and in the end P1. Switching among these is based on the temperature, preset as indoor temperature.

- if the indoor temperature is set to 30 degg.

- in the **P3/ Thermal Difference** one should set **3** degg.
- in the **P2/ Thermal Difference** one should set **1** deg.
- in the **P1/ Thermal Difference** one should set **1** deg.

Under the parameters set as above, the process will go like this:

On reaching 27 degg, which is 3 degg below the preset, P2 will launch; on reaching 29 degg, which is 1 deg below the preset, P1 will launch, and then – on reaching 31 deg, which is 1 deg above the preset – the device will transfer to stopping.

In the **Stop** Mode, Clean on Extinguish Fire will launch. In this mode, the temperature is expected to decrease to two deg below the preset one, in example above – to reach 28 deg. This will be followed by second attempt to star the fuel, ignition, set on fire ... processes.

Under the **Stop** Mode, Cleaning before Extinguishing is activated. In this mode, the unit waits until the temperature goes two degrees lower than the preset one, in this case to reach 28 deg. C. This is followed by a new starting of the filling, ignition, and set of fire processes...

On Cleaning Time in Stop Mode having elapsed, the Unit transfers to **ECO** Mode. In **ECO** Mode the unit waits for two major events to take place:

The first one being Timer Time, preset to 600 seconds, to elapse and only then the room temperature is checked to have gone below the preset one; having completed these two conditions, the unit goes again to Starting, Filling, Ignition, etc...



On reaching the modulations, one can set – through pressing the field, which displays the modes – on which modulation the device is to operate under!



Meaning, if we are on P3 and press the selection field, it will switch to P2, pressing in again, the selection field will switch to P1, and so on.

Please note, that is change is constant; it is recorded and on restart of the Control Unit & reaching the modulations, if P2 is preset, the device will transfer immediately to it, skipping P3!

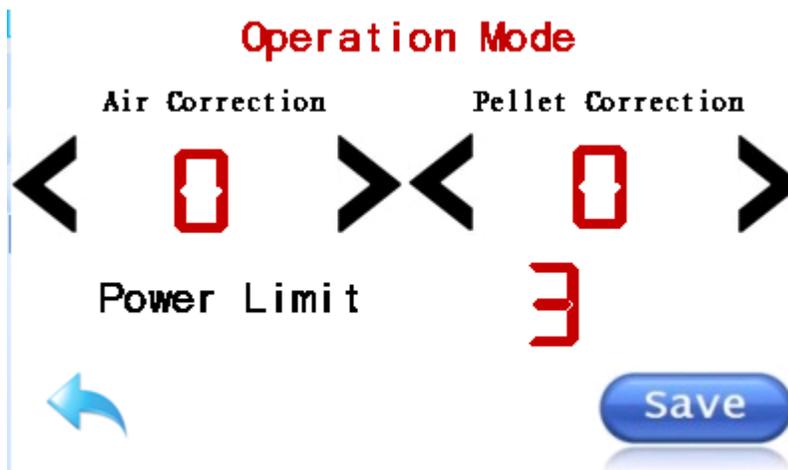
### **3. Main Menu.**

#### **3.1 Operation Mode.**

## Menu



There are three parameters to set in the **Operation Mode**.



The first one is **Air Correction**, the second – **Pellet Correction**, and the third one is Power Limit.

In the first two parameters what is set is the percentage smoke fan power lag in operation modes and pause (rest) during the operation of the screw conveyor!

It can be set within the range of **- 15%** up to **+15%** for both parameters!

The third parameter would be setting the level of operation of the system – **P3**, **P2**, **P1**.

### 3.2 Current Values.



In the **Current Values** one can observe the operation of the sensors, to check the operation mode, etc.

<b>Current values</b>		<b>Ready</b>	
Fan power	- [ ]		
Fan speed	- [ ]	Rpm	
Indoor Temp.	- [ ]	°C	
Smoke gases	- [ ]	°C	[ ]   [ ]
Pressure	- [ ]		
Cleaning	- [ ]		
Pellets	- [ ] [ ]	Kg.	

In the line, named as Smoke Gas, there are two parameters, coloured respectively in green and red.

The green one is the temperature at which the device transfers from **IGNITION** to **SET FIRE**.

It is important to know that if a temperature of 60 degg is set in the **IGNITION/Flame Sensor** Menu then the temperature to transit from the one mode to the

other will be 62 degg, and not 60 deg, because of the preset system hysteresis of 2 degg.

The red one indicates the temperature of launching the indoor fan!

Here the same rule of the two-degree system hysteresis will apply, but is also combining with an additional hysteresis from the **Blowing/ Hysteresis** Menu.

- '**PRESSURE**' indicates if there is any Pressure Switch connected to the system. A (0) indicates active pressure switch, if the value is 800 + measure units this is an indicator for an open (non-active) Pressure Switch.

