

The logo for DEFRO HOME, featuring the brand name in a clean, white, sans-serif font. The word 'DEFRO' is positioned above 'HOME'. The background of the logo area is a dark grey band with a geometric, low-poly pattern in various shades of grey.

DEFRO  
HOME

operating manual

controller

**NG01 AIR**

with control panel K100

adapted for operation with MYPELL and SLIMPELL pellet stoves manufactured by DEFRO



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# Introduction

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NG01 is a control system for stoves fired with pellet and is available in two versions: Air and Hydro.

It is characterized by:

- easy installation and user,
- simple and intuitive user functions,
- reliable and flexible operation of the software with proven technology from TiEmme elettronica,
- advanced functions available for designers allowing adaptation to the various stoves and systems.

## Product composition:

- electronic board with durable and safe 4-point fixing
- removable connections
- flue gas temperature sensor
- ambient probe
- mainboard - control panel connecting cable
- control panel with antistatic cover

## Safety notice

Prior to installation user should acquire knowledge of:

- Environmental and safety standards.
- Follow all local regulations, inclusive of these given in the national and European standards.
- Follow all applicable safety standards.
- This instruction is intended only for technical personnel



## DECLARATION OF CONFORMITY

**Applied regulations:** EN 60730-1 50081-1 EN 60730-1 A1 50081-2.

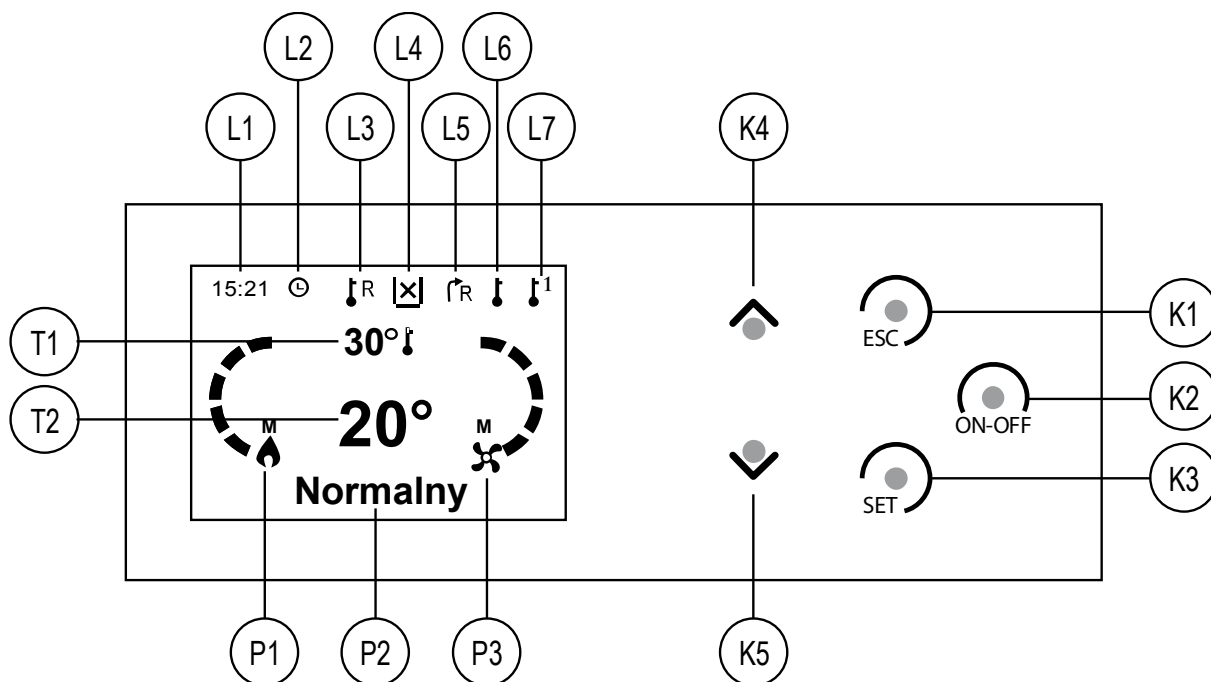
This manual has been prepared with due care, but information may not be complete, exhaustive or may contain errors. Therefore, design and information may be changed without prior notice.

