PONAST®

Automatic boiler for biomass
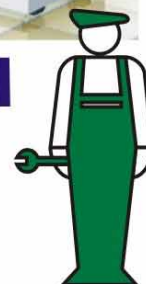## KP 12, KP 12E
KP 22, KP 22E
KP 62, KP 62E

Service manual

Automatic boiler for biomass – Service manual

We would like to focus your attention mainly on the following chapters:
> number 1 – Important notes
> number 6 – Putting the product into operation
> number 7 – Maintenance and attendance of the boiler during operation

The boiler has been approved for operation in the Czech Republic and in 27 EU countries by the State Testing Institute, state testing plant number 202.

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1   IMPORTANT NOTES

This product may only be put into operation by an installation organization trained by the manufacturer.

This product may only be operated by adult persons, duly acquainted with the way the product is controlled and duly acquainted also with these Instructions. If you adhere to the below mentioned principles, the product will serve you reliably to your full satisfaction.

1) It is prohibited to intervene in any way in the structure or electrical installation of products. Having the equipment been disconnected from the electric network, the power supply cord has to be plugged from the mains outlet!

2) It is prohibited to use inflammable liquids for ignition.

3) No inflammable materials may be stored on the boiler, neither may they be stored within the distance of 1,500 mm from the boiler (except for operating stock in the metal bin).

4) In order to preserve long-term service life of the boiler body, it is not recommended to operate the boiler frequently under the temperature of 60°C, if the boiler is not protected with a primary circuit. The temperature of 60°C should be considered as the minimum temperature.

5) The check how the boiler is filled with fuel is only visual. Any verification with touch is prohibited as it may result in injury.

6) Never open door of the boiler if there is a ignition process. Blinking AUTO will apear on display in this stage

7) The door of the boiler has always to be close shut. Should you perform any check, open the door carefully to prevent from getting jeopardized by gathered products of combustion or to prevent any sparks flying out from the boiler from being the cause of any accident. Open the door slowly in order to get the combustion chamber aerated towards the chimney. This procedure has to be adhered to when the ash is being removed from the ash pan's space.

8) If any work which generates inflammable vapours takes place in the boiler room (glueing the floor, etc.), the boiler has to be out of operation and the fire has to be burnt out in the boiler.

9) Having the heating season been finished, clean the boiler thoroughly as per the chapter 7 - Maintenance. Products of combustion stuck to the walls of the exchanger may act corrosively for the whole period of time when the boiler will be out of operation. If the burner is not cleaned, this may have effect on faulty combustion. We recommend to hire a specialized company to perform this work.

10) If you work on or near to the mechanically movable parts (fuel feeder, etc.), ensure safe disconnection of the equipment from electric voltage. There is a risk of injury.

11) You should always operate the boiler only under parameters and in harmony with recommendations given in these Instructions for installation and operation. If the boiler works in the AUTO mode and if there is a failure of current, the boiler will start operation again with the electric firing programme (if this programme has been installed) after the delivery of electric current is restored.

12) The manufacturer does not assume any liability for errors and subsequent damage caused by unskilled operation of the equipment or by infringement of principles given in these Instructions for installation and operation or by infringement of generally binding standards and regulations or by using inadequate fuel.

13) If the boiler is moved or otherwise handled with, safety regulations which apply to handling with heavy loads have to be adhered to.

14) It is prohibited to place heavy loads on jacketed boiler and to step on it. It is recommended toremove the protective transport after all the building and installation work has been completely finished.

15) External ashtray has to be firmly connected to a boiler fitiing while in the operation. Cover of this ashtray has to be closed. There could be a dangerous escape of combustion products in to a boiler room.

2   USE OF THE BOILER AND ITS ADVANTAGES

The series of automatic hot-water boilers for wood pellets is designed mainly to heat family houses, small municipal buildings, cottages and small plants or business buildings.

The main advantages of products:

1)   AUTOMATIC OPERATION ensured by the control unit which cooperates with the indoor thermostat, thermostat of SW tank for hot watter, outside thermometer in the mode of equitherm regulation, eventually by superior control system, which ensures COMFORT for the user including maximum saving of fuel.

2)   Automatic ash removing and heat exchanger cleaning ensures a long time maintanance free and maximum comfort of heating while keeping high burning efficiency.

3)   CONTROL UNIT with modern design – controls operation of the boiler, ensures automatic operation, high operational reliability and long distance control.

4)   PRIORITY HEATING of hot service water – is secured by the structure and software package of the boiler without any need for other control elemets.

5)   MODULATION PERFORMANCE of the boiler allows adjust production of the heat to an actual needs of the building.

6)   Heating by EQUITHERM regulation of the water temperature to a needed temperature lowers the cost of the heating.

7)   The burne system used with two independent drives and with a system of ceramic catalytic reflector ensures perfect SMOKELESS FUEL COMBUSTION, which supports high thermal efficiency of the product and also excellent ecological parametrs with the minimum content of harmful sustances in combustion products (20-50x less than in case of classic boilers).

8)   SAFETY OF OPERATION given by separated structure of transport routes for fuel and by the selected transport mode.

9)   The boiler makes it possible to ensure economical MODERATE HEATING of building by a suitably selected systém using electric power.

10) DESIGN AND SURFACE. Jacketingof the product is coated with a heavy-duty COMAXITE COATING which is perfectly resistant to environment effects and ensures perfect appearance of products on long-term basis. Design of whole solution is using a modern shape elements.

11) This SUBSIDIED ABLE PRODUCT – is fullfilling all required conditions for obtaining subsidies in many states of the European Union.

12) LONG DISTANCE CONTROL and monitoring by internet or GSM connection.

3 TECHNICAL DATA OF THE BOILER KP X2

Table 1   **Thermal and technical parameters of products**

Parameter	Unit	KP 12/12E	KP 22/22E	KP 62/62E
Rated output	kW	19	29	62
Output range	kW	5,5 - 19	8 - 29	18 - 62
Fuel consumption	kg x hour.$^{-1}$	~1,3 - 4,4	~1,9 - 6,6	~4,1 – 14,28
Efficiency (rated output)	%	91,2	90,9	90,6
Efficiency (minimum output)	%	90,1	90,1	90,1
Temperature of combustion products	°C	94 - 151	94 - 148	94 - 140
Class of the boiler		3		
Hours of burning - min/pow. – fuel bin 400L	hour	213 – 61	142 - 40	64 - 19
Hours of burning - min/pow. – fuel bin 700L	hour	373 – 107	249 - 70	111 – 33

*in heating value 17,5MJ/Kg and efficiency 90%

Table 2   **Solid harmful substances in combustion**

Parameter	Unit	KP 12/12E	KP 22/22E	KP 62/62E
Average mass flow rate solid elements pollutions at rated power	g / hrs^{-1}	0,36	0,65	2,2

Table 3   **Technical parameters of products**

Parameter	Unit	KP 12/12E	KP 22/22E	KP 62/62E
Weight	kg	310	370	590
Water content	l	55	70	160
Fume duct diameter	mm	130	150	160
Connections: heating and return water	Js	G 1 1/2"		
Heating surface	m^2	1,8	2,1	3,2
Dimensions (w + d) without ashtray	mm	477x 980	614x980	845x1360
Dimensions (h)	mm	1435	1435	1720
Working overpressure of water	bar	in to 2,5		
Hydraul. loss ΔT 10 K	mbar	4,77	10,97	33,7
Hydraul. loss ΔT 20 K	mbar	1,26	2,77	8,3
Required draught	mbar	0,1 – 0,2		0,3 – 0,4
Recom.operating temp. of heating water	°C	60 – 80		
Lowest temp. of incoming water	°C	55		

Table 4   **Electrical parameters of products**

Parameter	Unit	KP 12/12E	KP 22/22E	KP 62/62E
Connecting voltage		230 V AC ± 10%, 50 Hz ± 2 Hz		
Electric input (4 motors, fan)	W	180	210	340
El. Protection of the control unit	---	IP 54		
El. Protection of the boiler´s wiring	---	IP 20		

Table 5   **Fuel and its parameters**

Wood pellets diameter	6,0 - 8,5 mm
Caloric value	approximately 16-18 MJ / kg
Water content	Up to 10 %
Ash content	Up to 1 % (0,8 – 1,0%)
Bulk weight	0,6 – 0,64 kg / dm3
Fuel delivery system	PE/PP bags 15 – 25 kg, bags Big Bag by 800 - 1100 kg, loose - fill (cistern)

As a guaranteed fuels for all KP boilers are wood pellets, with parameters specified in table 5.

Boliers KP x2 are adapted for a burning of different kinds granulated fuels. Correct use of other than granulated kind of fuel has to be always consulted with a manufacturer or an authorized service center. Authorized service center will make a professional set-up of the boiler for the type of the fuel which was specified by you.

4   STRUCTURAL DESCRIPTION OF PRODUCTS

The structure adheres to the Czech standard ČSN – EN 303.5 / 2000 i.e. boilers for central heating - part 5 (boilers for central heating with automatic fuel feed of rated heat output up to 300 kW).

Main parts of the boiler are:

4.1   Boiler body
4.2   Control unit of the boiler E2000
    4.2.1   control unit RJE 2008
    4.2.2   control terminal TE2008
4.3   Burning chamber
    4.3.1   feeder F2 with independent drive
    4.3.2   connecting flexible house
    4.3.3   main fan
    4.3.4   spirals for el. ignition
4.4   Ceramic parts
    4.4.1   ceramic reflector
    4.4.2   secondary ceramic grate
    4.4.3   ceramic shield
4.5   Feeder F1 with independent drive (from fuel bin)
4.6   Jacketing of the boiler including heat insulation
4.7   Cleaning system
    4.7.1   ash removing
    4.7.2   heat exchager cleaning
    4.7.3   external ashtray
4.8   Flue fan (with KP12, 22 is as a option)

Other parts which can be delivered:

4.9   Standard accessories
4.10   Optional accessories
4.11   Fuel bin (by needs of customer)

DIAGRAM OF THE PRODUCTS AND DESCRIPTION OF THE MAIN PARTS

4.11 FUEL BIN

4.2.2 CONTROL PANEL

4.1 BOILER BODY

4.4.2 CERAMIC SECONDARY GRATE

4.7.3 ASH CONTAINER

4.1.2 DOOR

4.4.3 CERAMIC SHIELD

4.4.1 CERAMIC REFLECTOR

4.7.2 AUTOMATIC CLEANING SYSTEM WITH TURBULATORS

4.8 FLUE GAS EXHAUST WITH FAN

4.2.1 E 2008 CONTROL SYSTEM

4.5 FEEDER F1

4.3.2 CONNECTING FLEXI HOSE

4.3 BURNER CHAMBER

4.3.1 FEEDER F2

4.3.4 EL. IGNITION

4.7.1 MOTOR FOR ASH REMOVING

4.8.2 EL. HEATERS FOR MODERATE HEATING

4.3.3 MAIN FAN

Picture 1   Diagram of the products and description of the main parts

4.1 BOILER BODY, SCHEMA OF THE PRODUCTS AND DESCRIPTION OF THE MAIN PARTS

is made of top-quality steel metal sheets and pipes for boiler in form of a weldment. Its shape is adapted in such a way so that combustion products are cooled down efficiently at individual levels of power output, which is, moreover, assisted by a newly developed system of turbulator of combustion products. The exchanger is shaped in such a way so that the exhaust pipes of combustion products can be cleaned individually and efficiently.

Boiler body i fitted with the following:

4.1.1   steel weldment with turbulator heat exchanger
4.1.2   1 pc. of door, allowing inspection of conbustion and burner while in operation, installation of all ceramic parts before starting the operation and possible cleaning of the burning chamber
4.1.3   flue gas exhaust - diametr of the flue ∅ 130 - 150 - 160 mm fot individual types which are in table 3.
4.1.4   output of heating water G 1½´´ (inside thread)
4.1.5   input of return water G 1½´´ (inside thread)
4.1.6   rear flanged orifice in order to install the burner systém
4.1.7   an outlet of ½´´ in order to install an inlet (outlet) valve
4.1.8   extension piece with inside thread M48 x 2 mm in order to make it possible to install an electrical heating unit
4.1.9   turbulators (event. with system of semiautomatic cleaning of the heat exchanger)
4.1.10   opennig on top for cleaning covered by a lid of the boiler´s body
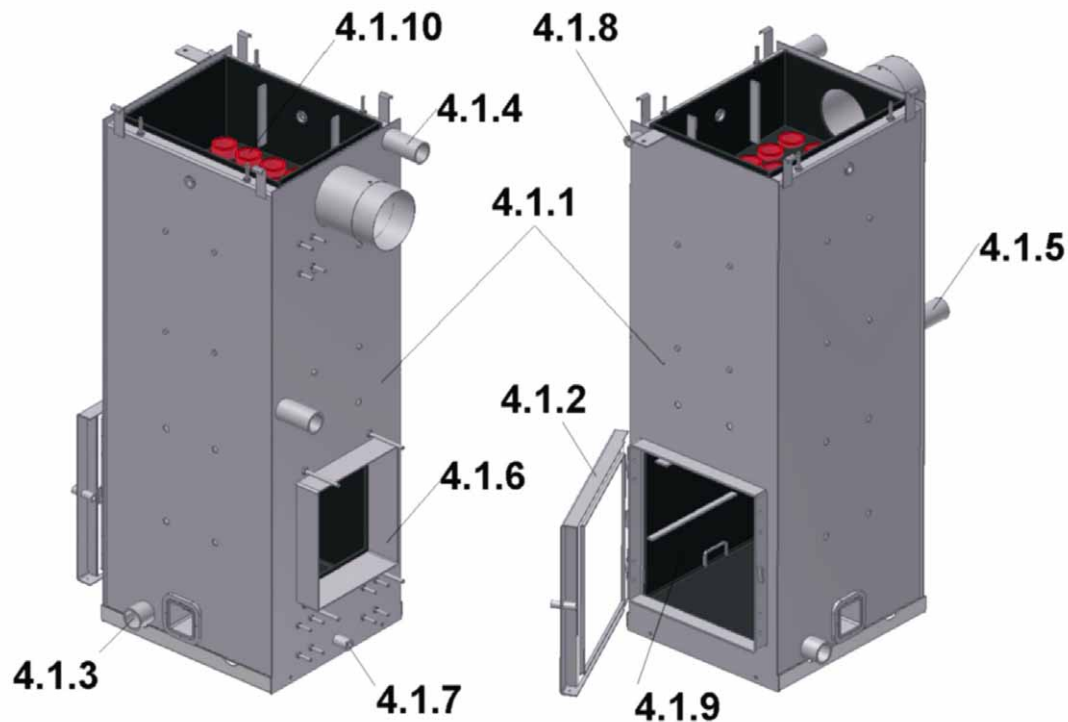
Picture 2   Boiler body

4.2   CONTROL SYSTEM OF THE BOILER

The Boilers are equipped with the E2008 control system. This control system enables automatic boiler operation with the help of control and regulation features (thermometers, sensors, et al.) in the respective modes. It also enables MANUAL MODE of control, which is used for instance during the boiler initial operation. The control system is comprised of the performance part located on the side of the boiler (position 4.2.1) and of the control terminal (position 4.2.2). The terminal also comes in a different model with a two-line foil keyboard display or it may be equipped with a touch screen. The control system construction and its electrical shielding (IP 45) make safe and reliable operation possible even under the demanding operational and climatic conditions common to boiler rooms.
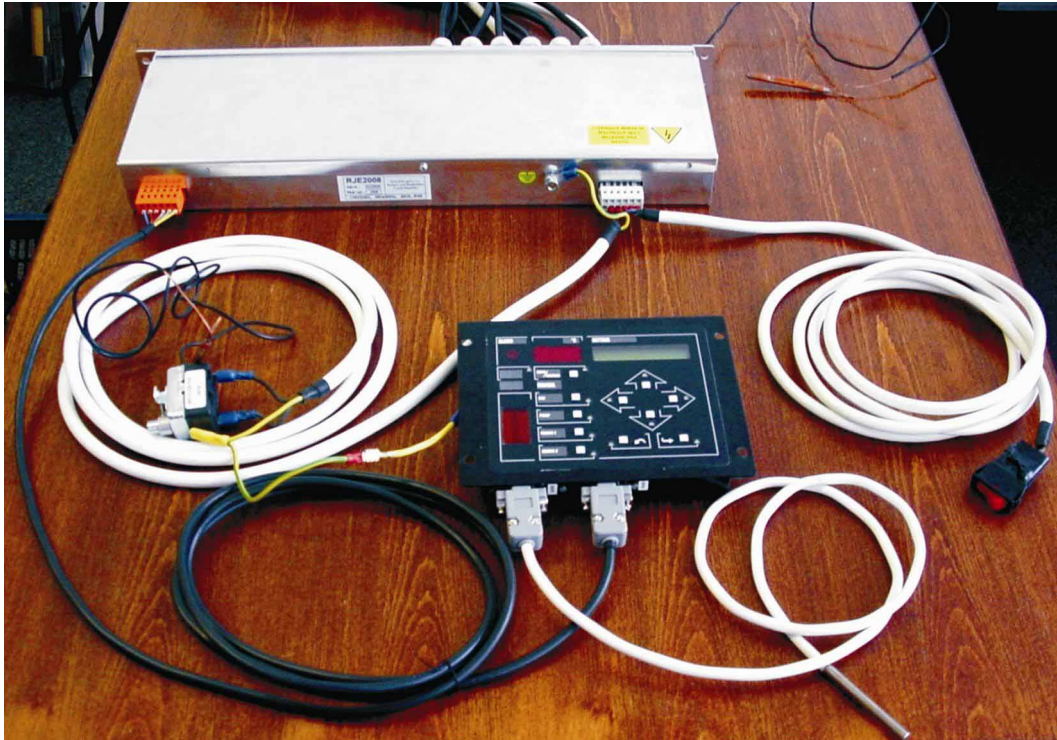
Picture 3   E2008 Control System

The boiler modular set is comprised of these parts:

Name	Type	Use
Control Unit	RJE 2008	Z
Terminal with mechanical buttons	TE 2008	Z
Terminal with touch color display including connector cable (set)	MT506TV	V
Module expander	EEX2008	V
Module Ethernet	X-PORT1	V
GSM modem (cable, modem, antenna, adapter)	M35	V
Control unit and terminal connection	PK01	Z
Control unit and main switch and emergency thermostat connection	PK02	Z
Surface temperature sensor (NTC10000)	QAD36	Z 2 pcs
Outside temperature sensor (NTC10000)	QAC34	Z
Waste temperature detector Pt1000 with connector	PT1000SK	Z
Magnetic rotation sensor	MSO2	Z 2 pcs
Programmer	PROG3	S
2PIN connector socket	AK950/2	Z 2 pcs
4PIN connector socket	AK950/4	V

Z – basic control system set, V – optional parts of the control system, S – service equipment

E2008 is supplied from the electrical power network; voltage is 230V/50Hz. The core of the system is the **RJE2008** unit. Control is possible either by specialized terminal TE2008 or by a touch screen terminal **MT506TV**. Communication with the **RJE2008** control unit is provided by the "MODBUS" communication protocol and it can use the physical layer RS485 for its communication.

The terminal is power supplied from the control unit, which contains a DC 20-24V/max1A supply source. If we use a different terminal from the one supplied by the manufacturer, the terminal may have different electrical supply. If the supply voltage or the maximum terminal demand is outside the listed range, special supply must be provided. The number of inputs and outputs (control of remote units, reading data from a distance) can be increased by using the **EEX2008** expanders. The communication between the expander and the control unit is provided by the RS485 bus.

The E2008 algorithms can operate in real time. A remote control and incorporation to a higher-up system are possible with the help of a standard communication interface. Even mobile phone service is implemented. The option of recording all activities by "BLACKBOX" is built into the system.

4.2.1   Control Unit RJE 2008

The mechanical construction of the control unit is based on a standard 19" case; terminals have a "panel-type design" and are encased in the equipment covering with a high degree of shielding.

To communicate with outside units, the E2008 control unit is equipped with the following:
- a)   General inputs
  - -   Analog   (4x, range 0 to 2.5V, resolution 10bit)
  - -   Binary   (2x, log. zero 0V to 2V, log. one 3V to 5V)
  - -   Binary   (2x, log. zero 0V to 5V, log. one 7V to 12V)
  - -   Binary (expander)   (2x, log. zero 0V to 2V, log. one 3V to 5V)
- b)   Specialized inputs
  - -   thermometers PT 1000   (2x)
  - -   thermometers NTC 10000   (3x)
  - -   emergency thermostat   (2x)
  - -   room thermostat   (1x)
  - -   LAMBDA probe   (1x)
- c)   Power outputs
  - -   9 x ON/OFF   active (contact relay, AC, 8A/230V)
  - -   2x ON/OFF   active (semiconductor switch, AC, 6A/230V)
  - -   2x phases regulated   synchronized with supply voltage. (AC 230V/ max. 6A)
- d)   Communication lines
  - -   RS485   (2x)
  - -   RS232   (1x)
  - -   OPENTHERM   (1x)
  - -   Ethernet or WIFI   (1x)
  - -   SPI   (1x)
  - -   JTAG   (1x)

  Auxiliary supply voltage output (1x DC 24V/max. 0,1A)

The unit is constructed as an integrated 19" module. The unit is built-in vertically either to the **left** or **right** side of the lateral boiler covering, depending on the space possibilities of the boiler room.
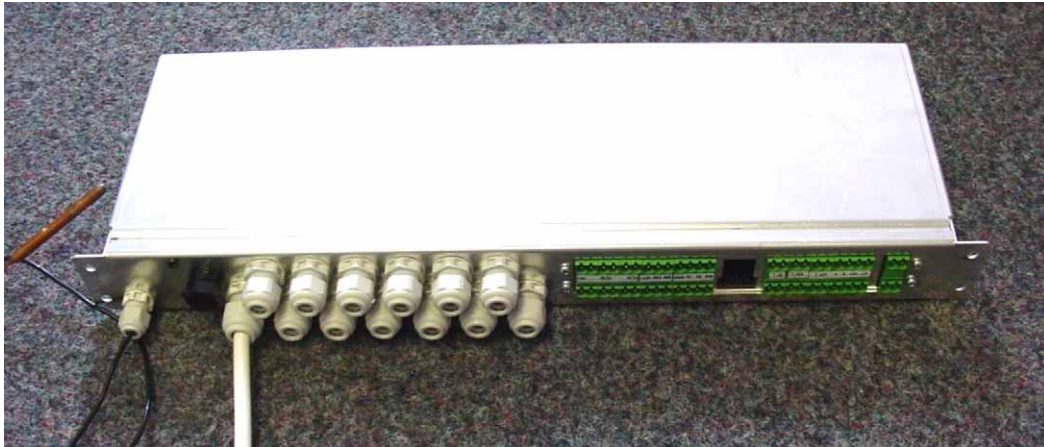
Picture 4 **RJE2008 Control unit**

The unit itself consists of two modules. The power part is affixed to the unit cover.
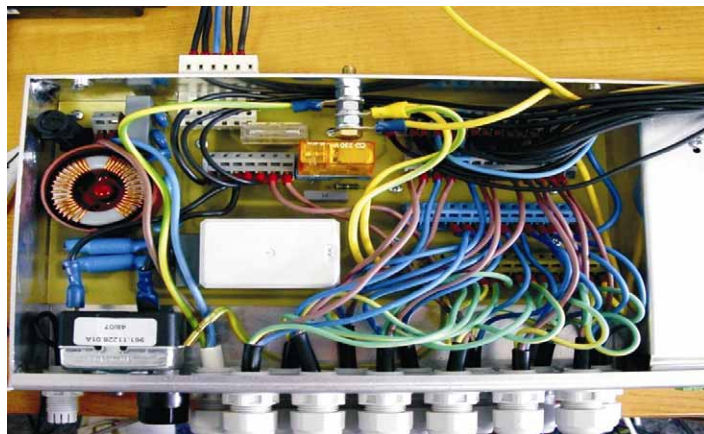
Picture 5 **RJE2008 Control unit – power and connecting parts**

E2008 Module processor is removable.
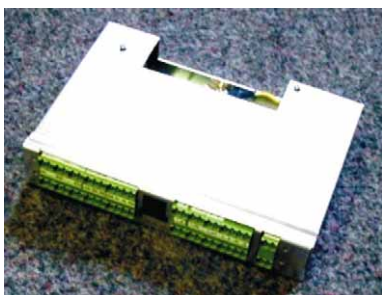
Picture 6 **Processor E2008**

Both modules are connected by a connector cable.

TECHNICAL DATA

Supply	230V/50Hz
Control unit supply	max 40VA
Total maximum input	2kW (depending on outputs)
Dimensions	450 × 155 × 50
Weight	2.8 kg
Protection class pursuant to ČSN 33 2000-4-41 ed. 2:2007	I
Protection from dangerous touching of live parts pursuant to ČSN 33 2000-4-41 ed. 2:2007	By covering and insulation
Protection from dangerous touching of non-live parts pursuant to ČSN 33 2000-4-41 ed. 2:2007 basic	By automatic disconnection from source
Protection from dangerous touching of non-live parts pursuant to ČSN 33 2000-4-41 ed.2:2007 increased amended	By connecting
Shielding pursuant to ČSN 60 529	IP31

- Basic characteristics setting pursuant to norm ČSN 33 2000-3:

> AA5   temperature +5 - +40 °C
> AB5   temperature +5 - +40 °C, humidity 15 – 100%
> BA5   people skills - knowledgeable
> BC3   ground contact – frequent

> (Described in detail in E2008 documentation)

- This equipment is designed in accordance to norms ČSN EN 60335-1 and ČSN EN 60335-2.
- Classification is in accordance to ČSN-EN 55014-2, Category II.

4.2.1.1   Description of RJE2008 inputs

Unless specified otherwise, the majority of inputs is connected directly or through a converter to the processor module and may not be connected to power circuits and outside sources of dangerous voltage! The input terminals are protected against outside conditions (EMC), but they are galvanically connected with the terminal.

See the VN barriers in the drawing (picture No. 53).

Thermometer inputs NTC10000 a PT1000 (connector markings: XV3A, XV5A, XV5B, XV2, XV6A, XV6B) are connected as voltmeters (A/D conversion 10BIT, range 0V to 2.5V). The decrease of sensor resistance is measured with constant electrical current.

Binary inputs (connectors XV7A, XV7B, XV8A, XV8B, XV9A, XV9B), are equipped with PULL UP resistors 10 kOhm, connected to 5V voltage and ready for control by type OC (open connector) sensors or passive contacts.

Binary inputs with supply supports (connectors XV11A, XV11B) are three-pronged – they have an extra terminal with supply voltage 12V and they are ready for sensor control of the OC type (open connector), while the load (PULL UP resistor) is expected in the sensor.

Room thermostat (connector XV13B) is a specialized input – output. This is an active input, which is ready for a metallic switch. If switched on, constant pulsating (10 ms is on, 10 ms is off) current (range 0 to max +5 mA, open circuit voltage approximately +6 to +8) runs through the circuit. If this input is equipped on its side by an E1074 adaptor, this channel can be used also as an output. A 10 ms time window, when electrical current is not running through the circuit, is used to transfer additional information. This function can be used for instance to control the room thermostat by GSM.
This communication channel (input – output) is "floating" in relation to the other control unit circuits. Only equipment with SELV may be connected to these terminals.

Emergency thermostats (K3 connector and copper capillary running through an opening).
Both thermostats are serially connected and deactivation (disconnection) of either one of them leads to disconnection of all outputs, except outputs on terminal K13-2. Reactivation of the emergency thermostat may be done by qualified personnel only. Before reactivation, the service worker must assess the reason for this occurrence.

The LAMBDA probe (XV4B connector) is a specialized input designated for connection of the residual oxygen sensor in burnt gases in the E2008 system. The terminals of this connector have a supply voltage 12V/1.5A for the heating spiral of the probe and two terminals for controlled value input.

4.2.1.2 RJE2008 outputs description

All control unit outputs are active and if they are switched on, their terminals will show grid voltage, phase or total.

Three-prong relay outputs (terminals K14-1, K14-2, K15-1, K23-1, K23-2, K16 - 2) are designated for general use. The maximum load of each output is up to 6A and the current total limitation for RJE2008 is 10A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals will show grid voltage.

Three-prong relay outputs (terminals K13-1, K13-2) are designated for general use. The maximum load of each output is up to 6A and the current total limitation for RJE2008 is 10A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. This output is in RJE2008 used in the solid fuel application as a main switch of the circular pump. It is the only unit output, which is live even when the emergency thermostat is inactive.

Triac (motion sensor) relay passive outputs (terminals K19-1, K19-2) are designated for general use. The maximum load of each output is up to 6A and the current total limitation for RJE2008 is 10A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. The K19-2 output is "dependent" on the K19-1 output.
(Voltage can be present on the K19-2 terminal only if terminal K19-1 had been switched on before that).

Triac (motion sensor) relay active outputs (terminals K17-1, K18-2) are designated for general use. The maximum load of each output is up to 6A and the current total limitation for RJE2008 is 10A. If the unit is meeting activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. The angle of connection can be entered as a percentage value or this value can be part of the algorithms.

Four-prong relay (terminals K15-2, K16-1) connects two outputs, which can be used for independent switching. They have only two common terminals - PE and N. These outputs are mutually blocked. If both switches are simultaneously activated by operator mistake or by a program failure, both outputs will remain without voltage. The maximum load of each output is up to 6A and the current total limitation for RJE2008 is 10A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. The setup of the prongs enables for instance connection of a "SERVA" four-way valve in solid fuel boilers.

4.2.1.3 RJE2008 communication lines description

RS485 line to the terminal (XV2 connector). This line is connected as a standard two-wire conductor to 120 Ohm impedance. The inner resistance of the receiver is standard (12 kOhm) and enables theoretical connection for 32 line "participants". Signals A/B are "spaced" to an inactive level by resistors (820 Ohm). The line is loaded by an end resistor (120 Ohm).

RS485 line for general use (XV4A connector). This line is connected as a standard two-wire conductor to 120 Ohm impedance. The inner resistance of the receiver is standard (12 kOhm) and enables theoretical connection for 32 line "participants". Signals A/B are "spaced" to an inactive level by resistors (820 Ohm). The line is loaded by an end resistor (120 Ohm).

RS232 line (connector XV12A) contains RxD, TxD and RING channels. The fourth connector pin is GNS. The line is designated for general use; voltage levels are standard, +/- 10 to 12V. Transfer speed up to 115 kBit.

OPENTHERM (connector XV3B) is a standard physical layer linking elements supporting the HVAC (Heating Ventilation Air Condition) interface.

4.2.1.4 Description of programming interfaces

Programming of the control unit can be done either by the ISP interface (service connector XV10) or by JTAG interface (connector XV14). For programming and monitoring from a PC it is necessary to use the PROG3 programmer.

4.2.2 TE2008 terminal

The TE2008 terminal in the E2008 system is equipment programmable by a customer designated as a "man – machine" interface. It is designed for placement on the front of the equipment for communication with the boiler operator or the service technician.

