# Boiler temperature controller with a feeder

## MASTER 600

# Service Manual


DK System

INS-023-003 130x184.5

## Safety instructions and notes on installation

- The controller is designed for use with boilers with automatic feeding of fuel.
- The controller must be installed by an authorized person.
- The controller must be connected to a socket with a protective contact.
- It is required that the boiler had its own safeguards against excessive temperature rise of the boiler caused e.g. boiler controller or related equipment malfunction.
- The controller should be placed in a location that prevents its heating to a temperature higher than 40°C.
- The controller must not be exposed to water and conditions causing condensation (e.g. sudden changes in ambient temperature).
- The device should be installed and operated as described in the assembly description and rules for electrical equipment.
- A blown fuse due to bad wiring or a short circuit in the electrical system does not constitute grounds for a warranty repair.
- Before starting the controller, you should check the electrical connections.
- The controller is protected with two 5 A fuses.
- Connection of the power cord and fuse replacement should be made with the controller powered off (the controller power plug must be disconnected from the mains). Connection of the receiving devices and replacement of fuses with the mains plug of the controller plugged in creates an electric shock hazard.
- The connection cables of the controller can be replaced only by the manufacturer or their authorized service establishment.
- You must not use a damaged controller.
- Any damage caused by lightning, improper power surges in the power grid or random events are not eligible for warranty repair (please refer to the warranty terms and conditions).

Notice: Fuses should be replaced only with the controller powered off and the plug disconnected from the mains.

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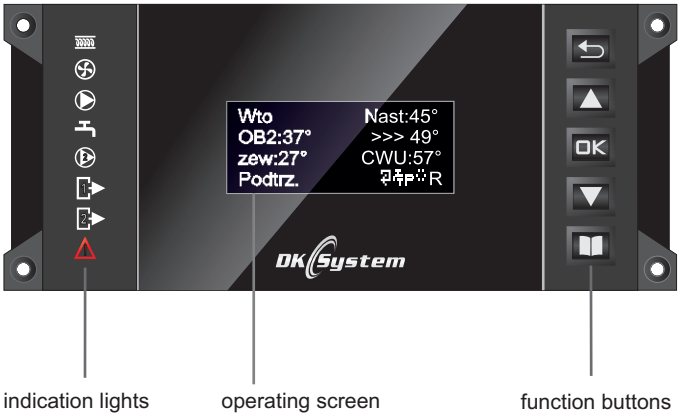
# 1. Description of a controller

Controller is designed for an automatic fuel feeding system boiler operation control, domestic hot water pump control, 2. circuit pump, circulation pump, 3- or 4-way valve control depending on the external temperature in central heating installations. The controller has the following features:

- ❑ maintaining the preset temperature of a boiler by controlling the air blow-in and the feeder operation
- ❑ possibility of operating the boiler with an emergency grate
- ❑ adjustment of the heating temperature of two circuits on the basis of the outside temperature acc. to the selected heating curve
- ❑ possibility of choosing an independent heating curve for the boiler and a circuit with the mixing valve
- ❑ function of moving the curve up or down to better match the thermal characteristics of the building
- ❑ high-temperature silicone cables of temperature sensors
- ❑ protection of floor heating systems against overheating
- ❑ smooth operation of a fan and preset power
- ❑ function of supporting the combustion process by the so-called blow-bys
- ❑ adjustable damping time and automatic turn off during fuel shortage
- ❑ control of the central heating circulation pump
- ❑ control of the 3- or 4-way valve
- ❑ option of enabling or disabling the DHW priority
- ❑ control of the domestic hot water heater charging pump depending on the required temperature
- ❑ control of the 3rd circuit pump working as a circulation pump, a pump protecting the boiler from cold return or a floor heating pump
- ❑ control of the boiler operation and domestic hot water pump acc. to one of several weekly programs
- ❑ protection of domestic hot water heater against Legionella
- ❑ option to work in the SUMMER mode
- ❑ COMFORT SYSTEM function, which protects the pump and mixing valve against scaling
- ❑ protection system - a thermal fuse as an additional, mechanical protection of the boiler against uncontrolled temperature increase
- ❑ cooperation with liquid STB protection
- ❑ detection and sound and optical alarm of the STB protection activation
- ❑ function of protecting the system against freezing and overheating of the boiler
- ❑ damage indication of the temperature sensors
- ❑ adjustable display brightness - increased during settings modification
- ❑ possibility of connecting a room thermostat
- ❑ large, readable, alphanumeric LCD display with 4x16 characters

## 1.1 Description of a controller - functions

## 2. Controller components description




**Indication lights - description**

feeder
fan
central heating pump
DHW pump
2. circuit pump
3D/4D valve opening
3D/4D valve closing
alarm

**Function buttons - description**

- one level up in Menu, operating mode change
- moving between Menu categories, settings change - values increase
- entering Menu category, confirming, entering “TEMPERATURE” screen, operating mode change,
- moving between Menu categories, settings change - values decrease
- entering Main and Service Menu

Fig.1 Control panel - front

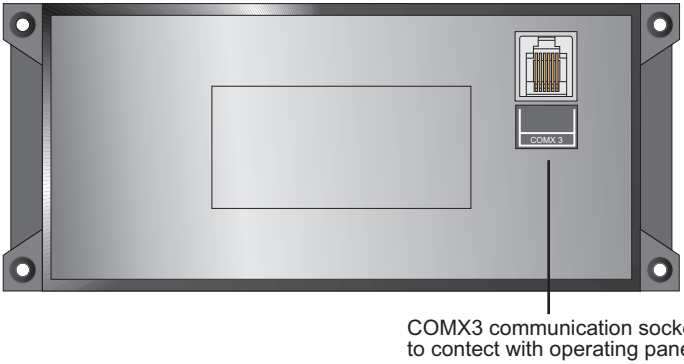



Fig.2 Control panel - back

## 3. Operating panel description

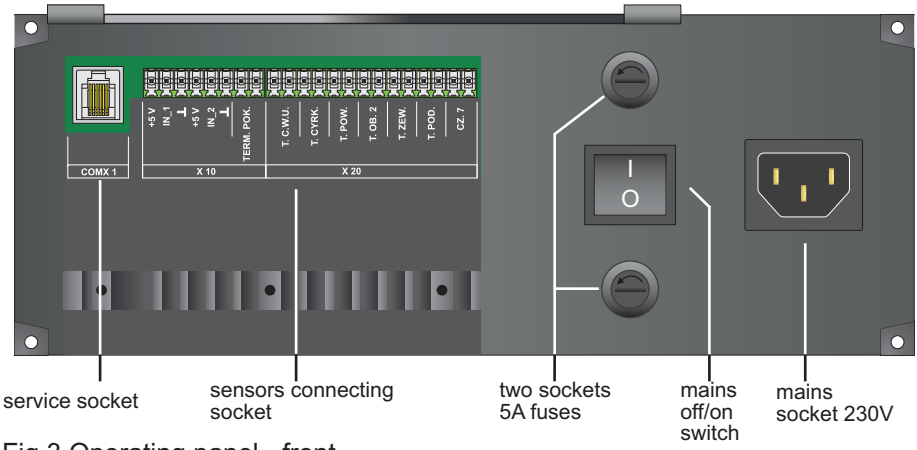



Fig.3 Operating panel - front

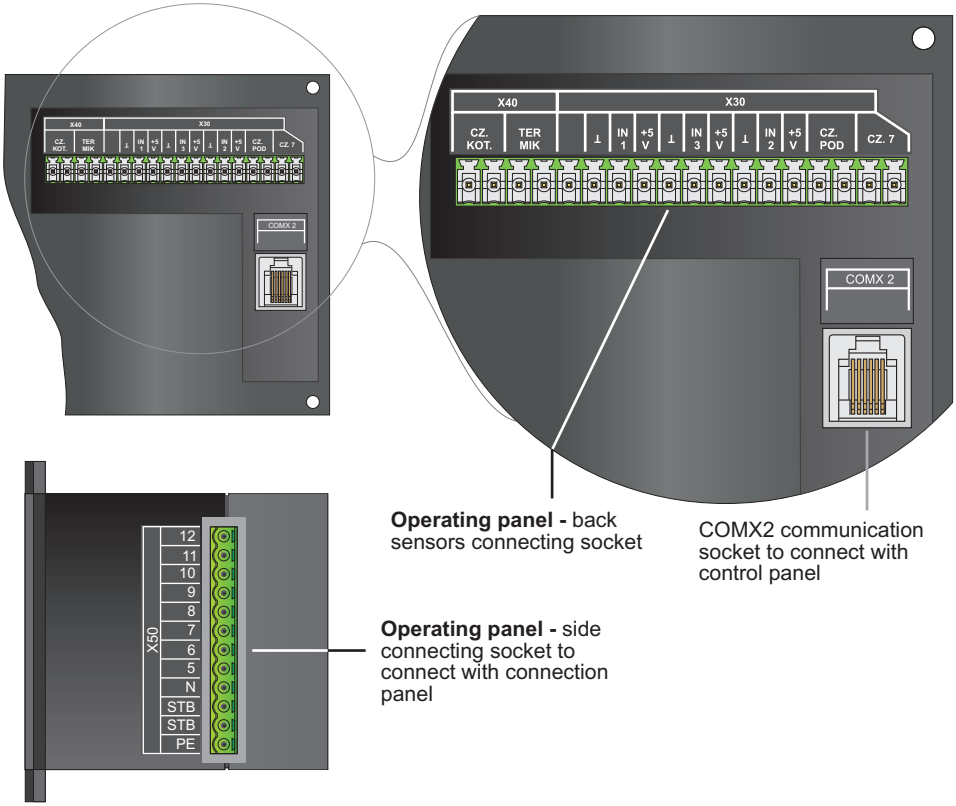
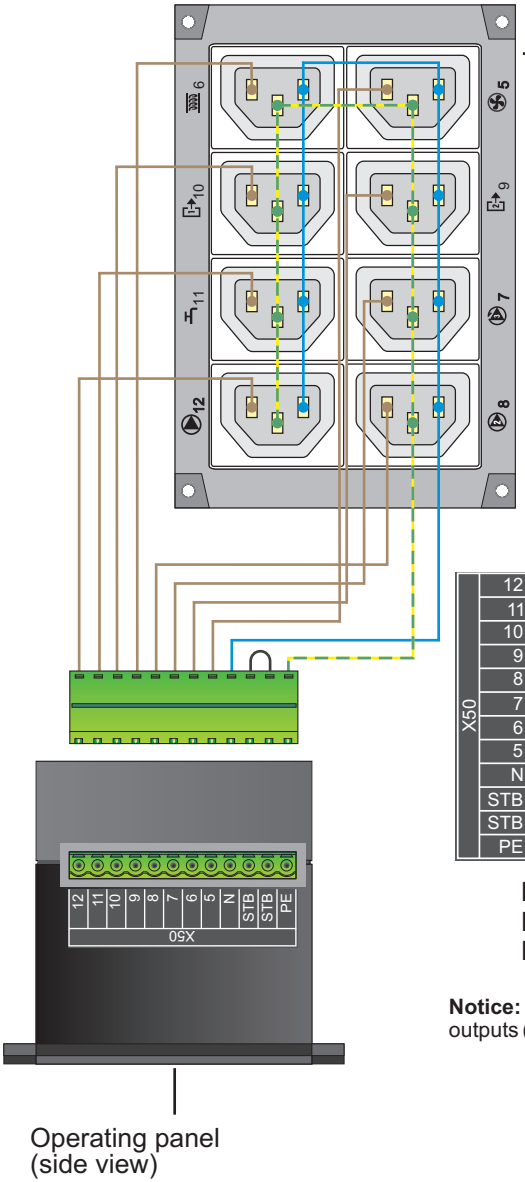



Fig. 4 Operating panel - side and back

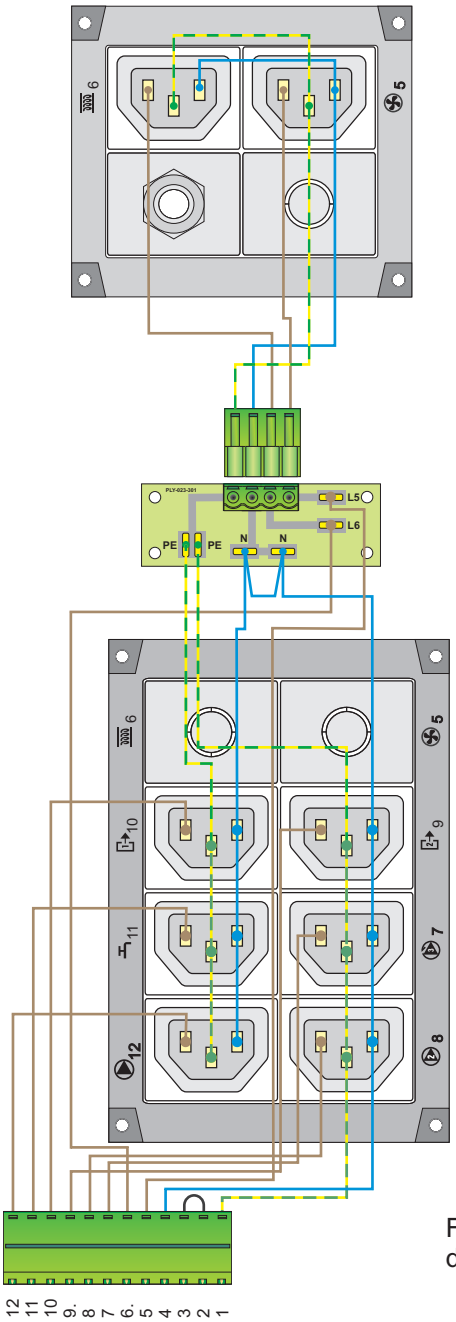
## 4. Connection panel – components and connections




**Notice:** If STB sensor has not been connected, the outputs (marked STB) must be bridged.

Fig. 5 Connection panel wiring diagram

## 4.1 Connection panel – version with external power delivery




- 12 central heating pump
- 11 DHW pump
- 10 3/4 – way valve - on
- 9 3/4 – way valve - off
- 8 2nd circuit pump
- 7 circulation pump
- 6 feeder
- 5 fan