**TiEmme elettronica** shall not be responsible for incomplete or incorrect information.

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# Control panel



Picture 1 View of control panel K100

## Keys

Key	Description
<b>K1</b>	<ul style="list-style-type: none"> <li>exit from menu/submenu</li> </ul>
<b>K2</b>	<ul style="list-style-type: none"> <li>ignition/damping (press for 3 sec.)</li> <li>errors reset (press for 3 sec.)</li> <li>activation/lock of the clock (chrono)</li> </ul>
<b>K3</b>	<ul style="list-style-type: none"> <li>entry to menu/submenu of the user 1</li> <li>entry to user menu 2 (press for 3 sec.)</li> <li>save of settings</li> </ul>
<b>K4</b>	<ul style="list-style-type: none"> <li>entry to visualisation menu,</li> <li>value increase</li> </ul>
<b>K5</b>	<ul style="list-style-type: none"> <li>entry to visualisation menu,</li> <li>value decrease</li> </ul>



## Diodes

Designation	Icon	Description
<b>L1</b>	15:21	clock, current time
<b>L2</b>	⌚	signalling of activation of chrono mode
<b>L3</b>	⊗	signalling of empty pellet container
<b>L4</b>	↑R	signalling of reaching remote temperature
<b>L5</b>	↑R	signalling of hot air flow to the room
	↗	signalling of hot air flow to the DGP system
<b>L6</b>	↑	signalling of reaching local temperature
<b>L7</b>	1	operation modes

## Temperature indicators

Designation	Appearance	Description
T1	30°!	Local temperature set
T2	20°	Current temperature set

## Indicators

Designation	Appearance	Description
P1		Combustion power level. M letter stands for manual level setting, A letter stands for automatically selected level (usually it is a maximum level).
P2		Power level for blowing fan with hot air
P3	Normal	Current operating state

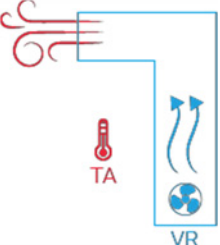
## Configuration made by the fitter

The fitter is obliged to configure the controller after installation of the pellet stove in the target location. The configuration comprises of three stages:

- Selection of heating system,
- Selection of controlled device by output **A1(P52)** and **A2(P47)**,
- Selection of devices connected to inputs **IN2** (P77), **IN3** (P75), **IN6**(P78) and **IN7** (P82),

## Selection of heating system

A first step it selection of heating system by parameter **P69** in option **Konfiguracja (Configuration)** in **Menu Systemu (System)** (access from **Menu Modyfikacje (Modifications) Menu**).

Configuration	Scheme of the system	P69 parameter value
Configuration 0		0

Configuration 3		<b>3</b>
Configuration 4		<b>4</b>
Configuration 5		<b>5</b>
Configuration 8		<b>8</b>
Configuration 10		<b>10</b>
Configuration 11		<b>11</b>

## A1 and A2 outputs configuration

Next step is the configuration of outputs **A1 (P52)** and **A2 (P47)** specifying the equipment, which should be controlled by this output.

Device	Parameter	Output A1(P52)	Output A2(P47)
<b>Output blocked</b>	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Pellet safety valve</b>	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Pellet loading motor</b>	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Output under thermostat</b>	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Selector of heating system</b>	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

<i>Igniter</i>	19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Cleaning motor</i>	25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Duct fan</i>	29	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Configuration of IN2, IN3, IN6 i IN7 inputs

The last stage of configuration is the definition of equipment connected to IN2, IN3, IN6, IN7 inputs.

Device	Parameter	Inputs			
		IN2 (P77)	IN3 (P75)	IN6 (P78)	IN7 (P82)
<i>Unused input</i>	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Door sensor</i>	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Pellet level sensor</i>	6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Limit switch for cleaning the motor</i>	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Selector limit switch</i>	13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Air flow sensor</i>	16	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>External clock (Chrono)</i>	17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Remote room thermostat</i>	19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Remote room probe</i>	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Encoder of conveying screw</i>	28	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Operation status

Status	Code
<i>Switched off</i>	-
<i>Checking</i>	<i>ChEc</i>
<i>Firing up</i>	<i>On 1</i>
<i>Stabilization</i>	<i>On 5</i>
<i>Normal</i>	-
<i>Modulation</i>	<i>Mod</i>
<i>Standby</i>	<i>Stby</i>
<i>Damping</i>	<i>OFF</i>
<i>Probe</i>	<i>ChEc</i>
<i>Operation</i>	<i>Alt</i>
<i>Firing up repeat</i>	<i>rEc</i>