4.2.2.1 Technical data

Supply	DC 24V
Input from source	max 1A, type 0.5A
Dimensions	182 × 142 × 25
Weight	0.9kg
Protection class pursuant to norm ČSN 33 2000-4-41 ed. 2:2007	II – voltage SELV
Shielding pursuant to ČSN 60529	IP31 – independent unit
	IP65 – after integration

- Basic characteristics setting pursuant to norm ČSN 33 2000-3:
- AA5   temperature +5 - +40 °C
- AB5   temperature +5 - +40 °C, humidity 15 – 100%
- BA5   people skills - knowledgeable
- BC3   contact with ground – frequent

(Described in detail in E2008 documentation)

- This equipment is designed in accordance to norms ČSN EN 60335-1 and ČSN EN 60335-2.
- Classification in accordance to ČSN-EN 55014-2, Category II.

4.2.2.2 Description
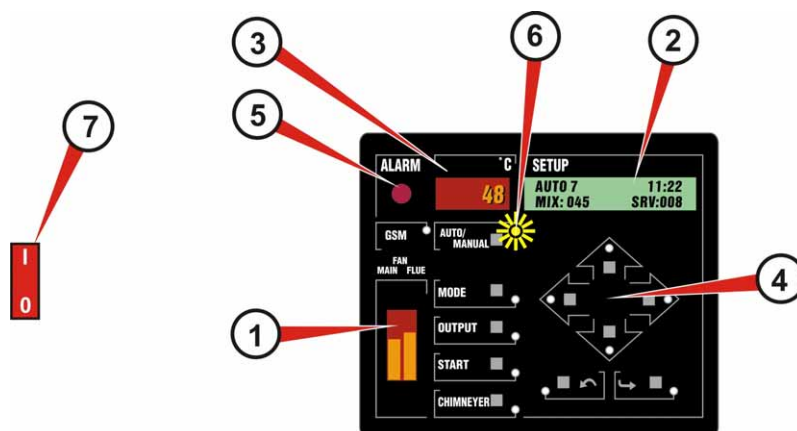
Picture 7   Description of terminal

Control panel contains:

    pos. (1)   column indicators 2x10 LED tapes
    pos. (2)   alphanumeric display 2x16 characters
    pos. (3)   three-digit seven-segment LED
    pos. (4)   foil keyboard with mechanical "click" and inserted indication diodes
    pos. (5)   accentuated red indicator
    pos. (6)   control indicators
    pos. (7)   The main switch is placed on the front panel of the boiler near the terminal.

The foil keyboard is especially designed for easy replacement of keys description by paper tabs insertion into the individual spaces – "pockets". This design enables a universal functional use and easy national versions of the keyboard description. The keyboard is comprised of eleven buttons with a mechanical click. Every button has a light indicator diode. The diodes are lit by using a particular button or by operation of the equipment, which is controlled by the button.

From the design viewpoint, this is an application controlled by a microprocessor and communicating with a superordinate system after the RS485 interface. The terminal supply is provided from the superordinate system RJE2008.

4.2.2.3   Description of the connectors

<u>XZ62 input</u> – ISP entry programming terminal
<u>XV61 terminal supply,</u> communication after RS485 with a superordinate system

4.2.3   Expander EEx2008

The expander is designated for the increase in the number of inputs and outputs in the RJE2008 control unit.

Picture 8   Expander EEx2008

It is designed as a DIN bar module where it occupies six positions. Its application is suggested in a remote distributor where sufficient shielding will be ensured. The expander has its own power supply.

4.2.3.1   Technical data

|	
Supply	230V/50Hz
Control unit supply	5 VA
Dimensions	105 × 90 × 59
Weight	0.35 kg
Protection class pursuant to ČSN 33 2000-4-41 ed. 2:2007	I
Protection from dangerous touching of live parts pursuant to ČSN 33 2000-4-41 ed. 2:2007	By covering and insulation
Protection from dangerous touching of non-live parts pursuant to ČSN 33 2000-4-41 ed. 2:2007 basic	By automatic disconnection from source
Shielding pursuant to ČSN 60 529	IP31

- Basic characteristics settings pursuant to norm ČSN 33 2000-3:

      AA5   temperature +5 - +40 °C
      AB5   temperature +5 - +40 °C, humidity 15 – 100%
      BA5   people skills - knowledgeable
      BC3   contact with ground – frequent

    (Described in detail in E2008 documentation.)

- The equipment is designed in accordance to norms ČSN EN 60335-1 and ČSN EN 60335-2.
- Classification is in accordance to ČSN-EN 55014-2, Category II.

4.2.3.2   Description of binary inputs of the expander

<u>Binary inputs</u> supporting X1, X2 expander are "three-prong – they have one 12 V terminal" and they are prepared for control by OC (open connector) sensor.

4.2.3.3   Description of EEx2008 expander outputs

<u>Triac (motion sensor) active output</u> (expander terminals X5) is designated for general use. The maximum load of each output is up to 6A and the current total limitation for EXE2008 is 16A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. The angle of connection can be entered as percentage value or this value can be part of the expander inside algorithms.

📖 ***Important note:*** This output must have outside protection!!!

<u>Triac (motion sensor) active output</u> (expander terminals X6) is designated for general use. The maximum load of each output is up to 12A and the current total limitation for EXE2008 is 16A. If the unit is meeting the activation conditions (program, manual control and active emergency thermostats), these terminals show grid voltage. The angle of connection can be changed from zero to 90º, after that the relay is on. This function enables start up of a motor with large input, this eliminates heat load for the semiconductor. This output can be run for lower outputs as a standard controlled output. It can be activated from the control unit or this value can be part of the expander inside algorithms.

📖 ***Important note:*** This output must have outside protection!!!

The relay output (X7 expander terminals) is designated for general use. The maximum load capability of each output is up to 6A and the total current limitation for EXE2008 is 16A.

📖 ***Important note:*** This output must have outside protection!!!

📖 ***Note:*** This output can be used as a support of the triac output (X5 or X6) to minimize heat loses on the triac.

Description of expander communication line

<u>RS485 line for general use</u> (connector X4 and X9). It is connected as a standard two conductor 120 Ohm impedance connector. The inner resistance of the receiver is standard (12 kOhm) and enables a theoretical connection for 32 line "participants". Signals A/B are spaced to an inactive level by resistors (820 Ohm). The line is loaded by an end resistor (120 Ohm).

4.2.3.4   Description of the EEx2008 expander use

The expander and its properties can be used for:
      - Control of pneumatic transfer including the turbine soft start
      - Control of pumps for multiple heating circuits
      - Control of spiral feeder motors

4.3   BURNER HEATING CHAMBER INCL. FEEDER F1 WITH   INDEPENDENT DRIVE

The heating chamber is depicted in picture Nr. 1 and is comprises of these parts:

4.3.1   The burner body
4.3.2   F2 feeder including the drive
4.3.3   Impulse revolution sensor
4.3.4   Adapters for installation of a flexible hose
4.3.5   Adapter for fan installation
4.3.6   Connecting hose from inflammable material
4.3.7   Main fan
4.3.8   Electrical resistance spirals for automatic ignition
4.3.9   Cleaning equipment for the burner – in KP62 agro burner for burning less efficient fuel
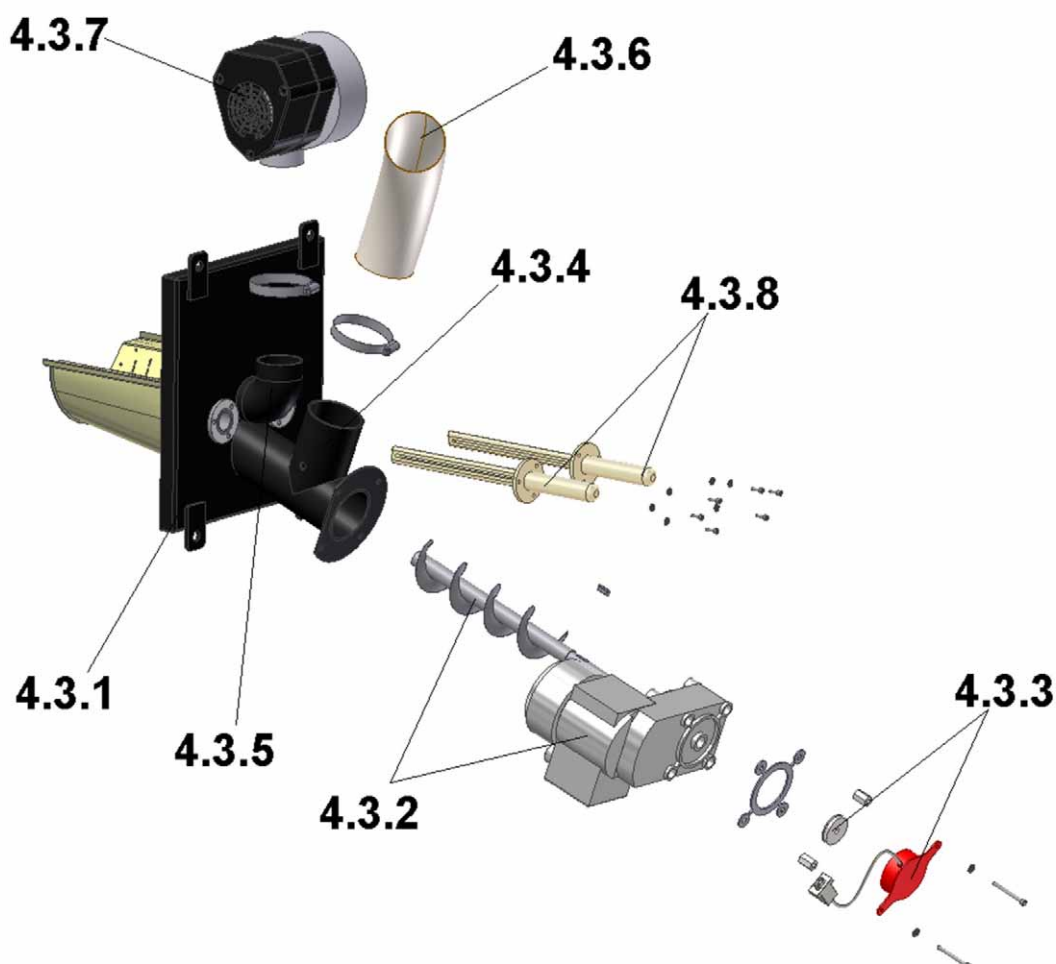
Picture 9   Burner 50-KP12, KP22
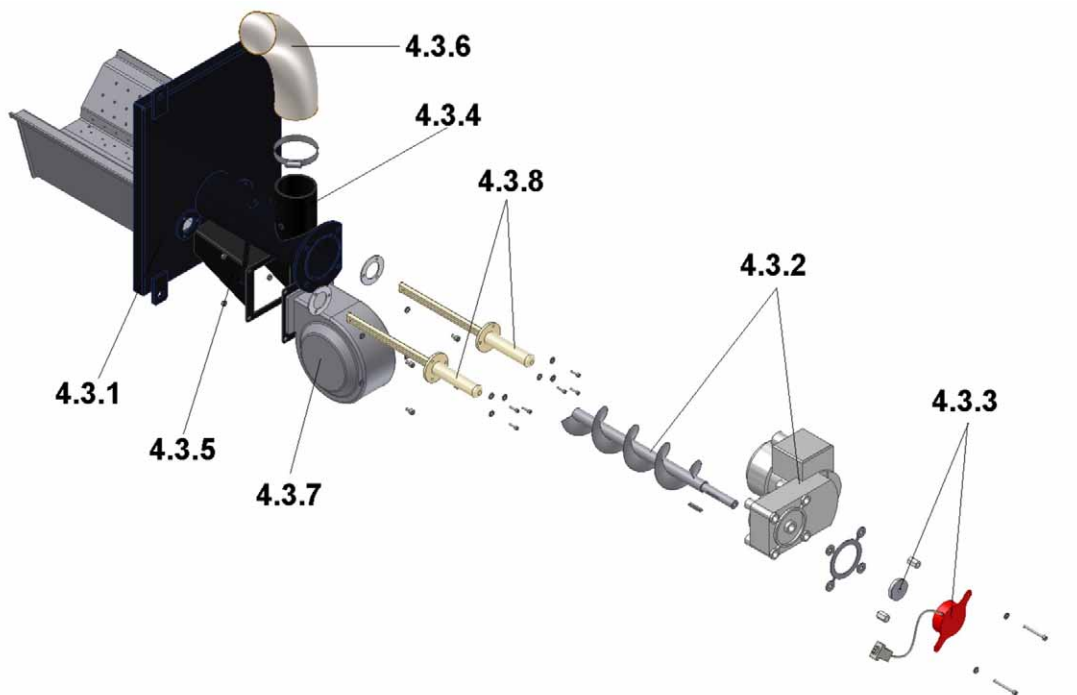
Picture 10   Burner KP62
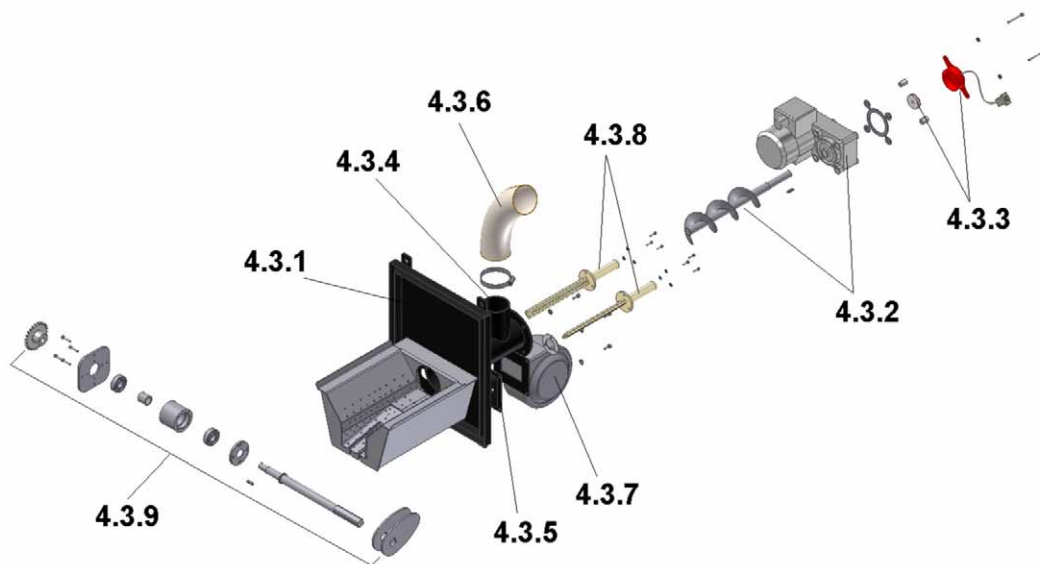
Picture 11   Burner KP62 with cleaning

The burner body – is a hollow weldment made from highly legated material with a bottom transversal fuel inlet. The fuel is delivered by a built-in **_F2 feeder_** driven by an electric motor with a gearbox.

A set of slit and round jets in the burning grill ensures inflow of air in order to facilitate controlled full burning of delivered fuel during its stay in the burner chamber. The burned out fuel is subsequently pushed over the edge of the chamber into the ash receiver.

The inner space of the burner body is connected to an **_air fan_**, whose revolutions can be regulated within a large range depending on the required boiler output or the type of fuel being used. (See MENU 11.9 Fans – chapter 9.4.9).

Impulse revolution sensor

The gearboxes of the F1 and F2 feeders are equipped with impulse sensors, which ensure safe operation of the boiler.

Connecting hose to the F1 feeder made of inflammable material connect feeder 1 and feeder 2. It is part of the transfer fuel lines. It must meet strict installation rules:

> It cannot have significant folds, which would block smooth fuel movement and must be built with an inclination of minimum 50º (in a relation to horizontal plane).
> Attachment to both adaptors must be tight.

Cleaning of KP62 burner provides removal of excessive ash or cinder volume from the burner when burning lower quality fuel. The drive of the cleaning mechanism is works together with ash cleaning.

📖 **_Note:_** Use of alternate fuels requires change of the burner type and also change of boiler program setup.
📖 **_Note:_** The cleaning mechanism burner drive and its installation are depicted in chapter 4.7 – Cleaning system.

4.4   CERAMIC PARTS

These parts are an inseparable component of the combustion chamber of the boiler and they have a major influence on the quality of burning.

4.4.1   Ceramic reflector – placed on the top of the burner
4.4.2   Ceramic secondary grate – placed in the boiler body above the burner heating chamber
4.4.3   Ceramic plate – placed above the door
4.4.4   Ceramic door jacketing– mounted on the door
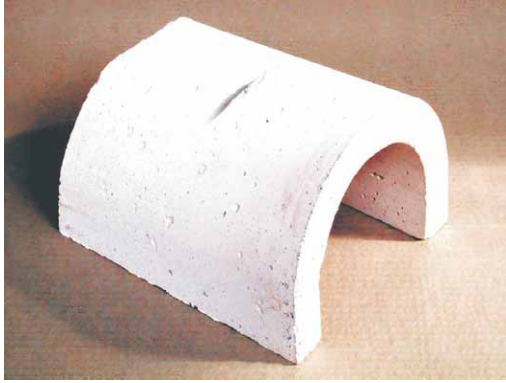
Picture 12   Cer. reflector KP 12, KP 22
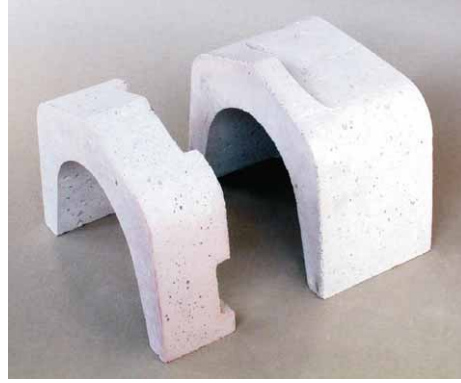
Picture 13   Two-part cer. reflector KP62
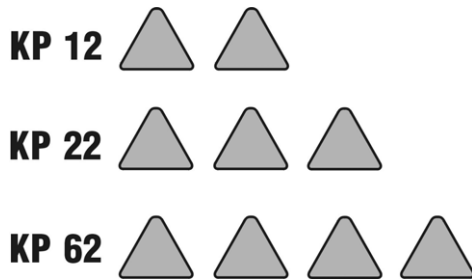
Picture 15   Ceramic secondary grate

Picture 14   Ceramic shield
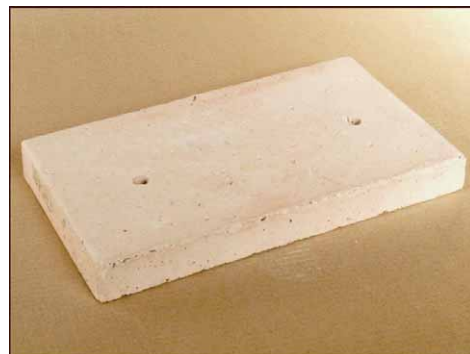
Picture 16   Ceramic door casing

4.5   F1 FEEDER WITH INDEPENDENT DRIVE (FROM FUEL STORAGE)

F1 feeder delivers fuel from fuel storage to the burning chamber. It comprises of a pipe delivery path with an overflow part and an end sleeve. The feeder is built into the fuel storage under an angle, which cannot exceed 45º. If the angle was any bigger, fuel could be dispensed inaccurately. The transporter has its own electric drive, which is controlled by the control unit. The feeder is supplied in various lengths accommodating specific types of storage tanks.

Feeder F1 and F2 gearboxes are equipped with impulse sensors, which ensure safe operation of the boiler.

Feeder F1 set comprises of:

4.5.1   Body of feeder with flange
4.5.2   Axle-less spiral (diameter 38 mm in KP12, KP22; diameter 56 mm in KP62
4.5.3   A small bar for mounting of the spiral
4.5.4   Motor and gearbox
4.5.5   Connecting hose to F2 feeder
4.5.6   Impulse revolution sensor
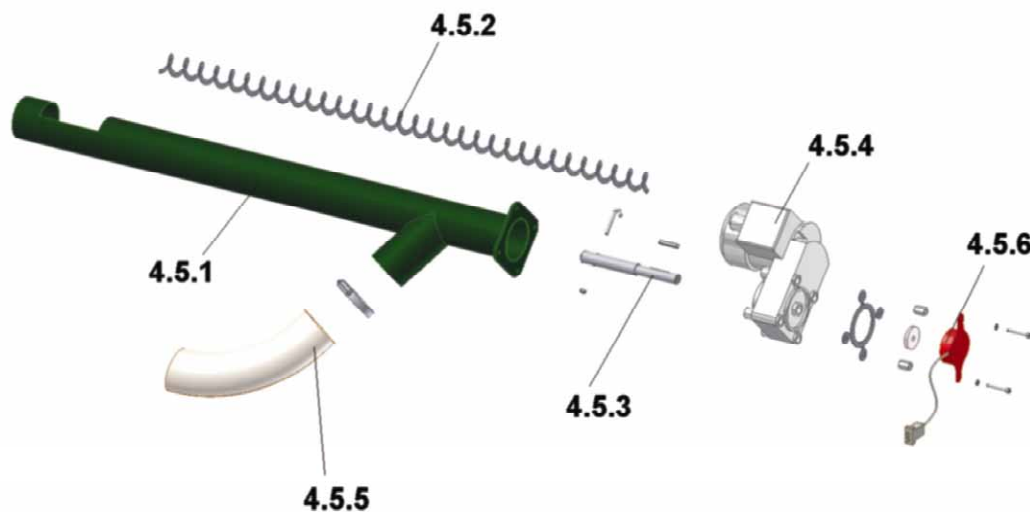
Picture 17   Feeder 1

4.6   BOILER SHEATHING INCLUDING HEAT INSULATION

The product sheathing is manufactured from steel sheet metal. It is painted with durable paint applied with the powder painting technology (KOMAXIT), which is highly resistant to outside conditions and ensures long-term perfect look of the product. Heat insulation 2 or 8 cm thick is done with heat insulation ROCKWOL boards.

The sheathing consists of the following parts:
4.6.1.   Left side plate – including coverings
4.6.2.   Right side plate – including coverings
4.6.3.   Upper cover
4.6.4.   Front lower cover
4.6.5.   Back lower cover
4.6.6.   Back cover – including covering
4.6.7.   Door cover
4.6.8.   Terminal KP62 cover
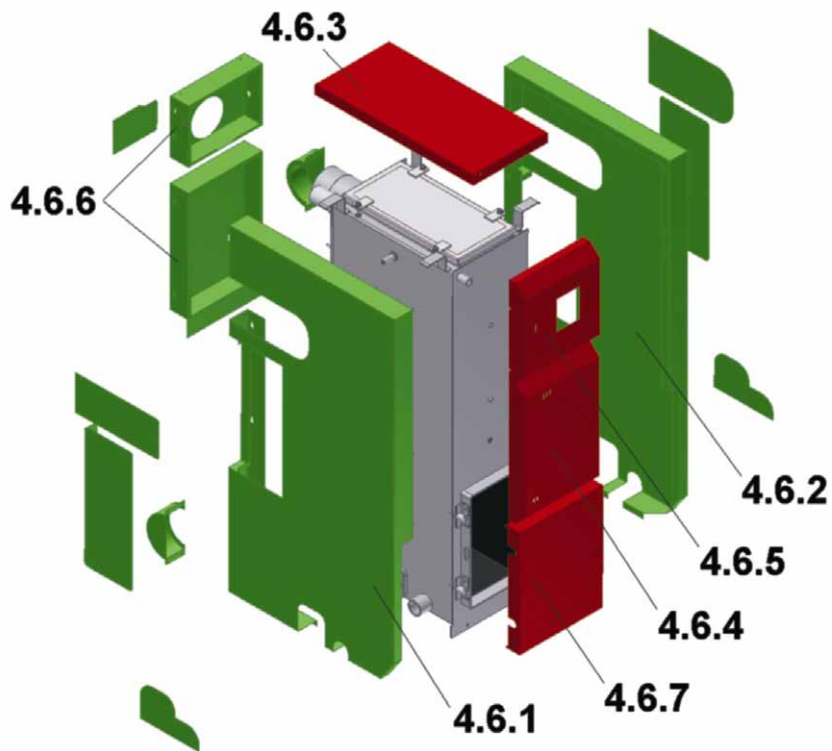
Picture 18   Jacketing KP12
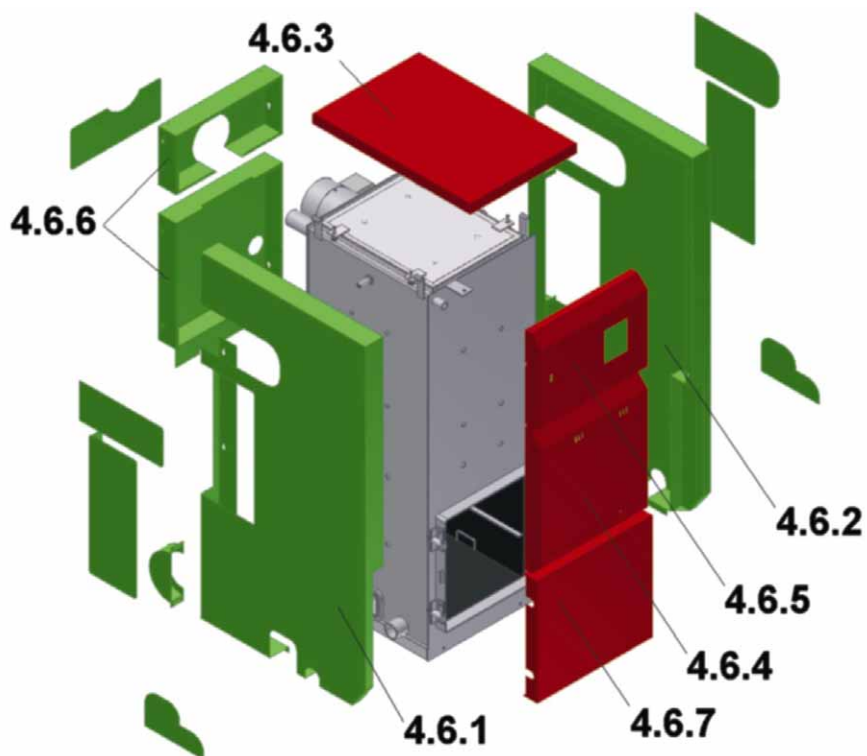
Picture 19   Jacketing KP22
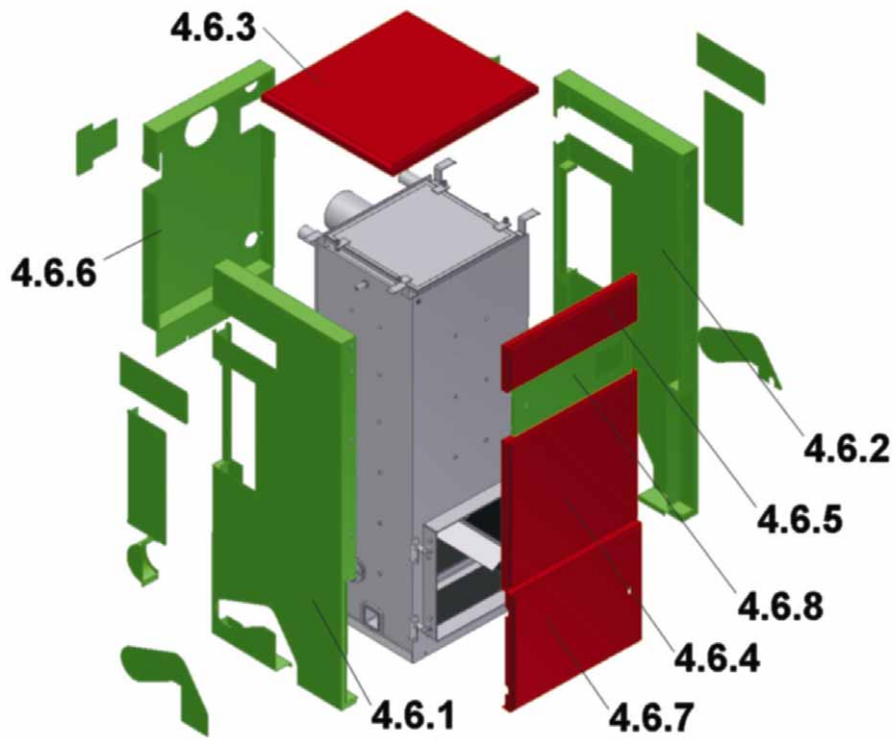
Picture 20   Jacketing KP62

4.7   CLEANING SYSTEM

The automatic cleaning system of the boiler significantly affects time of service-free operation of the boiler.

4.7.1   Ash removal

Ash removal is a complex set of technical and program means, which ensure ash removal from burner heating chamber to external ash receiver in a regular intervals. The ash is taken out by a spiral conveyor. It is driven by an electric motor through a toothed chain transmission.

The ash removal system can be mounted on the left or on the right side. Assembly of the particular version is done in the manufacturing facility based on an order. A professional service firm can perform a change (left/right) at the boiler location.

The motor is connected to the control unit with terminals K14-2, N, PE.
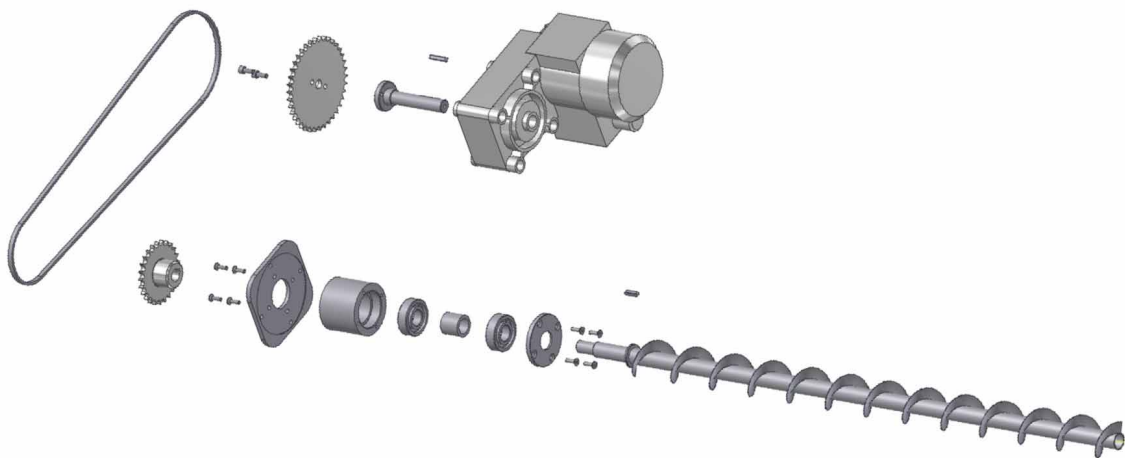
Picture 21   Ash removal system

4.7.2   Heat exchanger cleaning

Heat exchanger cleaning is a complex set of technical and program means, which ensure removal of solid waste from warm water boiler exchanger pipes in regular intervals. The cleaning is performed by linear movement of turbulators in the exchanger pipes. It is driven by an electric motor through a lever gearbox.