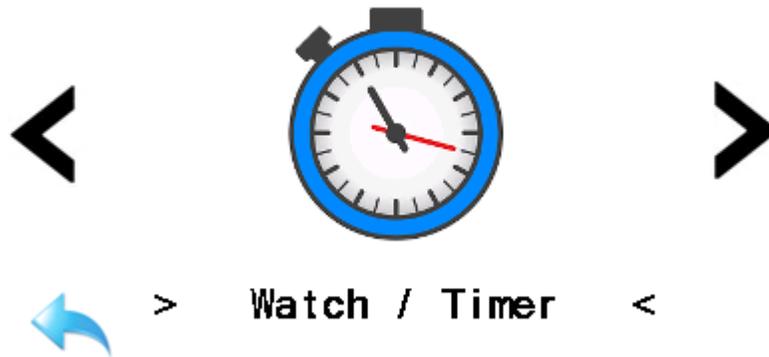
- '**Intermediate Clean**' denotes the time left before the system transfers to cleaning! This time is set in the **Clean/ Intermediate Clean** Menu. The time is based on the operation of the screw conveyor in seconds.

- '**Pellets**' denotes the pellets, burned by the fireplace during the operation of the control unit. Pressing the figures transfers to a page where grammes of pellets per minute can be entered.



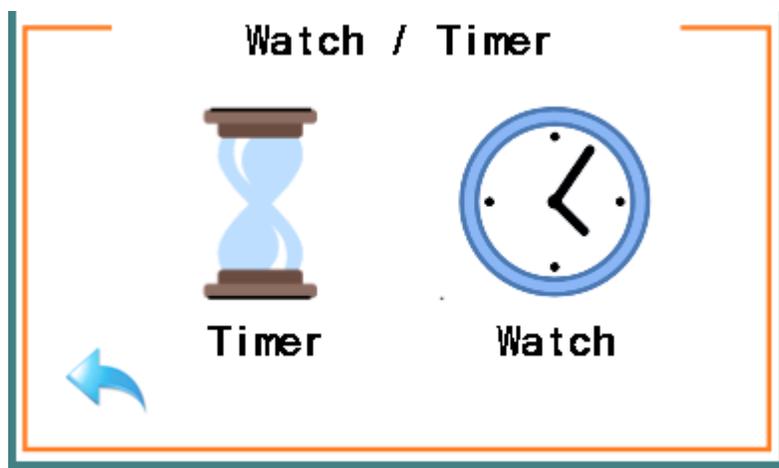
### **3.3 Watch/ Timer.**

## Menu



The next icon is **Watch/Timer**.

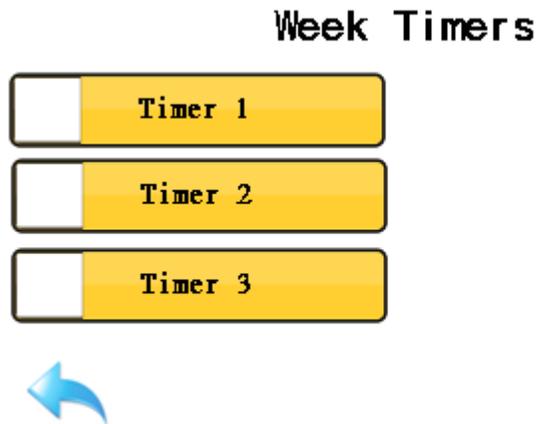
It can set the time and date in the **Watch** Menu, there is also a timer integrated to set a delay start and/ or stop of the system!



## Date/ Hour Setting

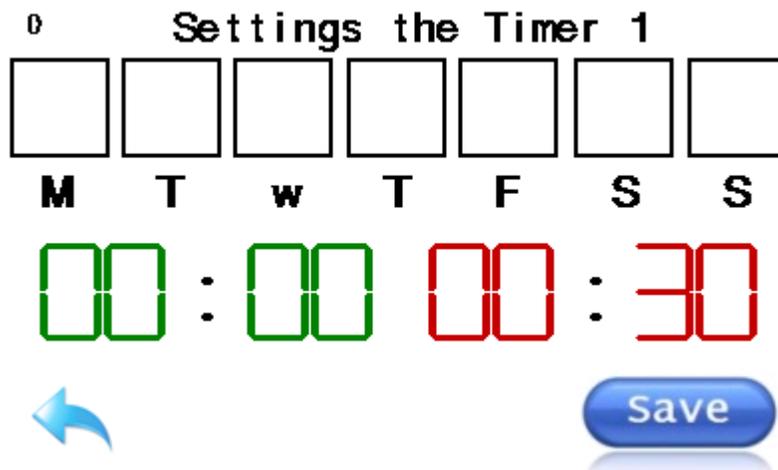


### 3.3.1 Setting of the Timer.



При натискане на иконата на таймера ни се дава шанс да избираме между три таймера.

Pressing the Timer Icon gives one a chance to select among three timers.



- the letters **M, T, W, T, F, S, S** denote the days of the week.

Respectively:

- Понеделник, Вторник, Сряда, Четвъртък, Петък, Събота, Неделя. Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.

If none of the boxes is checked, the timer is switched off.

If one checks eg. Monday, Wednesday & Friday, then the fireplace will start or stop in the checked days.