## Alarms

Code	Description
Er01	High Voltage Safety Error 1: signalled also by shutdown of the system
Er02	High Voltage Safety Error 2: signalled only if the combustion fan is switched on
Er03	Damping for the too low temperature of outlet
Er05	Damping for the excessive temperature of outlet
Er07	Fan encoder error: lack of encoder signal (for P25 = 1 or 2)
Er08	Fan encoder error: Combustion fan adjustment failed: (for P25 = 1 or 2)
Er11	Day and night are not correct due to prolonged lack of supply
Er12	Ignition failed
Er15	No supply voltage
Er16	RS485 communication error
Er17	Error of air flow controller
Er18	Lack of pellet
Er25	Damaged cleaning motor
Er39	Air flow sensor damaged
Er41	Minimum flow of air in Control/Checking modes has not been reached
Er42	Maximum air flow reached (FL40)
Er44	Open door error
Er47	Conveying screw encoder error: lack of encoder signal (for P81 = 1 or 2)
Er48	Conveying screw encoder error: encoder speed adjustment failed (for P81 = 1 or 2)



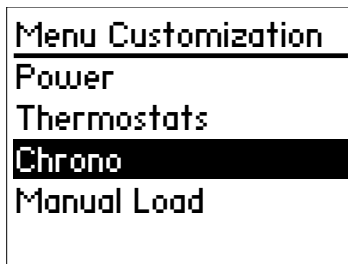
<b>Service</b>	Service error. Informs that the hours planned for operation (parameter T66) have been reached. Contact with service required.
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## User menu

### Menu Customization

Settings menu is intended for control of the current operation of the stove by:

- power adjustment - *Moc*,
- thermostats settings menu - *Termostaty*,
- working time programming - *Chrono*,
- forcing of endless screw loading – *Zaladuj Slimak*.



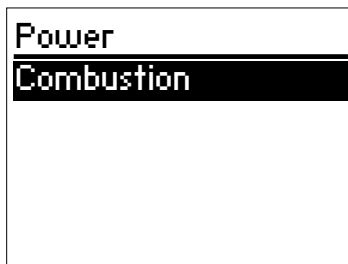
*Menu Ustawienia (Settings)* will be displayed after pressing  button.

#### Menu customization → Power

Content of this screen depends on the configuration of the heating system.




Meaning of menu items

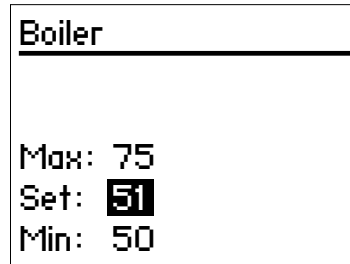
**Combustion** – adjustment of combustion power



#### Power → Combustion

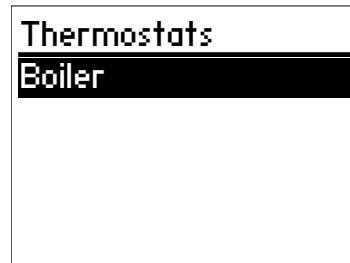
**Combustion** menu is used to adjust power of the stove in the range of seven levels (from 0 to 6). The first stage corresponds to minimum power of the stove (approx. 40% of nominal power) and the last one to the nominal power. It is also possible to set automatic selection of power using **AUTO** item.

- Select required level with a key  and .
- Confirm the selection with a key .






#### Menu Customization → Thermostats

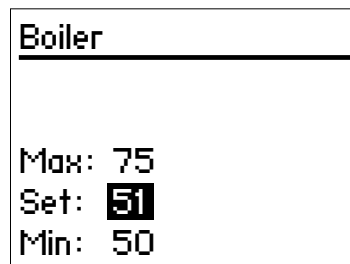
The menu allows changing values of thermostat temperature in the room where the stove is installed and in the other room where the temperature sensor has been installed.



#### Menu Customization → Boiler

Set value is within the determined limits between the given **Max** and **Min** values:

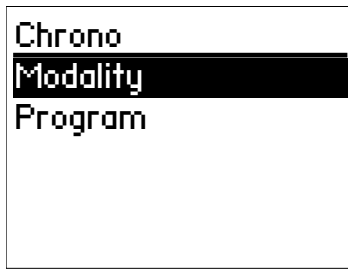
- Select required value of water temperature in boiler using keys  and .
- Confirm the setting with  button.



#### Menu Customization → Chrono






Chrono, that is time programmer allows setting and activation of a programme controlling the duration of stove operation.