The heat exchanger cleaning system can be mounted on the left or on the right side. Assembly of the particular version is done in the manufacturing facility based on an order. A professional service firm can perform a change (left/right) at the boiler location.
The drive motor is connected with the control unit to terminals K14-1, N, PE.
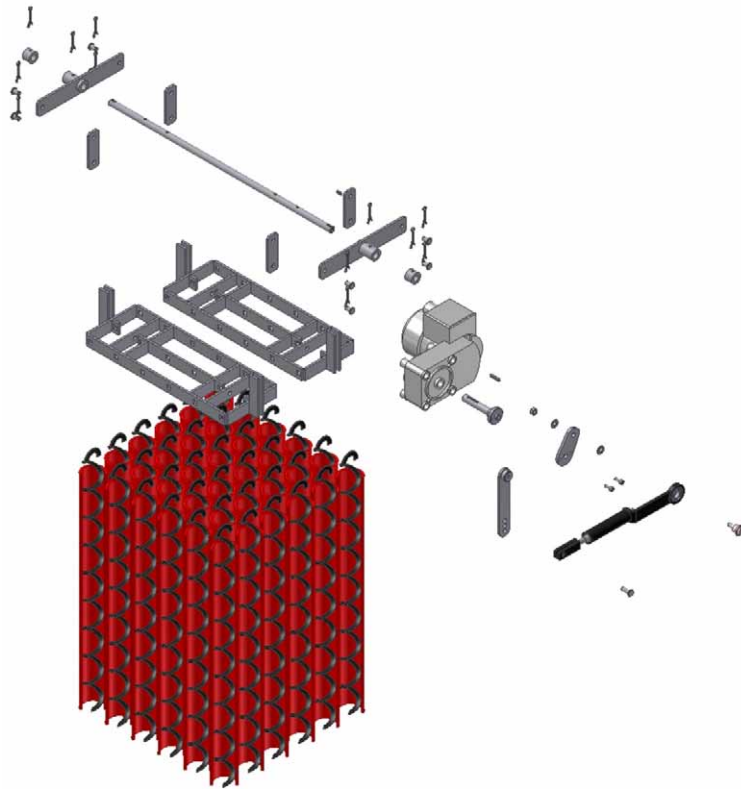
Picture 22   Exchanger cleaning system

4.7.3   External ash container

The external receiver provides space for long-term ash collection outside the burning chamber. It enables long-term service-free operation even when using fuel with high ash content. It is attached to the boiler with a detent lever. During boiler operation the lever must be in the lower position and the connecting piping between the boiler and the ash receiver must be tight. Also the receiver cover must be tightly closed. Both of these requirements prevent burning fumes release to the boiler room.

The receiver is removed by moving the detent lever to the upper position and pulling it away from the boiler.

Dispensing of the contents to the waste disposal container is best done by two people because of its weight.
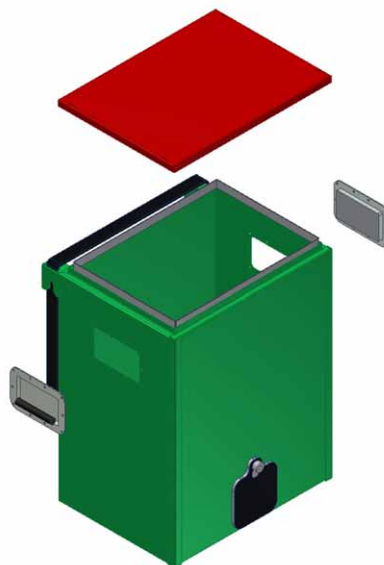
Picture 23   External ash container

4.8 FLUE FAN

The flue fan can significantly contribute to a problem-free and reliable boiler operation in case the natural chimney flue is low. When using the flue fan the chimney must be tight and without outlets above the flue fan connection. Fan revolutions and consequently the required flue can be set in menu 11.1 – Programs. If the flue behind the boiler is too high, it is unfavorable for optimal burning and the manufacturer recommends maximum flue regulation by the particular flue reducer. Keep connections recommended by the manufacturer.

The flue fan is connected to terminals K17-2 and the ground wire to K17-1.
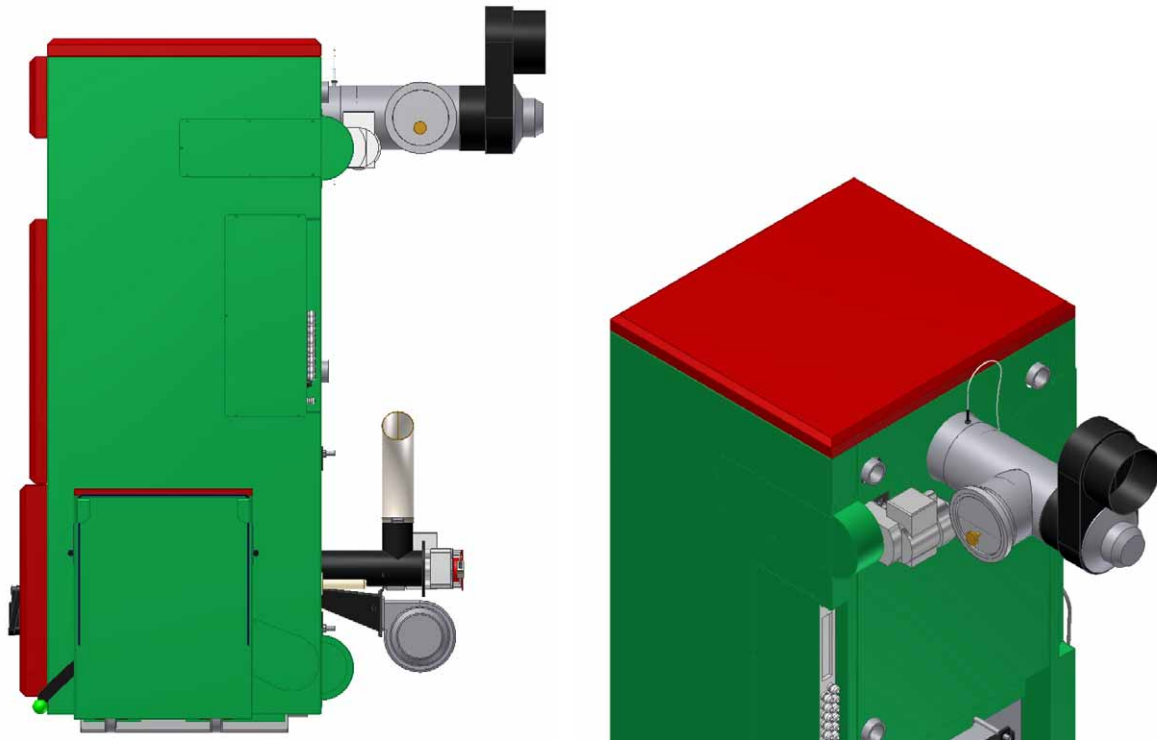
Picture 24   Flue fan assembly

4.9 STANDARD ACCESSORIES

- Feeder Nr. 1 (the feeder length corresponds to the fuel bin and the particular installation used)
- Outside temperature sensor for equithermal regulation
- Surface temperature sensor – measuring of temperature behind the mixing valve
- Surface temperature sensor – measuring of temperature of returning water
- Cleaning tools (scraper for manual cleaning of the boiler body)
- Outlet/inlet valve ½ "
- KP boiler operation and service manual
- Quality and completeness certificate of the product – Warranty Certificate

4.10   OPTIONAL ACCESSORIES

- Fuel storage (elective size)
- Electric heating unit – for tempering of the building in an alternate program. Heating units are protected from frost damage to the boiler and the heating system. The heating unit - TJ M 48/2 output 2.4; 3; 4; 4.5 a 6 kW.
- Circulatory pump
- Three-way (four-way) valve with a servomotor
- Flue fan (for KP12, KP22 and KP62 boilers)
- Digital room thermostat
- Tank for heating warm water (80 – 350 l)
- Accumulation vessels (for instance 500 l, 750 l, 1 000 l)
- Seasonal large volume fuel storage tanks
- Spiral fuel feeder from seasonal tank – ensures automatic fuel refilling in the daily tank.
- Automatic fuel feeding from the seasonal tank – ensures automatic operations of the spiral feeder from seasonal tank.
- Pneumatic fuel feeder from seasonal tank – for fuel refilling in the daily tank from a longer distance.
- Automatic control of another three loops (circulatory pump)
- GSM modem – for remote control and monitoring of boiler operation.
- Module for boiler connection to Ethernet communication network (Internet)
- Outside temperature sensor for equithermal regulation
- Surface temperature sensor – in the fuel intake area.
- Surface temperature sensor – temperature measuring behind the mixing valve.
- Surface temperature sensor – temperature measuring of returning water.
- Connector outlet 2 pin
- Connector outlet 4 pin
- Compact hydraulic modules REGPON SYS
- Compact hydraulic modules REGPON SWH
- Compact hydraulic modules REGPON F

📖 *Note:* Optional accessories are not included in the boiler price.

4.11   FUEL BIN

The tank is supplied as optional accessory in sizes 100, 400, 700 and 1 400 l.
The 400 l tank has a special modification for pneumatic transfer.
Atypical tank finish can be delivered based on special order after consultation with the manufacturer.
The tank can be refilled up to full volume without limitations. Fuel refilling of tanks supplied by the boiler manufacturer is safe, because the tank construction ensures safe distance of the operator from moving parts.
During automatic boiler operation the filling tank cover must be closed.

4.9.1	Bin 100 l
4.9.2	Bin 400 l for pneumatic transfer
4.9.3	Bin 400 l
4.9.4	Bin 700 l
4.9.5	Bin 1 400 l
4.9.6	Bin based on customer request – made to order
4.9.7	Bin 400 l - folding
4.9.8	Bin 700 l - folding
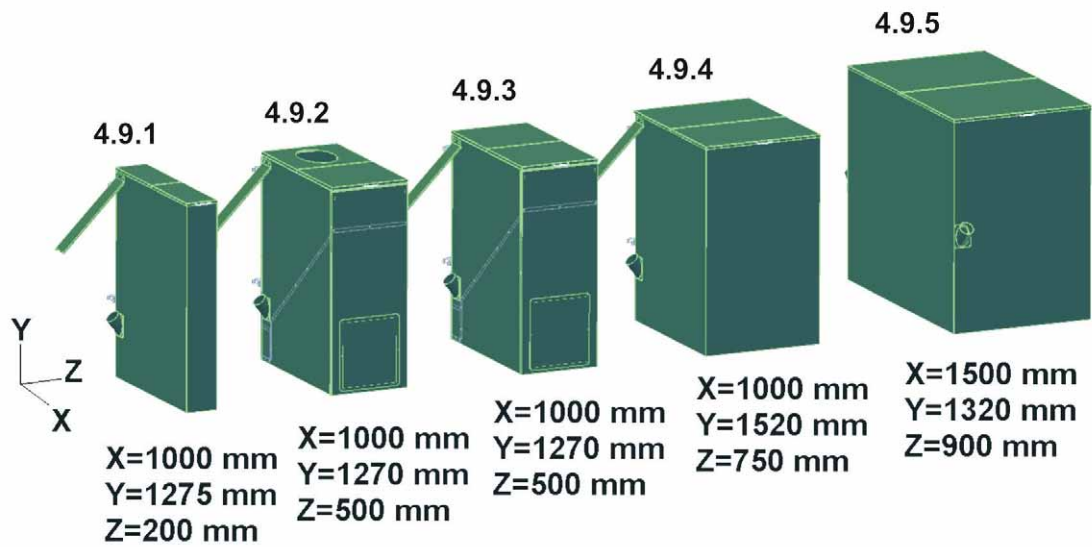
Picture 25   Standard fuel bin sizes
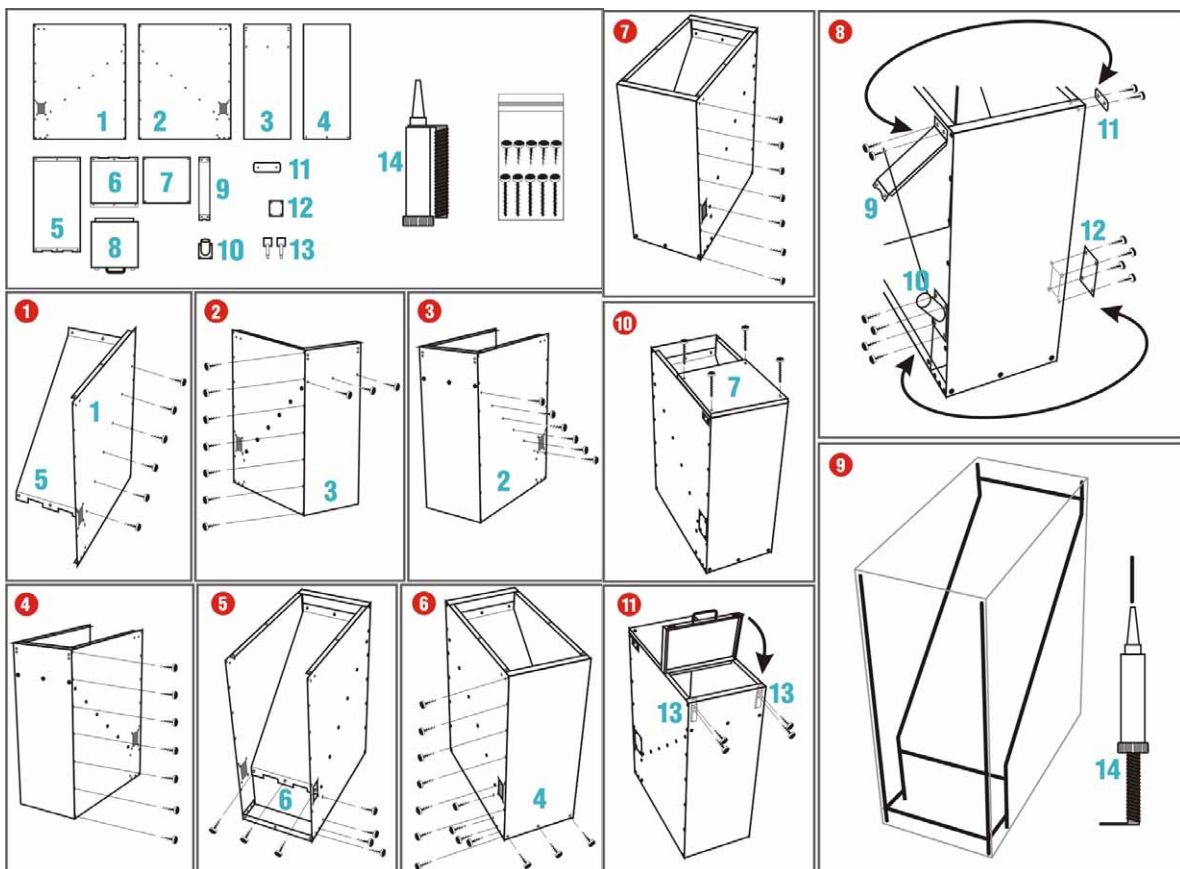
Picture 26   Collapsible bin assembly guide

5 PLACEMENT OF THE PRODUCT IN BOILER ROOMS, PRINCIPLES OF INSTALLATION

5.1 PLACEMENT OF PRODUCTS IN BOILER ROOMS

Minimum distances determine the space necessary to perform the operation and maintenance of the equipment. Boiler must be placed on horizontal non-flammable material, which ovelap min. 10 cm over the platform of installed quipment. Floor in front of the cleaning door has to be out of non-flammable material and min. 60 cm.

The necessary height over the boiler to the ceiling of the boiler room is approximately 450 mm (600mm with KP62) for cleaning of the boiler.

5.2 SAFE DISTANCE FROM COMBUSTIBLE MATERIAL

COMBUSTIBILITY GRADE OF MATERIALS:

Grade A – non- combustible: stone, concrete, bricks, plasters, etc.
Grade B – hardly combustible: inorganic insulation – Rotoflex, glass wool, basalt insulation, wood wool slabs, etc.
Grade C1 – low combustible : formica, versalit, fibreboard, hardwood (beech, oak).
Grade C2 – moderately combustible: soft wood (spruce), chipboard, rubber, floor covering.
Grade C3 – easily combustible : asphalt, tar paper, PVC, paper --- etc

Minimum safe distance from bulk flammable materials of the type B, C_1 and C_2 is 200 mm <u>in course of installation of the boiler </u>(as well as during its operation).

This distance is double - i.e. 400 mm for easily combustible materials C_3.

As regards relation to the electrical network – it is necessary to ensure that the wall socket where the boiler is connected is always accessible.

5.3 LEGISLATION IN FORCE

The product may only be installed by an organization trained by the manufacturer with authorization.

Electric parts may only be connected by an authorized person (CZ - the regulation number 50/1978) on professional competence in electrical engineering and trained by a manufacturer.

Installation company or person installing the boiler has to adhere the following standards and regulations, apart from other things or yours national equivalents:

5.3.1 Heating system and boiler

ČSN 06 0310 / 1983 – central heating, designing, installation.
ČSN – EN 303.5./2000 – boilers for central heating, part 5.
ČSN 06 0830 / 1996 – security systems for central heating and heating of hot service water.
ČSN EN ISO 12100-2/2004 - structure and versions of boilers.

5.3.2 Venting

ČSN-EN 1443 – Chimneys – general requirements 734200 (9/2004).
ČSN 73 42 01 – Chimneys and fume ducts, designing, implementation and connection of fuel consumers (02/2008)
Pressure and temperature conditions necessary for safe operation of heat installations are described in the following standards:ČSN 73 4201 and EN 13 384-1 and EN 13 384-2.
Recommended draught of chimney has to be within the range specified by the manufacturer (see picture 27) in connection with the installed power output of the boiler.
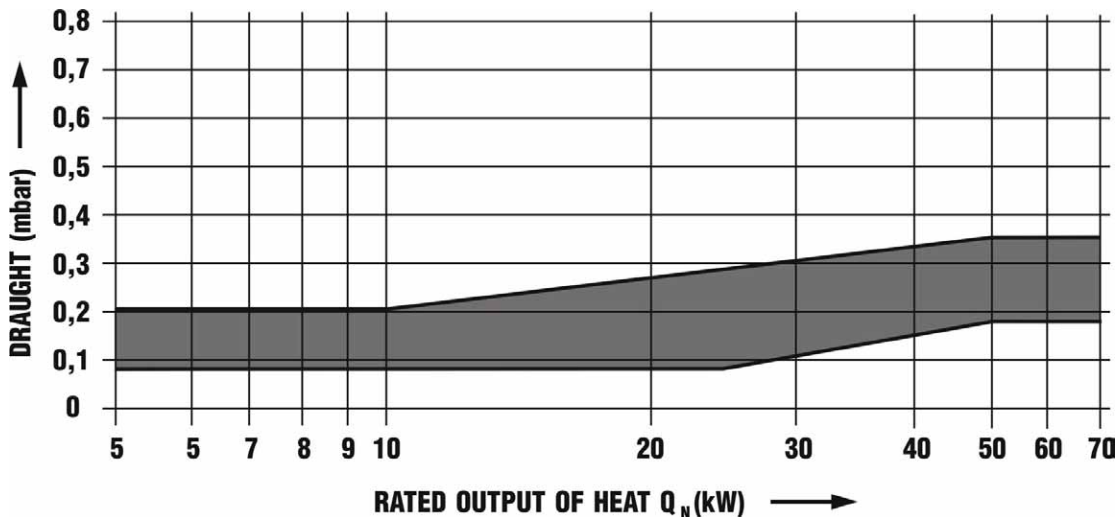
Picture 27   Required chimney draft

Chimney systems resistant to humidity in which condensation of water vapour is permitted are recommended in order to ensure long-term trouble-free and safe operation of the boiler. (Chimneys resistant to humidity are recommended for appliances with temperature of combustion products from 30°C to 100°C.)

5.3.3   Fire regulations

ČSN 73 0823 / 1984 – fire and technical properties and combustibility grades
ČSN 06 1008 / 1997 – fire safety of heat installations, structure of boilers from fire safety aspect

5.3.4   Electrical

Government Regulation no.17/2003 Coll.

ČSN – EN 60 335-1 ed.2.20073– Electrical appliances for domestic and other similar use – Safety - General requirements.

ČSN – EN 60 335-2-102:2007- Safety – Part 2-102: Special requirements for appliences burning gas, petroleum and solid fuels containing electrical connections.

5.3.5   Protection against noise

Government Regulation no. 148/2006 Coll. – product is fullfilling all requirements.

5.4   STORAGE OF FUEL

Wood pellets have to be in a dry place protected against atmospheric effects because humidity damages the and aggravates their burning parameters. Excessive humidity completely destroys pellets. They should be stored in a different room than the boiler or at least 1,500 mm from the boiler.

Operating stock of fuel may be stored in a special central bin which has to be manufactured from non-combustible material. Bins supplied by the manufacturer meet operating and safety requirements. They may be filled without any limits up to their total volume.

Large-volume bins have to meet corresponding fire and safety regulations. The supplier is obliged to work out working regulations and instructions for operation and maintenance of large-volume bins.

5.5   BOILER ROOM VENTILATION

Permanent ventilation of the boiler within approximately 75 m_3 x $hour_{-1}$ of fresh air has to be ensured, if a boiler of approximately 20 kW of power output is operated.

6 PUTTING THE PRODUCTS INTO OPERATION

6.1 CONNECTION TO THE SYSTEM

Connection to the system is performed in a usual manner - see the below given installation dimensions of products. Recommended connection of the boiler to the heating system – see pict. no. 40 - 52.

📖 *Important:* With boilers KP 62, KP 62E – it is important to have both water output connect!

KP 12/12E
1 - Output of heating water G 1 1/2"
2 - Heating tube Ø130 mm
3 - Input of return water G 1 1/2"
4 - Eletric heater M 48/2
5 - Outlet valve G 1/2"

KP 22/22E
1 - Output of heating water G 1 1/2"
2 - Heating tube Ø150 mm
3 - Input of return water G 1 1/2"
4 - Eletric heater M 48/2
5 - Outlet valve G 1/2"

KP 62/62E
1 - Output of heating water G 1 1/2"
2 - Heating tube Ø160 mm
3 - Input of return water G 1 1/2"
4 - Eletric heater M 48/2
5 - Outlet valve G 1/2"

Picture 28   Installation dimensions of boiler

Filling the system with water takes also place in a standard way and the following principles have to be adhered to at the same time:
- water for the heating system has to be clean, free from any admixtures. Its hardness has to meet the Czech standard ČSN 07 7401 / 1992 – if the hardness does not meet this standard, it has to be treated with a corresponding softener.

- if extremely hard water is used, there is a risk of "scale" formation - which is to the detriment of heat exchange and causes tension in the boiler body and this tension may cause damage to the homogeneity of the body.

Attention!
Impurities and sediments which might jeopardize failure-free operation of pumps have to be thoroughly rinsed before the system is finally filled with water.

6.2   INSTALLATION OF THE BURNER

The burner of the boiler is configured into one unit – the body of the burner + screw feeder + gear unit + motor + 2 spirals for electric ignition including needful cable se picture no. 9,10,11.

Burner has to be placed in a flange on the back side of the boiler and fasten it by nuts M 10 with washers so, that Hořák nasadíme na přírubu na zadní straně kotle a připevníme maticemi M 10 s podložkami tak, aby těsnicí the non-flammable roupe is fitting evenly and very closely around circumference of the flange.

Connect the cable of the feeder F2 on clip K19-1, kabel of the fan on clip K18-1, K18-2 (picture 51). Place the fan in flange.

On the flange determined to a pellet supply connect by flexible hose and attach with fastener.

Insert a boiler thermostat sensor in to a tube placed on flange for pellet supply.

With burner KP62 attach a security thermostat by two straps on a pipe of the fuel input in to a burner.
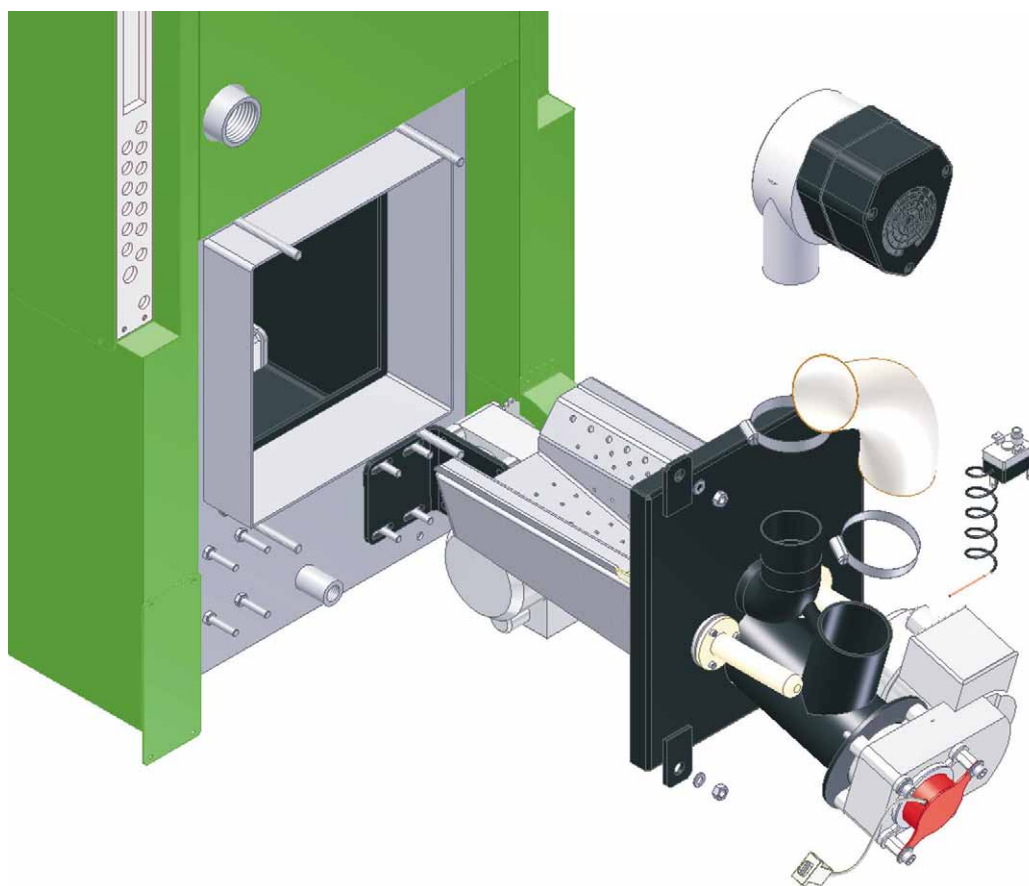
Picture 29   Burner installation in boiler

6.3 INSTALLATION OF THE CERAMIC CATALYTIC REFLECTOR

The ceramic catalytic reflector is manufactured from highly heat-resistant material (1800°C). It has two functions:

- directs the flow of combustion products through the boiler body

- assists very efficiently to burn out carbon substances and thus to reduce considerably harmful substances in combustion products.

The reflector is placed outside the combustion space during transport in order to prevent from any damage. The shape of the reflector reminds a hollow semi cylinder with one face closed - see picture no. 30.
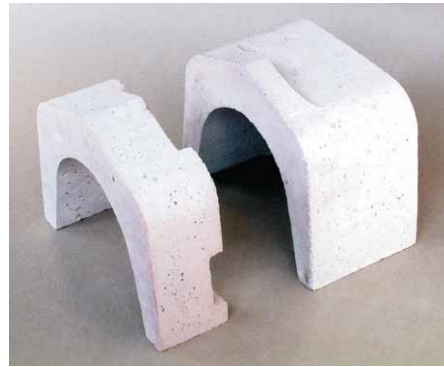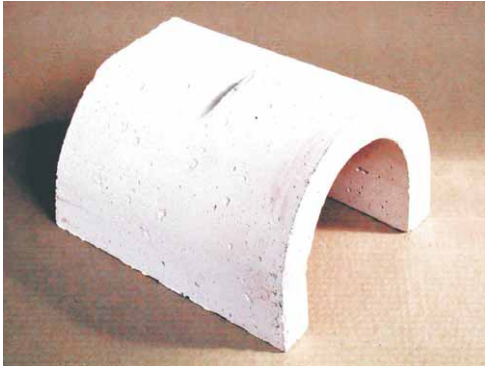
Picture 30   Ceramic reflector
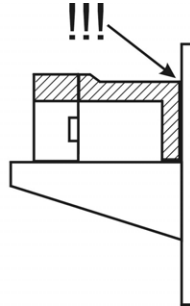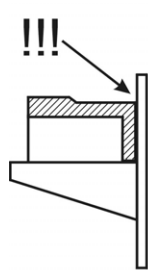
The reflector is installed into the boiler on the surface of the burner boiler with the stop on its rear side and symmetrically to its centre line.

While in operation ceramic reflector has to touch the back part of isolation desk of the burner.

If you do not keep it, there is a chance of burner damage or a Boiler!! Check regulary!!

6.4 INSTALLATION OF SECONDARY CERAMIC GRATE

Individual parts of secondary ceramic grate on the picture no. 31

KP 12

KP 22

KP 62
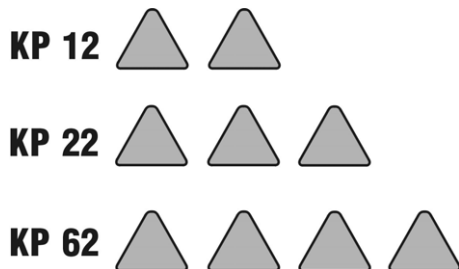
Picture 31   Parts of secondary ceramic grate

Function as such of these parts is as follows:
- increase turbulence of combustion products before entry to the exchanger
- use additionally the so far unburnt residues of the gaseous combustible on the ceramic burning surface
- direct the flow of combustion products through the exchanger.

Installation of grate in to working surfase is done trought cleaning door of the boiler. Individual parts has to lift in the angle and place in back part of the burning chamber upwards. After is pushed all the way up to ceiling of a burning chamber the front side of the ceramic has to lift up in to a horizontal level and than place the ceramic part downwards in to s grooves. Grooves of the ceramic grate are in front and back side of a burning chamber.

Steps:
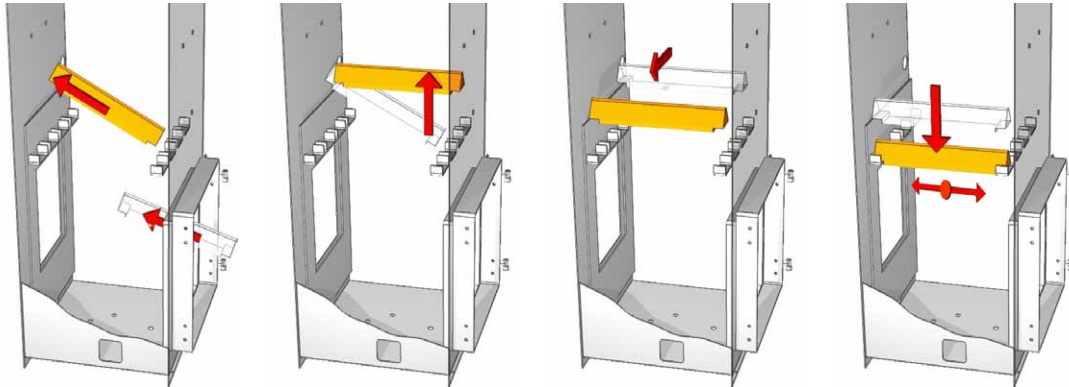
Picture 32   Ceramic grate parts placement guide

6.5   INSTALLATION OF CERAMIC SHIELD

Picture 33   Ceramic shield

Insert the ceramic shield flatways across the boiler space and fit the part on holders over the door from inside. (See picture no. 34).