- the green timer indicates the **Starting Timer**, setting it is in every 30 minutes;

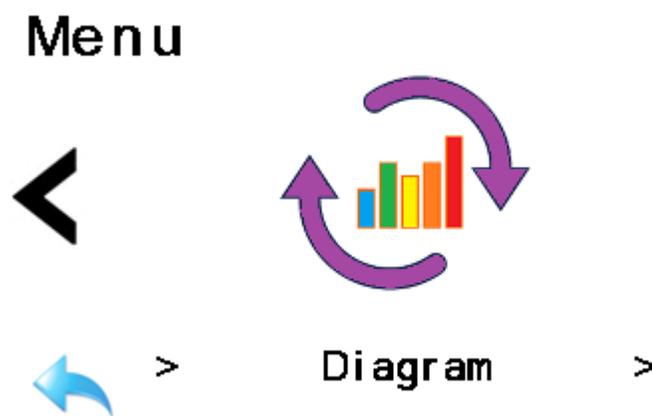
- the red timer indicates the **Stopping Timer**, setting it is in every 30 minutes.

Please note that there are two protections, activated:

- the first one would be that the software would automatically lag the stopping timer by 30 minutes in an attempt to set identical times of the timers!

- the second one would be that the software would automatically select – in an attempt to set identical times of start and stop to two different timers – the Starting Timer to avoid conflict.

### **3.4 Diagramme Menu.**



Here one can observe the progress of the temperature of the Smoke Sensor and the turns of the Smoke Fan in real time, making a graphic of their peaks and drops.

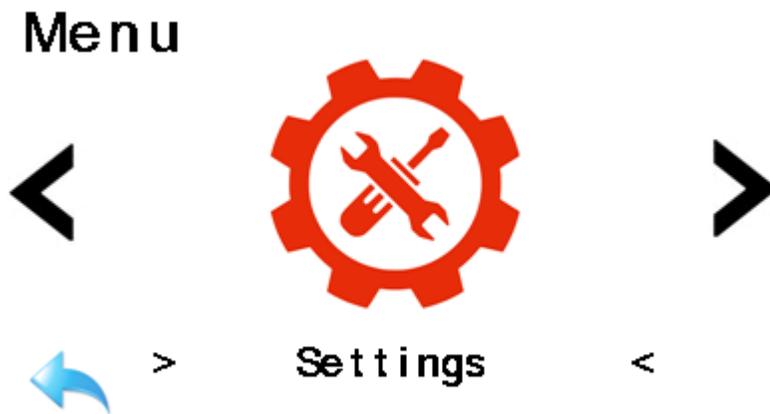
Updating is in every 1 second.



The white line observes the progress of the Smoke Sensor Turns. It is displayed in figures on the left side of the diagramme. On the right one measurement is done in the red range (0-2700 turns).

Consequently, the Smoke Gas Temperature displays in the yellow line. It displays in figures in the left corner in black figures. In the right part the measurement is done in the black range (0-300 degg).

### **3.5 Settings Menu.**

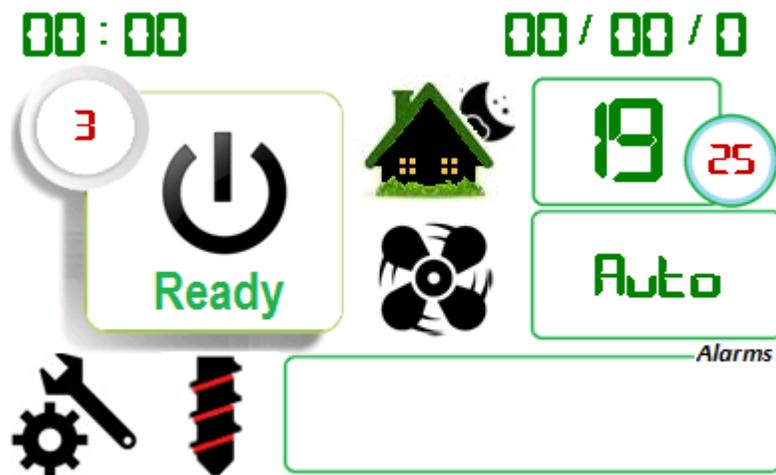


Here one has access to the internal settings of the control unit. Pressing the icon displays access panel requiring entering a password!

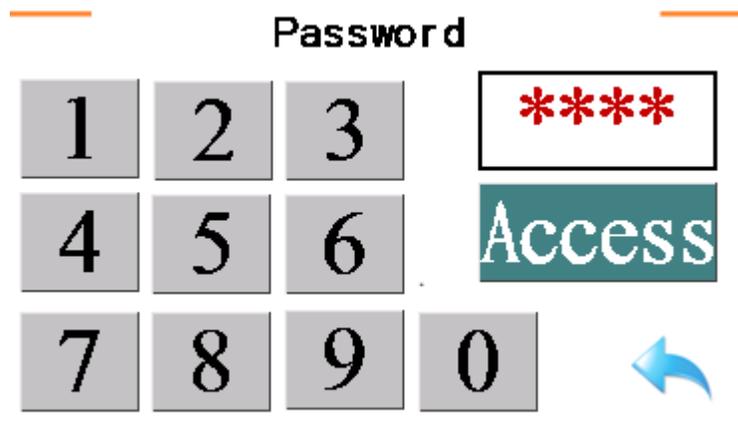
The settings have been restricted in three access levels:

The settings are segmented in four levels of access:

- first level is Installer with password 5555;
- second level is Service Technician with password 1234;
- third level is Special Settings with password 9999;
- the fourth password is 2468 and is used to unlock the display.



The second one is (on) automatically in standby mode of the display for 10 minutes.