Fig. 6 Version with external power delivery of the fan and feeder

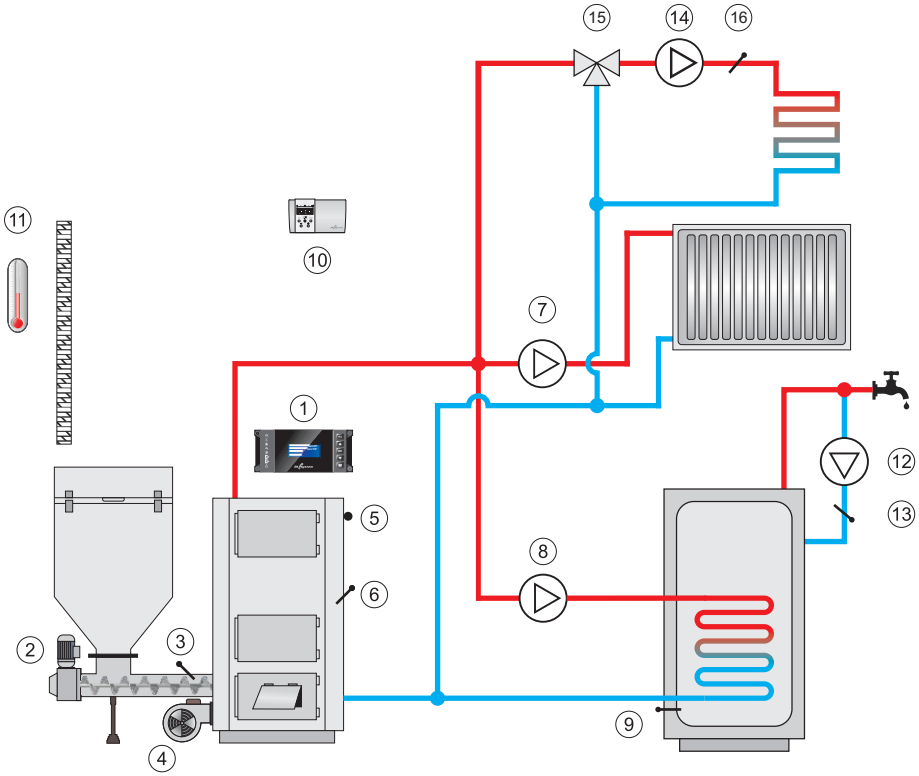
## 5. Controller installation

Proper installation and running of the controller is achieved by observing the following measures:

- ❑ Heating installation has been performed in accordance with the project.
- ❑ Output devices have been connected to the connection panel in accordance with the project.
- ❑ The connector of the connection panel has been connected with the socket of the operating panel.
- ❑ If a STB sensor has been provided by the project, it should be connected to the connection panel after removing the bridge (with power delivery on).
- ❑ Connect the sensors in accordance with the hydraulic project to the corresponding sockets of the operating panel. **Notice: Boiler and thermal (Ter-mik) sensors outputs are located in the rear of the operating panel (Fig.4). Feeder and additional sensor (No 7) outputs are doubled**.
- ❑ Connect the operating panel (COMX2 socket) with a control panel (COMX3 socket) by the attached cable.
- ❑ Turn the operating panel on by pressing the mains switch.
- ❑ If all connections has been made in a correct way, the control panel will display the main screen. If the screen is dark or the following info is displayed "**No Communication**" one should check the electrical connections, heating installation, fuses, or replace the cable connecting the control panel with operating panel. If you are still having difficulty, please contact DK System.
- ❑ Open Main menu / Manual opration and test manually the connection of the connected external devices
- ❑ Proceed to clock setting and configuration of the controller (which has a pre-set factory settings).


**Notice:** If the controller is turned on and the screen display is not lit, please check whether the outlet is powered, then check the fuses in the device and replace with a new 5 A, if blown. If, despite the replacement of fuses, the display screen remains dark, please contact the service.
**Fuses must be replaced when the device if off and the plug removed from the mains socket.**

## 6. Diagrams of connections to the heating installation




1. Controller
2. Feeder motor
3. Feeder temperature sensor
4. Fan
5. Thermal fuse
6. Central heating boiler temperature sensor
7. Central heating pump
8. DHW pump
9. DHW heater sensor
10. Room thermostat
11. External temperature sensor
12. Circulation pump
13. Circulation circuit sensor
14. 2nd circuit pump
15. 3/4 - way valve
16. 2nd circuit temperature sensor

Fig.7 Example of the heating installation diagram without the cutting off and protecting devices. It does not replace a professional project at the assembly spot.

## 6. Diagrams of connections to the heating installation

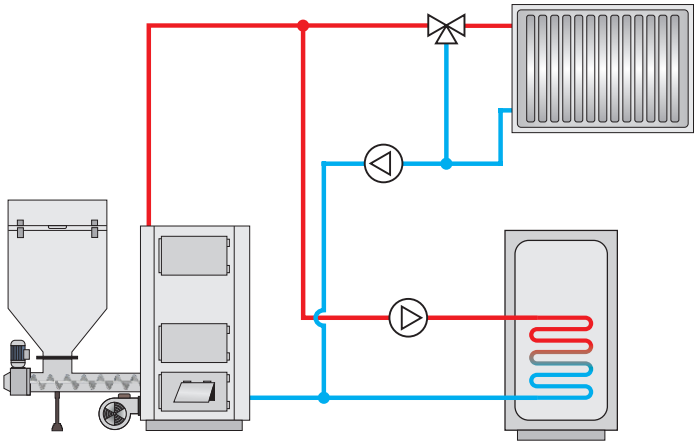


Fig. 8 Example of heating installation in configuration with 3-way valve on the 1. circuit and DHW circuit, w/o shut-off and protecting devices. It does not replace professional project on the installation site.

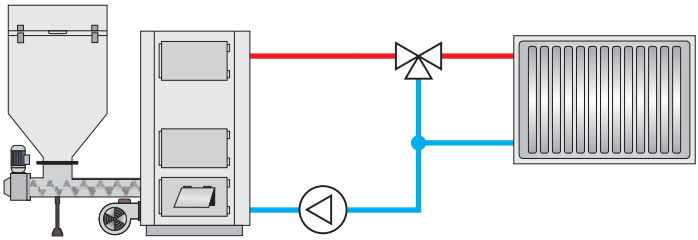


Fig. 9 Example of heating installation in configuration with 3-way valve on the 1. circuit and circulation pump working as an additional pump protecting the boiler against cold return.

## 6. Diagrams of connections to the heating installation

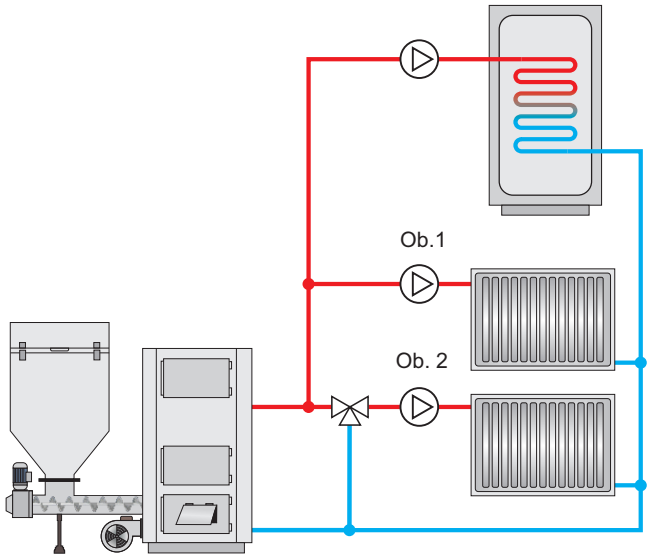



Fig.10 Example of heating installation in configuration with 3-way valve on the 2. circuit and DHW pump, w/o shut-off and protecting devices. It does not replace professional project on the installation site.

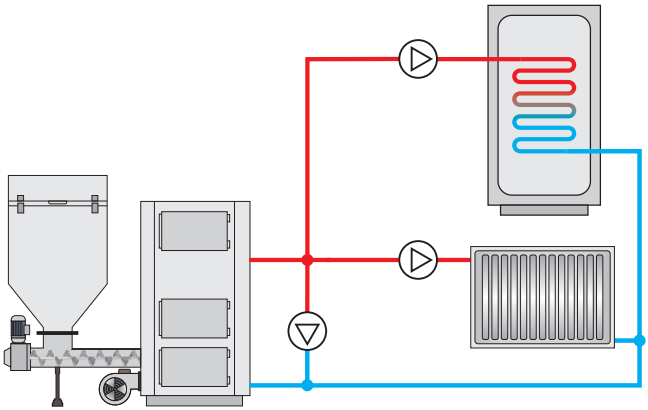


Fig.11 Example of heating installation in configuration with central heating pump, DHW pump and additional pump (circulation type) working as a protection of the boiler against cold return, w/o shut-off and protecting devices. It does not replace professional project on the installation site.

## 6. Diagrams of connections to the heating installation

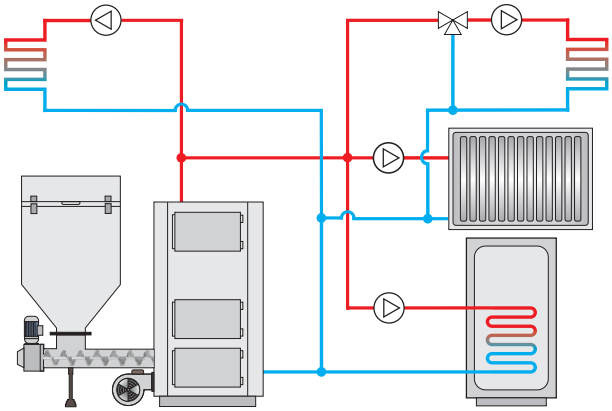


Fig.12 Example of heating installation in configuration with central heating pump, DHW pump, 2. circuit pump with 3-way valve and circulation pump working as a floor heating pump. W/o shut-off and protecting devices. It does not replace professional project on the installation site.

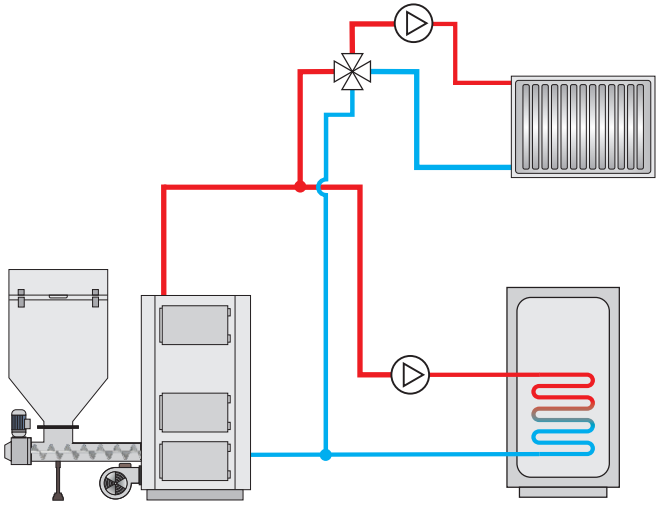


Fig.13 Example of heating installation in configuration with central heating pump, DHW pump and 4-way valve working as a protection of the boiler against cold return, w/o shut-off and protecting devices. It does not replace professional project on the installation site.

## 6. Diagrams of connections to the heating installation

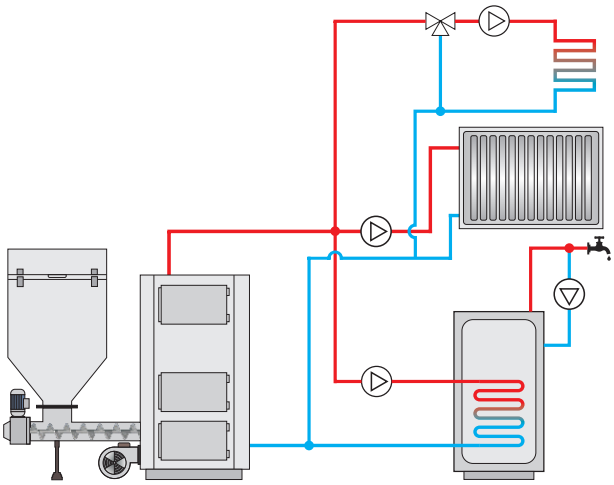


Fig.14 Example of heating installation in configuration with central heating pump, DHW pump, circulation pump and 2. circuit pump and 3-way valve, w/o shut-off and protecting devices. It does not replace professional project on the installation site.