Steps:
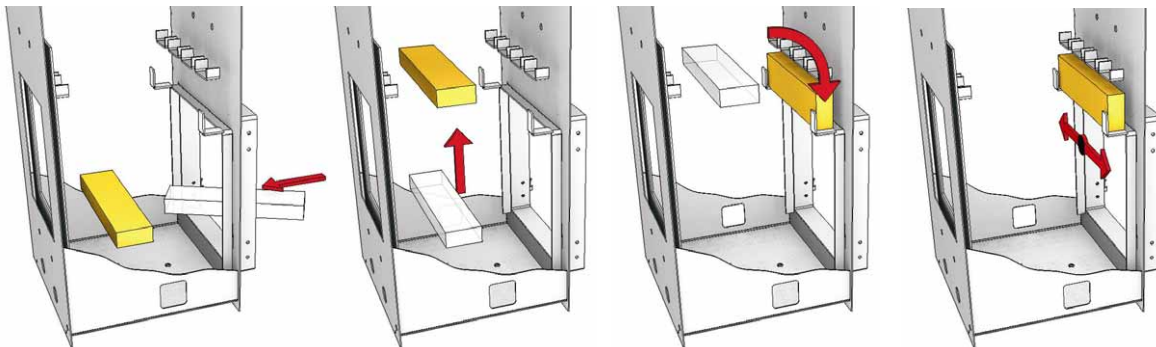
Picture 34   Ceramic top placement guide

6.6   CONNECTION OF ELECTRICAL PARTS

The electric parts connections can be performed by qualified personnel only. Connect the particular appliances 6.6.1 – 6.6.14 to corresponding terminals according to drawing in picture 51. During connecting the equipment must be shut down with the main switch or disconnected from power supply by pulling the electric cord from the outlet.

Connect:		Connection terminal
6.6.1	Feeder motor F2	K19-1, N, PE
6.6.2	Impulse sensor F2	XV11A
6.6.3	Electronic ignition spiral cables	K23-1,K23-2, N, PE
6.6.4	Fan	K18-2,K18-1, PE
6.6.5	Flue fan (if used)	K17-2,K17-1, PE
6.6.6	Feeder motor F1	K19-2, N, PE
6.6.7	Impulse sensor F1	XV11B
6.6.8	Flue thermometer	XV6B
6.6.9	System pump K13-2, N, PE	
6.6.10	Boiler pump	K16-2, N, PE
6.6.11	Servomotor 3 (4) – way valve	K15-2, K16-1, N, PE
6.6.12	Room thermostat cable	XV13B
6.6.13	Boiler thermostat cable	XV7B
6.6.14	Surface temperature sensor	XV5B
6.6.15	Surface temperature sensor of returning water	XV3A
6.6.16	Outside temperature sensor	XV5A
6.6.17	(Module ETHERNET)	XV10
6.6.18	(GSM Modem)	XV12A
6.6.19	(Module Expander)	XV4A

📖 ***Important note:*** Fan 6.6.4 and flue fan 6.6.5 are controlled proportionally. The fan neutral conductor must be connected to blue terminal K17-1 or K17-2!!! It may not be connected to the common neutral conductor – blue terminal N.

With the help of MENU 1 – *direct control* - to be checked by qualified personnel:

6.6.20   F1 feeder motor function and correct rotation direction
6.6.21   F2 feeder motor function and correct rotation direction
6.6.22   Correct functioning of F1 feeder impulse sensor and simultaneously
6.6.23   Correct functioning of F2 feeder impulse sensor
6.6.24   Functioning of fan and linearity of its regulation
6.6.25   Functioning of flue fan and linearity of his regulation (if used)
6.6.26   Functioning of system pump and its deaeration
6.6.27   Functioning of boiler pump and its deaeration
6.6.28   Functioning of motor and correct rotation direction of ash removal spiral screw
6.6.29   Functioning of exchange cleaning motor
6.6.30   Functioning and correct rotation direction of servomotor
6.6.31   Functioning and timing of servomotor between limit positions and agreement of timing with SW setting
6.6.32   Correct functioning of electric ignition spirals
6.6.33   Correct functioning of attached thermometers, check with the button ⬚ ∩ **ESC** on the LCD display
6.6.34   Correct functioning of GSM communication menu (menu 8, chapter 9.3.8)
6.6.35   Setting of a proper equithermal curve (menu 9, chapter9.3.9)
6.6.36   Setting or changing servomotor timing (menu 11.15, chapter 9.4.15)

6.7   CHECKING TASKS BEFORE BOILER FIRST OPERATION

The authorized service technician preparing the boiler for its initial operation must perform the following tasks before start-up. He will record results of all checking tasks – will fill a Certificate of Introduction to Service – see appendix.

6.7.1   Checking water volume in the heating system and corresponding water pressure.
6.7.2   Check whether fittings between the boiler and the heating system are open.
6.7.3   Check the heating system for leaks at all new connections – pressure test done by a professional firm.

6.7.4   Check the chimney connection (must be tight and safe to prevent escape of flue gases). Chimney and boiler connection must have valid inspection.

6.7.5   Check functionality of circulatory pump and its deaeration.

6.7.6   The electrical grid outlet must be always accessible. New electrical outlet must have a valid inspection..

6.7.7   Check the heating chamber and ash receptacles. Clean from possible dirt.

6.7.8   Check tank filling by specified fuel.

6.7.9   Check operating parameters for the specific boiler type.

7   BOILER SERVICE AND MAINTANANCE DURING OPERATION

Service and maintenance intervals are directly dependent on the type and quality of used fuel.
If recommended fuel – wood pellets with clearly guaranteed quality parameters is used, service and maintenance of the product during operation is very simple.

7.1   SERVICE

Pellet boiler service comprises of only two tasks. The necessary presumption is use of guaranteed fuel endorsed by the manufacturer. As a standard, use wood pellets with the 6mm or 8mm diameter.

7.1.1   Refueling

The fuel level must be maintained in such height that there is always a minimum of 10cm pellets above the F1 feeder inlet. Insufficient pellet volume may result in irregular dispensing or boiler fire extinction.

You will be told the presumed refueling interval by the service technician according to your specific configuration.

 Note: The refueling interval cannot be prescribed ambiguously.

It depends on: Fuel bin size
                                  The average boiler output in the particular time interval
                                  Quality of used fuel

Anticipated interval – see anticipated burning times in table 1.

 Note: A seasonal tank may be installed to the boiler. Refueling is controlled automatically or manually.

7.1.2   Emptying the external ash containers

It is generally true that ash must be removed any time the ash level exceeds 2cm level below the side edges of the external ash container.

Before you remove the external ash container, switch the boiler to the MANUAL mode by pushing the **AUTO/MANUAL** button. This way you will avoid spontaneous commencement of ash removal and escape of burnt gases during time when there is no external ash container in place.

Anticipated intervals: 1 x in 6 month   (KP12 – KP22) when using wood pellets
                                   1 x in 2 month   (KP62) when using wood pellets

It is also possible to remove ash from the burning chamber by turning on the ash removing drive in the Menu.

<mark>**1. Direct control**</mark>
<mark>**10. Ash removal ON**</mark>

 Note: The ash container removal interval depends on the following:
                   Equipment output (volume of used fuel per given time period)
                   Quality of fuel. **When using alternative fuel, this interval shortens significantly.**
                   Correct boiler adjustment.
                   Type of boiler installed.

 Important note: After checking the ash volume in the container or after ash removal, always close the receptacle cover carefully. This way you will prevent escape of burnt gases to the boiler room.

📖 *Important note: T*he external ash container must be tightly attached in the right place to the boiler during operation.

📖 *Important note:* After each visual check of burning or after ash removal you must always make sure that the boiler door is tightly closed to avoid being stricken by flames from the burning chamber!!! Ajar or slightly opened door will cause increased fire hazard and also negatively affect the fuel burning processes.

7.1.3   Flue gases exchanger cleaning

Cleaning of the gas flue is done automatically in intervals set by the control unit program. Proper setting is done in the manufacturing facility or later by an authorized service technician. Exchanger cleaning is performed repeatedly several times per day depending on burning intensity. Exchanger cleaning can be limited by time. It is not feasible to use exchanger cleaning for instance during night time.

📖 *Note:* In case the boiler shows signs of faulty burning, smokes when the door is open or the burnt gases temperature is rising, check the efficiency of exchanger cleaning. Change the cleaning interval.

7.2   MAINTENANCE

7.2.1   Burnt gases exchanger cleaning

Is done automatically, electric motor drives lever cleaning mechanism.

Operation interval: set by the program, differs by fuel types.

It is also possible to remove ash from the burning chamber by turning on the ash removing drive in the Menu.

1 Direct control
9 Ash removal ON

The service technician checks correct function of the equipment, checks turbulators for damage, correct function of the drive and lever mechanism and must lubricate cleaning drives if needed.

| Anticipated intervals: | 1 x per year | when using wood pellets |
| | 1 x per month | when using alternative pellets |

7.2.2   Burner grate cleaning

During checking it is necessary to pay attention to burning grate cleaning in order to avoid plugging of the burner air jets.
Always perform cleaning, when a continuous layer of ash exceeds 4cm.
Clean the burner grate with jets simply by moving a scraper along the burner grate area.

| Anticipated intervals: | 1 x in 3 – 10 day | wood pellets |
| | 1 x daily | alternative pellets |

7.2.3   Ceramic grate cleaning

The ceramic grate construction has a self-cleaning feature. Dust particles do not stick to the grate after burning pellets. Nevertheless check cleanliness of these parts. If needed, you can get rid of the dust particles by slightly shaking the individual parts of the ceramic grate. After this procedure check correct placement of ceramic parts.

| Anticipated intervals: | 1 x in 4 month | wood pellets |
| | 1 x month | alternative pellets |

📖 *Note:* Perform this check when the burned gases temperature repeatedly or permanently exceeds 200ºC.
📖 *Important note:* Ceramic parts could be extremely hot. Use a proper tool or protective gloves.

7.2.4   Annual audit

Every boiler of the KP series should undergo annual audit after the end of the main heating season. This audit is necessary in order to prevent from possible non-standard conditions in the next year of operation of the equipment. If the annual audit is not performed as per the below mentioned programme, this may be considered by the manufacturer to be the reason for rejection of guarantee conditions in the second year of use. At the same time, the user gets exposed to a risk of any failure which may cause loss of operating certainty or large physical damage.

Annual audit - due to demanding activities - has to be entrusted to a trained servicing company which will make record of the audit in the documentation of the boiler.

We proceed as follows during the annual audit:

Turn off the main switch of the control unit

disconnect the boiler from network by pulling the mains cord from the wall socket or by turning the socket circuit off in the switchboard.

As we will also work inside the boiler, let us the boiler 2 - 3 hours to cool down before we start next work.

After the boiler gets cooled down

we will start dismantling of ceramic parts through the burner door - i.e.:

remove the ceramic shield over the burner door (by gradual moving to the left and

release it then to the bottom right side from the fixation aperture)

remove the ceramic reflector by simple pulling forward

remove all parts of ceramic burning out grate. Lift the back side to a maximum possible hights, front side lower down and remove the part out.

Now remove all ash buildups by steel brush from ceramic parts.

📖 *Note:* Do not forget that it is about one ceramic. Work carrefully so you do not damage all parts.

Cleaning the draughts of combustion products

If there is automatic cleaning installed, there just has to removed a dust above exchanger by a vacuum cleaner or by forfeiture dust throught pipes of heat exchanger in to a burning chamber.

proceed as follows:

close the burner door so that the boiler does not contaminate the boiler room too much when we will clean the draughts,

remove lid of the jacketing,

dismantle the lid of the boiler body (4 screws) and place it on the floor. When you mount it back later, remove slightly ash from it and be careful not to damage insulation during this operation.

now release ash from turbulators and

vacuum dust from the space above exchager

📖 *Note:* With advantage we use ash separator and regular vacuum cleaner

Dismantling of the burner

remove the fan from the extension pipe on the flange of the burner,

dismantle the flanged joint (4 screws) from the drive of the spiral-chute feeder 2, remove the complete feed screw and place aside. Check it for wear and tear at the same time.

dismantle now the whole burner flange (4 screws) and remove the burner. Clean the whole inside surface of the burner carefully with a wire brush, mainly in the place of the feeder's outlet and also in all places of round and slotted nozzles. These places are most susceptible to sedimentation of solid products of burning.

finally, remove all solid waste located inside the air box of the burner. Tilt the burner gradually in order to pour out all impurities from the burner through the pipe of the fan. Work until the burner is completely cleaned.

if automatic ignition is installed on the burner, dismantle both spirals and remove all impurities from the air box of the burner through the installation apertures.

Cleaning of burning chamber

In order to prevent from increased dustiness, we recommend to place the lid of the boiler body on the boiler for this time.

While cleaning, we may not forget about the placement bars of the extension grate which have to be perfectly cleaned so that individual parts of the extension grate can be precisely placed on them back.

After complete assembly of all boiler parts remove ash to the external ash container by manually turning on the ash removal drive in manual control in Menu 1.

1 Direct Control
10.Sweep Ash ON

Remaining ash can be removed by scraper from a burning chamber in to a auger.

Back installation of all parts

Should be done in reverse order. Ensure mainly the following in course of this activity:

Electric resistance coils - Maximum tightness has to be ensured between the flange of spirals and the wall of the burner.

The flange of the burner has to be put precisely so that the packing cord of the flange fits tightly on the protruding ribs of the body all over the circumference.

The spiral-chute feeder should be anchored precisely in the axis of the pipe and should not thus drag against the wall of the pipe (which is one of reasons why smooth operation is blocked).

The joint has to be treated with a sealing paste before the flange of the drive is installed, which is an important measure against smoke penetration.

Individual part of the extension grate have to be placed precisely in their correct order.

The ceramic reflector has to be placed symmetrically in the corresponding bed of the burner and plugged in the stop to the rear side. Individual bearing surfaces (of the burner and reflector) have to be in mutual contact.

Having the back installation been done completely, check via gradual visual check whether all parts are installed correctly. Finally, try operation of the spiral-chute feeder. Its operation has to be calm and without any disturbing noise.

Re-entry into service

After the maitenance is done connect boiler to a power line a trun on main switch.

Check if feeders are fill with a fuel and that the pellets are transported in to a burner.

Press buttn ⬜ **START** and confirm by pressing button ⬜ → **ENTER**.

If the boiler is not going to be used in summer time (like heating of service water), we keep the main switch off.

7.3   OPERATING CONDITIONS - BASIC DISPLAY

AUTO1 (2-10)
Boiler is operationg in automatic mode by values of parameters in specific program (v MENU 2, 5, 6, and service menu).

"AUTO"(blinking)
boiler is operating in mode of electrrical ignition by values of parameters in specific program set up in MENU 6, and service menu.

"AUTO" >I<(blinking)
boiler is operating in the mode of electrical ignition and el. spirals are in this process.

MOD1 (2-10)
Boiler is operating in automatic modul mode by values of parameters stored in memory of CU (in MENU 2, 5, 6, and service menu).

EQT1 (2-16)
Boiler is operating in automatic equitherm regulation mode by values of parameters stored in memory of CU (v MENU 2, 5, 6, 9 and service menu) and by outside temperature

SW Tank
the boiler is working in the automatic mode of hot service water priority heating as per the values of parameters saved in the memory P10 (MENU 5.5, and service menu.)

MANUAL
Boiler is not not working in manual mode. In Menu 1 – Direct control – is possible to control individual parts of the boiler and monitor inputs stages.

STANDBY
quiet mode of the boiler when the boiler is not burning actively. Boiler is ready on the basis of implus from surrounding equipmnts (thermostats, GSM Modem) to restore the supply of heat.

"AUTO!"(blinking)
indicates an ongoing process of adding and igniting of fuel in the boiler operating mode without automatic ignition under the STANDBY state.

"B"
indicates situation when the heater's thermostat is switched in – active. Blinking letter B will be displayed on the display unit outside the periods of time adjusted in the MENU 5. SW Tank is active see chapter 6. SW TANK ACTIVE

8 DISPOSAL OF PRODUCT AFTER THE END OF ITS SERVICE LIFE

Product is made out of materials the waste of which does not have any hazardous properties.

The following main kinds of waste will be generated after the end of the product´s service life:

Steel exchanger, jacketing, feeders, bin	– waste code 170405, category O.
Heat insulation (ROTAFLEX, SIBRAL)	– waste code 170604, category O.
Ceramic grate, reflector and plates on door	– waste code 170103, category O.
Control unit with sensing and control elements	– waste code 200136, category O.

8.1 NATURAL PERSON

Shall perform disposal of the product as follows:

8.1.1 Steel waste shall be sold to the nearest scrap-yard.

8.1.2 Heat insulation and ceramic parts shall be disposed of as mixed municipal waste.

8.1.3 The control unit with sensing and control elements is subjeck to return collection.

Return collection takes place in seller´s plant, where was this product purchased or at the manufacturer of the boiler. Return collection is free of charge.

In accordance with current requirements of environmental protection the electronic parts of the poduct does not contain lead!

Still do not dispose el. equipment as a municipal waste!

8.2 LEGAL ENTITY

Shall perform disposal as per Act no. 185/2001 – Act on wastes as amended. Waste shall be sorted as per the kind and category (see main kinds of waste) and handed over to an authorized entity for disposal.

Exception is represented by control with sensing and control elements is subject to return collection ehich is directly performed by the seller´s plan where the product was bought or by the manufacturer of the boiler. Return collection is free of charge.

In accordance with current requirements of environmental protection the electronic parts of the poduct does not contain lead!

9   CONTROL UNIT OPERATION

9.1   USER SETTINGS – MAIN MENU

Control panel description
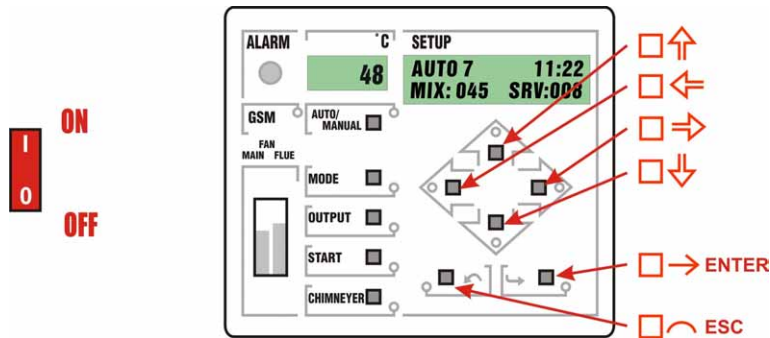
The boiler control unit can be turned on by pushing the lever to I position at the main switch located on the boiler panel.

The bold red display will show the immediate water temperature, for instance   **048**

The first line of the alphanumeric display 2 will show:
A) The sign **MANUAL** in format *hh mm*. The temperature display 3 show immediate boiler water temperature or

B) Signs **AUTOx, MODx, EQTx , BOILER** or **STAND-BY** in case the control unit was turned off in one of these modes and automatic ignition is not allowed by the program or

C) Flashing sign **AUTO** and **>I<**, if the unit is equipped with electric ignition and automatic ignition is allowed by the program. From the moment the ignition spirals stop working only the sign **AUTO** is flashing, depending on the current mode.

The second line will read:

M:045 E:045 S120	temperature behind the mix valve – required equithermal temperature - servomotor position (mode EQT).
(MIX:045 SRV:120)	temperature behind mix valve - servomotor position (mode AUTO, MOD) or after pushing ⬜ ∩ **ESC**
SPAL:142 VST:050	burnt gases temperature behind the boiler – temperature of returning water (recuperation) or after pushing ⬜ ∩ **ESC**
Ven:-12 HOR:050	outside temperature – burner temperature at fuel intake

📖 ***Note:*** The required equithermal temperature value is displayed only in the EQTx mode. Outside temperature and burner temperature will show correct value only if thermometers are on.

📖 ***Note:*** S120 (SRV120) is the position of the servomotor in sec. The limit positions are set by the service technician.

Boiler control by the user is possible within the framework shown in the following drawing:

BLOCK DRAWING OF CONTROL UNIT OPERATION
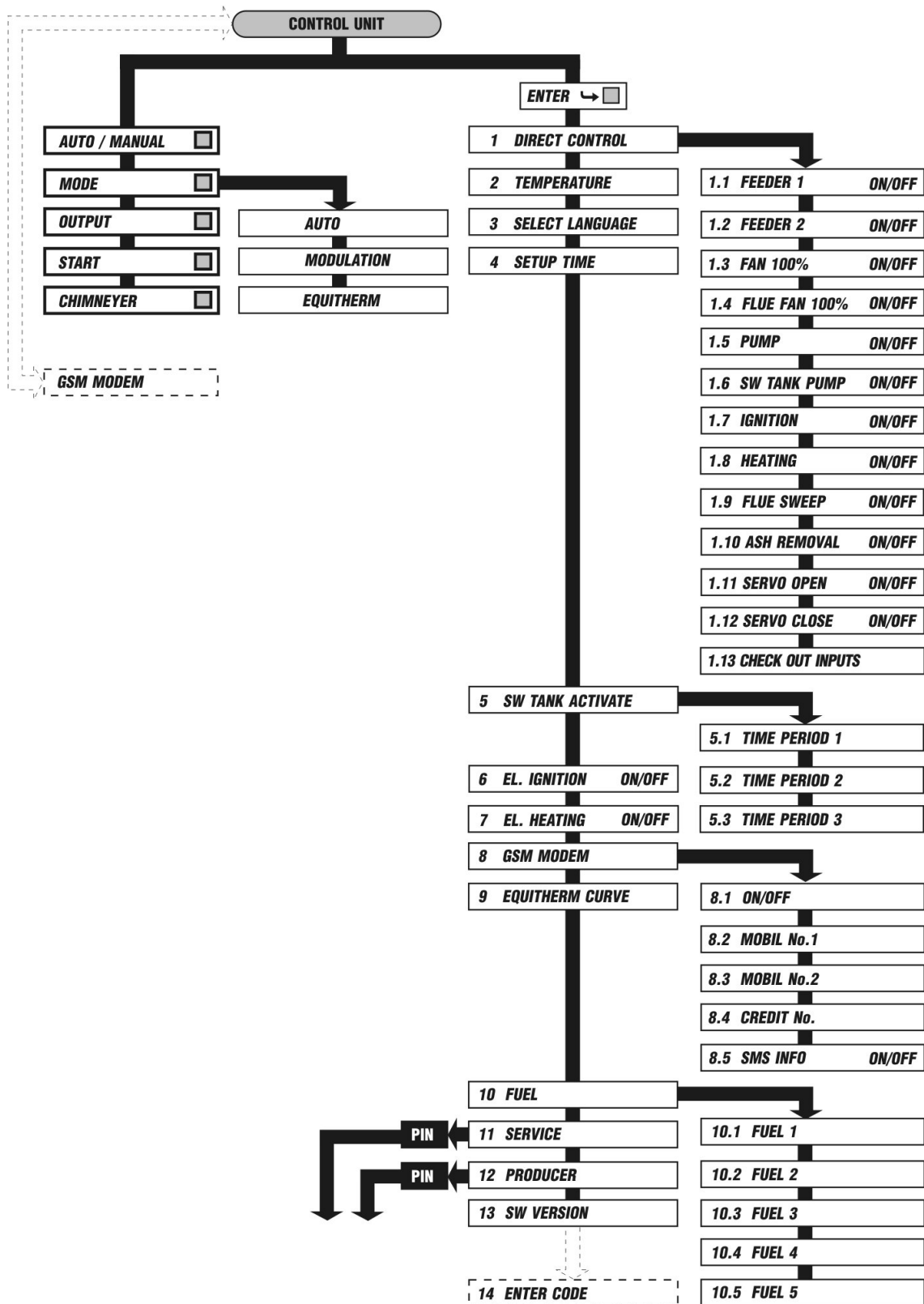
Picture 35   Operation block diagram - User

9.2   OPERATION MODE SELECTION

The service personnel can choose the boiler operation mode with the button MODE on the keyboard and also directly control individual parameters with cursor arrows ⬚⇐ ⬚⇑ ⬚⇒ ⬚⇓.

 AUTO/MANUAL

Switching between automatic operation and manual mode is done with this button.

Yellow LED near the button is on in the AUTO mode.

 MODE

By pushing this button repeatedly, we can select the boiler operation mode. The display will successively show these signs:

Mode:AUTO
Mode:MOD
Mode:EQT

Currently selected mode is confirmed by pushing the ⬚ → **ENTER** button**.** The control system will switch to MANUAL MODE.
Switching to automatic mode is done by pushing the button ⬚ **AUTO/MANUAL.**
AUTO mode represents automatic boiler operations based on firmly set output; the output value is selected by the service personnel.

MOD mode represents automatic boiler operation. The control unit automatically changes the immediate output to one of ten output levels to fit the needs of the heating system in the best possible manner.

EQT mode is an automatic boiler operation with heating water of defined temperature being let in the heating system. The heating water temperature depends on the outside temperature and heat properties of the facility being heated. The control unit automatically changes the immediate output to one of ten output levels to fit the needs of the heating system in the best possible manner.

 Note: We can switch modes in any random moment of boiler operation.
 Note: If a mode with automatic output change (MODx, EQTx) is selected, the yellow LED near the button is turned on. The control unit switches automatically between ten output levels according to a preset mode ("x" is the number of current output).
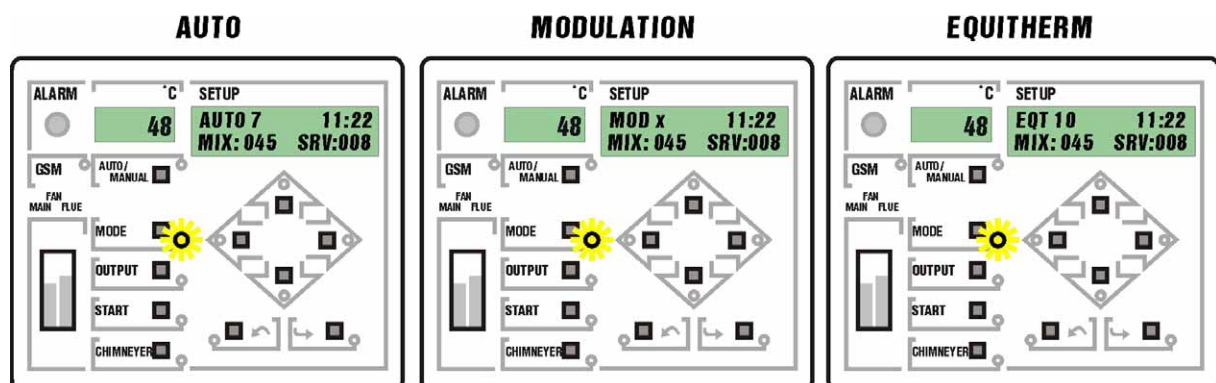
 OUTPUT

Manual setting of the output level can be done in the following manner:
a) Select the **AUTO** mode and confirm by pushing the ⬚ → **ENTER** button. The boiler switched to the **MANUAL** mode.

b) Push the ⬚ **OUTPUT** button – the current output setting can be changed by the ⬚⇑ ⬚⇓ arrows. You can select one of 10 preprogrammed outputs levels.

The new setting is confirmed by pushing the ⬚ → **ENTER** button.

c) By pushing the ⬚ **AUTO/MANUAL** button we switch to the **AUTOx** mode.

📖 **Note:** If the control unit operates in an automatic mode (AUTOx, MODx, EQTx, BOILER), the display will show the current output after pushing the ⬚ **OUTPUT** button.

AUTOx PP kW, nn %

x - number of currently selected program
PP - boiler output corresponding to the selected program
nn - relative number showing the percentage in relation to nominal boiler output
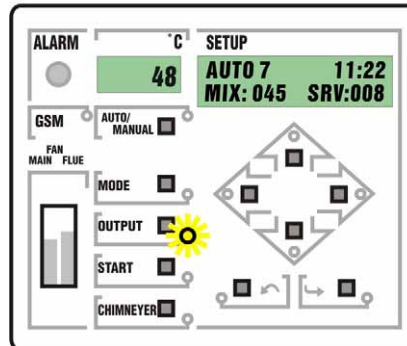
⬚ **START**

If the automatic ignition is permitted ba the programme (the main MENU 6), the following scripts will gradually appear by pressing the key.

> ON <
-El.ignition-
> START! <
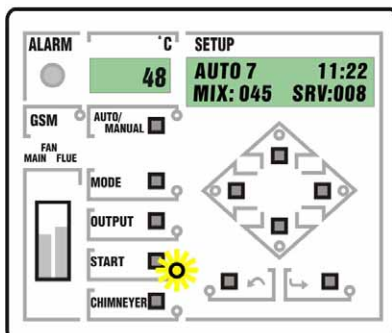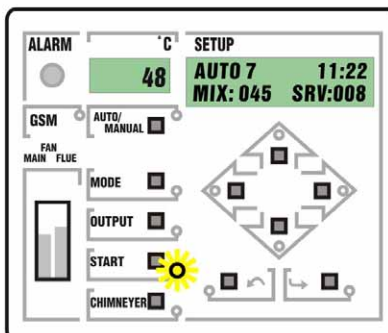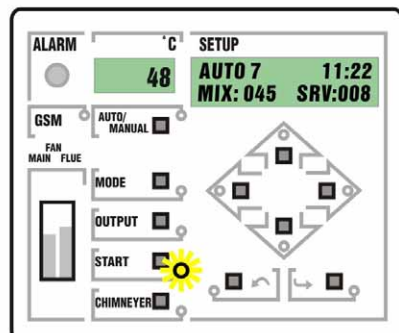
If we confirm this offer by pressing the key **ENTER**, the boiler will start themode of automatic ignition, which is indicated by blinking script **AUTO** and >I<.

If automatic ignition is prohibited by the programme (the main MENU 6), the following script wiil gradually appear by pressing the key

> OFF<

and control unit will return back to mode **MANUAL**

📖 **Note**: The programme routine of Automatic Ignition has absolute priority to be carried out in full extent. If the routine is activated, it is not possible to interrupt or stop it in any way. This fact is an important condition for reliable operation of the boiler because it is then possible only to ascertain indirectly from further behaviour of the boiler whether it is burning or not.
The ongoing routine of Automatic Ignition may be terminated only by the operator by switching over to the mode **MANUAL**. Service is than responsible for the correct set up to a automatic operation**.**

📖 **Note:** If the boiler is working in the mode **AUTOx, MODx, EQTx** or **SW TANK** and power supply is interrupted the boiler will start with the electric ignition routine after the power supply is resumed.

⬚ **CHIMNEYER**

the key is used for service measurement during periodic checks of combustion products. Having the key been depressed, the boiler will start heating at the adjusted output of the boiler and on the programme entered in the service menu as program chimney.