In case a wrong password is entered, 'Wrong password' displays; it is allowed a new attempt.

#### **4. Installer Settings.**

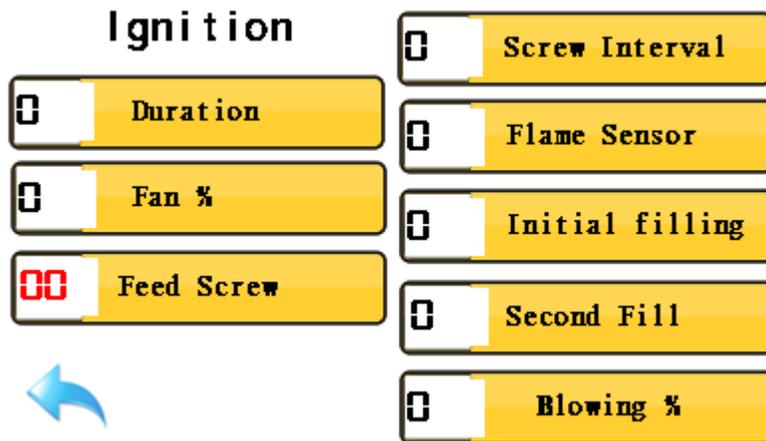
On accessing as an Installer the following menu displays:

- **Ignition**
- **Set of Fire**
- **Modulation**
- **Change of language**

##### **4.1. Ignition**



Pressing the Ignition Icon one enters the settings to configure the Ignition process.



Here 8 parameters can change:

**- Duration**

Here one can set operation time of the Ignition Mode. It can vary from 10 to 990 seconds. The **interval/ gap** to set is every 10 seconds.

**-Вентилятор**

Here one can set the power of the Smoke Fan for Ignition Mode. It can vary from 1 to 100%. The **interval/ gap** to set is every 1%.

**- Fuel Screw Conveyor**

Here one can set the time of operation of the screw conveyor in the Ignition Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 seconds.

**- Interval/ Gap Screw Conveyor**

Here one can set the time for the screw conveyor to rest in the Ignition Mode. It can vary from 1 to 99 seconds The interval/ gap to set is every 1 second.

**- Flame Sensor**

Here one can set the Smoke Gas Temperature, in which the device can transfer from Ignition Mode to Set Fire Mode. An important condition is that this

temperature is maintained at least 10 seconds to avoid any **transitions**, which might occur by coincidence

The temperature can be set from 40 up to 198 degg. The interval/gap is every 2 degg.

#### **- Initial Fuel**

Here one can set the time of the operation of the screw conveyor in the Fuel Mode. It can vary from 4 to 198 seconds. The interval/ gap to set is every 2 seocnds.

#### **- Second Fuel**

Here one can set the time of the operation of the screw conveyor in the Fuel Mode when attempting a second ignition. It can vary from 4 to 198 seconds. the interval/ gap to set is every 2 seconds.

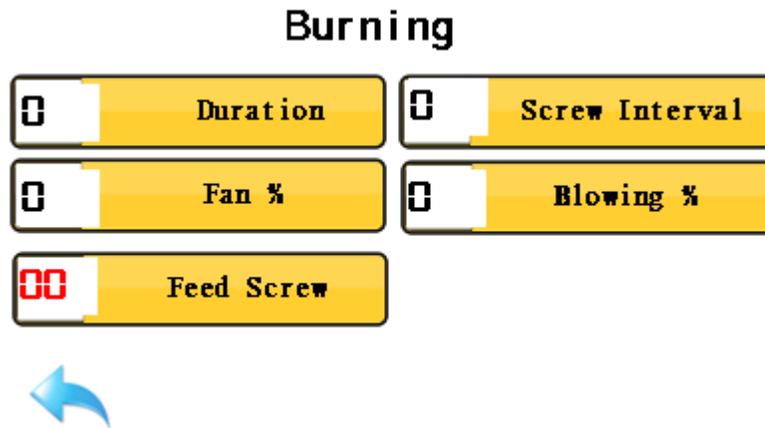
#### **- Blowing ...**

Here one can set the Indoor Fan Speed in the Ignition Mode. It can vary from 1 to 100 %. The interval/ gap to set is every 1%.

### **4.2 Set on Fire.**



Pressing the Ignition Icon gives access to the settings to configure the Ignition Process.



Here 5 parameters can change:

**- Duration**

Here once can set the time of operation of the Ignition Mode. It can vary from 4 to 198 seconds. The interval/ gap to set is every 2 seconds.

**- Fan**

Here one set the Smoke Fan Speed of the Ignition Mode. It can vary from 1 to 100%. The interval/ gap to set is every 1%.

**- Fuel Screw Conveyor**

Here one can set the time of operation of the screw conveyor in the Ignition Mode. It can vary from 0.1 to 9.9 seconds. The interval/ gap to set is every 0.1 second.