## 7. Main menu - description

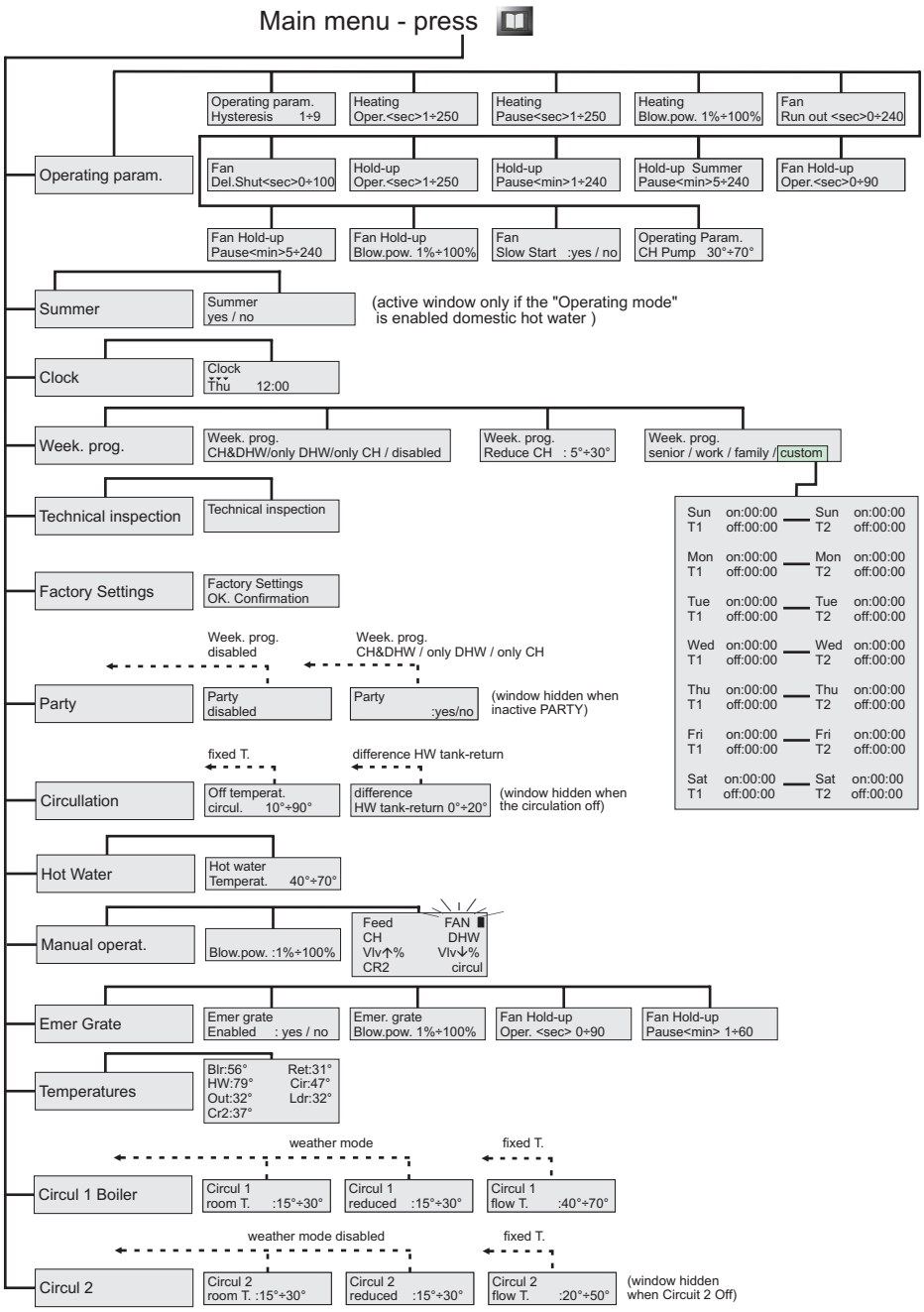
Navigating the Main menu is very simple and intuitive. To enter, please press the button . Use to select name of the parameter to be changed. Use buttons to enter settings. Use buttons to change value of the selected item. Use the button to confirm and move to the settings of next item. Use the button to return to the parameter name selection level. Press twice to go to the main screen.

**Notice:** Some windows in the Main menu are hidden if the function they are linke to is inactive, eg. the “Summer” window can be seen only when DHW operation is on in the Operating mode in the Service menu.

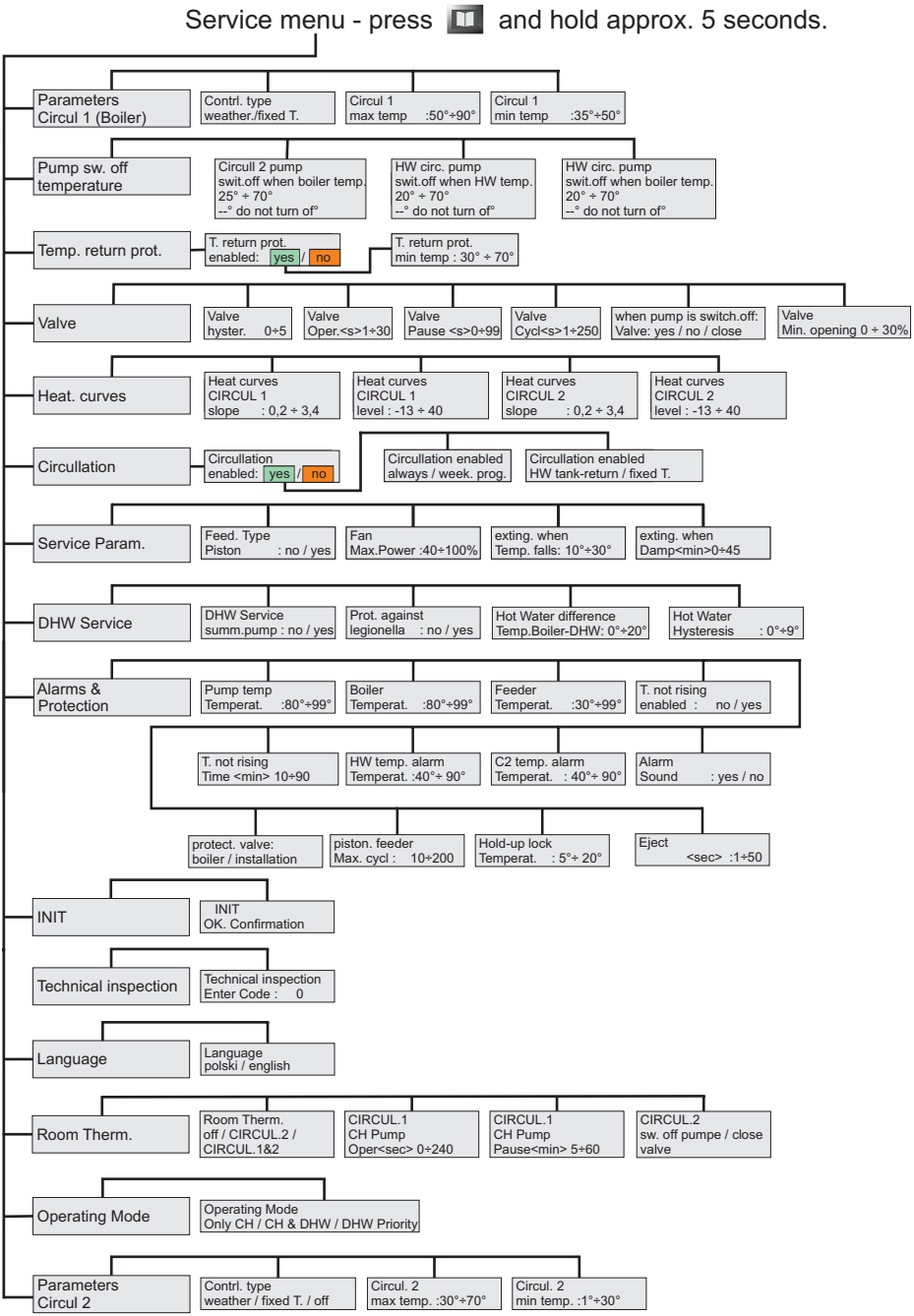
To enter the **Service menu** press and hold for a few seconds. Navigation and parameters change takes place as in the Main menu.

**Notice:** Service menu can be used only by highly qualified personnel!

# 8. Main menu - Structure



# 9. Service menu - structure



## 10. Settings table – Main menu

| | Name | Unit | Range of settings | Factory settings |
|---|---|---|---|---|
| Main menu | **HOT WATER** | | | |
| | temperature | °C | 40÷70 | 50 |
| | **OPERATING PARAM.** | | | |
| | hyster. boiler | °C | 1÷9 | 2 |
| | heating - oper. | sec | 1÷250 | 15 |
| | heating - pause | sec | 1÷250 | 60 |
| | heating - blow. power | % | 1÷100 | 38 |
| | fan - run out | sec | 0÷240 | 10 |
| | fan - del. shut. | sec | 0÷100 | 10 |
| | hold up - oper. | sec | 1÷250 | 10 |
| | hold up - pause | min | 1÷240 | 20 |
| | hold up Summer - pause | min | 5÷240 | 25 |
| | hold up fan - oper. | sec | 0÷90 | 10 |
| | hold up fan - pause | min | 5÷240 | 20 |
| | hold up fan - blow. power | % | 1÷100 | 38 |
| | fan slow start | - | yes/no | no |
| | oper. param. - CH pump | °C | 30÷70 | 40 |
| | **SUMMER** | - | yes/no | no |
| | **WEEKLY PROGRAM** | | | |
| | weekly program | - | CH&DHW/only DHW/ only CH/disabled | disabled |
| | reduce CH | °C | 5-30 | 5 |
| | **EMER GRATE** | | | |
| | enabled | - | yes/no | no |
| | blow. power | % | 1÷100 | 50 |
| | hold up fan - oper. | sec | 0÷90 | 15 |
| | hold up fan - pause | min | 1÷60 | 15 |
| | **MANUAL OPERAT.** | | | |
| | fan - blow. power | % | 1÷100 | 38 |
| | **CIRCUL. 2** | | | |
| | room temp. | °C | 15÷30 | 20 |
| | reduced | °C | 15÷30 | 18 |
| | flow temp. | °C | 20÷50 | 40 |
| | **CIRCUL. 1** | | | |
| | room temp. | °C | 15÷30 | 20 |
| | reduced | °C | 15÷30 | 18 |
| | flow temp. | °C | 40÷70 | 70 |
| | **CIRCULLATION** | | | |
| | off temp. circul. | °C | 10÷90 | 30 |
| | difference HW tank-return | °C | 0÷20 | 15 |

## 11. Settings table – Service menu

| | Name | Unit | Range of settings | Factory settings |
|---|---|---|---|---|
| Service menu | **PARAMETERS CIRCUL. 1** | | | |
| | control type | - | weather/fixed temp. | fixed temp. |
| | max. temp. | °C | 50÷90 | 70 |
| | min. temp. | °C | 40÷50 | 40 |
| | **PARAMETERS CIRCUL. 2** | | | |
| | control type | - | fixed t./weather/off | off |
| | max. temp. | °C | 30÷70 | 50 |
| | min. temp. | °C | 1÷30 | 20 |
| | **ALARMS & PROTECTION** | | | |
| | pump temp. | °C | 80÷99 | 80 |
| | boiler temp. | °C | 80÷99 | 85 |
| | feeder temp. | °C | 30÷99 | 80 |
| | temp. not rising | enabled | yes/no | no |
| | temp. not rising time | min | 10÷90 | 30 |
| | HW temp. | °C | 40÷90 | 80 |
| | circul. 2 temp. | °C | 40÷90 | 80 |
| | sound | - | yes/no | yes |
| | protect valve | - | boiler/installation | installation |
| | piston.feeder max.cycl | sec | 10÷200 | 50 |
| | maint. lock | °C | 5°÷20° | 15 |
| | eject | min | 1÷50 | 5 |
| | **DHW SERVICE** | | | |
| | summer pump | - | yes/no | no |
| | prot. against legionella | - | yes/no | no |
| | HW differ. temp. boiler-DHW | °C | 0÷20 | 5 |
| | hot water hysteresis | °C | 0÷9 | 5 |
| | **SERVICE PARAM.** | | | |
| | feed. type - piston | - | yes/no | no |
| | fan - max. power | % | 40÷100 | 100 |
| | exting. when damp. | min | 0÷45 | 30 |
| | exting. when temp falls (dt) | °C | 10÷30 | 30 |
| | **CIRCULLATION** | | | |
| | enabled | - | yes/no | no |
| | enabled | - | always/week. prog. | always |
| | enabled | - | HW tank-return/ fix. T. | fixed T. |
| | **HEAT. CURVES** | | | |
| | CIRCUL. 1 slope | - | 0,2÷3,4 | 0,8 |
| | CIRCUL. 1 level | °C | -13÷40 | 2 |
| | CIRCUL. 2 slope | - | 0,2÷3,4 | 0,2 |
| | CIRCUL. 2 level | °C | -13÷40 | 0 |
| | **VALVE** | | | |
| | hyster. | °C | 0÷5 | 2 |
| | oper. | sec | 1÷30 | 2 |
| | pause | sec | 0÷99 | 15 |
| | cycl | sec | 1÷250 | 125 |
| | when pump is switch. off | - | yes/no/close | yes |
| | min. opening | % | 0-30 | 8 |
| | **TEMP. RETURN PROT.** | | | |
| | enabled | - | yes/no | no |
| | min. temp. return prot. | °C | 30÷50 | 35 |

## 11. Settings table – Service Menu (cont.)

| Name | Unit | Range of settings | Factory settings |
|---|---|---|---|
| **PUMP SW.OFF TEMP.** | | | |
| circull 2 pump | °C | "--"/25÷70 | 35 |
| HW circ. pump HW temp. | °C | "--"/20÷70 | 35 |
| HW circ. pump boiler temp. | °C | "--"/20÷70 | 35 |
| **OPERATING MODE** | - | Only CH / CH & DHW / DHW Priority | Only CH |
| **ROOM THERM.** | | | |
| enabled | - | yes/no | no |
| CH pump - oper. | sec | 0÷240 | 30 |
| CH pump - pause | min | 5÷60 | 20 |
| Circull. 2 | - | sw.off pumpe / close valve | sw.off pumpe |

## 12. First start. Clock settings

Before running the controller, check all electrical connections and sensors. Press the mains switch buton on - the screen will display the following information: controller name and program number (eg. ver 1.10).


First start and adjustment of the controller to local and construction-site conditions as well as training of personel will be carried out by fitting company with suitable authorization.
The controller has been preset at the factory and is ready to work. See “Settings table” .
During the commissioning, the fitting company, can perform further adjustments, taking into consideration both the preferrences and requirements of the user. Any settings can be modified any time by the user.
Power shortages do not result in data loss from the memory, only the clock settings are influenced.

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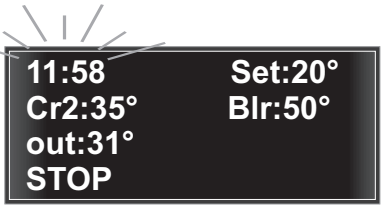
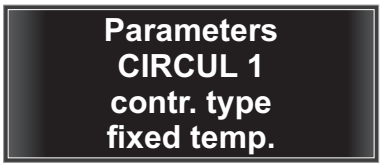
When putting the controller in motion for the first time, the clock on the display and the day of the week start flashing.




To set the correct time and date, use ▲ ▼ and set the desired day of the week and OK than confirm.
Proceed in the same way by setting the current time, and then the minute.
After finishing the settings and double-pressing ↩ the user will be redirected to the main screen.