Key ⬜ **CHIMNEYER** is possible to press in any automatic modeu.
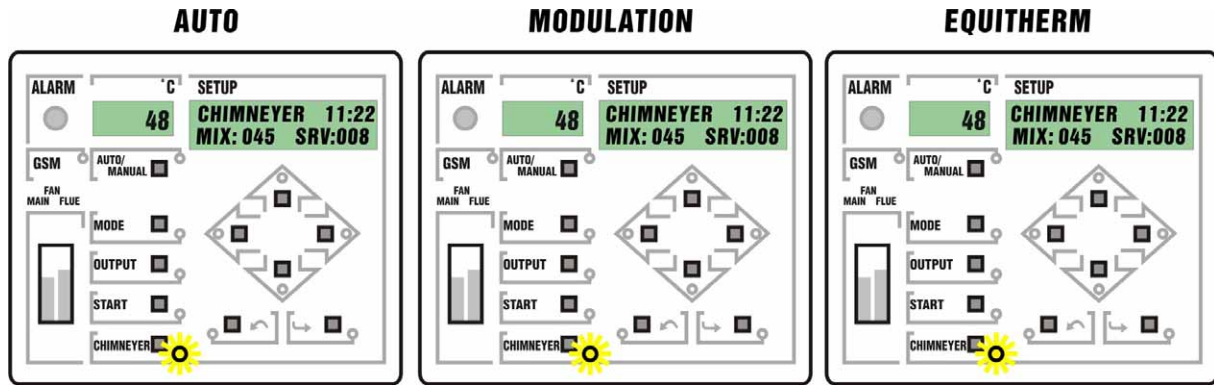
By re-pressing key ⬜ **CHIMNEYER** boiler goes in to mode, in which it was before mode CHIMNEYER.

📖 *Note:* The control unit only operates in this mode, if the boiler is not in the STANDBY state (chapter 8.). For correct operation, it is necessary to switch in the contact of the room thermostat or cool the boiler down - for example, by turning the circulation pump on (see chapter 5.1. direct control) under the temperature value of the outlet water Menu 2, chap. 6.

9.3 MAIN MENU

9.3.1 Menu 1_Direct control

Pressing the key ⬜ → **ENTER** – after short blinking of the "Main Menu" CU goes over to MENU1 Direct control

1. Direct cotrol<

The MENU 1 makes it possible to control very simply all outputs and to check the state of input signals. It is beneficially used to put the boiler into operation or in case of service interventions.

📖 *Note*: Direct control of feeders has to be used when the fuel runs out and the fuel feeders are empty (see chapter 7.10 Lack of pellets in the bin).

Using the cursor arrows ⬜ ⇑ ⬜⇓ we may go to the next or previous MENU, we can return to the previous menu or we can leave the menu by repeated depression of the key ⬜ ∩ **ESC**.

9.3.1.1 Menu 1.1_ Control of feeder F1

After a next pressing ⬜ → **ENTER** appears

Feeder1 xxxOFF

xxx The period of feeder operation in sec.
we may change the operation period of the feeder 1 by cursor arrows
⬜ ⇒ - increases the operation period by +10sec
⬜ ⇐ - reduces the operation period by –10sec
Turn on the Feeder 1 after the key ⬜ → **ENTER** has been depressed. The following will be displayed on the display unit

Feeder1   ON

The feeder will stop when the value 000 is reached.
The operation period of Feeder 1 may be increased ⬜ ⇒ or reduced ⬜ ⇐ during operation.
Operation of Feeder 1 is turned off by pushing the key ⬜ → **ENTER**.
📖 *Note:* Because of operation reliability and safety Feeder1 can be turn on only if Feeder2 is running.

9.3.1.2 Menu 1.2_Control of feeder F2

The following will be displayed on the display unit

Feeder2   OFF

Turn the Feeder 2 on by pushing the key ⬜ → **ENTER** The following will be displayed on the display unit

Feeder2 ON

Operation of Feeder 2 is turned off by pushing the key ⬜ → **ENTER**.

📖 *Note :* Manual control of the feeder has to be used if you run out of fuel and all transportation ways are empty (see chapter 7.10. LACK OF PELLETS IN THE BIN).

9.3.1.3   Menu 1.3 _Control of fan

The following will be displayed on the display unit

FAN vv% OFF

The value of revolutions may be changes by cursor arrows.
 ⇒ - increases revolutions of the fan by + 1 %
 ⇐ - reduced revolutions of the fan by −1%
Keys ⇒ ⇐ has a autorepeat function buil in (after a longer pressing automatic repeating of pressing)

The fan will be turned on after the key → **ENTER** is depressed. The following will be displayed on the display unit

FAN vv% ON

The value of revolutions of the fan may be increased ⇒ or reduced ⇐ during operation.
Operation of fan is turned off by pushing the key → **ENTER**.

9.3.1.4   Menu 1.4 _ Flue fan control

The display will show:

Flue F. vv % OFF

- **vv** – **currently** selected fan revolutions
We can change the revolution value with the cursor arrows.
 ⇒ - increases fan revolutions by +1%
 ⇐ - decreases fan revolutions − 1%
The buttons ⇒ ⇐ have a built-in autorepeat function (automatic repeat, if the button is pushed for a prolonged time)

After pushing the → **ENTER** button, the fan will switch on. The display will show:

Flue F. vv % ON

During operation fan revolutions can be increased with ⇒ or decreased with ⇐ .
The flue fan can be turned off by pushing the → **ENTER** button.

📖 *Note:* Depending on selected configuration, the display may mean "TO2 pump, short-circuiting pump", which does not enable pump revolution control!

9.3.1.5   Menu 1.5_ CONTROL OF THE HEATING SYSTEM PUMP

The following will be displayed on the display unit

PUMP OFF

Turn the pump on after pushing the key → **ENTER** The following will be displayed on the display unit

PUMP ON

Operation of pump is turned off by pushing the key → **ENTER**.

9.3.1.6   Menu 1.6_ CONTROL OF THE STORAGE WATER TANK PUMP

The following will be displayed on the display unit

SWT PUMP OFF

Turn the SW TANK pump on after pushing the key → **ENTER** The following will be displayed on the display unit

SWT PUMP ON

Operation of the SW TANK pump is turned off by pushing the key → **ENTER**.

9.3.1.7   Menu 1.7 _ CONTROL OF ELECTRIC IGNITION

The following will be displayed on the display unit

El.Ignition OFF

Turn the ignition on after pushing the key → **ENTER** The following will be displayed on the display unit

El.Ignition ON

Operation of ignition is turned off by pushing the key → **ENTER**.

📖 *Note*: Automatic turning off will take place after 60 seconds in order to prevent from damage to heating coils in case of omission.

9.3.1.8 Menu 1.8_ CONTROL OF HEATING

The following will be displayed on the display unit

<mark>El.Heating OFF</mark>

Turn heating on by pushing the key ⃞ → **ENTER** The following will be displayed on the display unit

<mark>El.Heating ON</mark>

Operation of the heating is turned off by pushing the key ⃞ → **ENTER**.

📖 **Note:** Automatic turning off will take place after 60 seconds in order to prevent from damage to heating coils in case of omission.

📖 **Note:** By the choosen configuration the output can have meaning of control „Pump TO2, constrictive pump"

9.3.1.9 Menu 1.9_Boiler flue sweeping

The display will show:

<mark>Fl. sweep OFF</mark>

Flue sweeping is turned on by pushing the ⃞ → **ENTER** button. The display will show:

<mark>Fl. sweep ON</mark>

Flue sweeping is turned off by pushing the ⃞ → **ENTER** button.

9.3.1.10 Menu 1.10_Ash removal

The display will show:

<mark>Ash removal OFF</mark>

Ash removal is turned on by pushing the ⃞ → **ENTER** button. The display will show:

<mark>Ash removal ON</mark>

Ash removal is turned off by pushing the ⃞ → **ENTER** button.

9.3.1.11 Menu 1.11_Opening servomotor

The display will show:

<mark>Servo open OFF</mark>

Servomotor opening is turned on by pushing the ⃞ → **ENTER** button. The display will show:

<mark>Servo open ON</mark>

Servomotor opening is turned off by pushing the ⃞ → **ENTER** button.

9.3.1.12 Menu 1.12_Closing servomotor

The display will show:

<mark>Servo close OFF</mark>

Servomotor closing is turned on by pushing the ⃞ → **ENTER** button. The display will show:

<mark>Servo close ON</mark>

Servomotor close is turned off by pushing the ⃞ → **ENTER** button.
📖 **Note:** In order to avoid servodrive damage, functions Servomotor ON/OFF block each other.

9.3.1.13 Menu 1.13_Display of inputs

The display will show:

<mark>RT:x WT:x RS:x x</mark>
<mark>ET:x x   BI:xxxxx</mark>

x – can have value 0 or 1
value 1 – means active state
value 0 – means inactive state

RT – room thermostat, **WT** – boiler thermostat, **RS** – F1 and F2 feeder rotation sensors
ET – emergency thermostat, burner thermostat
BI – state of binary inputs – for service purposes only
BI:xxxx1 – heating loop 2 room thermostat
BI:xxx1x – heating loop 3 room thermostat

📖 **Note:** After returning from "direct control" by pushing the ⃞ ∩**ESC** button or by "time out" (after 60 seconds without touching the keyboard), all outputs will switch to the initial mode OFF and the boiler will switch to the **MANUAL** mode.

9.3.2   Menu 2_Output water temperature setup

Output water temperature settings allows the user to adjust the operating mode requirements of the boiler heating system or temporary conditions in the heating requirements.
📖 *Note:* Minimum and maximum *TT* value is limited by mynufacturer.

MENU 2. Temperature will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⬚ ⇑ ⬚ ⇓ . The following script will appear by pushing the key ⬚ → **ENTER**

> **> 2. Temperature <**

After pushing the key ⬚ → **ENTER** we will get into the menu where we may change output water temperature.

T[°C]   tt   TT

where **tt** is the existing setup value, **TT** is the newly required setup value and is blinking.

The required output water temperature of the automatic boiler may be adjusted with cursor arrows ⬚ ⇑ ⬚⇓ This temperature is a significant parameter to control the operation of the boiler. If the output water temperature reaches the adjusted value, the boiler will get to a so-called STANDBY MODE. (see chapter 7.9.)

⬚ ⇑   - increases the required output water temperature in step of +1°C
⬚ ⇓   - reduces the required output water temperature in step of -1°C

We will confirm the newly adjusted value by pushing the key ⬚ → **ENTER***.* The value **TT** will stop blinking and is stored in the working register for operation of the boiler in some of the automatic modes.

The values of **tt** and **TT** are identical now.

The value **TT** will get blinking again by repeated depression of the key ⬚ → **ENTER** and may be changed. Depress the key ⬚ ∩ **ESC** to return to the main menu.

The value **TT** is accepted for further use, if the new value has been confirmed by the key ⬚ → **ENTER***.* (the value **TT** is not blinking). However, If the value **TT** is blinking, it will not be accepted when we return back to the MAIN MENU and the original setting value **tt** ill still be used.

9.3.3   Menu 3_Language selection

MENU 3 Language selection will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⬚ ⇑ ⬚⇓ . The following script will appear by pushing the key ⬚ → **ENTER**

> 3. Select Lang.<

The following script will appear by pushing the key ⬚ → **ENTER**

> Cestina <

Using the cursor arrows ⬚ ⇑ ⬚ ⇓ the user will choose the corresponding language version for communication with the operator from the following options

> Cestina<
> English<
> Deutsch<
> Polski<
> Español<
> Italiano<
> Svenska<
> Français<
> Русский<

Confirm the selection by pushing the key ⬚ → **ENTER***.*

Return back to the main menu > 3. Select Lang.< by pushing the key ⬚ ∩ **ESC**

Return back to the mode **MANUAL** or **AUTO** by repeated depression of the key ⬚ ∩ **ESC** or continue in selection of the next menu by cursor arrows ⬚ ⇑ ⬚⇓.

9.3.4   Menu 4_Setup time

MENU 4 Setup time will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⬚ ⇑ ⬚ ⇓ . The following script will appear by pushing the key ⬚ → **ENTER**

>4. Setup Time<

The following script will appear by pushing the key ⬚ → **ENTER**

Time : HH : MM : SS

And the value **HH** is blinking.

The current state of hours may be changed by cursor arrows ⬚ ⇑   ⬚ ⇓.

⮝ - increases the value of the number in step of +1h
⮟ - reduces the value of the number in step of -1h

If the value of hour has been adjusted, go to the setup of minutes by pushing the cursor arrows ⇒, or confirm the total setup of time by pushing the key → **ENTER** and return back to the menu

==>4. Setup Time<==

⇒ - moves to the neighbouring digit to the right
⇐ - moves to the neighbouring digit to the left

The current state of minutes may be changed by cursor arrows ⮝ ⮟.
⮝ - increases the value of the number in step of +1min
⮟ - reduces the value of the number in step of -1min

If the value of minutes has been adjusted, go to the setup of seconds or return back to the repeated setup of hours or confirm the total setup of time by pushing the key → **ENTER** and return back to the menu $>$ 4. Setup of time $<$.

⇒ - moves to the neighbouring digit to the right
⇐ - moves to the neighbouring digit to the left

The current state of seconds may be changed by cursor arrows ⮝ ⮟.
⮝ - increases the value of the number in step of +1s
⮟ - reduces the value of the number in step of -1s
If the value of seconds has been adjusted by pushing the cursor arrows, go to the setup of hours or return back to the setup of minutes.

Confirm the setup of time by pushing the key → **ENTER**. The programme will return back to the menu $>$Setup time $<$.

Return back to the mode **MANUAL** or **AUTO** by repeated depression of the key ∩ **ESC** or continue in selection of the next menu by cursor arrows ⮝ ⮟.

9.3.5   Menu 5_SW Tank active

Up to three time periods for heating hot service water may be determined in this MENU.

📖 *Note*: The control unit will accept the signal from the SW TANK's thermostat in the adjusted time period and the boiler will operate in the mode SW TANK. The signal from the SW TANK will be ignored outside these time periods. This state is indicated by blinking letter **"B"** on the display unit before the value of time.

MENU 5 SW TANK active will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⮝ ⮟. The following script will appear by pushing the key → **ENTER**.

==> 5.SWT active<==

on the display unit and after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⮝ ⮟. The following script will appear by pushing the key → **ENTER**

==1.Time per. I==
==>Tim1 hh:mm, HH:MM<==

The script

will appear by repeated pushing of the key → **ENTER**

==> hh:mm, HH:MM <==

and **hh** is blinking.

- **hh** is the time value in hours of the bottom limit for the time period 1
- **mm** is the time value in minutes of the bottom limit for the time period 1
- **HH** is the time value in hours of the top limit for the time period 1
- **MM** is the time value in minutes of the top limit for the time period 1

The current state of hours or minutes may be changed by cursor arrows ⮝ ⮟:
⮝ - increases the value of hours in step of +1h
⮟ - reduces the value of hours in step of -1h

If the bottom limit value in hours is adjusted, go on to the setup of minutes by pushing the cursor arrow ⇒ or by pushing the key → **ENTER**:
⮝ - increases the value of minutes in step of +1min
⮟ - reduces the value of minutes in step of -1min

If the bottom limit value in minutes is adjusted, go on to the setup of the top limit value in hours for the time period by pushing the cursor arrow ⇒ or by pushing the key → **ENTER**.

The top limit in hours and minutes for the time period is adjusted in the same way.

Return back to the menu 5 SW TANK ACTIVE or to the modes **MANUAL, AUTOx , MODx** or **SW TANK** by repeated pushing the key ☐ ∩ **ESC**
The same provisions apply for setup of the bottom and top limit for the time periods 2 and 3.

Time period 2

> **hh:mm, HH:MM <**

Time period 3

> **hh:mm, HH:MM <**

📖 *Note:* For the correct function check the time set-up in Menu 4.
📖 *Note:* The time zone cannot cross midnight, so it must be set accordingly.

9.3.6 Menu 6_Electric ignition

Permits and inhibits function of electric ignition heating coils and the use of routines to start extinguished boiler automatically.

MENU 6 Electric ignition will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows☐ ⇑ ☐⇓ .

> **6. El. ignition <**

By pushing the ☐ → **ENTER** button display will show:

> **El. ignition OFF<**

or
or depending on the last current setting

> **El. ignition ON<**

The setting of the electric ignition function can by changed by pushing the ☐ → **ENTER** button.
By repeatedly pushing the ☐ → **ENTER** button you can change the ON/OFF setting.

Select the desired setting and return to the **MANUAL, AUTOx, MODx, EQTx or BOILER** modes by pushing ☐ ∩**ESC** button. Further menu selections are available by pushing the ☐ ⇑ ☐⇓ arrows.

📖 *Note*: Service engineer or the manufacturer will adjust this value as per the technical equipment of the boiler. In order to use the function of electrical ignition, it is necessary for the boiler to be equipped with a burner boiler with a heating coil used to ignite pellets.

📖 *Note*: The course of electrical ignition takes place as per the time parameters which are adjusted by a service engineer when the boiler is being put into operation.

📖 *Note*: If electric ignition is > **OFF**< the routine for direct mode START is not active.

📖 *Important*: If there is a failure of EZ components boiler can work in reserve mode. See Chapter 7.10 fault stages.

9.3.7 Menu 7_ Suplemental electric heating

serves as protection against freezing of the heating system, for instance in unattended buildings, in case of failure or fuel shortage.

MENU 7 - The electric supplemental heating will show on the display after a short note – MAIN MENU. The setting can be changed by the ☐ ⇑ ☐⇓ arrows.

> **7. El. heating <**

By pushing the ☐ → **ENTER** button display will show:

> **7. El. heating OFF <**

or depending on the last current setting

> **7. El. heating ON <**

The setting of the electric heating function can by changed by pushing the ☐ → **ENTER** button.
By repeatedly pushing the ☐ → **ENTER** button you can change the ON/OFF setting.
Select the desired setting and return to the **MANUAL, AUTOx, MODx, EQTx or BOILER** modes by pushing ☐ ∩**ESC** button. Further menu selections are available by pushing the ☐ ⇑ ☐⇓ arrows.

📖 *Note*: Serviceman or a manufacturer will set this value by the technical requirements of the boiler. When using he function of Suplemental electric heating *it is necessary* to equip boiler with heating spirapls build in the boiler.

📖 *Note:* The electric supplemental heating spirals output is defined by the user or the designer. The manufacturer will equip the boiler with the proper spirals based on an order. Professional firm can perform the spirals mounting later.

By pushing ⧠ ∩ **ESC** button we are returning to mode **MANUAL , AUTOx , MODx, EQTx, BOILER** or it is possible to continue by pushing ⧠ ⇑ ⧠⇓ arrows to future menu selection.

📖 *Note:* If the output (Menu 11.4 – Configuration) is used for different function than electric heating, an attempt to set this function will result in a "not installed" message.

9.3.8   Menu 8_GSM modem

Activity of the control unit for cooperation with GSM modem is adjusted in the menu. Authorized participants for operation of the boiler are determined by defining telephone numbers for communication. The system enables remote control and monitoring of individual boilers as well as a network of boiler rooms. The function of an order activated via the GSM modem is active until the moment of the next operation of the control unit with the keyboard. Modem is installed by manufacturer or a service organization by the customer needs.

MENU 8. GSM modem will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⧠ ⇑ ⧠⇓ . 8. GSM modem

> **> GSM modem <**

By pushing the ⧠ → **ENTER** button display will show:

> **> 1.ON/OFF<**

By pushing the ⧠ → **ENTER** button display will show:

or

> **> 1.GSM modem OFF<**

> **> 1.GSM modem ON<**

By pushing ⧠ → **ENTER.** Button we change GSM modem function.
By repeatedly pushing the ⧠ → **ENTER** button you can change the ON/OFF setting.

Further menu selections are available by pushing the ⧠ ⇑ ⧠⇓ arrows.

> **> 2. Mobil No. 1<**

We will use this MENU to adjust the number the control unit will communicate with. Failure SMS reports will be sent to this number. A twelve-digit number including national area code will appear by pushing the key ⧠ → **ENTER** for example

420123456789

Adjust the required number by cursor arrows:
⧠ ⇑   - increases the value of the number in step of +1
⧠ ⇓   - reduces the value of the number in step of -1
⧠ ⇒   - moves to the neighbouring digit to the right
⧠ ⇐   - moves to the neighbouring digit to the left
Add character # after last valid number! By this you will define amount of valid numbers.

Confirm the adjusted number by pushing the key ⧠ → **ENTER**

The following script will appear of the display unit   **>O.K.-call?<**
Having this been confirmed by pushing the key ⧠ → **ENTER**, the control unit in cooperation with the modem will make a check call to the selected telephone number. This state is indicated by the following message while the number is being dialled and ringing

> **>dialling ...<**

Finish the check call by pushing the key ⧠ → **ENTER**.

📖 *Note*: The ring out function may only be used after the modem has been connected and activated.
📖 *Note*: Modem will be activated by the control unit when the power supply is turned on and provided the GSM function - modem ON is allowed. The modem has to be connected to the power supply before the control unit is turned on.
Further menu selections are available by pushing the ⧠ ⇑ ⧠⇓ arrows.

> **>3.Mobil No. 2<**

This MENU is used to adjust the second number the control unit will communicate with. No failure messages will come to this number, unlike the mobile number 1.

The mobile number 2 is adjusted in the same way as mentioned in the MENU 8.2 Mobile number 1.

> **> 4.Credit No.<**

Further menu selections are available by pushing the ⧠ ⇑ ⧠⇓ arrows.

This MENU may be used to adjust the number of operator the control unit will communicate with in case of query about the residual credit on a prepaid telephone card.

📖 *Note*: Information on the current credit level will be sent to the user with every SMS message sent by the control unit.

 Note: Number for information on credit may be found out from the operator. Example: T-mobile *101#.

Further menu selections are available by pushing the ⇑ ⇓ arrows.

<mark>**> 5.SMS info<**</mark>

This function will allow or inhibit sending any report in case of any failure on the equipment. The following script will appear by pushing the key → **ENTER**

<mark>**> 5.SMS info OFF<**</mark>

or

<mark>**> 5.SMS Info ON<**</mark>

depending on the last current setting

By pushing   → **ENTER***.* Button we change SMS info function.
By repeatedly pushing the → **ENTER** button you can change the ON/OFF setting.

 Note: A warning SMS message informing on any failure or operating conditions preventing from normal operation of the boiler is sent to the mobile number 1 and to the number of the service workshop, if entered as a GSM Master in the menu Manufacturer.

 Note: The control unit sends the following failure conditions:
STOP, STOP-NOT IGNITED, STOP-TEMP.>95C, STOP- TEMP >100C, BLOCKED FEEDER 1, BLOCKED FEEDER 2

By pushing   ∩ **ESC** button we are returning to mode **MANUAL*, AUTOx , MODx, EQTx, BOILER** or it is possible to continue by pushing ⇑   ⇓ arrows to future menu selection.

Description of activity:

The control unit program software is fitted with functions for receiving and transmitting short text messages. A set of defined commands assures simple boiler operation:

STATUS	The control unit will respond with current status information.
START	This command will start the boiler (room thermostat virtual contact is permanently ON).
STOP	This command will switch the boiler to the stand-by mode (room thermostat virtual contact is permanently OFF).
NORMAL	The boiler accepts the real time room thermostat status.
REM ON	The control unit will send a signal to the room thermostat, which is then switched to the "telephone" mode.
REM OFF	The control unit will send a signal to the room thermostat and the "telephone" mode is turned off.

 Note: The REM ON and REM OFF commands require installation and interaction with the room thermostat Siemens REV 23.

 Note: After receiving a text message and switching the control unit to remote control, the LED diode "GSM" will be on. The remote control is ended by receiving a NORMAL text message or by pushing any button on the control unit (boiler attendants are at home).

 Note: The control unit communicates only with telephone numbers, which the service personnel and the service organization have put into it.

 Note: The text message structure sent by the control unit is as follows: DISPLAY="AUTO8   12:20" T=040 PT=1 BT=0 MODULACE=0 Pon=05 Poff=30 V=056 Tsp=145 "256,60Kc"

The meaning is:

DISPLAY=AUTO8 12:20	status – control unit display
T=040	boiler water temperature
PT=1	Room thermostat ON
BT=0	Boiler thermostat OFF
MODULACE=0	Modulation OFF
Pon=05	Current setting – feeder 1, ON for 5 s
Poff=30	Current setting – feeder 1, ON for 30 s
V=056	Current setting of the fan 56%
Tsp=145	Current burnt gases temperature
"256,60Kc"	Remaining SIM card balance

 Note: The error text message structure sent by the control unit is as follows:

DISPLAY="STOP STAGEx 12:20"	status – control unit display
DISPLAY="STOP TEPL> 95"	status – control unit display
DISPLAY="STOP TEPL>100"	status – control unit display
DISPLAY="STOP NO FIRE"	status – control unit display
DISPLAY="Blocked.FEEDER x"	status – control unit display
DISPLAY="STOP-EMER.THERMx"	status – control unit display

Errors description is listed in Chapter 10 – Error messages

9.3.9   Menu 9_The equithermal curve

This MENU is for the equithermal curve selection. The equithermal curve defines the relation of the heating water temperature flowing to the heating system and the current outside temperature. It is generally true that the worse insulation properties of the heated building the steeper the selected curve. Curve 1 fits a building with bad insulation, curve 16 reflects a building with a very good insulation.

MENU 9 - The electric supplemental heating will show on the display after a short note – MAIN MENU. The setting can be changed by the ⇑ ⇓ arrows.

> **> 9. EQT. curve <**

 By pushing the → **ENTER** button display will show:

> **> EQT.cur. ee EE <**

Where **ee** is the current value, **EE** is the new value and it is flashing.

The desired equithermal curve can be set with   ⇑ ⇓ arrows.
  ⇑   - increases the desired value by +1
  ⇓   - decreases the desired value by − 1

Confirm the newly entered value by pushing the → **ENTER** button. The **EE** value will stop flashing and will be saved in the boiler operation working register in the **EQTx** mode.
The **ee** and **EE** values are now identical.

By pushing the   ENTER button again, the **EE** value starts flashing again and can be changed. By pushing ∩**ESC** button you can return to the main menu.

The **EE** value is accepted for further use, if the new value is confirmed by the → **ENTER** button (the **EE** value is not flashing). If the **EE** value is flashing, it will not be accepted after return to the main menu and the original value **ee** will be used instead.

 Note: The particular building has an equithermal curve constant, which is defined by the building construction. The equithermal curve must be changed only after changes such as windows replacement, adding of insulation, heating system remodeling, etc.
 Note: The equithermal curve is generally set by assumption and is adjusted based on test runs. After correct setting it is not changed anymore.
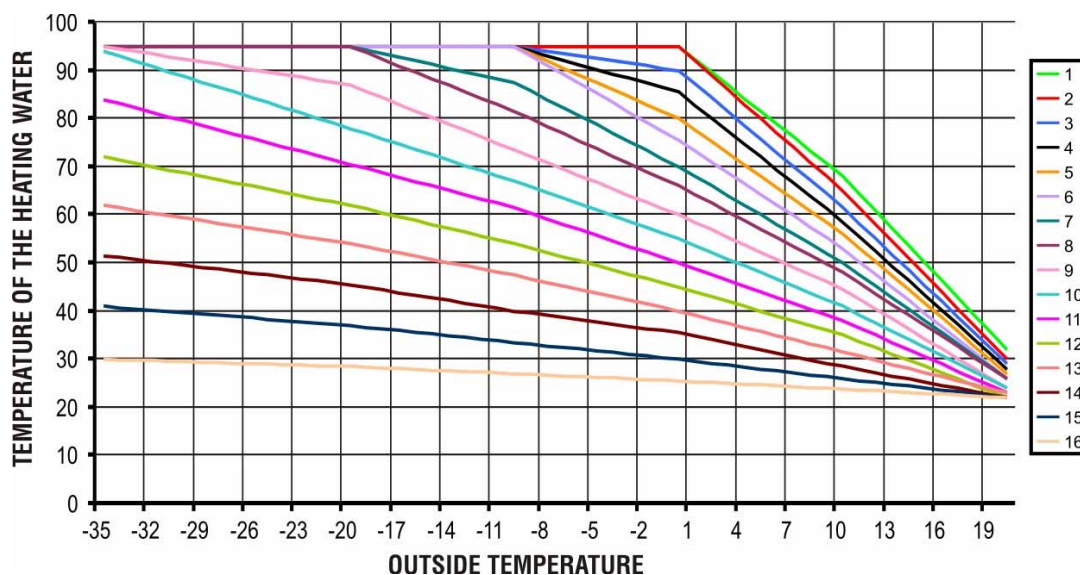
Picture 36   Equithermal curves 1 - 16

9.3.10 Menu 10_Fuel selection

This MENU is for selection of fuel.
MENU 10 – Fuel will show on the display after a short note – MAIN MENU. The setting can be changed by the
⬜ ⇧ ⬜⇓ arrows.

> **> 10.Select Fuel <**

By pushing the **ENTER** button the display will show the currently selected fuel type.

> **X. Fuel No.x ON**

and the type of the selected fuel:

> **Wood pellets**

Different type of fuel can be set by the ⬜ ⇧ ⬜⇓ arrows.
Change the new fuel setting from OFF to ON by pushing the ⬜ → **ENTER** button. This way a new type of fuel is selected.

The previously used fuel type is automatically turned off.

By pushing ⬜ ∩**ESC** button you can return to the main menu.

📖 ***Note:*** Boilers of the KP x2 model line are adapted for burning of different fuels. Feasibility of fuel other than the guaranteed type must always be consulted with the manufacturer or with an authorized service center. The authorized service center will perform professional adjustment of the boiler according to the fuel type you selected.

📖 ***Important note:*** Do not willfully change the fuel type unless the boiler is professionally adjusted for that particular fuel. Boiler damage or dangerous operation status may result. The service organization must record the adjustment to a different fuel type.

9.4 MENU 11_SERVICE

This MENU is accessible only to manufacturer staff or by professional service organizations. The access is blocked by four blocked PIN code agains a wrong use.