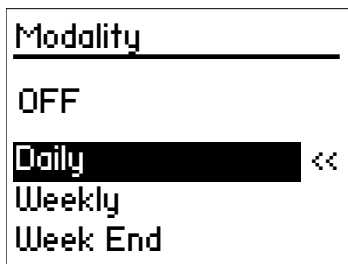
- **Modality** menu is used to select mode of programme operation,
- **Program** menu is used to set operating times for each mode.



### Chrono → Modality




It allows selecting one of the modes or locking operation of the program.

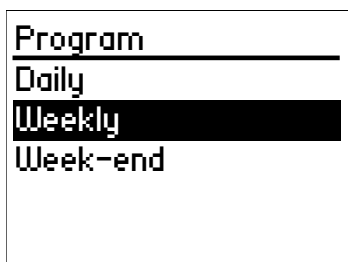
- enter to the mode with a key ,
- select required mode **Daily**, **Weekly** or **Week-end** using keys  ,
- Switching **ON/OFF** (program switch on/off) option by pressing  button,
- confirm new settings pressing the button .





### Chrono → Program



This menu can be used to program each of program modes by determining times of switching on and off of the stove:


- select the mode with a keys  ,
- enter the programming with a key .

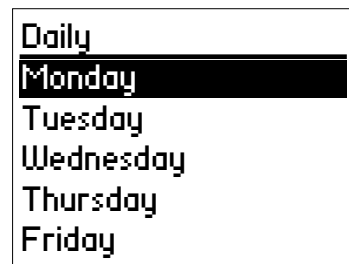


### Chrono → Program → Daily







**Daily** mode allows setting stove switching on/off times individually for each day of the week. The other days of the week (Saturday, Sunday) will be displayed after pressing   keys, when the currently selected day is **Monday** or **Friday**, respectively, (first or last item on the list).


- select day using   keys, for which you want to specify times of switching on and switching off,

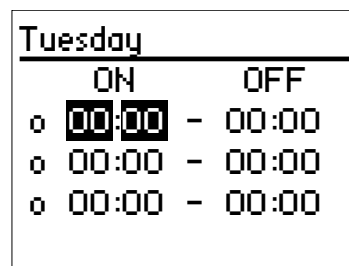
- press button .



Screen, where you can set maximum three operation cycles during the day, will be displayed after selection of a day.

- Choose selected field of time (00:00) with keys  . Switching on time is entered in **ON** column, while switching off time in **OFF** column
- Press  key, to confirm selection of hours or minutes field.
- Select hour and minutes (with 15-minutes interval) with the keys  
- Confirm selected value with a key .
- Repeat operations for the other fields.
- Each cycle can be activated or blocked pressing

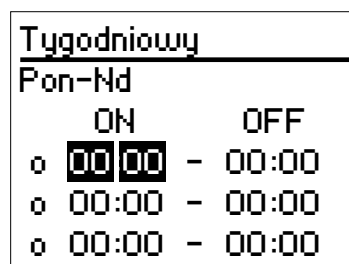
a button . Active time interval is marked by filling a bullet preceding each of the cycles (● - active, ○ - inactive).



### Chrono → Program → Weekly

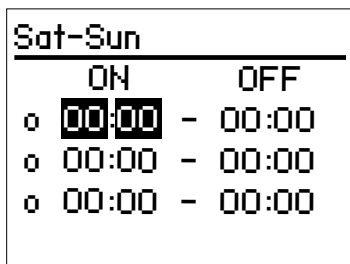
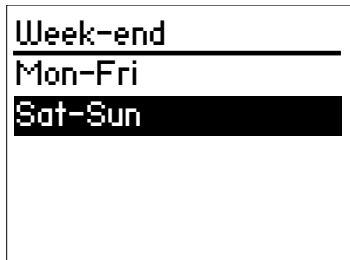
**Weekly** mode allows setting only one set of times for switching on and off the stove, which will be applicable for each day of the week.

Intervals are set in the same way as previously described for **Daily** mode.



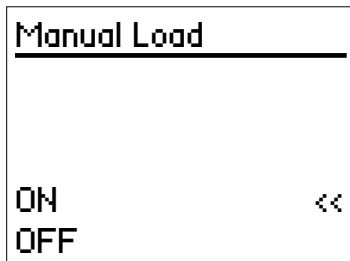
## Chrono → Program → Week-end

Intervals are set in the same way as previously described for **Daily (Codzienny)** mode.