## 13. Control mode settings

When the controller has been turned on, select the control mode for 1. and 2. Circuit. For control with external temperature sensor, select the “weather” type. Settings can be made in **Service menu / 1 CIRCUIT parameters** by selecting “weather” or “fixed temp”. Proceed in the same way when setting the mode for 2. circuit.




Range of changes: weather / fixed temp.
Factory setting: fixed temp.

## 14. Starting the bolier and setting the operating parameters

1. Open the ash pit door.

2.Start the feeder manually (see Manual operation - Testing outputs) and wait until coal shows at the level of the blow holes.

3.Turn off the feeder and then ignite the coal in the furnace chamber.

4. After obtaining a stable flame, start automatic operation of the controller by holding down for few seconds the ↩ or OK. The display shows **START** and the controller will start regular dosing fuel and will control the fan in order to obtain the desired temperature in the boiler.

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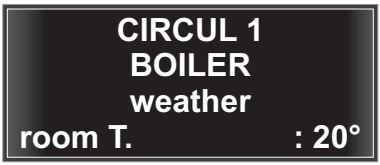
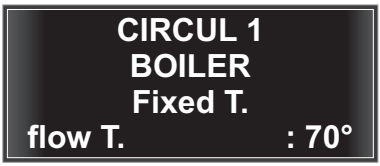
When the boiler temperature rises to the level specified by the "**dt**" parameter (see 38.3), the controller switches to **HEATING** mode.
After reaching the required temperature, the controller will switch to **HOLD UP** mode until the temperature drops below the hysteresis - to find out more see Operating parameters / HYSTERESIS.


Press the ▲ or ▼ To enter the settings of the “room” temperature for weather control or fixed temperature control. Use the same buttons to set the temperature: ▲ to increase the setting or ▼ to reduce thereof.
Press ↩ to confirm and move to next settings.




## 15. Shutting down the boiler

The boiler may be shut down due to lack of fuel, the completion of the damping process or manually switching to the **STOP** mode.
When there is no fuel, **EMPTY BUNK** will be displayed.

### 15.1 Shutting down the boiler – Stop mode

You can manually shut down the boiler and go to **STOP** mode.


To do this, press and hold for a few seconds the ⮌ - the display will show STOP. If the message is different (e.g. START or HEATING or HOLD UP), then repeat the action until STOP is displayed.

## 16. Description of controller functions

Description of all controller functions by the Main menu and Service menu order has been given below.

To enter Service menu press 🕮 and hold for a few seconds. Use ▲ ▼ to select the name of the parameter that is intended for modification. Next, use OK to enter the settings. Use ▼ ▲ to change the value of the selected option. Use OK to confirm and go to the settings of the next option. Use ⮌ to exit to the level of selection of the parameter name. Press twice ⮌ to go to the main screen.

## 17. Main menu - Operating parameters

The OPERATING PARAMETERS functionality makes it possible to set the operating parameters for the boiler, feeder, fan and CH pump.


Enter the settings - **Main menu / Operating parameters**/

## 17.1 Operating parameters - Boiler hysteresis

The parameter defines the number of degrees Celsius by which the temperature must fall below the setpoint, at which the controller will resume the HEATING mode - at this point the feeder will start regular operation as set by the parame-ters (more - see Operation parameters / HEATING - feeder operation AND Ope-ration parameters / HEATING - feeder pause) an will be switch on and will keep running until the boiler reaches the required temperature.


Range of changes: 1°÷9°
Factory setting: **2°**

Enter the settings - **Main menu / Operating parameters** / Boiler hysteresis

## 17.2 Operating parameters - Heating - feeder operation

The parameter defines the time (in seconds) of the duration of fuel feeding (feeder operation) in the **START** and **HEATING** mode.


Enter the settings - **Main menu / Operating parameters** / Heating oper.

Range of changes: 1 ÷ 250 sec
Factory setting: **15 sec**

## 17.3 Operating parameters - Heating - piston feeder operation

If a piston feeder is used, feeding of fuel into the furnace will be performed in cycles (i.e. stroke of the fuel drawer and its return).

Feeder type change to the piston type takes place in Service menu / Service parameters / Feeder type

Enter the settings - **Main menu / Operating parameters** / Heating cycles


Range of changes: 1÷ 20
Factory setting: **1**

**Notice:** In a piston feeder operation mode one must remember to connect the reed to input **In2** and ⊥ sensors in the connection socket of the operating panel (see Fig. 3)

## 17.4 Operating parameters - Heating - feeder pause

This parameter specifies the time (in seconds) of the interval between cyclic fuel delivery (feeder operation) in START and HEATING mode.

In the case of the piston feeder the scope and factory setting is changed.

Enter the settings - **Main menu / Operating parameters** / Heating Pause


Range of changes: 1 ÷ 250
Factory setting: **60**

Piston feeder:
Range of changes: 10 ÷ 900 sec
Factory setting: **25**

## 17.5 Operating parameters - Heating - blowing power

This parameter allows you to set the maximum power at which the fan will operate during HEATING mode. Range of changes:from 1% to max. defined in Service Menu - see Adjusting the maximum fan power.

Enter the settings - **Main menu / Operating parameters** / Heating blow. pow.


Range of changes: from 1% to max. defined in Service Menu
Factory settings: 38%

## 17.6 Operating parameters - Fan run-out

This parameter allows you to set the time (in seconds) of earlier switching on of the fan relative to the switching on of the feeder.

Enter the settings - **Main menu / Operating parameters** / Fan run-out


Range of changes: 1 ÷ 240 sec
Factory setting: **10**

## 17.7 Operating parameters - FAN - delayed switch-off of the fan

This parameter allows you to set the time (in seconds) to delay the switching off of the fan until the feeder is switched off.

Enter the settings - **Main menu / Operating parameters** / Fan Del. Shut


Range of changes: 1 ÷ 100 sec
Factory setting: **10**

## 17.8 Operating parameters - Hold-up - feeder operation

This parameter specifies the time (in seconds) of the duration fuel feeding (feeder operation) in the **HOLD-UP** mode.

If the piston feeder is used, its time of operation in maintaining mode will be defined by the number of cycles and not by seconds.

Enter the settings - **Main menu / Operating parameters / Heating Hold**

To change the type of a feeder into piston feeder go to **Service menu / Service parameters / Feeder type**


Range of changes: 1 ÷ 250 sek
Factory setting: **10**


Range of changes: 1 ÷ 20
Factory setting: **1**

## 17.9 Operating parameters - Hold-up - feeder pause

This parameter specifies the time (in min.) of the interval between cyclic fuel delivery (feeder operation) in the **HOLD-UP** mode.

Enter the settings - **Main menu / Operating parameters / HOLD-UP Pause**


Range of changes: 1 ÷ 240 min
Factory setting: **20**

### 17.10 Operating parameters - Hold-up Summer - feeder pause

This parameter specifies the time of the interval between cyclic fuel delivery (feeder operation) in the Hold-up mode during summer.

Enter the settings - **Main menu / Operating parameters / Hold. Summer - Pause**


Range of changes: 5 ÷ 240 min
Factory setting: **25**

### 17.11 Operating parameters - Hold-up - fan operation

This parameter defines the time of operation of the fan (in seconds) in the Hold-up mode.

Enter the settings - **Main menu / Operating parameters / Hold-up - fan operation**


Range of changes: 1 ÷ 90 sec
Factory setting: **10**

### 17.12 Operating parameters - Hold-up - fan pause

This parameter defines the time of interval in the operation of the fan in the Hold-up mode.


Range of changes: 5 ÷ 240 min
Factory setting: **20**

### 17.13 Operating parameters - Hold-up - blowing power

This parameter allows you to set the power at which the fan will operate during the Hold-up mode. Range of changes: 1% ÷ to max. defined in Service Menu - see **Adjusting the maximum fan power.**

Enter the settings - **Main menu / Operating parameters / blowing power**


Range of changes: 1% ÷ to max. defined in Service Menu
Factory setting: **38%**

### 17.14 Operating parameters - Fan slow start

The parameter enabling or disabling smooth operation of the fan. Enabling smooth operation causes the fan is switched on with fill set power.

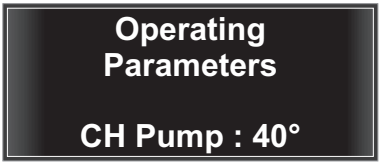
Enter the settings - **Main menu / Operating parameters / Fan slow start**


Range of changes: yes / no
Factory setting: **no**

### 17.15 Operating parameters - CH pump oper. threshold control

A parameter that specifies the temperature above which the central heating pump turns on and operates continuously. If the temperature of the boiler falls below this setting, the pump is switched off.

Enter the settings - **Main menu / Operating parameters** / **CH Pump**




Range of changes: 30° ÷ 70°
Factory setting: **40**

## 18. Main menu - Summer

SUMMER mode, indicated by the ⁘ symbol on the screen means that outside of the heating season the heating pump will not operate and all the heat generated by the boiler is designed to heat domestic hot water.

**NOTICE:** This window is active only when in "**Service Menu / Operation mode**" the CHW operation or CHW priorytet is on.

Enter the settings - **Main menu / Summer** /


Range of changes: nie / tak
Factory setting: **nie**


A wiev of the main screen with the "SUMMER" mode on and "Weekly program" on in the "CH & DHW" mode.

## 19. Main menu - Clock

The **CLOCK** function allows you to change the set time and day of the week, as described in the **Section Getting Started.**


**Notice:** With voltage decay, the clock settings are not maintained. They must be reset. All the remaining controller settings are kept in the memory.

## 20. Main menu - Weekly program

The **WEEKLY PROGRAM** option enables boiler and DHW pump operation according to one of several programs. Starting the weekly program for CH will have the effect that in the scopes indicated by the program the boiler operates according to set temperature and outside of these ranges - it operates at reduced temperature. For "**only DHW**" or "**CH & DHW**" settings, the DHW pump operates according to set ranges. First, select the circuits that the weekly program should apply to: - CH & DHW / only DHW / only CH / off.


Range of changes: disabled / only CH / only DHW / CH and DHW
Factory setting: **disabled**

Enter the settings - **Main menu / Weekly program**

**Tip:** Starting the weekly program for DHW is indicated with the **T** symbol.

### 20.1 Weekly program – Reduction of boiler temperature

This parameter determines the level of the boiler temperature reduction when running the weekly program for CH when boiler control is acc. to fixed temperature settings.


Range of changes: od 5°÷ 30°
Factory setting: **5°**

To enter the settings please select - **MAIN MENU / Weekly program / Reduce CH by**

## 20.2 Weekly program – Operation program selection

This parameter allows selection of one of 4 weekly operation programes. Programs: family, work and senior have factory settings. The “custom” program allows creation of a self-adjusted program.


Enter the settings - **Main menu / Program tygodniowy / family**

Range of changes: family / work /senior / custom
Factory setting: **family**

Belowa re given the parameters of 3 factory set programes showing working hours of the heating installation (day). For the remaining ranges, the installation operates as per the reduced (night) temperature.

| **family program** | | **work program** | | **senior program** | |
|---|---|---|---|---|---|
| Sun | 07:00 - 22:00 | Sun | 08:00 - 22:00 | Sun | 05:30 - 22:00 |
| Mon | 05:30 - 22:00 | Mon | 06:00 - 08:00, 16:00 - 22:00 | Mon | 05:30 - 22:00 |
| Tue | 05:30 - 22:00 | Tue | 06:00 - 08:00, 16:00 - 22:00 | Tue | 05:30 - 22:00 |
| Wed | 05:30 - 22:00 | Wed | 06:00 - 08:00, 16:00 - 22:00 | Wed | 05:30 - 22:00 |
| Thu | 05:30 - 22:00 | Thu | 06:00 - 08:00, 16:00 - 22:00 | Thu | 05:30 - 22:00 |
| Fri | 05:30 - 23:00 | Fri | 06:00 - 08:00, 15:00 - 23:00 | Fri | 05:30 - 22:00 |
| Sat | 06:30 - 23:30 | Sat | 07:00 - 23:30 | Sat | 05:30 - 22:00 |

## 20.3 Weekly program - Custom

Selection of the CUSTOM program enables creation of an individual program - for each day of the week it is possible to set two (T1 and T2) time intervals in normal (day) temperature. Beyond those ranges (setting: “**--;--**” ) the boiler will work as per the reduced temperature.

To make changes use the buttons, and confirm each setting by pressing OK .


Setting the ON/OFF parameters to “**--:--**” means that in a specific period the controller operates as per the reduced (night) temperature.


Enter the settings - **Main menu / Weekly program / custom**

## 21. Main menu - Technical inspection

This parameter informs the user of the time remaining until the next maintenance inspection of the controller.
Enter the settings - **Main menu / Technical inspection**


## 22. Main menu - Factory settings

This function is used to remove the parameters set by the user and return to the factory settings. Access the factory settings menu and confirm by pressing and holding the button OK for 3 sec.
This applies only to settings in Mani menu.
Enter the settings - **Main menu / Factory settings / OK.**


## 23. Main menu - Party mode

By turning the PARTY mode on, a normal room temperaturę is forced (raised - day mode). The PARTY mode switches off automatically when the closest heating mode in raised temperaturę comes to an end (day mode). When the PARTY mode is on, a text “PARTY” is displayed on the basic screen in top right corner together with the preset temperature, eg. “set :50°” .
To enter the settings please select - **MAIN MENU / PARTY / no**

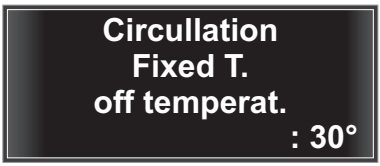


Range of changes: yes / no
Factory setting: **no**

**Notice:** If “weekly program” is set as “off” the “Party” mode is inactive.

## 24. Main menu - Circulation

The parameter defines temperature after which the circulation pump working in the fixed temperature mode (at the increase to this temperature) will be turned off.




Range of changes: 10° ÷ 90°
Factory setting: **30°**

If the circulation pump operates in the " **temp. difference / heating - return**" mode, this parameter defines the difference of temperatures measured on the heater and on a return of circulation water. When this level is reached, the circulation pump will turn off.