FUEL No.X

	11 SERVICE
	PIN
	ENTER ↵ ▢
	11.1 PROGRAMS

11.1.1 PROGRAM No.1	11.2 ADVANCE	
11.1.2 PROGRAM No.2	11.3 RUN-IN	
11.1.3 PROGRAM No.3	11.4 STANDBY TIME	
11.1.4 PROGRAM No.4	11.5 FIRING PARAMETER	
11.1.5 PROGRAM No.5	11.5.1 RED-HOT TIME	11.6 PUMP ON
11.1.6 PROGRAM No.6	11.5.2 FEED TIME	11.7 SW TANK PUMP ON
11.1.7 PROGRAM No.7	11.5.3 FAN ON/OFF	11.8 CHANGE SERVICE PIN
11.1.5 PROGRAM No.8	11.5.4 SPEED FAN	11.9 FANS
11.1.6 PROGRAM No.9	11.5.5 FLUE FAN ON/OFF	11.9.1 FAN TYPE
11.1.7 PROGRAM No.10	11.5.6 FLUE FAN REVOLUTION	11.9.2 FLUE FAN TYPE
	11.5.7 FLARE TIME	11.10 BOILER OUTPUT
	11.5.8 REFERENT TEMP.	11.10.1 OUTPUT KW
	11.5.9 FLUE GAS CHECK	11.10.2 CONSTANT OF FEEDER

	11.11 EQUITHERM REGULATION	
	11.12 MODULATION	11.11.1 STARTING PROGRAM
11.12.1 STARTING PROGRAM		11.11.2 GRADIENT LOW
11.12.2 GRADIENT LOW		11.11.3 GRADIENT UPPER
11.12.3 GRADIENT UPPER		11.11.4 ZONE 1
11.12.4 ZONE 1		11.11.5 ZONE 2
11.12.5 ZONE 2		11.11.6 REGULATION PERIOD
11.12.6 REGULATION PERIOD	11.13 SWEEPING, CLEARING	
	11.14 CONFIGURATION	
	11.13.1 BURNER CLEANING	11.15 SERVO
11.13.1.1 BURN.CLEAN. ON/OFF	11.13.2 ASH REMOVING	
11.13.1.2 PERIOD		11.13.2.1 ASH REMOVING ON/OFF
11.13.1.3 RUN F1 AND F2		11.13.2.2 No. OF FEEDS
11.13.1.4 FAN RUN		11.13.2.3 OPERATION PERIOD
11.13.1.5 FAN REVOLUTION	11.13.3 FLUE SWEEPING	
	11.13.4 ZONE 1	11.13.3.1 FLUE SWEEPING ON/OFF
	11.13.5 ZONE 2	11.13.3.2 No. OF FEEDS
	11.13.6 REGULATION PERIOD	11.13.3.3 OPERATION PERIOD
		11.13.3.4. TIME ZONE
		11.13.3.5 FLUE FAN REVOLUTION

Picture 37   Operational block diagram - Service

The Menu is PIN-encoded. It contains a file of adjustments accessible to service engineers. Output stages corresponding to the air quantity in course of burning and parameters ensuring safe and reliable operation of the boiler are adjusted in individual menus.

It is prohibited to notify the user or unqualified operator of the PIN. Unskilled intervention in adjusted parameters may result in operation of the boiler outside the permitted operating conditions.

MENU 11 - The service will show on the display after a short note – MAIN MENU. The setting can be changed by the ⟤ ⇑ ⟤⇓ arrows.

> **> 11. Service<**

By pushing the ⟤ → **ENTER** button display will show:

> **PIN: ××××**

Use the cursor arrows ⟤ ⇐ ⇑ ⇒ ⇓ to determine the user's PIN number (code combination) or the value of a particular parameter
⟤ ⇑ - increases the number value in steps of +1
⟤ ⇓ - reduces the number value in steps of -1
⟤ ⇒ - moves to the neighbouring digit to the right
⟤ ⇐ - moves to the neighbouring digit to the left
Confirm the adjusted number by pushing the key ⟤ → **ENTER**.
The adjusted value is not accepted by pushing the key ⟤ ∩**ESC** or we will return back to the previous menu
It is possible to change a blinking value or digit.
A parameter value confirmed by the key ⟤ → **ENTER**. will stop blinking and is accepted for operation of the control unit.

If the PIN value entered is correct, the following script will appear shortly on the alphanumeric display unit

> **PIN O.K.**
> **SERVICE**

If the PIN value has been entered incorrectly, the following script will shortly appear on the alphanumeric display unit

> **- Bad PIN !!! -**

Access to the menu for SERVICE is not allowed.

 Note: The service PIN is set by a manufacturer.
 Note: If the PIN has been changed by the service engineer, this code has to be stored well. If the PIN is lost, an intervention of the producer's employee is necessary.

9.4.1   Menu 11.1_Programs

Timing of feeders and rotations of the fan are adjusted in this menu in order to adjust outputs and optimum combustion.
MENU 11.1 Programs will appear on the display unit after the correct PIN has been entered in the menu Service

> **> 1. Programs<**

Depress the key .⟤ → **ENTER** to get into the menu to adjust operating values of the boiler for individual programs.

> **>1. Program no.1<**
> **Fuel.x**

Fuel x is possible to select in menu 10. If you want to set a power of the boiler and using a specific kind of fuel, first select this fuel in menu 10, chapter 9.3.10!
Use the cursor arrows ⟤ ⇑ ⟤ ⇓ it is possible to select program no.1 – 10, Boiler program, Chimney program.

 Note: SW Tank program gets activated upon a request to deliver heat into the tank for the hot service water.
 Note: Chimneyer program gets activated under the mode of CHIMNEYER, adjusted by pushing the key on the keyboard.
By puching the key ⟤ → **ENTER** to change parameters of a selected programs

> **ON05 OFF20 F067**
> **Fuel.1 Flue F. 060**

where the value 05 is blinking.

ON   - is the value of feeder 1 operation in seconds
OFF   - is the idleness time of the feeder 1 in seconds
V   - is the value of fan's rotations in %
Flue F.   - it is a value of the flue fan revolutions
Fuel.1 - number of currently selected fuel type

New values for feeder 1 and the fan can be set by using the ⇩ ⇐ ⇑ ⇒ ⇓ buttons.

📖 *Note:* The boiler output can be set by adjusting the "z" and "v" values. It is recommended that the output setting in the individual programs is done in ascending order – the lowest output in Program Nr. 1, the highest one in Program Nr. 10.

📖 *Important note:* The ascending order is mandatory in the Modulation mode!!!

Example:

Menu

11.1.1.	Fuel 1	Program No.1	on05 off90 F30 FlueF40	minimum output 6,0 kW
11.1.2.	Fuel 1	Program No.2	on05 off60 F36 FlueF40	8,5 kW
11.1.3.	Fuel 1	Program No.3	on05 off50 F40 FlueF45	10,0 kW
11.1.4.	Fuel 1	Program No.4	on05 off38 F48 FlueF45	13,0 kW
11.1.5.	Fuel 1	Program No.5	on05 off28 F50 FlueF45	17,0 kW
11.1.6.	Fuel 1	Program No.6	on09 off41 F53 FlueF50	20,0 kW
11.1.7.	Fuel 1	Program No.7	on09 off34 F59 FlueF50	23,5 kW
11.1.8.	Fuel 1	Program No.8	on09 off29 F64 FlueF55	26,0 kW
11.1.9.	Fuel 1	Program No.9	on09 off27 F68 FlueF55	28,0 kW
11.1.10.	Fuel 1	Program No.10	on09 off25 F75 FlueF55	Nominal output 29 kW
11.1.11.	Fuel 1	SWT Program	on09 off41 F64 FlueFt50	20,0kW
11.1.12.	Fuel 1	Chimneyer Pr.	on09 off25 F75 FlueF55	Nominal output 29 kW

📖 *Important note:* Values "**ON**" and "**OFF**" can be changed only within limits set by the manufacturer. Values "V" and "V.odt." can be changed from 30 to 100%.

9.4.2   Menu 11.2_Advance

Determines the period of time by which the feeder F2 (burner's feeder) starts operating sooner than the feeder F1. Fuel falls into the running screw. The advance is significant to ensure fire safety of the boiler.

MENU 11.2 Advance will appear on the display unit after the menu -SERVICE- has been entered and after adjustment to this menu with the cursor arrows ⇩ ⇑ ⇩ ⇓. The following script will appear by pushing the key
⇩ → **ENTER**

>**2. Advance <**

By pushing the ⇩ → **ENTER** button display will show:

Advance aa AA

Where **aa** is the existing adjustment value, **AA** is the newly required adjustment value and is blinking.

Adjustment of the required advance operation time of the burner's feeder of the automatic solid fuel boiler can be controlled with cursor arrows ⇩ ⇑ ⇩ ⇓. This feature of the control unit is of use in case of boilers with two-stage solution of transport routes of fuel. The advance time determines the period of time in which the burner's feeder F2 will start working before the feeder F1. This feature of regulator facilitates passage of fuel and maintains transport routes without fuel. This has effect on safe operation of the boiler and prevents from blazing the fuel in the transport routes.

⇩ ⇑   - increases the required advance time of the feeder in steps of +1s
⇩ ⇓   - reduces the required advance time of the feeder in steps of -1s
We will confirm the newly adjusted value by pushing the key ⇩ → **ENTER**. The value **AA** will stop blinking and is stored in the working register for operation in the automatic mode of the boiler. The values of **aa** and **AA** are identical now.
The value **AA** will get blinking again by pusching the key ⇩ → **ENTER** and may be changed.
Return to the main menu will be performed by pushing the key ⇩ ∩**ESC**.

The value **AA** has been accepted for further use, provided the new value has been confirmed with the key ⇩ → **ENTER** (the value **AA** is not blinking). If the value **AA** is blinking, it will not be accepted when we return back to the MAIN MENU and the original setting value **aa** will still be used.

📖 *Note*: The range of values **AA** is determined within the interval of {0, xx}s where xx has to be a value less than the sum of the values: feeder off - feeder on + advance. The software checks this value and will not allow its adjustment outside the above mentioned range

📖 *Note*: The adjusted value of advance is in force for all programs.

9.4.3   Menu 11.3_Run-in

Determines a period of time by which the feeder F2 (burner's feeder) will stop operating sooner than the feeder F1. The fuel is safely slid out into the burner. The run-in is significant to ensure fire safety of the boiler.

MENU 10. 3. Run-in will appear on the display unit after the menu -SERVICE- has been entered and after adjustment to this¨menu with the cursor arrows ⎕ ⇧ ⎕ ⇩. The following script will appear by pushing the key
⎕ → **ENTER**

>3. Run-in <

By pushing the ⎕ → **ENTER** button display will show:

Run-in rr RR

where **rr** is the existing adjustment value, **RR** is the newly required adjustment value and is blinking.
The required time of after-run of the burner's feeder F2 of the automatic solid fuel boiler can be controlled with the cursor arrows⎕ ⇧ ⎕ ⇩ . This feature of the control unit is of use in case of boilers with two-stage solution of transport routes of fuel. The run-in time determines the period of time in which the burner's feeder is in operation longer time then the primary feeder F1. This feature of regulator facilitates passage of fuel and maintains transport routes without fuel. This has effect on safe operation of the boiler and prevents from blazing the fuel in the transport routes

The adjustment procedure is the same as that in the previous chapter.

📖 *Note:* The range of values **RR** is determined within the interval of {0, xx}s where xx has to be a value less than the sum of the values: feeder off - feeder on + run-in. The software checks this value and will not allow its adjustment outside the above mentioned range.
📖 *Note:* The adjusted value of run-in is in force for all programs.

9.4.4   Menu 11.4_Standby

Is an operating condition of the boiler when there is no requirement to deliver heat energy. See chapter 8. Automatic operation.

MENU 11.4 Standby Time will appear on the display unit after the menu -SERVICE- has been entered and after adjustment to this menu with the cursor arrows ⎕⇧ ⎕⇩ .

>4.StandbyTime<

By pushing the ⎕ → **ENTER** button display will show:

tmax [min] uu UU
Fuel 1

where **uu** is the existing adjustment value, **UU** is the newly required adjustment value and is blinking.

Adjustment of the required standby time of the automatic solid fuel boiler can be controlled by cursor arrows ⎕ ⇧ ⇩ The standby period determines the period of time when the automatic boiler is not burning actively. This mode makes it possible to keep the automatic solid fuel boiler in the standby state under minimum costs and fuel consumption. Only minimum quantity of burning fuel is kept in the burner space and full operation of the boiler can be restored at any time, if necessary. If the adjusted standby period is exceeded, the boiler will restore automatic operation for a period of 2 minutes and will then enter the standby state again.

📖 *Note:* The range of UU values has been determined by the producer within an interval of {20, 70}minutes.
📖 *Note:* The adjusted value of standby is in force for all programs.

9.4.5   Menu 11.5_Firing parameters

Adjusts parameters for automatic mode of boiler ignition. Time parameters adjusted in this program have to ensure reliable ignition when the boiler is started cold.

MENU 11.5 Firing param. will appear on the display unit after the menu -SERVICE- has been entered and after adjustment to this menu with the cursor arrows ⎕⇧ ⎕⇩.

> 5. Firing param <

9.4.5.1   Menu 11.5.1_ Red-hot time

By pushing ⎕ → **ENTER** key we will go to menu.

> 1. Red-hot time <
Fuel 1

By pushing the key ⮌ → **ENTER** to enter selection of the time value for red-hot time (operation time of the heating coil).

📖 ***Important note****:* Time of the fiiring is given by selected fuel. Select the fule in Menu 10. Time of the firing is specific to a selected fuel there could be big differences.

Heat [min] zzz ZZZ
Fuel 1

where **zzz** is the existing adjustment value, **ZZZ** is the newly required adjustment value and is blinking.

The required lower value to preheat preheating coils can be adjusted with the cursor arrows ⮌ ⇑ ⇓.
⮌ ⇑   - increases the required red-hot time in steps of +1min
⮌ ⇓   - reduces the required red-hot time in steps of - 1min
We will confirm the newly adjusted value by pushing the key ⮌ → **ENTER***.* The value **ZZZ** will stop blinking and is stored in the memory for boiler operation in the automatic mode of the boiler. The values of **zzz** and **ZZZ** are identical now.

The value **ZZZ** will get blinking again by pushing the key ⮌ → **ENTER** and may be changed.

By pushing ⮌ ∩ **ESC** key to return back to the menu >1. Red-hot time <. The value ZZZ is accepted for further use, provided the new value has been confirmed by the key ⮌ → **ENTER***.* (the value ZZZ is not blinking).

If the value ZZZ is blinking, it will not be accepted when we return back to the MAIN MENU and the original setting value zzz will still be used.

9.4.5.2   Menu 11.5.2_Feed time

By using cursor arrows ⮌⇑ ⮌⇓ we go to menu

>2. Feed time <
Fuel 1

By pushing ⮌ → **ENTER** key to enter the adjustment of the operation time of the feeders F1 and F2. Thus we ensure delivery of optimum quantity of fuel into the burner boiler for ignition.
📖 ***Important note****:* The feeding time are to a specific fuel. Select the fuel in Menu 10. Feed time is needed for each fuel different and it can be a big difference.

Feed. [sec] pp PP
Fuel 1

Adjustment of the operation time of the feeders F1 and F2 is performed in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL, AUTO, MODX** by repeated pushing the key ⮌ ∩ **ESC** or it is possible to continue with the cursor arrows∩ **ESC** in selection of the next menu after pushing the key ⮌ ⇑ ⇓ .

📖 ***Note***: Operation of the feeder F2 is smooth, operation of the feeder 1 has the following rhythm: 10 seconds on, 10 seconds off. This will achieve easier operation of the feeder F2. The operation of the feeder F2 exceeds by 15 seconds that of the feeder F1 in order to clear the transport route from fuel.

9.4.5.3   Menu 11.5.3_Fan

We enter this menu by pushing the ⮌ ⇑ ⮌⇓ arrows.

> 3. Fan on/off<
Fuel 1

In the automatic ignition mode we switch to shutting the main fan ON or OFF by pushing the ⮌ → **ENTER** button.

Fan on/off
Fuel 1 OFF

Select the desired fan mode – ON or OFF – by pushing the ⮌ → **ENTER** button again.
Return to Menu 11.5.3 by pushing the ⮌ ∩**ESC** button.

9.4.5.4   Menu 11.5.4_Fan revolutions

We enter the menu by pushing the ⮌ ⇑ ⮌⇓ arrows.

> 4. Fan revol. <
Fuel 1

In the automatic ignition mode we switch to fan revolution setting by pushing the ⮌ → **ENTER** button.

📖 ***Important note:*** Fan revolutions are set for a particular fuel type. First we select the fuel in Menu 10. Fan revolutions and the consequent needed air volume may be different for different fuel types.

Fan [%] vv VV
Fuel 1

Needed air volume setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬚ ∩**ESC** button or you can continue in your menu selection with the ⬚ ⇑ ⬚⇓ arrows.

9.4.5.5   Menu 11.5.5_Flue fan

We enter the menu by pushing the ⬚ ⇑ ⬚⇓ arrows

> 5. FlueF.on/off <
Fuel 1

Select the desired flue fan mode – ON or OFF – by pushing the ⬚ → **ENTER** button in the automatic ignition mode.

>Flue Fan on/off<
Fuel 1 OFF

Select the desired fan mode – ON or OFF – by pushing the ⬚ → **ENTER** button again.

Return to Menu 11.5.5 by pushing the ⬚ ∩**ESC** button.

9.4.5.6   Menu 11.5.6_Flue fan revolutions

We enter the menu by pushing the ⬚ ⇑ ⬚⇓ arrows.

> 6. Fl. F. revol. <
Fuel 1

Select the desired flue fan revolution mode by pushing the ⬚ → **ENTER** button in the automatic ignition mode.

📖 ***Important note:*** Fan revolutions are set for a particular fuel type. First we select the fuel in Menu 10. Fan revolutions and the consequent needed air volume may be different for different fuel types.

Fl. F. [%] vv VV
Fuel 1

Needed air volume setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬚ ∩**ESC** button or you can continue in your menu selection with the ⬚ ⇑ ⬚⇓ arrows.

9.4.5.7   Menu 11.5.7_Flare time

We enter the menu by pushing the ⬚ ⇑ ⬚⇓ arrows.

>7. Flare time <
Fuel 1

By pushing ⬚ → **ENTER** button we will enter adjustment of the period in minutes the fuel in the burner boiler has to be provided with in order to burn through well. The fuel has to burn on the whole surface of the boiler for further automatic operation.

📖 ***Important note:*** The flare time is given for the specific fuel. Fuel can be selected in Menu 10. Plare time can be different dipends of fuel type.

Flare [min] rr RR
Fuel 1

Adjustment of the burning up period of the automatic boiler is done in the same procedure as mentioned above in this chapter.

📖 ***Note:*** The adjusted time period to get the boiler burning will be repeated twice. After the adjusted time interval RR elapses, the boiler will add more fuel shortly (5 s) and another RR interval will follow

📖 ***Note:*** If modulation of the boiler output is allowed, the boiler will start heating on the starting program adjusted in the modulation menu (chapter 9.4.12.1. MENU 11.12.1) after the program routine of automatic ignition is finished.

📖 ***Important:*** Adjustment of parameters for electric ignition is partially dependent on the fuel used. The service engineer responsible for correct adjustment of these parameters is obliged to test the equipment for

functionality repeatedly. The demands for time result from the need to start the boiler from the state of being completely burnt out and cold.

9.4.5.8   Menu 11.5.8_Reference temperature

We enter the menu by pushing the ⬚ ⇑ ⬚⇓ arrows.

>8. Ref. Temper. <

By pushing key ⬚ → **ENTER** to enter adjustment of the **ΔT** value for reference temperature in ∘C by which the temperature of burnt gas has to be higher than that of the boiler water.

RTemp.[oC] kk KK

(Range: KK 0-99, typically 15°C)
Adjustment of the boiler water temperature increase is performed in the same procedure as mentioned above in this chapter.

🕮 **Note:** The electric ignition program routine is completed with a 3-minute interval in which the boiler heats at the output level corresponding to the starting program after the MODULATION mode has been initiated.v Menu 11.5.10

Having this interval been finished, the boiler enters the mode AUTO, AUTOx or SW Tank.
The control unit is evaluating at this moment whether the temperature of burnt gas is higher than that of water by the **Δt** value **(= temperature of burnt gas - temperature of water)**. This value is adjusted to 15_oC by the producer.

If the temperature of burnt gas is higher than the adjusted value **Δt** – **Reference temperature**, the boiler will resume its operation.

If the value is lower than **Δt** – **Reference temperature,** the control unit will make another attempt to ignite without supply of new fuel, the ignition course will then again be evaluated via another measurement.

If the value Δt – Reference temperature is exceeded, the boiler will resume its operation; if the value is lower or equal, the control unit will stop operation of the boiler and the following script will appear on the display unit **STOP-no ignition.**

9.4.5.9   Menu 11.5.9_Check burnt gas

We enter the menu by pushing the ⬚ ⇑ ⬚⇓ arrows.

>9. Check burnt <

By pushing   ⬚ → **ENTER** button to enter the time lag in minutes after which the control unit will carry out comparison between the boiler water temperature and that of burnt gas.

Check T[min] tt TT

(Range: TT 0-99)

The time lag is adjusted in the same procedure as mentioned above in this chapter.

🕮 **Note:** When the boiler is leaving the STADBY state:
The value of **Δt - Reference temperature** is always assessed after the boiler leaves the STANDBY state for the mode AUTO, AUTOx under the working modes of MODULATION or SW Tank at the previously programmed instant of time.
If the **Δt - Reference temperature** is exceeded, the boiler resumes its operation; if the value is lower than or equal to **Δt - Reference temperature**, the control unit will stop operation of the boiler and the script **STOP-no ignition** will appear on the display unit.

🕮 **Note:** Measurement of burnt gas temperature is only in operation, if the reference temperature is adjusted to > 0 (MENU 11.5.8.) If the reference temperature is adjusted to 0, the check programs are put out of operation (switched off).

🕮 **Important:** Neither the user not the operator are allowed to have access to this menu and they may not change the parameters adjusted.

9.4.6 Menu 11.6_Pump on temp

Will determine the boiler water temperature at which the circulation pump of the system will start working.

MENU 11.6 Pump on temp will appear on the display unit after the PIN for the menu -SERVICE- has been correctly entered and after adjustment to this menu with the cursor arrows⌷ ⇑⇓ .

> 6. Pump on Temp <

By pushing ⌷ → **ENTER** button to select this menu and the following script will appear

T.[°C] pump cc CC

Where **cc** is the existing adjustment value, **CC** is the newly required adjustment value and is blinking.

The current temperature of the output water which will turn the circulation pump on can be changed with the cursor arrows ⌷ ⇑⇓ .

📖 *Note:* The minimum and maximum CC values are limited by the producer.
📖 *Note:* The value ofthe pump temperature is set by manufacturer to 55°CH.
📖 *Note:* Run-up of the pump from a temperature higher than the so-called condensation temperature (approximately 55$_o$C) has a significant effect on the service life of boilers.

9.4.7 Menu 11.7_SW Tank pump on

Will determine the boiler water temperature at which the circulation pump to heat the hot service water will start working.

MENU 11.7 SWTank pump on will appear on the display unit after the PIN for the menu -SERVICE- has been correctly entered and after adjustment to this menu with the cursor arrows⌷ ⇑ ⇓ .

>7. SWT pump on <

By pushing the button ⌷ → **ENTER** to select this menu and the following script will appear

T[°C]cer cc CC

Where **cc** is the existing adjustment value, **CC** is the newly required adjustment value and is blinking.
The current temperature of the output water which will turn the SW Tank pump on can be changed with the cursor arrows ⌷ ⇑ ⇓ .

📖 *Note:* The minimum and maximum CC values are limited by the producer.

📖 *Note:* The recommended temperature to switch the SW Tank pump in is 60$_o$C. Hot service water is predominantly heated up to this temperature. If the pump is switched in at lower temperature, the water heated in the heater will be cooled down through the boiler.

9.4.8 Menu 11.8_Pin change

The service engineer may use his/her own PIN in case of a particular boiler. Thus he/she is sure that the operating parameters adjusted by him/her will not be changed by the user.

MENU 11.8 PIN Change will appear on the display unit after the PIN for the menu -SERVICE- has been correctly entered and after adjustment to this menu with the cursor arrows ⌷ ⇑⇓ .

> 8. PIN Change <

By pushing the button ⌷ → **ENTER** to select this menu and the following script will appear

New PIN : 0* **

0 is blinking at the same time.

The PIN user number (code combination) which enables access to the service menu is determined by the cursor arrows ⌷ ⇐⇑⇒⇓ The adjusted PIN value is confirmed by pushing the key ⌷ → **ENTER**.

The following script will appear on the display unit

PIN check : 0* **

0 is blinking at the same time.

The operator has to enter identical PIN again. The adjusted PIN value is confirmed by pushing the key ⌷ → **ENTER**. again

The PIN will be compared with the previously entered PIN and if both of them are identical, the new PIN value will be accepted and the following script will shortly appear on the alphanumeric display unit

- PIN O.K.!! -

If the key ⬚ ∩ **ESC** is depressed before the first or second confirmation of PIN, this PIN will not be accepted and return back to the main menu will be performed. The original PIN will remain in force

📖 *Note:* The service PIN is set by manufacturer.

📖 *Note:* If the PIN has been changed by the user, this code has to be stored well. If the PIN is lost, an intervention of the producer's employee is necessary.

📖 *Note:* The PIN may contain digits 0-9, lower case letters from the a-z alphabet and upper case letters from the A-Z alphabet. It is not possible to break through via the trial-and-error method a PIN entered by means of this combination.

9.4.9 Menu 11.9_Setup Fans

The producer or the service engineer will adjust in this menu the type of the fan used. The user does not work with this parameter.

MENU 11.9 Select Fan will appear on the display unit after the PIN for the Producer menu has been correctly entered

> **> 9. Setup Fan <**

By pushing key ⬚ → **ENTER** we will got to menu

9.4.9.1 Menu 11.9.1_SELECT FAN

The following script will appear on dispay

> **> 1. Select Fan <**

By pressing key ⬚ → **ENTER** the following script will shortly appear

> **Type 1 (ES 30-98)**

This menu may be changed into a different type with cursor arrows ⬚ ⇑⇓.

The producer may deliver one of the following types of fans:

Type1	**(ES 30-98)**	Manufacturer REGULUS
Type2	**(ES**-108)**	Manufacturer REGULUS
Type3	**(RGL – 97)**	Manufacturer EBM – Papst
Type4	**(G2E120)**	Manufacturer EBM – Papst
Type5	**(RG14S)**	Manufacturer ZIEL ABEGG
Type6	**(RG12S)**	Manufacturer ZIEL ABEGG

The selected mode in which the fan will be used by the control unit will be confirmed by pushing the key ⬚ → **ENTER**. The following script will appear shortly on the display unit

Control unit will than return to menu > 1.Type main.fan.<

📖 *Important:* Selection of the correct type of fan is important for harmony of the adjusted air quantity on the display unit with the real rotations of the fan. If a wrong type has been selected, this dependence is not linear and may result in incorrect aeration and thus in wrong operation of the boiler in course of burning

📖 *Note:* Check of the correct selection of fan can also be done by listening. Change the rotations of fan by 10 % (see chapter 5) in the manual operation and check whether the adjustment of the control unit is changed linearly. If the type of fan has been adjusted incorrectly, step change of rotations appears at certain adjustment.

9.4.9.2 Menu 11.9.2_Flue fan type

In this menu the manufacturer or the service technician will set the flue fan type being used.

MENU 11.9.2 – Flue fan type will show on the display by using the ⬚ ⇑ ⬚⇓ arrows. We enter the menu by pushing the ⬚ → **ENTER** button.

> **> 1. Select Fl. F. <**

After pushing the ⬚ → **ENTER** button the display will show the currently selected flue fan type.

> **Type 1 (R2E150)**

We can switch to different type by pushing ⬚ ⇑ ⬚⇓ arrows.

The manufacturer uses these fans for boilers of the KPx2 model line:

Type7	**(R2E150)**	manufacturer EBM PAPST
Type8	**(R2E180)**	manufacturer EBM PAPST
Type9	**(R2E210)**	manufacturer EBM PAPST

Confirm the selected flue fan type by pushing the ⎕ → **ENTER** button. The display will briefly show the selected fan type.

The control unit will return to menu item > 2. Flue fan type <.

9.4.10   Menu 11.10_Boiler output

Data on the rated output of the boiler as well as parameters of fuel feeders are entered in this menu. Values entered in this way are used by the control unit to calculate the momentary output of the boiler for a particular adjustment of operation of feeders and will display these data upon the operator's request. These set values will not effect on actual boiler power output. Even with wrong set up boiler will work in correct power set in menu 11.1 Program.

MENU 11.10 Boiler output will appear on the display unit after the PIN for the Producer menu has been correctly entered and after adjustment to this menu has been done by cursor arrows ⎕ ⇑ ⇓ .

>10. Boiler out.<

By pushing key ⎕ → **ENTER** to enter the adjustment of rated output of the boiler the control unit is used for.

>1. Output [kW] <

Enter the adjustment of rated output of the boiler by pushssing the key ⎕ → **ENTER**

Output [kW] xx XX

where **xx** is the existing adjustment value, **XX** is the newly required adjustment value and is blinking.

The new value of rated output of the boiler is adjusted with the cursor arrows ⎕ ⇐ ⇑ ⇒ ⇓.

Confirm the newly adjusted value by pushing the key ⎕ → **ENTER**. The value **XX** will stop blinking and will be saved in the memory boiler operation in the automatic mode. The values **xx** and **XX** are identical now. The **XX** value starts blinking by repeated pushing the key ⎕ → **ENTE**R and may be changed. Depress the key ⎕ ∩ ESC to return to the menu *>1. Power (kW)< .*

The value **XX** has been accepted for further use, provided the new value has been confirmed with the key ⎕ → **ENTER.** (the value **XX** is not blinking). If the value **XX** is blinking, it will not be accepted after the return to the MAIN MENU and he original adjustment value **xx** will still be used.

We will enter the following menu by means of the cursor arrows ⎕ ⇑ ⇓

>2. K1 [mg/sec] <
Fuel 1

Enter the adjustment of the F1 feeder's factor by pushing the key ⎕ → **ENTER** This factor gives the average dose of fuel delivered into the boiler for 1 second.

K1 xxxx XXXX
Fuel 1

The factor is adjusted with cursor arrows in usual way.
We will return back to the mode **MANUAL, AUTOX, MODX** or **SW TANK** by repeated pushing the key ⎕ ∩ **ESC**.

📖 *Important note:* constant feeder setting for the type of fuel. Fuel choose in advance in Menu 10 Constant feeders reflects both the amount of fuel (dose for 1 sec) but also the calorific value of fuel used.

📖 *Note:* Entered values of the boiler output and factor of the feeder F1 are used by the control unit to calculate the output indirectly. The value stated is only for information and depends on the precision of fuel dosing.

📖 *Note:* Conversion of output is always carried out after a change of fuel dosing or after the RESET of the control unit.

📖 *Note:*
 Constant values of the feeder F1 for some types of feeders:

screw D38mm	gear 1:56	K1 = 0700	wood pellets
screw D56mm	gear 1:56	K1 = 1340	wood pellets

It is possible then to ascertain easily the constant K1 by weighing a defined quantity of doses of fuel converted to 1 second. The factor K1 should be modified as per the following formulation, if a fuel the caloric value of which substantially differs from that of wood pellets is used:

$$K1_{upr} = K1 * xx \text{ MJ} / 17 \text{ MJ}$$

where xx is caloric value of fuel in MJ, caloric value of wood is 17 MJ.
Enter the value K1$_{upr}$ into the control unit.

9.4.11   Menu 11.11_Equithermal regulation

Equithermal regulation is an automatic boiler operation mode, which allows heating water of defined temperature to enter the heating system. The heating water temperature depends on the outside temperature and the heat properties of the heated building. The control unit automatically changes the immediate boiler output between 10 output levels in order to match the requirements of the heating system in the best possible way. The program automatically uses output values preset in programs 1 – 10 in order to minimize frequency of undesirable stand-by modes. This is a similar mode to output modulation. Important role is assumed by the servomotor.