## Menu Customization → Manual Load

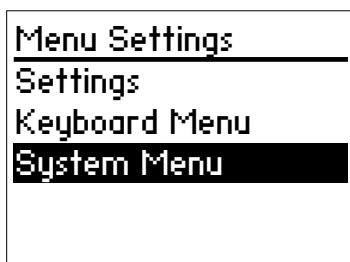
The procedure forces load of pellet. Loading is automatically stopped after 300 seconds. To activate this function it is required to select previously **OFF** option. Only for local panel.



## Menu Settings

This menu contains three options:

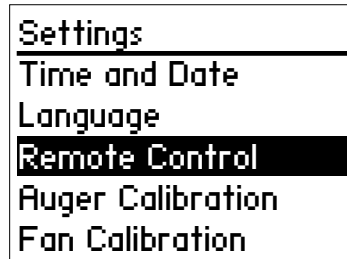
- **Settings** – additional configuration of stove operation
- **Keyboard Menu** – setting of display operation parameters
- **System Menu** – access after entering the password; menu contains options set by the fitter or service technician.



## Menu Settings → Settings

Configuration contains:

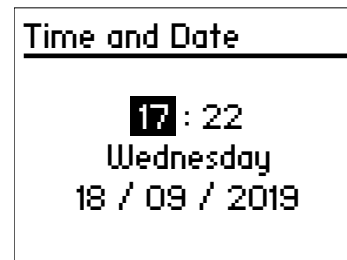
- Time and Date
- Language
- Remote control
- Auger Calibration
- Fan calibration



## Settings → Time and Date

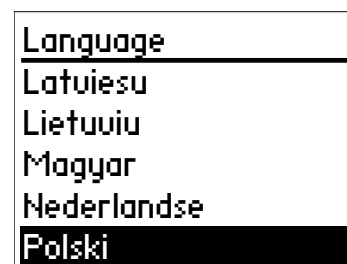
Setting of current data and time.

- Select field with the keys ,
- Confirm selection ,
- Using the keys set the values for: hour, minute, day, month or year.



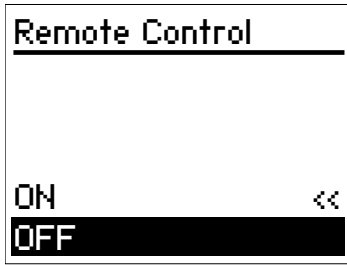
## Settings → Language

Selection of language for the messages from the controller.



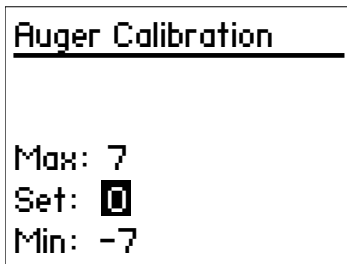
## Settings → Remote control

Switching on or switching off the control by remote module.



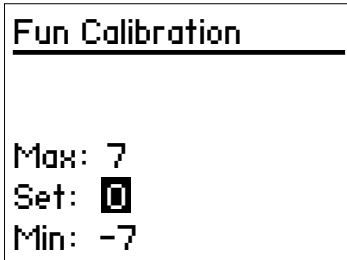
### Settings → Auger Calibration

Calibration of endless screw allows changing speed of operation or duration of operation of drive of the conveying screw. Factory setting is 0, while value set by the user should be between -7 to 7.



### Settings → Fun Calibration

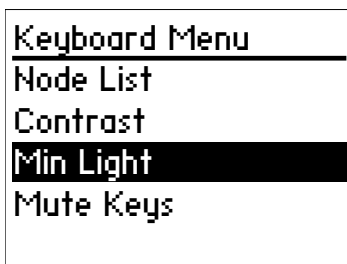
Fan calibration is intended for changing of flue gas fan speed from -7 to 7 in relation to the factory settings (value 0).



## Menu Customization → Keyboard Menu

Display menu contains functions responsible for control of its operations:

- Node list
- Contrast
- Min Light
- Mute Keys

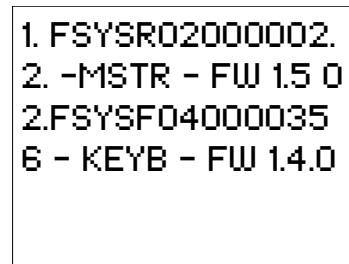


### Keyboard Menu → Node List

**Nmode List** contains list of cooperating devices connected with the controller. Each item of the list contains address, type and version of software.