Enter the settings - **Main menu / Circulation** /

**Notice:** This function is inactive if circulation is off in the service menu.

Range of changes: 0° ÷ 20°
Factory setting: **15°**

### 24.1 Other application of circulation pump

**Tips:** If the circulation pump is used as a return protection pump or the floor heating pump, circulation must be switched on in the Service menu and set to "always" and "fixed temperature" modes. Next, in the Service menu / pumps switching off tempertures / circulation pump / switch off when DHW temp – set to "do not turn off" (below 20°C). In options of Service menu / pumps switching off tempertures / circulation pump / switch off when boiler temperatur – the switching off temperature shall be left for 35° level or the same as CH pumps switching on temperature. Next, in the Main menu / Circulation set the circulation pump switching off temperature. Circulation temperaturę sensor shall be installed depending on the following configuration: by the water return to boiler or by the hot water inlet to the floor heating system.

**Notice:** Circulation temperaturę sensor should be applied for all the above mentioned configurations. The proper temperature on a screen for the above is "circulation temperature".

Circulation pump operation is indicated on a screen by a sign.

## 25. Main menu - Hot water (DHW)

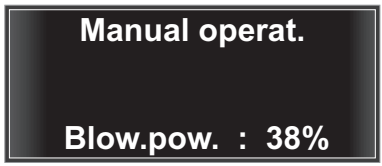
This parameter specifies the temperature in domestic hot water heater below which a DHW pump is turned on, taking into consideration the preset hysteresis.
Enter the settings - **Main menu / Hot water** / **Temperat.**


Range of changes: 40° ÷ 70°
Factory setting: **50°**

**Tips:** The prerequisite to turn the DHW pump on is reaching the minimum temperature difference measured between a boiler and a heater (see “Service menu / DHW service / Boiler-Heater.”)
The controller must be set to the following mode “CH and DWH” or “DHW priority”. Settings in the “Service menu / Operation mode”.

## 26. Main menu - Manual operation

This function is used for testing the correctness of the connected equipment and controller outputs. In the “Blow. pow.” windo the fan power for manual operation can be set.




The operation and correctness of connection of all 8 control outputs can be checked in the second window.
Use OK to move to the next exit and ▼ ▲ to turn on and turn of the device. Active output starts flashing. Activation is indicated by the symbol ▮ .


## 27. Main menu - Emergency grate

The controller allows you to control the boiler also when it is burning fuel using the emergency grate instead of the retort furnace. Boiler operation in this mode is indicated by the **GRATE** message, displayed on the screen.


Range of changes: yes / no
Factory setting: **no**

### 27.1 Emergency grate - blowing power

This parameter allows you to set the maximum power at which the fan will operate when the emergency grate is used. Range of changes: from 1% to max. defined in Service Menu - see **Adjusting the maximum fan power**.


Range of changes: from 1% to max. defined in Service Menu
Factory setting: **50%**

### 27.2 Emergency grate - Hold-up - fan operation

This parameter defines the time of operation of the fan (in seconds) in the Hold-up mode, with the furnace operation with the emergency grate.


Range of changes: 1 ÷ 90 sek
Factory setting: **15 sek**

### 27.3 Emergency grate - Hold-up - fan pause

This parameter defines the time of interval in the operation of the fan (in seconds) in the Hold-up mode, with the furnace operation with the emergency grate.
Enter the settings - **Main menu / Emer Grate** / Hold-up pause


Range of changes: 1 ÷ 60 min
Factory setting: **15 min**

## 28. Main menu - Temperatures

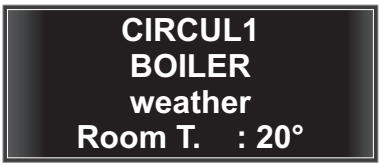
A window indicating the currently measured temperature: on the boiler (Blr), on the CWU heater (HW), external (Out), 2. circuit (Cr2), return (Ret), circulation circuit (Cir), feeder (Ldr).


Enter the settings - **Main menu / Temperatures** /
or directly from the main screen by pressing the button OK .

**Tips:** In case of failure of temperature sensor, the screen displays "**--°**". Replace the sensor and contact DK System.

## 29. Main menu - 1. circuit

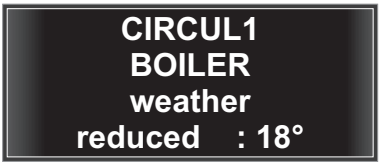
Allows setting 3 operating parameters of the 1. Circuit. If the controller works in the weather mode, the room required and reduced temperature are set.To enter the settings please select - Service menu / Parameters 1. Circuit / Control mode / weather or off or fixed temperature.
See also “Heating curves / Adjusting the room temperature”.




Room temperature
Range of changes: 15° ÷ 30°
Factory setting: **20°**

Enter the settings - **Main menu / 1 Circuit / Room temp.**

In the weather mode, it is possible to set the reduced temperature as well. This temperature is lower, and used, e.g. during night.
See also “Heating curves / Reduced room temperature”.

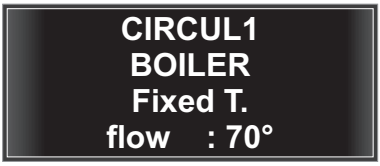



Enter the settings - **Main menu / Circul. 1 / Reduced**

Reduced temp
Range of changes: 15° ÷ 30°
Factory setting: **18°**

**Tips:** Weather adjustment of boiler means dependence of the boiler water directed by the device to the said heating installation from the current external temperatures, which means, the colder outside, the stronger operation of the boiler and vice versa.
In the weather mode, it is possible to set two temperatures required in the building: the so-called normal temperature, i.e. day temperature (the time spent at home), and reduced, i.e. night temperature (sleep time or time spent not at home).

For the fixed temperaturę mode, the 1. Circuit delivery temperaturę measured on the boiler output is set.




Enter the settings - **Main menu / 1. Circuit / Flow. temp.**

**Flow. temp.**
Range of changes: 40° ÷ 70°
Factory setting: **70°**

## 30. Main menu - 2. circuit

As for the 1. Circuit, this option allows setting 3 parameters of the 2. Circuit. If the controller works in the weather mode, it is possible to set the room required temperature and reduced temperature.

Enter the settings - **Main menu / 2. Circuit / Room temp.**


Room temp.
Range of changes: 15° ÷ 30°
Factory setting: **20°**

The reduced temperature is a room temperatur in a reduced (night) working mode of the Weekly program.
To change the control mode SERVICE MENU / Parameters 2. Circuit / Control mode / Weather or off or fixed temperature.

Enter the settings - **Main menu / 2. Circuit / Reduced temp.**


Reduced temp.
Range of changes: 15° ÷ 30°
Factory setting: **18°**

For the fixed temperature mode, the delivery temperaturę of the 2. Circuit measured behind the 3-way valve is set.

Enter the settings - **Main menu / 2. Circuit / flow temp.**


Flow temp.
Range of changes: 20° ÷ 50°
Factory setting: **40°**

**Notice:** When the 2. Circuit is off, this window remains invisible. To turn on and set the mode go to Service menu / Parameters 2. Circuit /

**Notice:** Adjustment of temperature in 2. Circuit takes place by closing and opening of the 3/4-way valve; besides, the 2. Circuit pump turning off temperature is set depending of the boiler temperature using the parameter set in “Service menu / pumps turning off temperature / 2. circuit pump – turn off when boiler temp.”.

## 31. Service menu

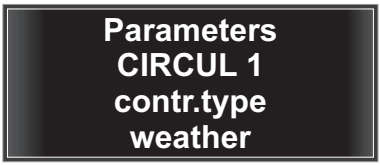
Service menu is used to set particular deivce operation parameters by the serviceman.
To open the service menu, press and hold for a few seconds the button .
Next, using the buttons select a given option, and than use the button OK to access the settings of the parameters of the given option. Press the button OK again to confirm and go to the settings of the next parameter of a given option. Press to exit.

## 32. Service menu – Parameters 1. Circuit

### 32.1 Parameters 1. Circuit – Control type

The controller allows selection between two operation modes in the 1. Circuit: weather or fixed temperatrue. The weather mode allows full use of the controller and heating system for economic and comfortable control of the home heating system.

Enter the settings - **Service menu / Parameters 1. Circuit / Control mode**

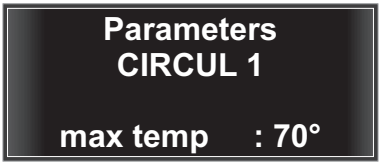



Range of changes: weather / fixed temp.
Factory setting: fixed temp.

### 32.2 Parameters 1. Circuit – Max. temperature

Allows setting the maximum temperature for the 1. Circuit. See “Heating curves - description “.

Enter the settings - **Service menu / Parameters 1. Circuit / temp. max.**

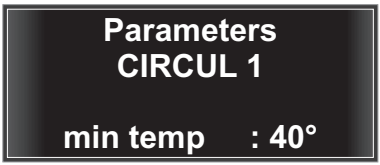



Range of changes: 50° ÷ 90°
Factory setting: **70°**

### 32.3 Parameters 1. Circuit – Min. temperature

Allows setting the minimum temperature for the 1. Circuit. See “Heating curves - description“.

Enter the settings - **Service menu / Parameters 1. Circuit / temp. min.**



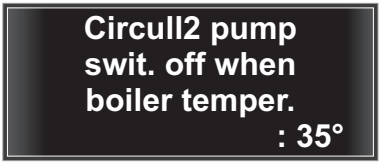

Range of changes: 35° ÷ 50°
Factory setting: **40°**

## 33. Service menu - Pumps turning off temperatures

### 33.1 Pumps turning off temperatures – 2. Circuit pump

This parameter defines the boiler temperature, which when reached will turn the 2. circuit pump off (at the drop to this temperature).

Enter the settings - **Service menu / Pumps turning off temperatures / 2. circuit pump**

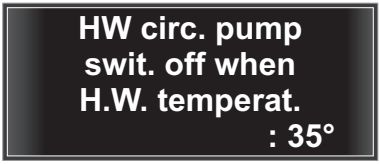



Range of changes: 25°÷ 70°
Factory setting: **35°**
when setting below 25°- “**do not turn off**”

### 33.2 Pumps turning off temperatures – Circulation pump – DHW temp.

This parameter defines the DHW temperature, which when reached will turn the circulation pump off (at the drop to this temperature).

Enter the settings - **Service menu / Pumps turning off temperatures / Circulation pump DHW temp.**



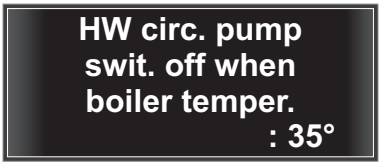

Range of changes: 20°÷ 70°
Factory setting: **35°**
when setting below 20° “**do not turn off**”

**Tips:** If the circulation pump is used as the return protection pump or the floor heating pump, the turning off temperature must be set to “**do not turn off**” (below 20°C). Next, in the **Main menu / Circulation** set the circulation pump turning off temperature.

### 33.3 Pumps turning off temperatures - Circulation pump - Boiler temp.

This parameter defines the boiler temperatre which when reached will turn circulation pump off (at the drop to this temperature).

Enter the settings - **Service menu / Pumps turning off temperatures / Circulation pump boiler temp.**




Range of changes: 20°÷ 70°
Factory setting: **35°**
when setting below 20° " **do not turn off**"

## 34. Service menu - Boiler return protection

The parameters enabling setting and turnig on the minimum boiler return temperature.
When temperature drops below the preset, the 3-way valve is closed.
The function operates if the 2. Circuit mode is on.


Range of changes: yes / no
Factory setting: **no**

Enter the settings - **Service menu / Return protection /**


Minimum return protection
Range of changes: 30°÷ 50°
Factory setting: **35°**

**Tips:** If the circulation pump (See - Fig. 9) is used in the configuration of the boiler proctection, than circulation shall be turned on in the Service menu and set it to "alwasy" and "fixed temperature" mode. In Service menu / pumps turning off temperatures / circulation pump / turn off when DHW temp - select "do not turn off" (below 20°C). In Service menu / pumps turning off temperatures / circulation pump / turn off when boiler temp. - the turning off temperature must be set to 35° or the same as the CH pump turning on temperature. Next, in the Main menu / circulation set the pump turning off temperature. Circulation temperature sensor should be installed at the water to boiler return.

## 35. Service menu - Valve

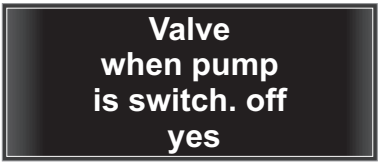
The parameters allowing correct configuration of the valve operation.
It is possible to set the hysteresis, working time, pause time, cycle length, to define operations to be made by the controller when the pump has been turned off and to define the minimum opening of the valve in %.

Enter the settings - **Service menu / Valve /**


Valve - working time
Range of changes: 1 sec ÷ 30 sec
Factory setting: **2** sec


Valve - pause time
Range of changes: 0 sec ÷ 99 sec
Factory setting: **15** sec


Valve - cycle time
Range of changes: 1 ÷ 260 sec
Factory setting: **125** sec




Valve - when the pump is turned off
Range of changes: yes / no / close
Factory setting:yes


Valve - minimum opening
Range of changes: 0 ÷ 30 %
Factory setting: **8%**

## 36. Service menu - Heating curves

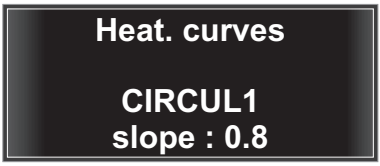
**Notice:** Before chaning the parameters of heating curves, it is required to become familiar with their description.

Temperature adjustment of both circuits (feeded directly from the boiler and equipped with a valve) can take place based on external temperature as per the selected heating curve. For both circuits it is possible to select independent heating curves.
17 settings of heating curves are available, which can be additionaly shifted to adjust the base temperature. This allows setting the delivery temperature to the building's characteristics.

### 36.1 Heating curves - 1. Circuit - Slope

Allows modifying the Slope of the heating curve for 1. Circuit.

Enter the settings - **Service menu / Heating curves / Heating curves 1. Circuit - Slope**

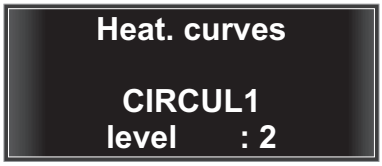



Range of changes: 0,2 ÷ 3,4
Factory setting: **0,8**

### 36.2 Heating curves - 1. Circuit 1 - Level

Allows modifying the Level of the heating curve for 1. Circuit .