The boiler water temperature value at which the boiler switches to the STAND-BY mode is flexible and is by 15ºC higher than the required heating water equithermal temperature. The low value is limited to 60ºC.

📖 ***Important note:*** Some parameters for the modulation mode are set for the given fuel type. Fuel is selected beforehand in Menu 10.

MENU 11.11_Modulation will appeared on the display after correctly entering PIN in the service menu and setting by using ⬜ ⇑ ⬜⇓ arrows.

> **>11.EQT. regul.<**

After pushing the ⬜ → **ENTER** button a short message will appear:

> **-EQT.regulation-**

We enter the program settings the boiler will use for heating after modulation start.

9.4.11.1   Menu 11.11.1_Start program

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> **> 1. Start. Progr. <**
> **Fuel 1**

Select the program the boiler will start heating after modulation activation by pushing the ⬜ → **ENTER** button.

> **Start progr. nn NN**
> **Fuel 1**

Set the new start program number valid after confirmation by pushing the ⬜ ⇐ ⇑ ⇒ ⇓ arrows.

Confirm the newly selected parameter by pushing the ⬜ → **ENTER** button. The value **NN** will stop flashing and will be saved in the boiler memory for automatic mode operation. Values **nn** and **NN** are now identical. By pushing the ⬜ → **ENTER** button again the **NN** value starts flashing again and can be changed. By pushing ⬜ ∩**ESC** button you can return to the main menu. The **NN** is accepted for further use, if the new value is confirmed by the ⬜ → **ENTER** button (the **NN** value is not flashing). If the **NN** value is flashing, it will not be accepted after return to the main menu and the original value **nn** will be used instead.

9.4.11.2   Menu 11. 11.2_Lower gradient

The lower temperature gradient is the required minimum temperature increase in a monitored time interval. If the increase is lower, the boiler will automatically increase its output in the next time interval.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> **> 2. Gradient low <**

Select the lower temperature gradient setting by pushing the ⬜ → **ENTER** button.

> **Grad. low gg GG**

Lower temperature gradient setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬜ ∩**ESC** button or you can continue in your menu selection with the ⬜ ⇑ ⬜⇓ arrows.

9.4.11.3   Menu 11.11.3_Upper gradient

The upper temperature gradient is the required minimum temperature increase in a monitored time interval. If the increase is upper., the boiler will automatically decrease its output in the next time interval.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> **> 3. Gradient upp<**

Select the upper temperature gradient setting by pushing the ⬜ → **ENTER** button.

> **Upper grad. hh HH**

Upper temperature gradient setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬜ ∩**ESC** button or you can continue in your menu selection with the ⬜ ⇑ ⬜⇓ arrows.

9.4.11.4   Menu 11.11.4_Range I

This is the first range near the calculated water temperature, at which the boiler would automatically switch to the STAND-BY mode. When the boiler reaches this range (temperature), the boiler will automatically decrease its output by one degree.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> 4. Zone I.<

Select the first temperature difference from the set output boiler water temperature, at which the boiler will automatically change its output, by pushing the ⬜ → **ENTER** button.

Zone I. pp PP

First temperature difference setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬜ ∩**ESC** button or you can continue in your menu selection with the ⬜ ⇑ ⬜⇓ arrows.

9.4.11.5   Menu 11.11.5_Range II

This is the second range near the calculated water temperature, at which the boiler would the automatically switch to the STAND-BY mode. When the boiler reaches this range (temperature), the boiler will automatically decrease its output by another output degree.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> 5. Zone II. <

Select the second temperature difference from the set output boiler water temperature, at which the boiler will automatically change its output, by pushing the ⬜ → **ENTER** button.

Zone II. pp PP

Second temperature difference setting is done the same way as above in this chapter.

Return to **MANUAL** mode by repeatedly pushing the ⬜ ∩**ESC** button or you can continue in your menu selection with the ⬜ ⇑ ⬜⇓ arrows.

9.4.11.6   Menu 11.11.6_Regulation period

The regulation period is the boiler activity time interval in the EQTx mode, in which water temperature increase or decrease is monitored and their immediate relation to the values of the lower gradient (Menu 11.12.2) and the upper gradient (Menu 11.12.3) is assessed.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> 6. Regul.period<

Select the period setting in minutes by pushing the ⬜ → **ENTER** button. The control unit uses this period for evaluation of preset and current parameters and performs a regulatory interference if needed.

R. per. [min] rr RR

Regulation period setting is done the same way as above in this chapter.

Return to the **MANUAL** mode by repeatedly pushing the ⬜ ∩**ESC** button or you can continue in your menu selection with the ⬜ ⇑ ⬜⇓ arrows.

📖 *Note:* The principle of the boiler operation in the equithermal mode should by easy to see in the attached chart.

📖 **Important note:** If we change the regulation period (for instance in small or very large heating systems), it is necessary to change also the temperature gradient values in a proper ratio in order to maintain regulation dynamics.
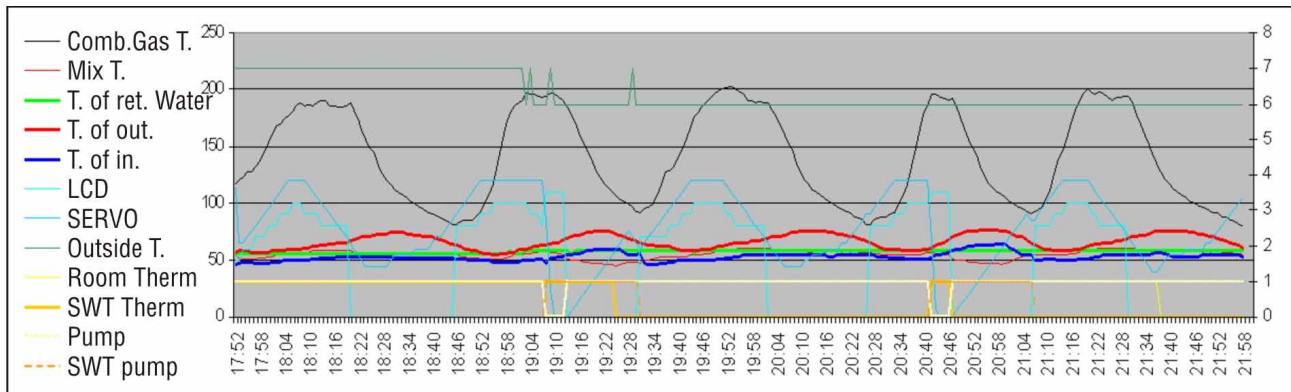
9.4.12   Menu 11.12_Modulation

Power output modulation is an automatic mode of the boiler in which the control unit changes the power output as well as the other operating parameters automatically as per the existing need for temperature in the building. The goal of this operating mode is to reach a balance between the heat requirement of the building and the amount of heat manufactured by the boiler.

The program uses automatically the power output values set up in memories 1 - 10 so that the frequency of undesirable Standby states.

📖 **Important note:** Some parameters is set for the specific fuel type for the mode modulation. The fuel is selected up front in menu 10.

MENU 11.12 Modulation will appear on the display unit after the PIN for the Producer menu has been correctly entered and after set uo to this menu has been done by cursor arrows⬛ ⇑⇓ .

>12.Modulation <

After pushing the ⬛ → **ENTER** button a short message will appear:

-Modulation output-

return to set the program, on which the boiler will start to heat after starting the moduation.

9.4.12.1   Menu 11.12.1_Starting program

We enter the menu of starting program by pushing the ⬛ ⇑ ⬛⇓ arrows.

>1. Start.progr.<
Fuel 1

By pushing key   ⬛ → **ENTER** we will enter set up of the program where the boiler starts heating after the modulation has been turned on.

Start. prg. nn NN
Fuel 1

Using the cursor arrows ⬛ ⇐ ⇑ ⇒ ⇓ determine the new number of the starting program which will be in force after it has been confirmed.

Confirm the newly set up value by pushing the key ⬛ → **ENTER**. The value **NN** will stop blinking and will be saved in the memory for boiler operation in the automatic mode. The values **nn** and **NN** are identical now. The value **NN** will start blinking again by repeated pushing the key⬛ → **ENTER** and may be changed. Return back to the menu >1. Start.progr.< by pushing the key⬛ ∩ **ESC** The value **NN** has been accepted for further use, provided the new value has been confirmed with the key⬛ → **ENTER**. (the value **NN** is not blinking). If the value **NN** is blinking, it will not be accepted after the return to the MAIN MENU and the original set up value **nn** will still be used.

9.4.12.2   Menu 11. 12.2_Lower gradient

Lower temperature gradient is requered minimum grow of the temperature in monitored time passage. If the grow is lower, the boiler will aoutomatically raise its power output for the next time passage of operation.

We enter the menu by pushing the ⇧ ⇩ arrows.

<div align="right">**>2. Gradient low <**</div>

By pushing key   → **ENTER** we will enter set up of the lower heat gradient program.

<div align="right">**Grad. low. gg GG**</div>

Lower temperature gradient adjustment will be carried out in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL** by repeated pushing the key ∩ **ESC** or it is possible to continue with the cursor arrows ∩ **ESC** in selection of the next menu after pushing the key ⇧⇩.

9.4.12.3   Menu 11.12.3_Upper gradient

 Upper temperature gradient is requered maximum grow of the temperature in monitored time passage. If the grow is higher, the boiler will aoutomatically lower its power output for the next time passage of operation.

We enter the menu by pushing the ⇧ ⇩ arrows.

<div align="right">**>3. Gradient upp <**</div>

By pushing key   → **ENTER** we will enter set up of the upper heat gradient program.

<div align="right">**Upper grad. hh HH**</div>

Upper temperature gradient adjustment will be carried out in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL** by repeated pushing the key ∩ **ESC** or it is possible to continue with the cursor arrows ∩ **ESC** in selection of the next menu after pushing the key ⇧⇩.

9.4.12.4   Menu 11.12.4_Zone I

The first approach zone to set the water temperature Menu 2 is the value of water temperature at which the boiler automatically reduces power by one degree.

We enter the menu by pushing the ⇧ ⇩ arrows.

<div align="right">**>4. Zone I.<**</div>

By pushing key   → **ENTER** we will enter the set up of the first temperature deviation from the set up temperature of the output water in the boiler at which the power output of the boiler will be changed automatically.

<div align="right">**Zone I. pp PP**</div>

Adjustment of the first temperature deviation shall be carried out in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL** by repeated pushing the key ∩ **ESC** or it is possible to continue with the cursor arrows ∩ **ESC** in selection of the next menu after pushing the key ⇧⇩ .

9.4.12.5   Menu 11.12.5_Zone II

The second approach zone to set the water temperature Menu 2 is the value of water temperature at which the boiler automatically reduces power by one degree.

We enter the menu by pushing the ⇧ ⇩ arrows.

<div align="right">**>5. Zone II.<**</div>

By pushing key → **ENTER** we will enter the adjustment of the second temperature deviation from the adjusted temperature of the output water in the boiler at which the power output of the boiler will be changed automatically.

<div align="right">**Zone II. pp PP**</div>

Adjustment of the second temperature deviation shall be carried out in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL** by repeated pushing the key ∩ **ESC** or it is possible to continue with the cursor arrows ∩ **ESC** in selection of the next menu after pushing the key ⇧⇩ .

9.4.12.6   Menu 11.12.6_Regulation period

Regulation periond is boiler time frame in the mode MODx, which monitors the increase or decrease water temperature and its immediate relationship to the value of the lower gradient (menu 11.12.2), the upper gradient (menu 11.12.3)

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

>6. Regul. period <

By pushing key ⬜ → **ENTER** we enter setup period in minutes. With this period control unit is evaluating set parameters and those which were achieved and it does a possible regulation intervention

R. per. [min] rr RR

The regulation period set up shall be performed in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL** by repeated by pushing the key ⬜ ∩ **ESC** or it is possible to continue with the cursor arrows ⬜ ∩ **ESC** in selection of the next menu after pushing the key ⬜ ⇑⇓ .

📖 *Note:* The principle of the operation of the boiler in the modulation mode is obvious from the attached diagram on the picture no. 50

📖 *Important:* If we change the regulation period (for example: in case of small heating systems or, on the contrary, in case of large ones), it is also necessary to change the values of temperature gradients in order to preserve the regulation dynamics.

9.4.13   Menu 11.13_Sweeping, cleaning

9.4.13.1   Menu 11.13.1_ Burner cleaning

This menu is not used for operation of KPx2 model line boilers. The function must remain OFF during the whole operation time!

9.4.13.2   Menu 11.13.2_Ash

The program of this Menu provides automatic ash take-out from the burning chamber into external ash container. The ash volume depends on the type of used fuel, on the boiler output and the heating time period. Therefore the activation of the outfeed spiral scroll is directly tied to the number of Nr. 1 feeder cycles.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> 2. Ash <
Fuel 1

When you push the ⬜ → **ENTER** button

- Ash removal –

We will enter the Menu, in which we either allow or prohibit the ash removal function.

> 1. ON/OFF <
Fuel 1

By pushing the ⬜ → **ENTER** button we enter the ON/OFF switch for ash removal.

> Ash OFF<
Fuel 1

By repeatedly pushing the ⬜ → **ENTER** button we will select the desired ON/OFF mode. By pushing the ⬜ ∩**ESC** button we return to Menu 11.13.2.

We enter the menu by pushing the ⬜ ⇑ ⬜⇓ arrows.

> 2. No. of cycles<
Fuel 1

Here we set the number of Nr. 1 feeder cycles, after which ash removal will commence. The outfeed spiral screw will operate for a period defined in the following menu:

> 3. Removal Time<
Fuel 1

Select this menu by pushing the ⬜ → **ENTER** button and this message will appear:

Time [min] cc CC
Fuel 1

By pushing the ☐ → **ENTER** button again we switch to the time period setting of the outfeed spiral screw. The time is set in minutes.
cc is the current value, **CC** is the new desired value and it is flashing.

The current time period of the ash outfeed spiral screw can by adjusted by the ☐ ⇑ ☐⇓ arrows.

9.4.13.3   Menu 11.13.3_Flue sweeping

The program of this Menu provides automatic boiler heat exchanger cleaning. The exchanger cleaning frequency depends on the type of used fuel, on the boiler output and the heating time period. Therefore the flue sweeping activation of the outfeed spiral screw is directly tied to the number of Nr. 1 feeder cycles.

We enter the menu by pushing the ☐ ⇑ ☐⇓ arrows.

> **> 3. Flue sweep <**
> **Fuel 1**

When you push the ☐ → **ENTER** button

> **- Flue sweep –**

We will enter the Menu, in which we either allow or prohibit the flue sweep function.

> **> 1. ON/OFF <**
> **Fuel 1**

By pushing the ☐ → **ENTER** button we enter the ON/OFF switch for flue sweeping.

> **> Flue sweep ON<**
> **Fuel 1**

By repeatedly pushing the ☐ → **ENTER** button we will select the desired ON/OFF mode. By pushing the ☐ ∩**ESC** button we return to Menu 11.13.3.

We enter the menu by pushing the ☐ ⇑ ☐⇓ arrows.

> **> 2. No. of cycles<**
> **Fuel 1**

Here we set the number of Nr. 1 feeder cycles, after which exchanger cleaning will commence. The outfeed spiral screw will operate for a period defined in the following menu:

> **> 3. Clean Time<**
> **Fuel 1**

Select this menu by pushing the ☐ → **ENTER** button and this message will appear:

> **Time [min] cc CC**
> **Fuel 1**

By pushing the ☐ → **ENTER** button again we switch to the time period setting of the outfeed spiral screw. The time is set in minutes.
cc is the current value, **CC** is the new desired value and it is flashing.
The current time period of the ash outfeed spiral screw can by adjusted by the ☐ ⇑ ☐⇓ arrows.
Set value confirm by pushing key ☐ → **ENTER**

Return to Menu 11.13.3 by pushing the ☐ ∩**ESC** button

We enter the menu by pushing the ☐ ⇑ ☐⇓ arrows.

> **> 4. Time per.<**

Here we set a time window, in which we allow regular flue sweeping. It is not recommended to perform flue cleaning at night because of possible noise.

Enter the time period setting function by pushing the ☐ → **ENTER** button.

> **Tim 08:00 22:00**

The desired time parameter can be set by pushing the ☐ ⇑ ☐⇓ arrows.
☐ ⇑ **-** increases the desired time parameter by +1 min
☐⇓ **-** decreases the desired time parameter by - 1 min
☐ ⇐ **-** switches to previous time value
☐ ⇒ **-** switches to following time value
Confirm the newly set value by pushing the ☐ → **ENTER** button. The time value will stop flashing and will be saved in the boiler memory for automatic mode operation.

Return to Menu 11.13.3 by pushing the ☐ ∩**ESC** button

We enter the menu by pushing the 🔲 ⇑ 🔲⇓ arrows.

> 5. Flue F. revol.<
> Fuel 1

Here we select the desired flue fan revolutions during flue cleaning. It is not recommended to perform flue sweep when the boiler is hot or when the flue fan revolutions are high. Solid burning remains could enter the environment.

By pushing the 🔲 → **ENTER** button we switch to flue fan revolutions setting in the flue sweeping process.

📖 *Important note:* Fan revolutions are set for a particular fuel type. First we select the fuel in Menu 10. Fan revolutions and the consequent needed air volume may be different for different fuel types.

> Fl. F. [%] vv VV
> Fuel 1

Needed air volume setting is done the same way as above in this chapter. The newly set value is confirmed by pushing the 🔲 → **ENTER** button..

Return to **MANUAL** mode by repeatedly pushing the 🔲 ∩**ESC** button or you can continue in your menu selection with the 🔲 ⇑ 🔲⇓ arrows.

9.4.14   Menu 11.14_Configuration

The control system E2008 offers the option of a multiple use of the inputs and outputs.

9.4.14.1   Menu 11.14.1_ Configuration K15-1

We enter the menu by pushing the 🔲 ⇑ 🔲⇓ arrows.

> 14.Config.Outp <

We enter the menu by pushing the 🔲 → **ENTER** button.

> 1. Conf. K15-1<

Here we can choose the function of this relay output

Another push of the 🔲 → **ENTER** button will display the current output function.

> 1. El. heat ON<

The next function can be selected with the 🔲 ⇑ 🔲⇓ arrows.

> 2. zone 2 pump OFF<

By pushing the 🔲 → **ENTER** button we turn the function ON.

> 2. Zone 2 pump ON<

The previous function will be turned off automatically.

📖 *Note:* If this function is selected, the name of the output in Menu 1.7 (Direct control) will be changed. It will say TO1 ON/OFF.

📖 *Note:* If this function is selected, the output function XV9B will changed. The output will perform the room thermostat PO2 function.

Return to **MANUAL** mode by repeatedly pushing the 🔲 ∩**ESC** button or you can continue in your menu selection with the 🔲 ⇑ 🔲⇓ arrows.

We switch functions by pushing the 🔲 ⇑ 🔲⇓ arrows.

> 3. Bypass pump OFF<

By pushing the 🔲 → **ENTER** button we turn the output function ON.

> 3. Bypass pump ON<

The previous function will be turned off automatically.

📖 *Note:* If this function is selected, the name of the output in Menu 1.7 (Direct control) will be changed. It will read switching pump ON/OFF.

📖 *Note:* for configutation of K17-2 follow same instruction as for K15-1 output configuration.

9.4.14.2 Menu 11.14.2_Configuration K17-2

There are the same instruction for configuration of output K 17-2 flue fan as are for K15-1

9.4.14.3 Menu 11.14.3 Diference of return

If there is a configuration of any outputs KP-15 od KP 17-2 as a shorting pump, tenperature diference set up between water output from the boiler and temperature of return affects switching of the pump. If the temperature difference will higher than the set up difference the pump will be operating.

📖 *Note:* The boiler has to be equipted with input water thermometer.

9.4.15   Menu 11.15_ Servomotor

This menu serves for servomotor operation period setting between two limits. Correct setting of this time period is necessary for the correct temperature control function of output water (equithermal regulation) and closing and opening of the servomotor.

MENU 11.15 SERVO appears on the display after entering the Service Menu. Setting is done by using the ⮺ ⇑ ⮺⇓ arrows.

> 15.SERVO <

After pushing the ⮺ → **ENTER** button the alphanumeric display will read:

SRV sss SSS

sss is the current value, **SSS** is the newly set value and it is flashing.

Confirm the newly set value by pushing the ⮺ → **ENTER** button.

9.5   MENU 12_PRODUCER

This MENU is accessible only to a manufacturer or TOP service technicians. It is safeguarded by four number PIN code.
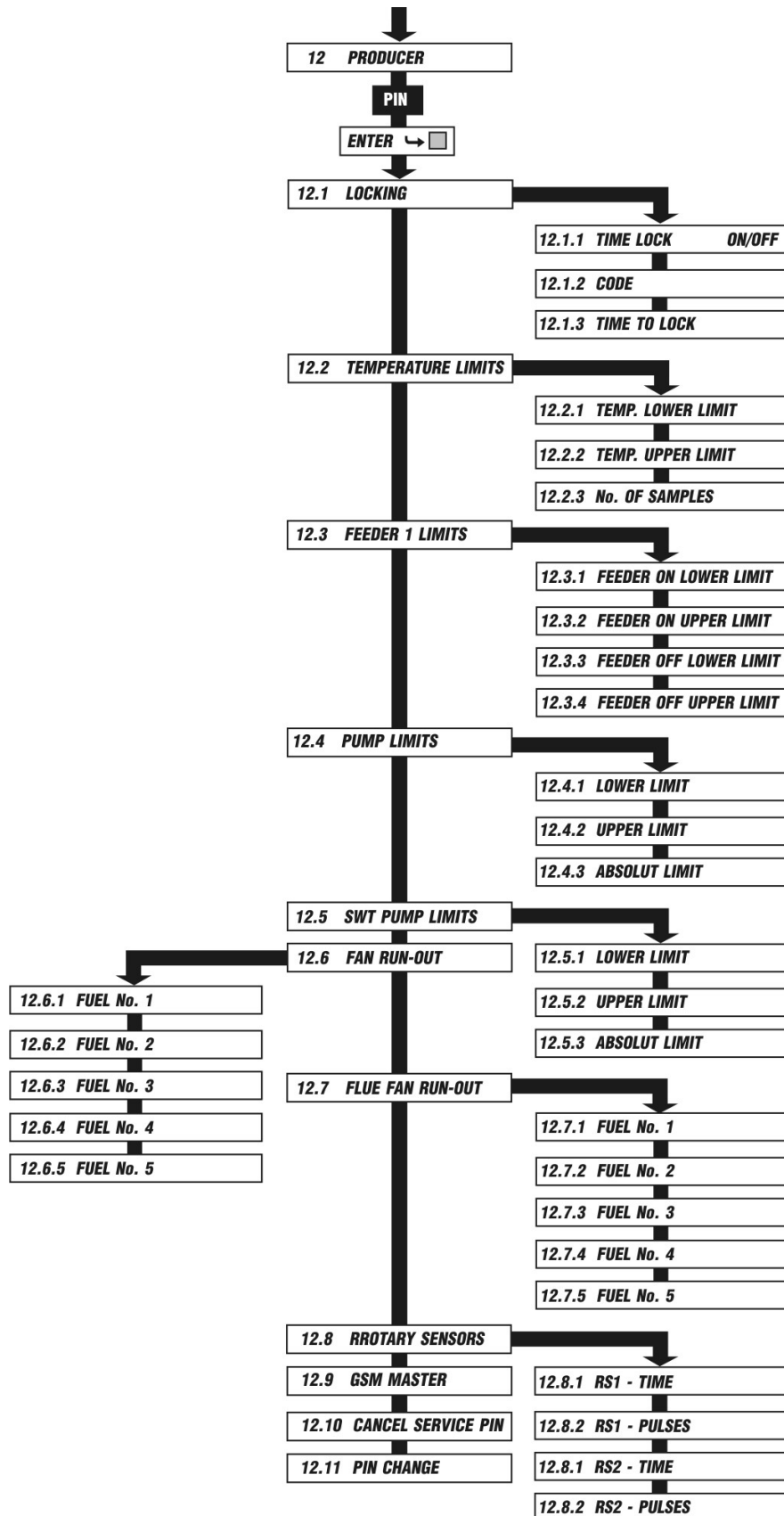
Picture 38   Operational block diagram - Producer

The producer or an authorized service engineer adjust in this Menu types of connection equipment, limits of individual parameters so that they correspond to a particular product and prevent the operator from setting parameters which might damage the product, for example, by output overload.

MENU 12 Producer will appear on the display unit after a short notification - MAIN MENU- and adjustment to this menu with the cursor arrows ⎕ ⇑ ⇓ . The following script will appear when the key ⎕ → **ENTER** is pushed

> **> 11. Producer <**

A script in the following format will appear by pushing the key ⎕ → **ENTER**:

> **Pin 0*****

The PIN producer's number (code combination) which enables access to the user menu is determined by the cursor arrows ⎕ ⇐ ⇑ ⇒ ⇓ The adjusted PIN value is confirmed by pushing the key ⎕ → **ENTER**.

If the entered PIN value is wrong, the following script will shortly appear on the alphanumeric display unit

> **- Bad PIN !!! -**
> **- Producer set up -**

The program will get back to the level

> **> 11. Producer <**

The PIN entering procedure has to be repeated.

If the entered PIN value is correct, the following script will shortly appear on the alphanumeric display unit

> **- PIN O.K. !!-**
> **- Nastaveni vyr. -**

📖 ***Note:*** The PIN may contain digits 0-9, lower-case letters from the a-z alphabet and upper-case letters from the A-Z alphabet.

9.5.1   Menu 12.1_Locking

Functions in this menu ensure time-limited operation of the boiler, if required so by the interest of the producer. If the control unit displays the Menu **14. Code entering**, the boiler is put into operation with time lock activation for a limited period of time. The time lock may be cancelled after entering a 6-point alphanumeric code (differentiates upper-case letters and lower-case letters) in the menu 14. before the adjusted period of time elapses. The control unit requires automatic entering after the period of time elapses.

9.5.2   Menu 12.2_Water temperature limits

The producer shall set up the lower and upper limit for the temperature range for operation of the boiler in this menu. The user will be allowed to change setting only in these limits in Menu 2.

MENU 12.2 Temp. limits will appear on the display unit after the PIN for the Producer menu has been correctly entered and after setting to this menu has been done by cursor arrows ⎕ ⇑⇓ .

> **> 2. Temp. limits <**

9.5.2.1   Menu 12.2.1_Temperature - lower limit

The following script will appear by pushing the key ⎕ → **ENTER**

> **> 1. Lower limit <**

By pushing key ⎕ → **ENTER** to enter the selection of the lower limit for the output water temperature.

> **T[°C] low. dd DD**

Where **dd** is the existing adjusted value, **DD** is the newly required adjustment value and is blinking.
Use the cursor arrows ⎕ ⇑⇓ to change the required value for the lower limit of the output water temperature for the automatic boiler.
Confirm the newly adjusted value by pushing the key ⎕ → **ENTER**. The value **DD** will stop blinking and will be saved in the working register for boiler operation in the automatic mode. The values **dd** and **DD** are identical now.

The **DD** value starts blinking by repeated pushing the key ⎕ → **ENTER** and may be changed. By pushing key ⎕ ∩ **ESC** to return to the menu >1. Lower limit<. The value **DD** has been accepted for further use, provided the new value has been confirmed with the key ⎕ → **ENTER**(the value **DD** is not blinking). If the value **DD** is blinking, it will not be accepted after the return to the MAIN MENU and the original set up value **dd** will still be used.

9.5.2.2   Menu 12.2.2_Temperature - upper limit

We will enter the following menu by means of the cursor arrows ⯈ ⇑ ⯈⇓**.**

> 2. Upper limit<

By pushing ⯈ → **ENTER** to enter the selection of the upper limit for the output water temperature.

T[°C] up hh HH

Adjustment of the upper limit for output water temperature shall be performed in the same way as mentioned
 in this chapter above.
We will return back to the mode **MANUAL** by repeated pushing the key ⯈ ∩ **ESC** or it is possible to continue with
the cursor arrows⯈ ∩ **ESC** in selection of the next menu after pushing the key ⯈ ⇑⇓.

📖 *Note:* The maximum temperature of the boiler water is limited to 90oC.

📖 *Note:* If it is not desirable for the user to have an option to change the operating temperature of the boiler,
adjust the lower and upper temperature limit to the same required value.

9.5.2.3   Menu 12.2.3_Temperature of samples

Displayed temperatures (boiler water temperature, outside temperature, flue gases temperature, etc.) are
measured and analyzed periodically by the control unit as an average value calculated from a set number
of samples.

MENU 12.2.3_Number of samples will appear on the display after you enter the correct PIN in the *Manufacturer*
Menu. You can reach it with the ⯈ ⇑ ⯈⇓ arrows.

> 3. Temp. samples<

Switch to the selection of the number of samples for the calculation of the average value of the displayed
temperatures by pushing the ⯈ → **ENTER** button.

Temp. samples 064

Suitable number of temperature measurements (samples) can be selected with the ⯈ ⇑ ⯈⇓ arrows.
📖 *Note:* If the number of selected samples is incorrect, the temperature value may flash. Incorrect number of
samples may cause excessive measurement time.

Return to **MANUAL** mode by repeatedly pushing the ⯈ ∩**ESC** button or you can continue in your menu selection
with the ⯈ ⇑ ⯈⇓ arrows.

9.5.3   Menu 12.3_Feeder F1 limits

Time limits and limits adjusted in this program have to ensure operation of the boiler at the necessary power
levels. Boiler Output is unambiguously given by the quantity of fuel delivered to the boiler during a unit of time.

MENU 12.2.3_ Feeder 1 limits will appear on the display unit after the PIN for the Producer menu has been
correctly entered and after setting to this menu has been done by cursor arrows⯈ ⇑ ⯈⇓.

> 3. Feed.1 limit <

9.5.3.1   Menu 12.3.1_Feeder on lower limit

The following script will appear by pushing the key ⯈ → **ENTER**

> 1. F. on low li. <

By pushing key ⯈ → **ENTER** to go to the selection of the lower value of the operation time of the feeder F1.

F. on low. li dd DD

Where **dd** is the existing adjustment value, **DD** is the newly required adjustment value and is blinking.
Use the cursor arrows ⯈ ⇑ ⇓ to adjust the required value for the lower limit of operation time for the feeder F1.
Confirm the newly adjusted value by pushing the key ⯈ → **ENTER**. The value **DD** will stop blinking and will be
saved in the working register for boiler operation in the automatic mode. The values **dd** and **DD** are identical
now.

The **DD** value starts blinking by repeated pushing the key ⯈ → **ENTE**R and may be changed.

Depress the key ⯈ ∩ **ESC** to return to the menu >1. F.on low li.<

The value **DD** has been accepted for further use, provided the new value has been confirmed with the key
⯈ → **ENTER.** (the value **DD** is not blinking). If the value **DD** is blinking, it will not be accepted after the return to
the MAIN MENU and the original adjustment value **dd** will still be used.

9.5.3.2 Menu 12.3.2_Feeder on upper limit

We will enter the following menu by means of the cursor arrows ⟐ ⇑ ⇓.