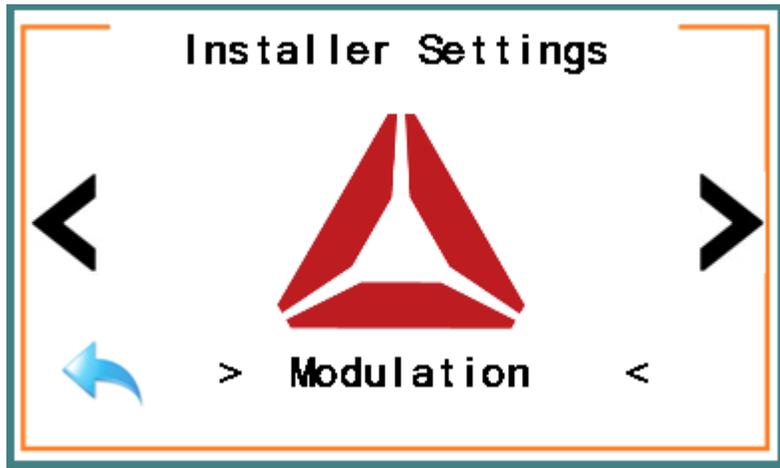
**- Interval/ Gap Screw Conveyor**

Here once can set the time for the screw conveyor to rest in the Ignition Mode. It can vary from 1 to 100 seconds. The interval/ gap to set is every 1 second.

**- Blowing ...**

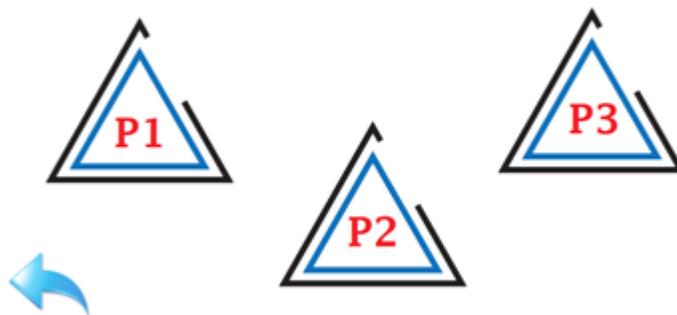
Here one can set the Indoor Fan Power for Ignition Mode. It can vary from 1 to 100%. The interval/ gap to set is every 1%.

#### 4.3. Modulation.



In this menu there are the settings of the modes, modulating the three **degrees/ stages** of the indoor temperature.

#### Modulation

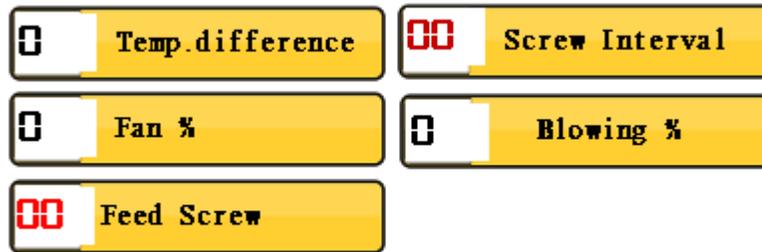


The **degrees/ stages** of modulation are three

##### 4.3.1 P3

Pressing the triangle with the title **P3** the device transfers from the system to a settings menu for the 3rd modulation.

## Modulation 3



Here 5 parameters can change:

### **- Thermal Difference**

Here the **Delta-t ( $\delta$ -t)** is set from 1 to 9 degg for Modulation 3.

### **- Fan**

Here one can set the Smoke Fan Power for Modulation 3 Mode. It can vary from 1 up to 100%. The interval/ gap to set is every 1%.

### **- Fuel Screw Conveyor**

Here one can set the time of the operation of the screw conveyor in the Modulation 3 Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 second.

### **- Interval/ Gap Screw Conveyor**

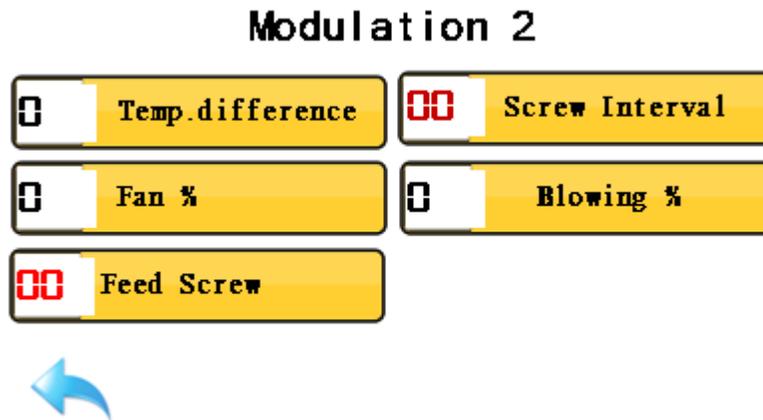
Here one can set the time for the screw conveyor to rest in the Modulation 3 Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 second.

### **- Blowing ...**

Here one can set the Indoor Fan Power in the Modulation 3 Mode. It can vary from 1 up to 100%. The interval/ gap to set is every 1%.

### 4.3.2 P2

Pressing the triangle with the title **P2** the device transfers from the system to a settings menu for the 2nd modulation.



Here 5 parameters can change:

#### - **Thermal Difference**

Here one can set the **Delta-t** from 1 up to 9 degg for the 2nd Modulation.

#### - **Fan**

Here one can set the Smoke Fan Power for 2<sup>nd</sup> Modulation Mode. It can vary from 1 to 100%. The interval/ gap is every 1%.