Enter the settings - **Service menu / Heating Level / Heating curves 1. Circuit - Level**

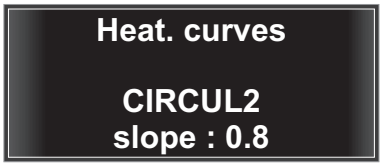



Range of changes: -13 ÷ 40
Factory setting: **2**

### 36.3 Heating curves - 2. Circuit - Slope

Allows modifying the Slope of the heating curve for 2. Circuit.

Enter the settings - **Service menu / Heating curves / Heating curves 2. Circuit - Slope**

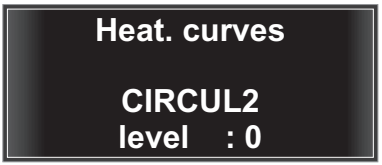



Range of changes: 0,2 ÷ 3,4
Factory setting: **0,8**

### 36.4 Heating curves - 2. Circuit - Level

Allows modifying the Level of the heating curve for 2. Circuit.

Enter the settings - **Service menu / Heating curves / Heating curves 2. Circuit - Level**




Range of changes: -13 ÷ 40
Factory setting: **0**

## 37. Service menu - Circulation

This parameter is used to operate an additional pump (outp. #7) that can work in three possible configurations:
1. As a circulation pump in domestic hot water circuit.
2. As a boiler return protection pump.
3. As an additional floor heating circuit pump.
For each of the above metioned, a circulation temperature sensor must be used. Also, please follow the indications of the “circulation temperature” display.

4 settings are available, which allow an appropriate adaptation of the circulation pump to user's needs.

Enter the settings - **Service menu / Circulation**

**Notice:** A notion “Return” in circulation system means temperature measured on the circulation sensor.
For configuration as a circulation pump, the sensor should be placed at the input of water returning to the DHW heater.

**Notice:** Proper operation of circulation pump is indicated by on a display.


Range of changes: yes / no
Factory setting: **no**


Range of changes: always / week.prog.
Factory setting: always


Range of changes: Heat.-Return / Fixedtemp
Factory setting: Fixedtemp


**Tips:** If the circulation pump is used as the return protection pump or the floor heating pump, circulation must be turned on and set to “always” ad “fixed temperature” mode. Next, in the Service menu / pumps turning off temperatures / circulation pump / turn off when DHW temp. - set to “do not turn off” (below20°C).

# 38. Service menu - Service parameters

## 38.1 Service parameters - Feeder type

This parameter switches the controller to work with a piston feeder.

Enter the settings - **Service menu / Service parameters / Feeder type**


Range of changes: no / yes
Factory setting: **no**

**Notice:** In a piston feeder operation mode one must remember to connect the contracton to input **In2** and ⊥ sensors in the connection socket of the operating panel (see Fig. 3).
Contracton operation is indicated by a symbol ▮ displayed on "Temperature" screen.

## 38.2 Service parameters - Setting maximum fan power

This parameter allows setting the maximum power of a working fan. This setting limits the maximum blowing power: "Main menu / heating - blowing power" and "Main menu / hold-up - blowing power"

Enter the settings - **Service menu / Service parameters / Fan.**


Range of changes: 40% ÷ 100%
Factory setting: **100%**

## 38.3 Service parameters - Initiation of DAMPING process (dt)

This parameter "**dt**" determines reduction of degrees centigrade in relations to the bolier temperature to initiate DAMPING proces and to start counting down resulting in terminating the boiler operation - see Damping time adjustment.

Enter the settings - **Service menu / Service parameters / damp when dropping by**


Range of changes: 10° ÷ 30°
Factory setting: **30°**

### 38.3 Service parameters - Initiation of DAMPING process (cont.)

Example:
- temperature set on a boiler: 50°C
- "dt": 10°C

During boiler damping, when temperature drops to the level of 40°C (50°C - 10°C), the controller will start counting down the preset time - see Damping time adjustment - causing the fan to stop.

### 38.4 Service parameters - Damping time adjustment

This parameter allows setting the fan'soperation time (in minutes) during its work in DAMPING mode, i.e. after temperature drops on the boiler by "**dt**" parameter.

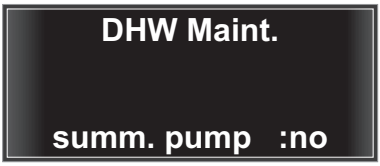

Enter the settings - **Service menu / Service parameters / damp when over**

Range of changes: 0 ÷ 45 min
Factory setting: **30 min**

## 39. Service menu - DHW - service

### 39.1 DHW service - Pump Summer

When this parameter is turned on, and during the controller's operation in SUMMER mode, the domestic hot water heater pump will keep working desite reaching the required temperature for DHW. The aim is to protect the boiler against too quick temperature increase.




Range of changes: yes / no
Factory setting: **no**

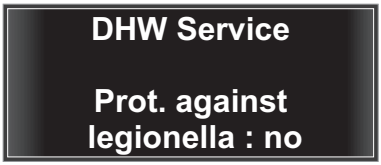
Enter the settings - **Service menu / DHW service / Pump Summer**

**Notice:** The prerequisite for setting the DHW pump in motion is keeping the minimum temperature difference between a boiler and DHW heater (see 39.3).

## 39.2 DHW service - Protection against Legionella

This function protects the DHW installation and DHW heater against Legionella bacteria growth.

Enter the settings - **Service menu / DHW service / Protection against Legionella**




Range of changes: yes / no
Factory setting: **no**

This function works only when the DHW service and “protection against Legionella” functions are on (factory setting is “off”). This function activates on Monday at 1:00 a.m. The boiler is heated to the maximum permissible adjustment temperature (defined in the service menu) . DHW pump works till 1:54 a.m. on the conditio that the boiler temperature is higher than DHW temperature. The following are turned off: circulation pump, central heating pump and 2. circuit (valve and pump).
If circulation function in on, than at 1:55 a.m. the circulation pump will be switched on, and at 2:00 a.m. the boiler will return to normal operation.

**Notice:** When the “protection against Legionella” is on, special attention must be kept when taking warm water to avoid skin burn. Warm water reaches temperature of ca. 70°.
Activation of this function is indicated by **“!”** .

**Notice:** To provide full DHW heater disinfection it is recommended to set the boiler temperature to at least 70°.

## 39.3 DHW service - Temp. difference between a boiler and heater

This parameters determines the minimum difference of temperatures measured between a boiler and a domestic hot water heater that must occur to make water heating cost-effective and to turn the DHW pump on. If the said difference is lower than preset - the domestic hot water pump will not be turning on (regardless the hot water priority is on or off).


Range of changes: 0° ÷ 20°
Factory setting: **5°**

Enter the settings - **Service menu / DHW service / Boiler - DHW**

### 39.4 DHW Maintenance - Hysteresis of the DHW pump

A parameter that specifies the number of degrees Celsius by which the temperature must fall on the domestic hot water heater below the set point for the domestic hot water pump to turn on.


Enter the settings - **Service menu / DHW service / Hysteresis**

Range of changes: 0° ÷ 9°
Factory setting: **5°**

## 40. Service menu - Alarms and protections

### 40.1 Alarms and protections - Pumps turning on temperature

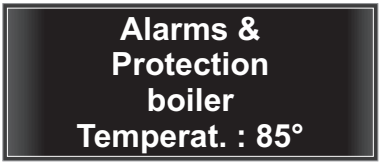
This parameter allows setting the boiler temperature above which both emergency pumps will be triggered (DHW pump will start on the condition that the controller operates in the domestic hot water mode).


Enter the settings - **Service menu / Alarms / CH & DHW pumps**

Range of changes: 80° ÷ 99°
Factory setting: **80°**

### 40.2 Alarms and protections – Boiler temperature

This parameter allows setting the boiler temperature above which the alarm will trigger.




Enter the settings - **Service menu / Alarms / boiler**

Range of changes: 80° ÷ 99°
Factory setting: **85°**

### 40.3 Alarms and protections - Feeder temperature

This parameter allows setting the feeder temperature above which the alarm will trigger. A feeder will be also activated in an emergency mode.


Enter the settings - **Service menu / Protections / feeder**

Range of changes: 30° ÷ 99°
Factory setting: **80°**

## 40.4 Alarms and protections - No temperature rise

This parameter allows enabling / disabling the boiler rise temperature option - see No rise temperature.

Enter the settings - **Service menu / Alarm/ T. does not rise**


Range of changes: yes / no
Factory setting: **no**

## 40.5 Alarms and protections - No temperature rise - time

This parameter defines the time (calculated in seconds), during which it is expected that the temperature will rise during operation in the **HEATING** mode. If the after specified time the temperature does not increase by 2 °C, then the message **EMPTY BUNKER** will be displayed.
Red LED ⚠ will turn on (only when the temperature rise option has been turned on - Service menu / Alarms and protections / Temp. does not rise)


Range of changes: 10 ÷ 90 min
Factory setting: **30 min**

Enter the settings - **Service menu / Alarm / T. does not rise**

## 40.6 Alarms and protections - DHW temperature.

The parameter allows setting the DHW temperature on the heater above which the alarm will be triggered.

Enter the settings - **Service menu / Alarms / alarm DHW temp.**


Range of changes: 40° ÷ 90°
Factory setting: **80°**

### 40.7 Alarms and protections - 2. Circuit temperature

The parameter allows setting the 2. Circut temperature above which the alarm will be triggered.

Enter the settings - **Service menu / Alarms / alarm 2. Circuit**


Range of changes: 40° ÷ 90°
Factory setting: **80°**

### 40.8 Alarms and protections - Sound

This parameter allows enabling or disabling the alarm sounds.

Enter the settings - **Service menu / Alarms / Sound**


Range of changes: yes / no
Factory setting: yes

### 40.9 Alarms and protections - Valve protection

This parameter allows enabling or disabling protection by valve.
With “boiler protection” option selected, after exceeding the emergency pumps turning on temperature (see 40.1), the controller will open the valve and turn the 2. Circuit pump on.
With “installation protection” option selected, the system remains unchanged.
Enter the settings - **Service menu / Alarms / Valve protection**


Range of changes: boiler / instal lation
Factory setting: installation

### 40.10 Alarms and protections - Emergency stop of piston feeder

This parameters determines the time (in seconds) that guarantee execution of a full feeder tray cycle. If for some reasons, the tray is blocked, than the feeder and fan will stop, and feeder failure message will be displayed on the screen - see more **Alarms - Failure of the piston feeder tray.**

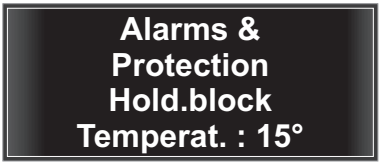
Enter the settings - **Service menu / Alarms and protections / piston feeder**


Range of changes: 10 ÷ 200 sec
Factory setting: **50 sec**

### 40.11 Alarms and protections - Feeder and fan blocking in HOLD-UP mode

This parameters determines the growth of boiler temperature above which the feeder and fan operation in the HOLD-UP mode will be blocked.

Enter the settings - **Service menu / Alarms and protections / Hold-up blocking**




Range of changes: 5 ÷ 20°
Factory setting: **15°**

### 40.12 Alarms and protections - Fuel outburst to a furnace in critical situation

This parameters determines the time (in minutes) when the feeder will force in fuel to the furnace in a situation when temperature in a feeder reaches critical temperature - see more **Alarm - feeder temperature**

Enter the settings - **Service menu / Alarms and protections / Eject**


Range of changes: 1÷ 50
Factory setting: **5**

## 41. Service menu - INIT

This parameter allows resetting the user setting to factory settings in the Main menu and Service menu. To confirm press OK and hold for ca. 3 sec.


## 42. Service menu - Technical inspection

This parameter allows resetting and changing the count down time to next technical inspection of the controller.


## 43. Service menu - Language

This setting is used to set the language for displaying of messages.
Enter the settings - **Service menu / Language / polski**


## 44. Service menu - Room thermostat

It is possible to connect a room thermostat that controls the operation of the central heating pump, depending on the room temperature. In order to operate the pump the boiler must also reach its corresponding minimum temperature.
After connecting the room thermostat it is necessary to select the operation mode, i.e. the circuits to be controlled.

The activated room thermostat function is indicated with the **"R"** symbol on the display.

Enter the settings - **Service Menu / Room thermostat/**


Range of changes: off / 2CIRC / 1CIRC +2CIRC
Factory setting: **off**

**Tips:** The room thermostat function should be activated only after its connection to a controller.

## 44. Service menu - Room thermostat (cont.)

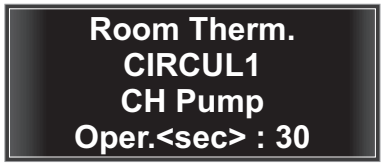
In order to improve thermal comfort, the controller will periodically run the CH pump when the room temperature is at a preset level.
In order to determine the conditions of this operation, set the operation time and pause time for the central heating pump (see next points).
Recommended room thermostats: DK LOGIC 100 - wired and DK LOGIC 200 wireless (radio communication) .

### 44.1 Room thermostat - CH pump - operation time

This parameters specifies the CH pump operation time (in seconds) when working together with the room thermostat.

Use the buttons ▼ ▲ to change settings. Use OK to confirm and go to the next settings.

Enter the settings - **Service menu / Room thermostat / 1. Circuit CH pump**




Range of changes: od 0 ÷ 240 sec
Factory setting: **30 sec**

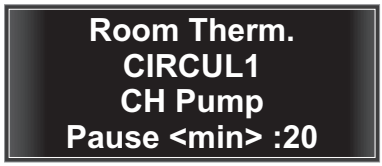
**Tips:** When room temperature drops below the preset - a signal from thermostat will turn the pump on and cause its constant operation until the desired temperature is reached. This does not indicate malfunction of the controller.
After reaching the desired temperature, the controller will be periodically tuning on the pump as per the preset times of operation and pause.