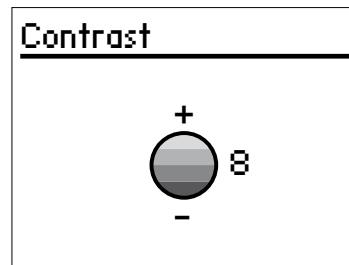
Designation of types:

- **MSTR** – master device
- **INP** – input
- **KEYB** – Keyboard
- **OUT** – output
- **CMPS** – complex device
- **SENS** – sensor
- **COM** – communication link



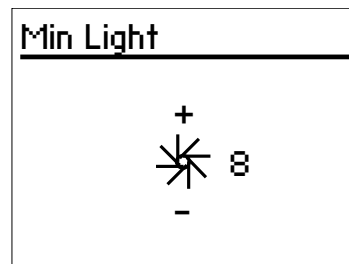
### Keyboard Menu → Contrast

This option is used to adjust contrast of the display



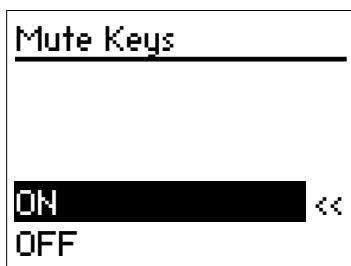
### Keyboard Menu → Min Light

This screen can be used to set a degree of screen backlight.



### Keyboard Menu → Mute Keys

**Buttons Tone** menu allows switching on and off a sound during pressing of panel control buttons



## Information screens

Information on current parameters of boiler operation is displayed on two screens titled **Information**, which are recalled by buttons.

Screen displayed with a button (when main screen is currently displayed):

- Exhaust T.** – temperature of flue gas
- Boiler T.** – air temperature near the stove
- Fan** – rotational speed of flue gas fan
- Auger [s]** – cycle time of endless screw

Informations	
Exhaust T. [°C]	101
Boiler T. [°C]	65
Buffer T. [°C]	36
Fan [rpm]	0
Auger [s]	0.0

Screen displayed with a button :

- Work time** – operating time of stove in **Normal**, **Modulation** modes.
- Ignitions** – number of firing up cycles
- Prod.Code.** – product code

Informations	
Work time [h]	65
Ignitions	11
Prod. Code:	562 0

## Control of stove operation

### First start-up of the stove

During first start-up of the stove or when it is stated after refuelling resulting from complete combustion of pellet.

- Turn on the power
- Switch on pellet endless screw **Menu Customization** → **Manual Load** using option

**ON**, when you hear a sound of falling pellet, switch off using **OFF** option.

- Switch on Rozpalanie/Firing up with button.
- The stove will switch to firing up and will continue operation in automatic mode.

### Stove start-up

- Turn on the power.
- Press button .
- The stove will switch to firing up and will continue operation in automatic mode.

### Operating power setting

In **Menu Customization** → **Power** → **Combustion** there is a 7-stage controller, which can be used for control of stove maximum power (from 0 to 6). The stove is operating on power 6 by default, that is it uses whole power for heating. This status is indicated by a letter **A** on **P1** indicator of controller display. When user decreases power in the menu it will be reflected in **P1** index, letter **M** will appear instead of letter **A**. Decreasing combustion power results in prolongation of time for reaching of temperature, decreasing at the same time portions of supplied pellet.

### Work cycle

After initiation of the firing the stove switches successively to the following operation modes:

- **Checking**
- **Probe**
- **Firing up**
- **Stabilization**
- **Operation**
- **Modulation**
- **Standby**
- **Damping**

Presented cycle is repeated automatically to maintain constant power of the stove and temperature of air.

### Stove shutdown

Stove, in any operating mode, can be switched off by

button , what results in automatic switching to **Damping** mode. After completion of this cycle the stove switches to **Turn off** mode and in this mode you can safely shutdown supply of the stove.

### Stove emergency shutdown

In case of emergency the stove can be immediately switched off by disconnecting power supply - using switch or pulling out the plug from a supply socket. A

small part of pellet in burner will be combusted during several seconds and flame will be damped.

## Working time programming

The stove can be programmed for scheduled operation using **Customization Menu → Chrono → Modality**. Selected mode causes switching on and off the stove in accordance with the periods set in **Customization Menu → Chrono → Program** with a programme corresponding to the given mode. Time programming details are described in the chapter **Customization Menu**, subsection **Chrono**.



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**DEFRO**<sup>®</sup>  
heating technology

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