#### - **Fuel Screw Conveyor.**

Here one can set the time for the screw conveyor to operate in 2<sup>nd</sup> Modulation Mode. It can vary from 0.1 to 9.9 seconds. The interval/ gap is every 0.1 second.

#### - **Interval/ Gap Screw Conveyor**

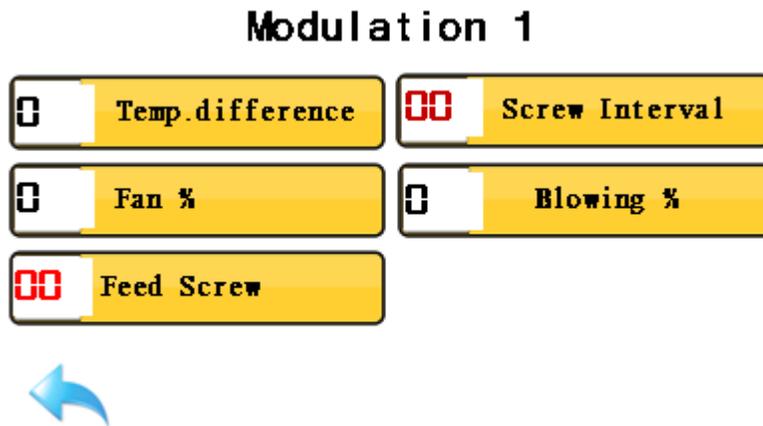
Here one can set the time for the screw conveyor to rest in the 2<sup>nd</sup> Modulation Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 second.

#### - **Blowing...**

Here one can set the Indoor Fan Power for the 2<sup>nd</sup> Modulation Mode. It can vary from 1 to 100%. The interval/ gap to set is every 1%.

### 4.3.3 P1

Pressing the triangle with the title **P1** the device transfers from the system to a settings menu for the 1st modulation.



Here 5 parameters can change:

#### - *Thermal Difference*

Here the **Delta-t** is set from 1 to 9 degg for the 1<sup>st</sup> Modulation.

#### - *Fan*

Here one can set the Smoke Fan Power for the 1<sup>st</sup> Modulation Mode. It can vary from 1 up to 100%. The interval/ gap to set is every 1%.

#### - *Fuel Screw Conveyor*

Here one can set the time for the screw conveyor to operate in the 1st Modulation Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 second.

#### - *Interval/ Gap Screw Conveyor*

Here one can set the time for the screw conveyor to rest in the 1<sup>st</sup> Modulation Mode. It can vary from 0.1 up to 9.9 seconds. The interval/ gap to set is every 0.1 second.

- **Blowing...**

Here once can set the Indoor Fan Power in the 1<sup>st</sup> Modulation Mode. It can vary from 1 up to 100%. The interval/ gap is every 1%.

**4.4 Change of the language.**



In this menu a selection can do between two display languages.

The first one is Bulgaria, and the second one is English.

**Change of the Language**



English



Български



## Change of the Language

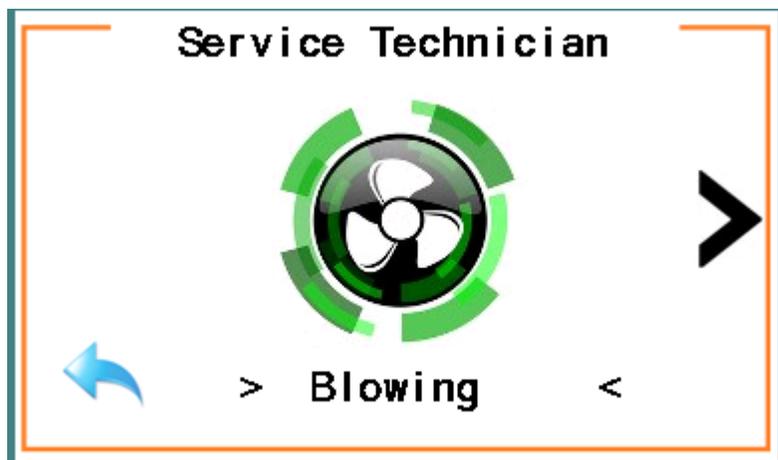


### **5. Service Technician Settings.**

The second possible access to the system is as a service technician

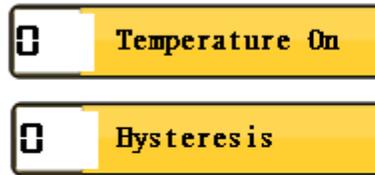
Here there are 4 types of settings possible.

#### **5.1 Blowing**



Pressing the Blowing Icon, the service technician has the opportunity to set the Indoor Fan operation.

## Blowing



Here there are 2 parameters to change:

### - *Switch-on Temperature*

Here one can set the Smoke Gas Temperature, which the indoor fan switches on at.

Example:

If the switch-on temperature **Temp(on)** is set to 60degg and the hysteresis **Xis** is set to 5 degg, then the indoor fan will start on reaching 67 degg. The reason why is because the system has a preset constant hysteresis of 2 degg, which is added!

To put it as a formula:

$$\mathbf{Temp(start)=Temp(on)+Xis+2}$$

On stopping of the fan applies the contrary rule!

$$\mathbf{Temp(stop)=Temp(on) - (Xis+2)}$$

Meaning, in the above-mentioned example, stopping will take place at 53 degg at the Smoke Gas Sensor!