### 44.2 Room thermostat - CH pump - pause time

This parameter specifies the time interval in the operation of the CH PUMP (calculated in minutes) when interoperability with the room thermostat.

Use the buttons ▼ ▲ to change settings. Use OK to confirm and go to the next settings.

Enter the settings - **Service menu / Room thermostat / 1. Circuit CH pump**




Range of changes: od 5 ÷ 60 min
Factory setting: **20 min**

### 44.3 Room thermostat - 2. Circuit

This parameters determines future actions of the controller in the 2. Circuit after reaching temperature set on a thermostat.
This option works when the room controller is set to "**1CIRCUIT + 2CIRCUIT**".

Use the buttons ▼ ▲ to change settings. Use OK to confirm and go to the next settings.

Enter the settings - **Service menu / Room thermostat / 2. Circuit**


Range of changes: close valve / turn pump off
Factory setting: **turn pump off**

## 45. Service menu - Operating mode

You can choose the mode in which the controller operates. The mode determines whether the DHW pump is to be operated and whether it must run in the DHW priority mode.

Enter the settings - **Service menu / Operating mode /**

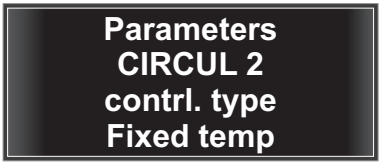

Range of changes: CH & DHW / Only CH / DHW priority
Factory settings: **Only CH**

**Tips:** Active "**DHW priority**" mode is indicated on a screen by symbol **P** and . Active "**CH & DHW**" mode is indicated on a screen by symbol .
The prerequisite to turn the DHW pump on is reaching the minimum temperature difference measured between a boiler and DHW heater (see - Service menu / DHW service / Hot water Boiler-Heater).
DHW priority means that when water temperature in a DHW heater drops below the preset temperature than the boiler will stop working to meet the needs of the central heating and will start heating domestic water. If "boiler-heater" configuration has been properly selected, any shortages in heating shall not deteriorate thermal comfort.

# 46. Service menu - Parameters 2. Circuit2

## 46.1 Parameters 2. Circuit - Control mode

Allows selection between two operation modes: weather and fixed temperature. The weather mode allows full use of the controller and the heating circuit for economic and convenient control of the house heating

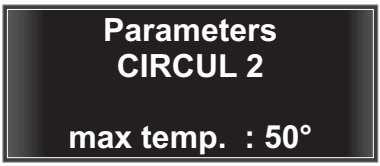



Enter the settings - **Service menu / Parameters 2. Circuit / Control type**

Range of changes: weather / fixed temp. / off
Factory setting: **off**

## 46.2 Parameters 2. Circuit - Maximum temperature

Allows setting the maximum temperature for the 2. Circuit. See "**Heating curves - description**".

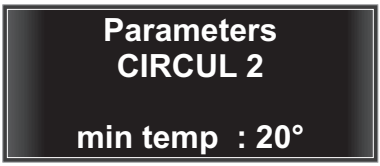



Enter the settings - **Service menu / Parameters 2. Circuit / temp. max.**

Range of changes: 30° ÷ 70°
Factory setting: **50°**

## 46.3 Parameters 2. Circuit - Minimum temperature

Allows setting the minimum temperature for the 2. Circuit. See "**Heating curves - description**".




Enter the settings - **Service menu / Parame-ters 2. Circuit / temp. min.**

Range of changes: 1° ÷ 30°
Factory setting: **20°**

## 47. COMFORT SYSTEM function

The COMFORT SYSTEM built-in in the controller prevents circuit pump blockage by deposition of scale between on a rotor of the pump. The controller automatically switches the pump on for 30 seconds every 24 hours from its last run. Pump operation in this mode is indicated by the blinking PUMP LED. The function takes effect after 24 hours from turning the controller on.

**Notice:** For the COMFORT SYSTEM function to be active after the end of the heating season, leave the controller plugged in.

## 48. Protection against freezing

The controller protects the heating system from freezing, both pumps running all the time when the temperature of water falls to 4°C or lower ((DHW pump will start, provided that the controller runs in the DHW mode).

## 49. Alarms - description

### 49.1 Over temperature on the boiler

When the temperature in the boiler exceeds the value set in Alarm - boiler temperature, the display will show **"Boiler T"** and an intermittent beep will be generated (as long as it is turned on - see **Alarm - sounds**). ).
Red LED will turn on .


To cancel press

### 49.2 Over temperature on the feeder

When the temperature in the feeder exceeds the value set in Alarm - feeder temperature, the display will show **Feeder T** and an intermittent beep will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on .


To cancel press

## 49.3 Damaged boiler temperature sensor

When the boiler temperature sensor is damaged, the display shows **Boil.Sens.** (the fan stops working), instead of the boiler temperature "**--**" will be shown and a continuous sound will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on ⚠ .


To cancel press ⮌

## 49.4 Damaged feeder temperature sensor

When the feeder temperature sensor is damaged, the display shows **Feed. Sens.** (fan operation will stop and the feeder will continue for the time set in Fuel outburst to furnace in critical situation), instead of the temperature "**--**" will be shown and a continuous sound will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on ⚠ .


To cancel press ⮌

## 49.5 Damage to the outside temperature sensor

When the external temperature sensor is damaged, the display shows **Out. Sens.** instead of the outside temperature "**out:**" "**--**" will be shown and a continuous sound will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on ⚠ .


To cancel press ⮌

## 49.6 Damaged DHW temperature sensor

When DHW temperature sensor is damaged, the display shows **Sen.DHW** (DHW pump operation will stop), instead of the DHW temperature indications, "**--**" will be shown and a continuous sound will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on .


To cancel press .

**Tips:** To use boiler without the DHW sensor switch to "only CH" mode.

## 49.7 Damaged temperature sensor 2. Circuit

When 2 CIRCUIT temperature sensor is damaged, the display shows **Cr2.Sens**, instead of the **Cr2** temperature indications, "**--**" will be shown and a continuous sound will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on .


To cancel press .

## 49.8 Thermal fuse

In the event of an overrun on the boiler temperature above 90 °C, the fan will be disabled in emergency mode. At the same time the display will show **THERMAL FUSE** and an intermittent beep will be generated (as long as it is turned on - see Alarm - sounds).
Red LED will turn on .


**Tips:** hen the temperature drops below 90 °C, the thermal protection system is "off" and the controller returns to normal operation. Cancel alarm by pressing and activate boiler by pressing OK leaving the STOP mode.

## 49.9 Piston feeder drawer fault

When there is a fault / jamming of the piston feeder mechanism (the drawer will not move), then the screen will show **Feed** (the feeder and fan will be stopped) and a continuous sound will be generated (as long as this option is enabled - see Alarm - sounds).
Red LED will turn on ⚠ .


To cancel press ⮌

## 49.10 Return temperature sensor fault

When there is a fault of the return temperature sensor, then the screen will show **Retn.Sens.**, instead of RET temperature, "**--**" will be shown and a continuous sound will be generated (as long as this option is enabled - see Alarm - sounds).
Red LED will turn on ⚠ .


To cancel press ⮌

## 49.11 Circulation temperature sensor fault

When there is a fault of the circulation temperature sensor, then the screen will show **Circ.Sens.**, instead of "Cir" temperature, "**--**" will be shown and a continuous sound will be generated (as long as this option is enabled - see Alarm - sounds)
Red LED will turn on ⚠ .


To cancel press ⮌

## 50. Weather control as per the heating curves

Weather control option is used to adjust the installation working parameters depending on the external temperature. As a result of temperature changes outside, the temperature of water in installation also changes, which means the colder outside the boiler heats stronger and vice versa. To this end, a temperature sensor is installed outside the premises to send information to the weather controller.

To set the weather control option go to **Service menu / 1. Circuit / Control type / weather.** Do the same for 2. Circuit. The screen will show the preset room temperature “Preset 20°”. And the temperature which the boiler should reach is shown alternate with the boiler temperature. It is preceded with “**>>>**”. This temperature changes depending on the external temperature. It also depends on the settings of the heating curves. When the temperature is reached, the boiler goes to the “Hold-up” mode. This applies to 1. Circuit.
For 2. Circuit, temperature is adjusted by closing and opening the 3- or 4-way valve. Operation of this valve depends on the external temperature and operating thresholds depend on the settings of the heating curves for 2. Circuit.


# 51. Heating curves - introduction

**A heating curve**
Correct setting of the heating curve ensures keeping the constant temperature inside a building when temperatures outside are different. A precise setting of the heating curve is particularly important for condensation boilers and heat pump. The lower working temperatures for these devices the higher efficiency thereof. The heating curve formula allows defining its required slope depending on the nominal parameters of the heating system. However in practice, it often turns out that this is not enough and the calculated basic parameters must be corrected based on the building behaviour. This behaviour together with its reaction to temperature changes is strongly dependent on the calorific capacity (a massive vs. light structure of the building), thermal inertia and heat profits from insolation.

**Example**
- A house with good thermal insulation in a covered area (with radiator heater): **Slope = 1,2**
- A house set on an open space or with an old heating installation (with radiator heater): **Slope = 1,6**

Heating curves represent a relation between external temperatures, a room temperature (the required value), and water temperature in a boiler or on the delivery (heating circuit). The lower external temperature, the higher water temperature in a boiler or on the delivery (heating circuit). In order to guarantee enough heat energy for each external temperature with minimum fuel consumption, it is necessary to consider the building and heating installation's features. To this end, the installation company must set the heating curve.

**Tips**
*If heating circuits with a mixer are available in your heating installation, water temperature on the delivery for the heating circuit without a mixer is higher by the preset difference from water temperature on the delivery for heating circuits with a mixer.*

Temperature adjustment for both circuits (the one supplied directly from a boiler and this equipped with a valve) can take place based on the external temperature acc. to the selected heating curve. For both circuits it is possible to select independent heating curves.
17 settings of the heating curves are available. They can be additionally shifted by adjusting the base temperature. This allows adjusting the delivery temperatures to the building's characteristics.
Floor heating installations work at low temperatures, e.g. 40° delivery and 30° return or 35° delivery and 27° return. Curves with low slope are selected (between 0.2 and 0.6). For radiator installations, curves with a greater slope are selected (between 0.6 and 1.2). For old type heating installations and for detached houses and poorly insulated, with water temperature in a boiler above 75°, curves with a high slope are selected (between 1.2 and 2.0).
Each external temperature increase by 1°C boosts fuel consumption by the boiler by few percentage hence one should strive for setting the lowest heating curve, which allows reaching the thermal comfort of a building. This may require several corrections of the heating curve during a year.

## 52. Heating curves - tracing

A heating curve can be initially determined by calculations with the assumed heating installation delivery temperature and the required room temperature.

$\Delta T_1 = t_k - t_p$

$\Delta T_2 = t_p - t_z$

$N_{KG} = \Delta T_1 / \Delta T_2$

$\Delta t_1$ - difference of an installation delivery $t_k$ and the required room temperature $t_p$

$\Delta t_2$ - difference of a room temperature $t_p$ and external temperature $t_z$

$t_k$ - heating installation (or a boiler) delivery temperature

$t_p$ - room temperature

$t_z$ - external temperature

$N_{KG}$ - heating curve slope

## 53. Heating curves - description

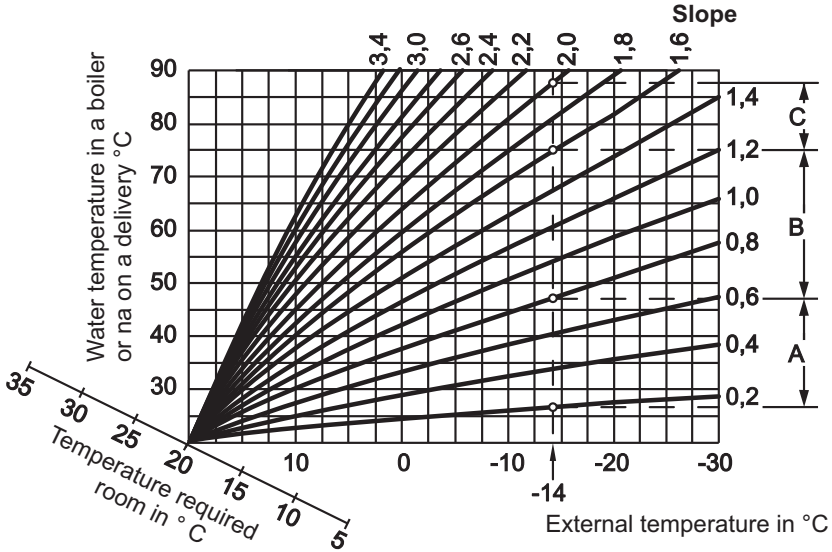



Fig.15 Heating curves

**Example**

For external temperature of -14°C:

**A** Heating curves slope range for floor heating installations from 0,2 to 0,8

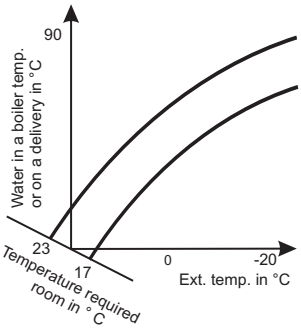
**B** Heating curves slope range for low temperature heating installations from 0,8 to 1,6

**C** Heating curves slope range for installations with water temperature in a boiler above 75°C from 1,6 to 2,0

# 53. Heating curves - description (cont.)

**Adjustment of a room temperature**

The required room temperature may be adjusted only in a weather mode (for settings see “Service menu / Parameters 1. Circuit / Control type”). Select the heating circuit and set normal room temperature for a day. Set reduced temperature for night or weekend.




Enter the settings - **Main menu / 1. Circuit / Room T.**


Repeat for 2. Circuit

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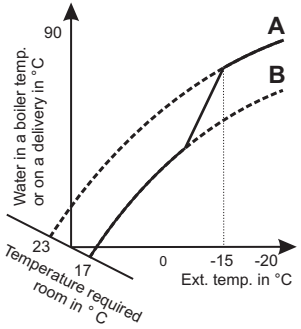
Fig.16 Adjustment of room temperature

**Adjustmetn of the reduced room temperature**

**A** Heating curve for operation with normal room temperature
**B** Heating curve for operation with reduced room temperature
In a reduced room temperature operation mode, the required value of this temperature can be changed automatically depending on eternal temperature. Temperature change runs accor-ding to the set heating curve, max. until the normal required room temperature value is reached.




Enter the settings - **Main menu / 1. Circuit / Red. T.**


Repeat for 2. Circuit

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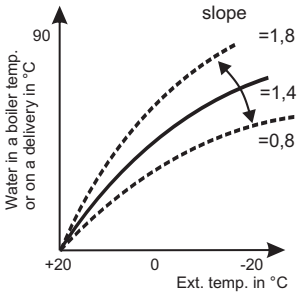
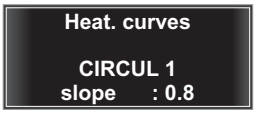
Fig.17 Reduced room temperature

**Adjustment of a heating curve slope**

Depending on the heating type, energy parameters of the house and weather dependence observations, a suitable **slope** of the heating curve and the **level** must be selected.




Enter the settings - **Service menu / Heating curves / 1. Circuit / Slope/**




Repeat for 2. Circuit

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Fig.18 Heating curve slope

# 53. Heating curves - description (cont.)

### Adjustment of a heating curve level

By changing the level of a heating curve, its diagram is shifted vertically. The purpose is better adaptation of the heating installation to variable weather conditions, e.g. setting the curve level to 2 will cause a temperature rise by 2° to which water will be heated by a boiler.

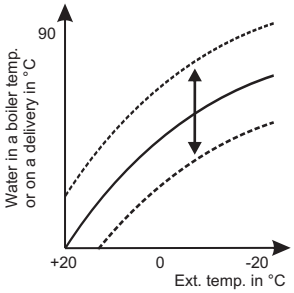
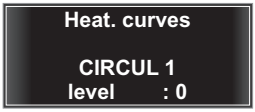



Fig.19 Level of a heating curve

Enter the settings - **Service menu / Heating curves / 1. Circuit / Level**




Repeat for 2. Circuit

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### Limitation of max. and min. temperature

Set max. and min. boiler temperature. For both circuits or for a floor heating reduce temp. to ca. 50°. See “Settings table / Factory settings

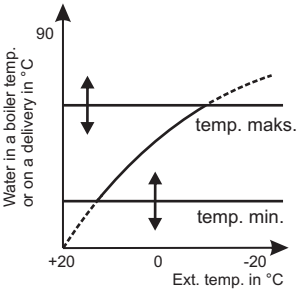
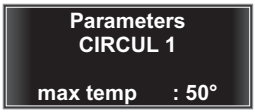



Fig. 20 Reduction of a boiler temp. max. and min.

Enter the settings - **Service menu / Parameters 1. Circuit / Temp. max**




Repeat for 2. Circuit

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## 54. Correction of the heating curves' settings

If for a longer period of time in the heating period, the room temperature does not match your requirements, it is possible to change the heating mode. It can be influenced by modifying the slope and a heating curve level. Please do observe the modified heating mode for a couple of days (if possible, wait for a significant weather change) before taking decision on further modifications.

| Signs | Activity | Tips |
|---|---|---|
| Internal temperature is too low at different external temperatures | Change the heating curve slope e.g. from 1,2 to 1,4. Delivery temperature will rise in the entire range of weather adjustment of the heating system operation | See Fig. 18 |
| Too cold in a room during winter time | Set the heating curve slope to another higher value (e.g. from 1,4 to1,6) | See Fig.18 |
| Too warm in a room during winter time | Set the heating curve slope to another lower value (e.g. from 1,4 to 1,2) | See Fig.18 |
| Too cold in a room during transient and winter time | Set the heating curve level to higher value (e.g. from 0 to +3) | See Fig.19 |
| Too warm in a room during transient and winter time | Set the heating curve level to lower value (e.g. from 0 to −3) | See Fig.19 |
| Too cold in a room during transient time and warm enough during winter time | Set the heating curve slope to another lower value, and level to higher value | See Fig.18 and Fig.19 |
| Too warm in a room during transient time and warm enough during winter time | Set the heating curve slope to another higher value, and level to lower value | See Fig.18 and Fig.19 |

## 55. Heating curve - guides

Modification of the curve's slope means a shift of the right corner of a diagram upwards or downwards when the left end touches the required temperature axis of the room. Modification of the level means simultaneous rise of the left and right end of the diagram upwards or downwards by a determined value, which is the same for the left and right end of the diagram. This gives us vast possibilities of adjustment.
Increasing the required temperature by one degree raises only the beginning of the curve, which means that with + temperatures the change will be higher and with - temperatures the change will be smaller (the diagram raised only from the left, and the fixed point from the right). Vertical modification (of the level) will change the position of the left and right side of a beam hence the modification will be noticeable within the whole temperature range.
For a start, the slope of a heating curve should be adjusted (Fig. 18), i.e. by increasing or decreasing the right end of this curve. If this does not help in a full temperature range, the level of the curve should be changed (Fig.19). Modification of the level of the heating curve shall allow precise adjustment of a heating system to the user's requirements.
Lowering the level of the curve by 2° will impact the temperature drop to which the water will be heated by a boiler by 2 degrees less than it results from the currently selected heating curve and external temperature.

## 56. Temperature sensors characteristics

| Temp. (°C) | Resist. (Ω) | Temp. (°C) | Resist. (Ω) | Temp. (°C) | Resist. (Ω) |
|---|---|---|---|---|---|
| -30 | 1247 | 20 | 1922 | 60 | 2597 |
| -20 | 1367 | 25 | 2000 | 70 | 2785 |
| -10 | 1495 | 30 | 2080 | 80 | 2980 |
| 0 | 1630 | 40 | 2245 | 90 | 3182 |
| 10 | 1772 | 50 | 2417 | 100 | 3392 |

Fig. 21 Sensors characteristics

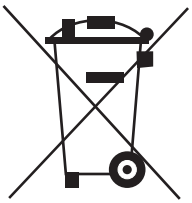
**Tips:** Sensors resistance should be compared with their characteristics. For significant departures, replace the sensor.

## 57. Technical data*

| | |
|---|---|
| Range of measured temperature | from - 9 °C to + 120 °C |
| Range of temperature settings for a boiler | from + 40 °C to + 85 °C |
| Range of temperature settings for a DHW heater | from + 40 °C to + 70 °C |
| Range of temperature settings for CH pump | from + 30°C to + 70 °C |
| Smooth fan start-up | yes |
| Adjustable max. fan | 40 - 100 % |
| Hysteresis of a fan (on/off difference) | from 1 °C to 9 °C |
| Hysteresis of a DHW pump (on/off difference) | from 2 °C to 9 °C |
| Adjustable blow-by (possibility | oper.: 0 - 90 sec |
| to turn off the blow-by completely) | break: 1 - 60 min |
| Adjustable boiler damping time | 0 - 45 min |
| Allowable outputs load | fan: 100 W / 230 V |
| | feeder: 200 W / 230 V |
| | central heating pump: 100 W / 230 V |
| | DHW pump: 100 W / 230 V |
| | circulation pump: 100W / 230 V |
| | 3W/4W valve: 100 W / 230 V |
| Rated voltage | ~ 230 V, 50 Hz |
| Electric protection | 2 x 5 A |
| Relative air humidity | < 95 % |
| Housing protection class | IP 20 |
| Ambient temperature from | from 0 °C to + 40 °C |

*__Notice:__ Depending on the program version, some ranges might be different than the above.

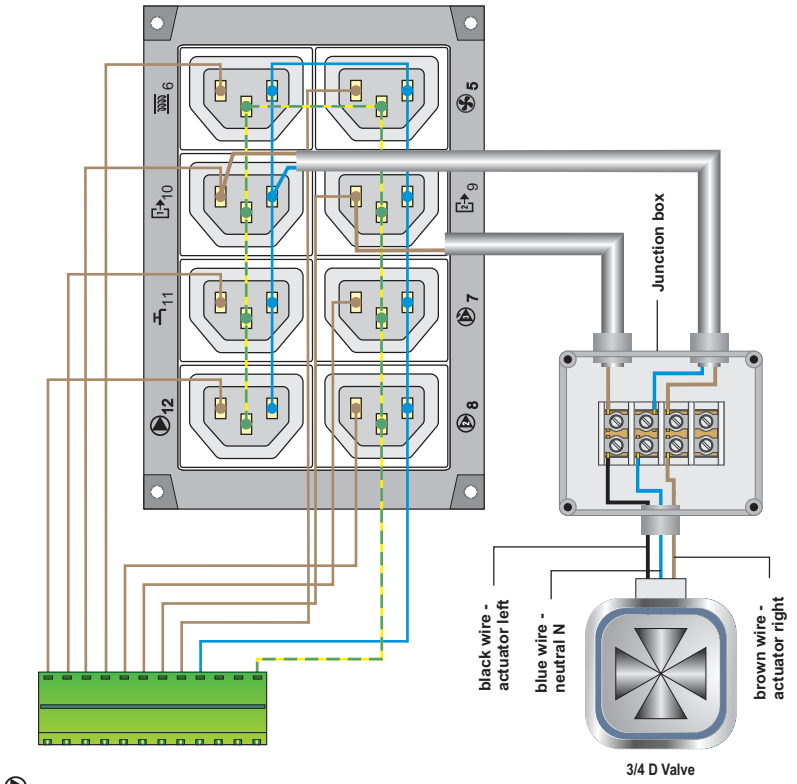
## 58.Rules of conduct with waste electrical and electronic equipment



Utilization of Waste Electrical and Electronic Equipment (applicable in the European Union and other European countries with separate collection systems).

This symbol on the product or its packaging (according to the Act of July 29th, 2005, on waste electrical and electronic equipment) states that this product may not be considered as a household waste. It should be handed over to the applicable collection point for waste electrical and electronic equipment. By ensuring proper storage you help to prevent negative consequences threatening the environment and human health. Recycling helps to conserve natural resources. For more detailed information about recycling of this product, information about the established system of receiving and collecting the waste electrical and electronic equipment and a list of processing plants, please contact our office or our distributors.

# 59. Appendix




12 **central heating pump**

11 **DHW pump**

10 **3D/4D valve opening**

9 **3D/4D valve closing**

8 **2. circuit pump**

7 **circulation pump**

6 **feeder**

5 **fan**

**Notice: If the valve operates in a reverse mode, change location of the black and brown servo cables.**

Fig. 22 The 3/4 way valve connection to the connection box diagram

## 59. Appendix

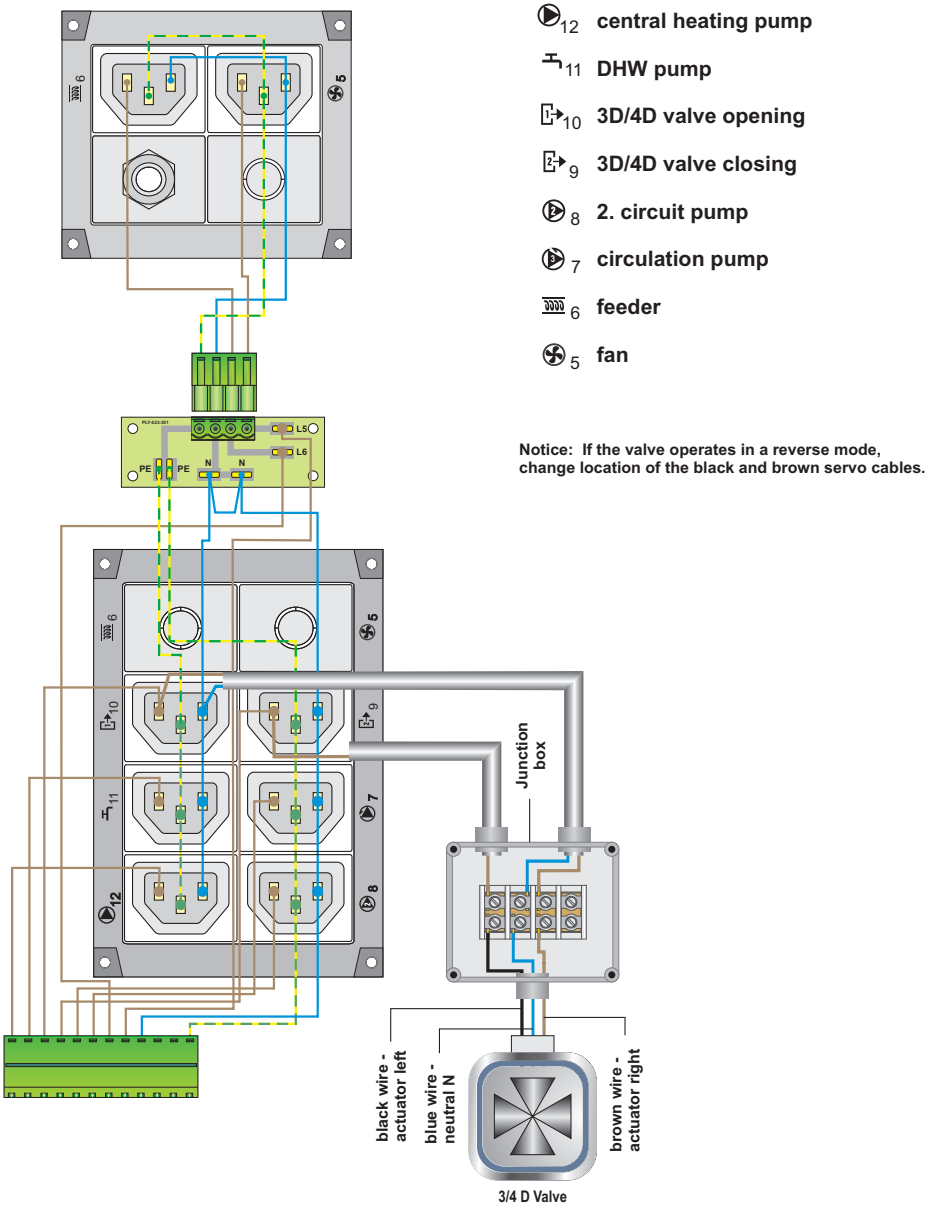



Fig.23 The 3/4 way valve connection to the connection box with external supply.

## 60. Notes

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