### - *Hysteresis*

This is the thermal lag at the time of switch on and off of the indoor fan.

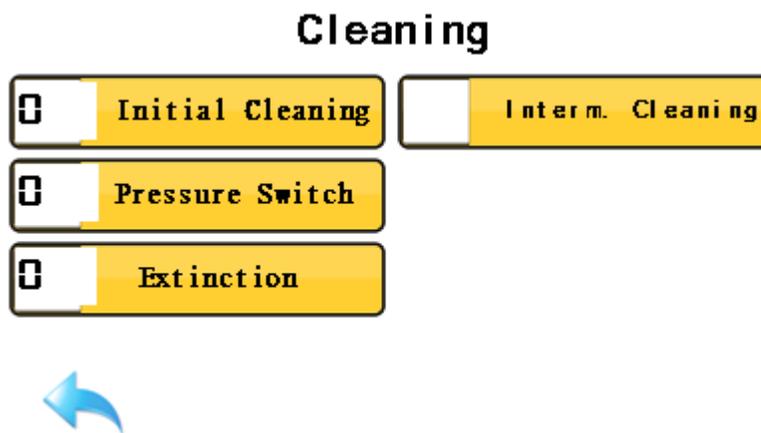
It can be set within the range of 1 to 10 degg.

### 5.2 Clean.



In the Clean Menu the times/ durations of the system to clean can be set.

The service technician has at their disposal 4 setting in this mode:



#### - Initial Clean

In Initial Clean the duration of the operation of the smoke fan can be set to 100% in seconds in the **Start** Mode.

It can be set from 4 up to 198 seconds.

#### - Pressure Switch Test

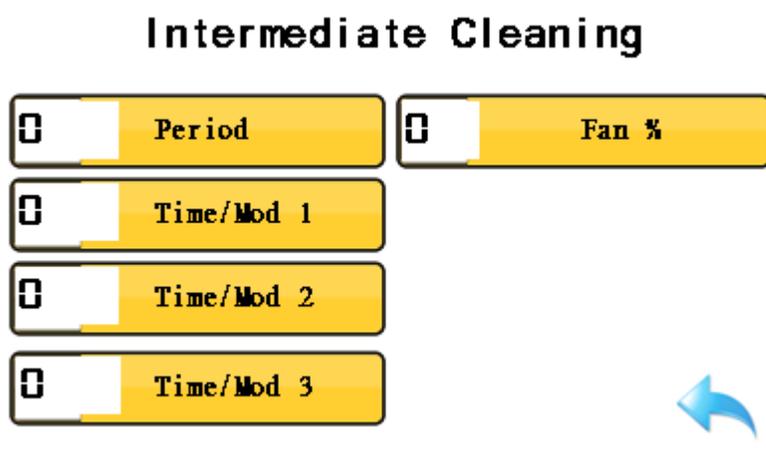
Pressure Switch Test is a test mode. Here one can set the lowest value for the smoke fan to blow so that they can check if the **Pressure Switch** will close properly at the lowest level of blowing of the smoke fan. The test can be done in the **Start Mode**. For the first 10 seconds the fan will operate at 100%, then it will transfer to the preset lowest value, if the pressure switch opens, then the interrupted operation of the pressure switch alert will set!

#### **- Extinct Fire**

In extinct fire one can set the duration for the smoke fan to operate at 100 % in **Clean Mode**. This mode gets active if the control unit transfers to switch-off and extinction of the fireplace!

It can be set from 4 to 198 seconds.

#### **- Intermediate Clean**



There are 5 parameters to set in the intermediate clean.

#### **- Period**

Here one can set the time from 10 to 990 seconds. It is displayed in the **System Information** Menu as well. This setting is about how long it will take the fireplace to launch cumulative residue clean.

The time to set should be the sumtotal of the operation of the screw conveyor. This way one can calculate the amount of pellets after which there should follow a cleaning process!

***There are three types of time to set:***

***Time/ Mod1 is the time to clean in Modulation Mode 1.***

***Time/ Mod2 is the time to clean in Modulation Mode 2.***

***Time/ Mod3 is the time clean in Modulation Mode 3.***

#### ***- Time***

For how long the intermediate clean should last.

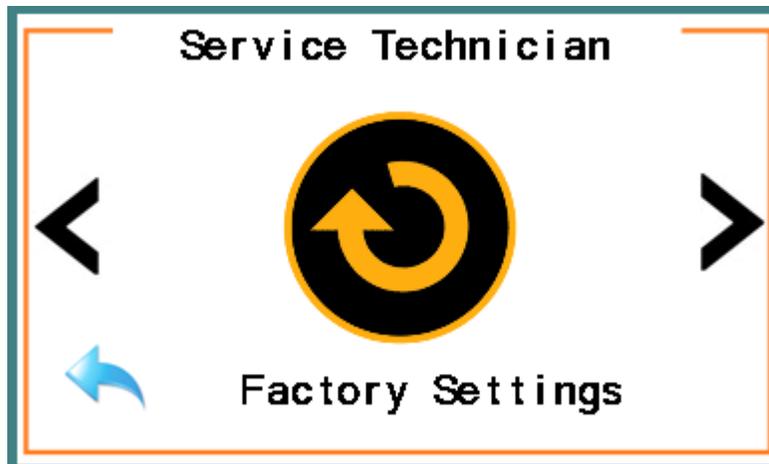
The time is set within the range from 4 to 198 seconds.

#### ***- Fan***

Via this parameter one can set the power of the smoke fan while the intermediate clean is performed.

It can be set within the range from 1 to 99%.

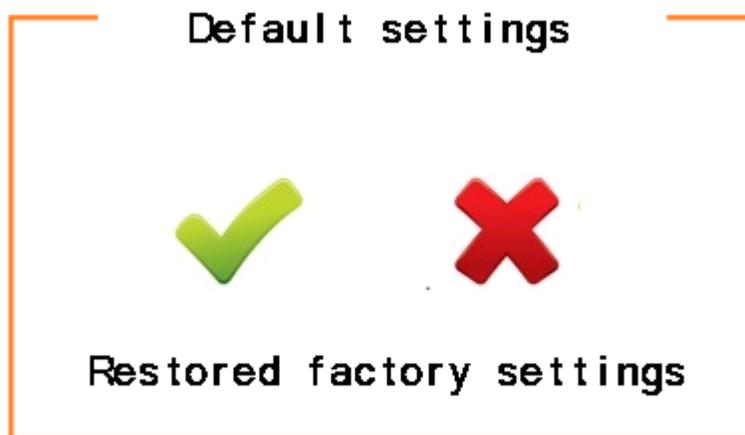
### ***5.3 Factory Settings.***



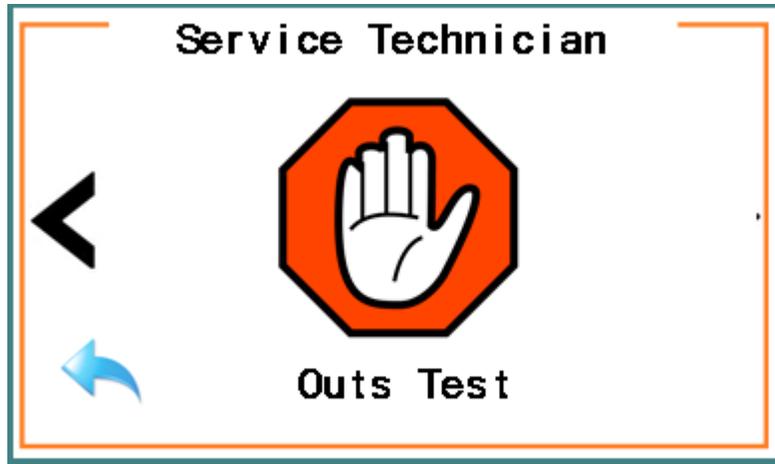
Here one can restore the factory settings of the control unit.

*Нека да се има предвид, че се ресетва абсолютно всичко!*

*Please note that absolutely everything is reset!*

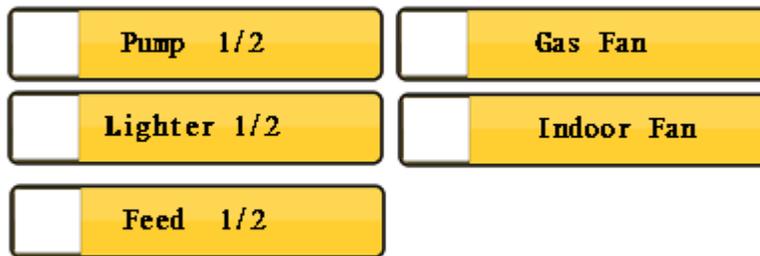


**5.4 Output test.**



Accessing the Output Test menu, there are 5 settings shown:

### Outs Test



#### - **Pump** ½

Where one can alternate between **1** and **2**.

Selecting the figure **1** and then pressing **Save**, the pump or **OUT2** switches off.

Selecting the figure **2** and then pressing **Save**, the pump or **OUT2** switches on.

#### - **Ignition** ½

Where one can alternate between **1** and **2**.

Selecting the figure **1** and then pressing **Save**, the ignition or **OUT1** switches off.

Selecting the figure **2** and then pressing **Save**, the ignition or **OUT1** switches on.

### **- Screw Conveyor ½**

Where one can alternate between **1** and **2**.

Selecting the figure **1** and then pressing **Save**, the screw conveyor or **OUT5** switches off.

Selecting the figure **2** and then pressing **Save**, the screw conveyor or **OUT5** switches on.

### **- Smoke Fan**

Here one can make a selection from 1 to 100 %.

Selecting any number from **1** to **100** and then pressing **Save** will be followed by a regulation of the power at the smoke fan output or **OUT4**.

### **- Indoor Fan**

Here one can make a selection from 1 to 100%.

Selecting any number from **1** to **100** and then pressing **Save** will be followed by a regulation of the power at the indoor fan output or **OUT3**.

Please note that the Output Test is possible only after the device is in **Ready** Mode. On transferring to **Start** Mode, the test terminates!

## **6. Special Settings.**

The access to the special settings is through a password – **9999**. Here two parameters can change:

- if the Smoke Fan Regulation is to do via automatic control or without it.
- the second setting concerns if there will or there will not be a second fuel (process).