>2. F. on upp. li <

By pushing key ⟐ → **ENTER** to go to the adjustment of the upper limit of the operation time of the feeder F1.

F. on up. l. hh HH

Adjustment of the upper limit for operation time of the feeder F1 shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL** by repeated pushing the key ⟐ ∩ **ESC** or it is possible to continue with the cursor arrows ⟐ ∩ **ESC** in selection of the next menu after pushing the key ⟐ ⇑⇓.

9.5.3.3 Menu 12.3.3 Feeder off lower limit

We will enter the following menu by means of the cursor arrows ⟐ ⇑ ⇓.

>3. F. off lo. li. <

By pushing key ⟐ → **ENTER** to go to the adjustment of the lower limit of the idleness time of the feeder F1.

F. off lo. dd DD

Adjustment of the upper limit for idleness time of the feeder F1 shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL** by repeated pushing the key ⟐ ∩ **ESC** or it is possible to continue with the cursor arrows ⟐ ∩ **ESC** in selection of the next menu after pushing the key ⟐ ⇑ ⇓ .

9.5.3.4 Menu 12.3.4 Feeder off upper limit

We will enter the following menu by means of the cursor arrows ⟐ ⇑ ⇓.

>4. F. off upp. l. <

By pushing key ⟐ → **ENTER** to go to the adjustment of the upper limit of the idleness time of the feeder F1.

F. off up. li hh HH

Adjustment of the upper limit for idleness of the feeder F1 shall be performed in the same way as mentioned in this chapter above.

📖 *Note:* It is not recommended to reduce the upper limit of the turn-on time under 5 s.
📖 *Important:* Set up of the upper limit of the switch-in time together with the adjusted lower limit for idleness of the feeder F1 has to ensure that the dosing which corresponds to the maximum power output of the boiler will not be exceeded!

9.5.4 Menu 12.4_Pump limits

The producer will set up in this menu the upper and lower limit of the temperature range in which the pump of the heating system is turned on. The service engineer will be allowed to change setting only within these limits (kapitola 6 ,Menu 10.6)

Producer shall set up also the absolute temperature under which the pump will always be turned on regardless of ambient conditions. This mode of the pump control increases operating reliability of the boiler and prevent from boiler overheating in case of wrong adjustment of the boiler (for example: short standby period).

MENU 12.4 Pump limits will appear on the display unit after the PIN for the Producer menu has been correctly entered and after setting to this menu has been done by cursor arrows ⟐ ⇑⇓ **.**

> 4. Pump limits <

9.5.4.1 Menu 12.4.1_Lower limit

The following script will appear by pushing the key ⟐ → *ENTER*.

>1. Lower limit<

By pushing key ⟐ → **ENTER** to go to the selection of the lower temperature limit for the output water in order to turn the pump of the heating system on.

T[°C] low dd DD

Where **dd** is the existing set up value, **DD** is the newly required set up value and is blinking.
The required lower limit value of the output water temperature of the automatic boiler for solid fuel can be set up with the cursor arrows ⟐ ⇑ ⇓**.** Confirm the newly set up value by pushing the key ⟐ → **ENTER**. The value **DD** will

stop blinking and will be saved in the working register for boiler operation in the automatic mode. The values **dd** and **DD** are identical now.

The value **DD** will start blinking again by repeated pushing the key ⬚ → **ENTER** and may be changed. Return back to the menu >1. Lower limit<. by pushing the key ⬚ ∩ **ESC** The value **DD** has been accepted for further use, provided the new value has been confirmed with the key

⬚ → **ENTER.** (the value **DD** is not blinking). If the value **DD** is blinking, it will not be accepted after the return to the MAIN MENU and the original set up value **dd** will still be used.

9.5.4.2 Menu 12.4.2_Upper limit

We will enter the following menu by means of the cursor arrows ⬚ ⇑ ⇓ .

>2. Upper limit<

By pushing key ⬚ → **ENTER** to go to the selection of the upper temperature limit for the output water in order to turn the circulation pump of the heating system on.

T[°C] up hh HH

Where **hh** is the existing adjustment value, **HH** is the newly required set up value and is blinking.

Adjustment of the upper limit for the output water temperature to turn the circulation pump of the heating system on shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL** by repeated pushing the key ⬚ ∩ **ESC** or it is possible to continue with the cursor arrows ⬚ ∩ **ESC** in selection of the next menu after pushing the key ⬚ ⇑ ⇓ .

📖 *Note:* Maximum temperature level of the boilers water is limited to 70°C fro starting a pump, so it pevents boier overheating. Minimum temperature must be kept above value condensing temperature (55°C).

9.5.4.3 Menu 12.4.3_Absolut limit

We will enter the following menu by means of the cursor arrows ⬚ ⇑ ⇓ .

>3. Absolut lim.<

By pushing key ⬚ → **ENTER** to go to the selection of the absolute temperature of the output water in order to turn the pump of the heating system on.

T[°C]abs. aa AA

Where **aa** is the existing set up value, **AA** is the newly required set up value and is blinking.

Adjustment of the upper limit for the output water temperature to turn the pump of the heating system on shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⬚ ∩ **ESC** or it is possible to continue with the cursor arrows ⬚ ∩ **ESC** in selection of the next menu after pushing the key

⬚ ⇑ ⇓ .

📖 *Note:* The maximum temperature of the boiler water to turn the pump on is limited to 70oC in order to prevent the boiler from overheating. The minimum temperature has to be maintained above the condensation temperature (55oC).

9.5.4.4 Menu 12.4.4_Pump run out time

We will enter the following menu by means of the cursor arrows ⬚ ⇑ ⇓ .

>4. Pump run out <

By pushing key ⬚ → **ENTER** to go to the selection of the time in minutes for run out time of the pump of the systém after he boiler enter the Standby state (default value: 4 minutes).

Run o [min] dd DD

Where **dd** is the existing set up value, **DD** is the newly required set up value and is blinking.

Adjustment of the run out time for the circulation pump of the system will be carried out in the same way as mentioned above in this chapter.

We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⬚ ∩ **ESC** or it is possible to continue with the cursor arrows ⬚ ∩ **ESC** in selection of the next menu after pushing the key ⬚ ⇑ ⇓ .

📖 *Note:* Pump run out is removing an excess heat from the boiler.

9.5.5   Menu 12.5_SW Tank pump limits

The producer will set up in this menu the upper and lower limit of the temperature range in which the circulation pump of the heating system is turned on to heat the hot service water. The service engineer will be allowed to change setting only within these limits in the chapter 6, Menu 10.7.

MENU 12.5 SW Tank pump limits will appear on the display unit after the PIN for the Producer menu has been correctly¨entered and after adjustment to this menu has been done by cursor arrows ⮑ ⇑ ⇓ .

>5.SWT pump li.<

9.5.5.1   Menu 12.5.1_Lower limit

The following script will appear by pushing the key ⮑ → **ENTER**.

>1. Lower limit<

By pushing key ⮑ → **ENTER** to go to the selection of the lower temperature limit for the output water in order to turn on the circulation pump of the heating system.

T[°C] low. dd DD

Where **dd** is the existing set up value, **DD** is the newly required set up value and is blinking.

The required lower limit value of the output water temperature of the automatic boiler for solid fuel can be set up with the cursor arrows ⮑ ⇑ ⇓ .

Confirm the newly set up value by pushing the key ⮑ → **ENTER**. The value **DD** will stop blinking and will be saved in the working register for boiler operation in the automatic mode. The values **dd** and **DD** are identical now. The value **DD** will start blinking again by repeated pushing the key ⮑ → **ENTER** and may be changed. Return back to the menu >6.Fan run-out<. by pushing the key ⮑ ∩ **ESC** .

The value **DD** has been accepted for further use, provided the new value has been confirmed with the key ⮑ → **ENTER**. (the value **DD** is not blinking). If the value **DD** is blinking, it will not be accepted after the return to the MAIN MENU and the original set up value **dd** will still be used.

9.5.5.2   Menu 12.5.2_Upper limit

We will enter the following menu by means of the cursor arrows ⮑ ⇑ ⇓.

>2. Upper limit<

By pushing key ⮑ → **ENTER** to go to the selection of the upper temperature limit for the output water in order to turn on the circulation pump of the heating system.

T[°C] up hh HH

Where **hh** is the existing set up value, **HH** is the newly required set up value and is blinking.

Set up of the upper limit for the output water temperature to turn the circulation pump of the heating system on shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⮑ ∩ **ESC** or it is possible to continue with the cursor arrows ⮑ ∩ **ESC** in selection of the next menu after pushing the key ⮑ ⇑ ⇓ .

📖 **Note:** Maximum temperature level of the boilers water is limited to 70°C fro starting a pump, so it pevents boier overheating. Minimum temperature must be kept above value condensing temperature (55°C).
📖 **Note:** Recomended temperature for switching the pump of SW tank is 60°C. This is the temperature which is used for preheating of the SW Tank hot water. If the pump is going to switch by lower temperature, hot water from SW Tank will cool down trough the boiler.

9.5.5.3   Menu 12.5.3_Absolut limit

We will enter the following menu by means of the cursor arrows ⮑ ⇑ ⇓.

>3. Absolut lim.<

By pushing key ⮑ → **ENTER** to go to the selection of the upper absolute temperature for the output water in order to turn on the circulation pump of the heating system.

T[°C] abs. aa AA

Where **aa** is the existing set up value, **AA** is the newly required set up value and is blinking.

Adjustment of the upper limit for the output water temperature to turn the circulation pump of the heating system on shall be performed in the same way as mentioned in this chapter above.

We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⬚ ∩ **ESC** or it is possible to continue with the cursor arrows ⬚ ∩ **ESC** in selection of the next menu after pushing the key ⬚ ⇑ ⇓ .

📖 *Note:* Maximum value for switching the pump is temperature, which determine when the boiler is going to be swicthed on. Swtcing the pump and cooling down the boiler is as a safeguard agains boiler overheating.

9.5.6   Menu 12.6_Fan run-out

Fan run-in is a parameter which defines the working time of the fan after the boiler has entered the STANDBY state. Setting makes it possible to improve emission parameters and optimizes fuel burnout.

📖 *Important Note:* Parametrs for the mode fan run-out we set-up to a specific fuel type. We select the fuel type in Menu 10 pro režim doběh ventilátoru nastavujeme pro daný typ paliva. Palivo zvolíme předem v Menu 10.

MENU 12.6 Fan run-out will appear on the display unit after the PIN for the Producer menu has been correctly entered and after set up to this menu has been done by cursor arrows⬚ ⇑⇓ .

<div style="background:yellow">**>6.Fan run-out <**
Fuel 1</div>

By pushing key ⬚ → **ENTER** to go to the selection of the time parameter for the fan run-in.

<div style="background:yellow">**Run o [min] dd DD**
Fuel 1</div>

Where **dd** is the existing set up value, **DD** is the newly required set up value and is blinking.

The required run-out value of the fan can be set up with the cursor arrows ⬚ ⇑ ⇓
Confirm the newly adjusted value by pushing the key ⬚ → **ENTER***.* The value **DD** will stop blinking and will be saved in the working register for boiler operation in the automatic mode. The values **dd** and **DD** are identical now.
The value **DD** will start blinking again by repeated pushing the key ⬚ → **ENTER** and may be changed. Return back to the menu >6.Fan run-out<. by pushing the key ⬚ ∩ **ESC** The value **DD** has been accepted for further use, provided the new value has been confirmed with the key ⬚ → **ENTER***.* (the value **DD** is not blinking). If the value **DD** is blinking, it will not be accepted after the return to the MAIN MENU and the original set up value **dd** will still be used.

We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⬚ ∩ **ESC** or it is possible to continue with the cursor arrows ⬚ ∩ **ESC** in selection of the next menu after pushing the key ⬚ ⇑ ⇓ .

9.5.7   Menu 12.7_Flue fan run-out

Fan rundown is a parameter, which defines the time of fan operation after the boiler switches to the STAND-BY mode. The setting enables to improve emission parameters during boiler stoppage and optimizes fuel afterburning and ensures exhaust of burned gases.

📖 *Important note:* The parameters for flue fan rundown mode are set for the particular fuel type. Fuel is selected beforehand in Menu 10.

MENU 12.7_Flue fan rundown will appear on the display after you enter the correct PIN in the *Manufacturer* Menu. You can reach it with the ⬚ ⇑ ⬚⇓ arrows.

<div style="background:yellow">**> 6. Fl. F. run-out <**</div>

Switch to the fan rundown time parameter selection the pushing the ⬚ → **ENTER** button.

<div style="background:yellow">**Run o [min] dd DD**</div>

dd id a current value, **DD** is the newly selected value and it is flashing.
Same notes apply as in the preceding chapter.

9.5.8   Menu 12.8_Rotary sensors

It is absolutely necessary to ensure operation of feeders and to know whether they are really functional for reliable and mainly safe operation of automatic boilers. Rotary sensors ensure higher level of this check.
It is possible to define the time window to count pulses in this menu independently for every sensor as well as the number of pulses which take place within this defined period of time.

MENU 11.8 Rotary sensors will appear on the display unit after the PIN for the Producer menu has been correctly entered and after set up to this menu has been done by cursor arrows ⮀ ⇑ ⇓

> **> 8. Rotary sens. <**

9.5.8.1 Menu 12.8.1_F1 MEASUREMENT TIME

The following script will appear by pushing the key ⮀ → *ENTER*

> **>1. RS1 time <**

By pushing key ⮀ → **ENTER** we will enter set up of time window in sec and we will count the incoming pulses in this time window for the feeder F1.

> **RS t. [sec] cc CC**

Using the cursor arrows ⮀ ⇑ ⇓ we will determine the new time value which will be in force after its confirmation.

Confirm the newly set up value by pushing the key ⮀ → **ENTER**. The value **CC** will stop blinking and will be saved in the memory for boiler operation in the automatic mode. The values **cc** and **CC** are identical now. The value **CC** will start blinking again by repeated pushing the key ⮀ → **ENTER** and may be changed. Return back to the menu 1. RS1 time< . by pushing the key ⮀ ∩ **ESC** The value **CC** has been accepted for further use, provided the new value has been confirmed with the key ⮀ → **ENTER.** (the value **CC** is not blinking). If the value **CC** is blinking, it will not be accepted after the return to the MAIN MENU and the original adjustment value **cc** will still be used.

9.5.8.2 Menu 12.8.2_1 NUMBER OF PULSES

We will enter the following menu by means of the cursor arrows ⮀ ⇑ ⇓.

> **>2. RS1 pulses <**

Go to the adjustment of the number of pulses from the feeder F1 which is expected in the adjusted time window in the previous menu by pushing the key ⮀ → **ENTER**.

> **RS1 puls ii II**

Expected number of pulses is set up by the same procedure as mentioned above in this chapter.
We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⮀ ∩ **ESC** or it is possible to continue with the cursor arrows ⮀ ∩ **ESC** in selection of the next menu after pushing the key ⮀ ⇑ ⇓ .

9.5.8.3 Menu 12.8.3_F2 MEASUREMENT TIME

We will enter the following menu by means of the cursor arrows ⮀ ⇑ ⇓.

> **>3. RS2 time <**

We will enter the set up of the time window to measure pulses of the feeder 2 by pushing the key ⮀ → **ENTER**.

> **RS t. [sec] cc CC**

Upper temperature gradient set up will be carried out in the same way as mentioned above in this chapter.
We will return back to the mode **MANUAL** by repeated pushing the key ⮀ ∩ **ESC** or it is possible to continue with the cursor arrows ⮀ ∩ **ESC** in selection of the next menu after pushing the key ⮀ ⇑ ⇓ .

9.5.8.4 Menu 12.8.4_F2 NUMBER OF PULSES

We will enter the following menu by means of the cursor arrows ⮀ ⇑ ⇓.

> **>4. RS2 pulses<**

Go to the adjustment of the number of pulses from the feeder F2 which is expected in the adjusted time window in the previous menu by pushing the key ⮀ → **ENTER**

> **RS puls. ii II**

Expected number of pulses is set upd by the same procedure as mentioned above in this chapter.
We will return back to the mode **MANUAL, AUTOX, MODX, SW TANK** by repeated pushing the key ⮀ ∩ **ESC** or it is possible to continue with the cursor arrows ⮀ ∩ **ESC** in selection of the next menu after pushing the key ⮀ ⇑ ⇓ .

📖 *Note:* It is permitted for the time window to be longer than the operation time of a feeder in one feeding cycle period. The control unit totals the operation times.

📖 **Note:** If the recorded number of pulses in the time window is higher than or equal to the set up number, the operation of feeders is permitted. If the number is lower, the control unit will stop the operation of the boiler and the following failure message will appear on the alphanumeric display unit: **Blocked feeder x** .

📖 **Important:** The set up number of pulses to the value of 000 turns off sensors of rotations of the feeder F1 or F2. This may result in dangerous operating conditions of the boiler.

9.5.9   Menu 12.9_GSM Master

Having been completed with the GSM modem, the control unit makes it possible to manage, adjust and monitor the boiler by the service centre. The service centre's telephone number is entered in this menu. Operating parameters of the boiler may be changed and operating instructions may be entered from this telephone number.

MENU 12.9 GSM Master will appear on the display unit after the PIN for the Producer menu has been correctly entered and after adjustment to this menu has been done by cursor arrows ⬚ ⇧ ⇩ . By pushing key ⬚ → **ENTER** we go to menu.

> 9. GSM master <

The number required by us will be adjusted with cursor arrows

420123456789

⬚ ⇧   - increases the number value in steps of +1
⬚ ⇩   - reduces the number value in steps of -1
⬚ ⇒   - moves to the neighbouring digit to the right
⬚ ⇐   - moves to the neighbouring digit to the left
Add character # after last valid number! By this you will define amount of valid numbers.
Confirm the adjusted number by pushing the key ⬚ → **ENTER.**

The following script will appear on the control unit

> O.K.-call? <

After this has been confirmed by pushing the key ⬚ → **ENTER** the control unit will make a check call in cooperation with the modem to a selected telephone number. Dialling and ringing is indicated by the following script.

> dialling… <

Control call will be terminated by pushing the key ⬚ → **ENTER.**

📖 **Note:** The ring through function may only be used after the modem has been connected and initiated.

📖 **Note:** The modem will be initiated by the control unit when the power supply is turned on and if the GSM modem function ON is enabled. The modem has to be connected to the power supply before the control unit is turned on.

📖 **Note:** The telephone number must include the national area code.

📖 **Note:** Control unit has phone number of the modem given by manufacturer. By that there is secured monitoring and asistence with boilers with GSM modem.

9.5.10   Menu 12.10_Service PIN cancellation

Enter the menu 10. SERVICE and use this menu, if you do not know the user's PIN.

MENU 12.10 Reset PIN will appear on the display unit after the PIN for the Producer menu has been correctly entered and after set up to this menu has been done by cursor arrows ⬚ ⇧ ⇩ .

> 10. Reset PIN <

Short message will appier on the alfanumeric display by pushing key ⬚ → **ENTER**

Service PIN: = 1111

The service PIN is hereby set up to the value of 1111 and is available for a service intervention.

9.5.11   Menu 12.11_Change of PIN

The PIN adjusted by the producer may be changed in this menu. The service organization or service engineer may use their own PIN, if there is an option that the PIN adjusted by the producer can be abused. Thus he/she is sure that the operating parameters adjusted by him/her will not be changed.

MENU 12.11 Change will appear on the display unit after the PIN for the menu Producer has been correctly entered and after set up to this menu with the cursor arrows ⬜ ⇑ ⇓ .

<mark>**> 11. PIN Change <**</mark>

We will enter the following menu by pushing the key ⬜ → **ENTER**

<mark>**New PIN: 0*****</mark>

Using the cursor arrows ⬜ ⇐ ⇑ ⇒ ⇓ we will determine the new PIN (code combination) which will be in force after confirmation. The adjusted PIN value is confirmed by pushing the key ⬜ → **ENTER**.

The control unit will prompt us to confirm this number by means of the following note

<mark>**PIN check: 0*****</mark>

We will enter the identical combination of numbers of the newly selected PIN, using the above mentioned procedure. We will confirm by pushing the key ⬜ → **ENTER.** Acceptance of this new PIN will be confirmed by the control unit by a short note on the alphanumeric display unit.

<mark>**PIN O.K. !!**</mark>

If the identical PIN combination is not entered in the Check mode, the new PIN will be not accepted and the control unit will notify it with a short note on the alphanumeric display unit.

<mark>**Bad PIN 2 !!!**</mark>

The whole above mentioned procedure has to be repeated for successful change of the PIN.

📖 ***Important:*** There is an option left by the producer how to enter the menu Producer in case the PIN is not known or if the PIN is forgotten!! However, RESET of the control unit is carried out, if this emergency option is used and the producer's default values are adjusted in all registers.

📖 ***Recommendation:*** The adjusted and tested values of operating parameters should be recorded in the operating og-book of the boiler.

📖 ***Note***: The PIN may contain digits 0-9, lower case letters from the a-z alphabet and upper case letters from the A-Z alphabet. It is not possible to break through via the trial-and-error method a PIN entered by means of this combination.

9.6   MENU 13_SOFTWARE VERSION

This MENU is used to identify the software version easily.

MENU 9 Software version will appear on the display unit after a short script - MAIN MENU - and after setup to this menu with cursor arrows ⬜ ⇑ ⬜ ⇓ .

<mark>**> 9.SW Version<**</mark>

A following short script will appear on the alphanumeric display unit by pushing the key ⬜ → **ENTER**

<mark>**RKP2_xx ddmmrr**</mark>

where **ddmmrr** is the date of software creation in the following format: day, month, year.

9.7   MENU 14_CODE ENTERING

If the control unit displays Menu 14. **Code Entering**, the boiler is put into operation with activation of the time lock activation for a limited period of time. If the adjusted time lock period gets exceeded, this is indicated by the following script on the display unit

To enter the code is possible in the boiler operation.
Code incleudes small and big letters and numbers.
After the correct code is entred MENU will disappear.

10 ERROR MESSAGES

10.1 STOPPAGE – OVERHEATING, EMERGENCY THERMOSTAT

The control unit is equipped with an emergency circuit for boiler overheating. The state of failure – OVERHEATING comes about when the water temperature at the boiler exit exceeds the 95ºC level. At this point the emergency circuit of the control unit is activated and the boiler is shut down.

This state is indicated by a red ALARM control light – position 5 at the control panel and also by a message on the display screen:

<div align="right">**STOP-EMERG. TERM1**</div>

An acoustic signal will sound at the same time.

Only the circulating pump is working to ensure the heat removal from the boiler exchanger.
Under normal conditions boiler overheating does not occur, therefore this situation is considered an emergency.

Service personnel attention is required, because it has to be determined why this state of failure occurred and how to fix the problem.

Possible causes	Repair
Boiler water temperature is set to a high value (around 90ºC).	Lower the boiler water output temperature (Menu 2), for instance to 80ºC.
Insufficient heat removal from the boiler: - circulatory pump is not running - cleaning filter is plugged up.	Check the circulatory pump; you may switch to a higher output. Close the particular valves and clean the filter.
Faulty hydraulics of the heating circuit (all thermal heads are closed).	Change the heating circuit settings, change the heating circuit wiring.
Stand-by time is to short in a boiler with electrical ignition turned off.	Check temperature increase in the STAND-BY mode and make the time period longer (STAND-BY, MENU 11.4). This should be done by professional service personnel.
Large volume of unburned fuel in the burning chamber.	Carefully clean the burning chamber and perform professional adjustment of burning.

Initial operation:

For automatic operation activation the output water temperature must drop below 65ºC. If this condition is not met, the control unit will not be able to function.

Boiler operation reactivation is done in the following steps::
1) We leave the boiler idle until the output water temperature drops below 65ºC (see display). To speed up this process we leave the pump running.
2) After that we push the safety thermostat reset button. You must hear the trigger click. (The red reset button is accessible without any tools by removing the top boiler cover and unscrewing the black coverings.)
Shut down the control unit with the switch for about 5 seconds and then turn it on again.

Now the control unit is ready for further operation in the MANUAL mode.

After that it is possible to switch to automatic boiler operation by pushing the **START** and **ENTER** buttons, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** button, if the boiler is still burning.

10.2 STOPPAGE – OVERHEATING, OPERATION THERMOMETER

The control unit has a program routine, which stores the emergency thermostat control. If the operation thermometer indicates a temperature higher than 100ºC, the boiler control unit will assure the boiler is shut down

This situation is indicated on the display by this message:

<div align="right">**STOP TEMP > 100°C**</div>

Only the circulatory pump is running for heat removal from the boiler exchanger.
Under normal conditions boiler overheating does not occur, therefore this situation is considered an emergency.

Possible causes	Repair
Faulty emergency thermostat.	Replace the emergency thermostat.
The emergency thermostat probe is not inserted in its well.	Insert and tighten the emergency thermostat probe in the well.

Service personnel attention is required, because it has to be determined why this state of failure occurred and how to fix the problem.
Reactivation:
For automatic operation activation of the control unit and consequently the boiler the output water temperature must dropped below 99ºC. If this condition is not met, the control unit want will not be able to function.
After that it is possible to switch to automatic boiler operation by pushing the **START** and **ENTER** buttons, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** buttons, if the boiler is still burning.

10.3   STOPPAGE – OVERHEATING IN THE FUEL PATHWAY

By adding a thermostat placed in the burner at the place of fuel entry the boiler safety can be increase and guard against burned gases back-draft through fuel pathways. This measure exceeds requirements of the safety norm ČSN-EN 33.5.

If the temperature at the plastic flexible hose connection to the burner increases to about 85ºC, the emergency thermostat disconnects and the control unit stops the boiler operation.

This state is indicated by a red ALARM control light – position 5 at the control panel and also by a message on the display screen:

STOP-EMERG.TERM2

An acoustic signal will sound at the same time.

Under normal conditions boiler overheating does not occur, therefore this situation is considered an emergency.
Service personnel attention is required, because it has to be determined why this state of failure occurred and how to fix the problem.

Possible causes	Repair
Plugged up jets in the burner.	Clean the burner as prescribed by annual check-up.
Plugged up chimney flue.	Clean boiler chimney flue.
Insufficient flue pull or back-draft.	Call professional chimney sweep, solution must be designed by professional firm.

Initial operation:
For automatic operation activation the output water temperature must dropped below 65ºC. If this condition is not met, the control unit will not be able to function.

Boiler operation reactivation is done in the following steps:

We leave the boiler idle until the output water temperature drops below 65ºC (see display). To speed up this process we leave the pump running.
After that we push the safety thermostat reset button. You must hear the trigger click. (The red reset button is accessible without any tools by removing the top boiler cover and unscrewing the black coverings.)   Shut down the control unit with the switch for about 5 seconds and then turn it on again.
Now the control unit is ready for further operation in the MANUAL mode.

After that it is possible to switch to automatic boiler operation by pushing the **START** and **ENTER** button, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** buttons, if the boiler is still burning.

10.4   STOPPAGE – BECAUSE OF FAULTY ATTENDANCE

If the boiler was switched to MANUAL mode and remained in this mode for too long, the boiler fire burned out

If the attendant now switches into automatic operation by pushing the □ **AUTO/MANUAL** button, the boiler will add fuel into a burned-out burner. After a short time the boiler will analyze the flue gases temperature and it will realize that the boiler is not burning and stop it and signal an emergency state on the display.

                                                                                    STOP STATE1

📖 **Note:** This boiler procedure works only if electric ignition is banned by the program.

📖 **Note:** If electric ignition is allowed by the program, the service personnel mistake is eliminated by activation of routine electric ignition at the moment the boiler realizes it is not burning. After ignition, the boiler works in a standard manner.

Possible causes	Repair
Faulty attendance	Ignite the boiler manually.

Boiler reactivation:

After this it is possible to switch to automatic boiler operation by pushing the □ **START** and □ **ENTER** button, if the equipment was shut down for a long time, or by pushing the □ **AUTO/MANUAL** buttons, if the boiler is still burning.

10.5   STOPPAGE – BECAUSE OF LOW WATER TEMPERATURE

If the boiler does not reach 45ºC temperature within 30 minutes after switching to automatic operation or if during operation the temperature drops below 40ºC for more than 30 minutes, the control unit will assess this situation as non-standard and will stop the boiler operation.

This is indicated by a display message:

                                                                                    STOP STATE2

Possible causes	Repair
Low quality fuel	Check the fuel by a professional firm, change if need it.
Shortage of fuel	Add fuel to the tank and fill pathways by manual feeder control.
Blocked pathways	Check, remove blockage, which prevents fuel entry into feeder.
Insufficient boiler output	Increase boiler output (up to maximum nominal output).
Incorrectly selected boiler output	Check the heating system size and the boiler output, preferably by a professional firm.

Boiler reactivation:

After this it is possible to switch to automatic boiler operation by pushing the □ **START** and □ **ENTER** button, if the equipment was shut down for a long time, or by pushing the □ **AUTO/MANUAL** buttons, if the boiler is still burning.

10.6   STOPPAGE – BECAUSE OF LOW FLUE GASES TEMPERATURE

If the boiler had been in a STAND-BY mode for only a short time and the boiler burns out anyway and switches into the automatic operation AUTOx, MODEx, EQTx or boiler modes, the boiler adds fuel to a burned-out burner. After a short time the boiler will analyze the flue gases temperature and it will realize that the boiler is not burning and stop it and signal an emergency state on the display.

                                                                                    STOP STATE3

📖 **Note:** This boiler procedure works only if electric ignition is banned by the program.

📖 **_Note:_** If electric ignition is allowed by the program, the service personnel mistake is eliminated by activation of routine electric ignition at the moment the boiler realizes it is not burning. After ignition the boiler works in a standard manner.

Possible causes	Repair
Low quality fuel	Replace fuel supplier.
Stand-by period is set incorrectly	Service technician will set longer stand-by period.

Boiler reactivation:

This happens only when electric ignition is off. Turn on the electric ignition in Menu 6 and fix it. Check possible causes for boiler burn-out. After this, it is possible to switch to automatic boiler operation by pushing the **START** and **ENTER** button, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** buttons, if the boiler is still burning.

10.7   BLOCKED FEEDER

The attendant is informed about this situation by a message on the display:

<div align="right">**BLOCKED FEEDER x.**</div>

This is a motor protection feature and an important fire protection point. (In case the F2 feeder is blocked, the whole fuel pathway could be filled with fuel and the fuel could burn through all the way to the tank.)

Stoppage prevents overload of the particular feeder motor and its possible destruction.

Possible causes	Repair
Foreign object in the fuel	Clean fuel pathways.
Unsuitable fuel (crumbling pellets)	Secure standardized fuel.
Faulty motor or faulty motor power supply	Check functionality of motor, check power supply.
Faulty gearbox	Replace gearbox
Faulty impulse sensor	Check sensor function, replace if needed.

Boiler reactivation:

After blockage removal by an authorized service it is possible to switch to automatic boiler operation by pushing the **START** and   **ENTER** button, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** buttons, if the boiler is still burning.

📖 **_Note:_** Fuel transportation pathways cleaning and electric parts work should be done by professional service personnel.

📖 **_Important note:_** During any manipulation in the fuel pathway the main boiler switch must be turned off or otherwise disconnected from electric supply.

10.8   TEMPERATURE SENSOR ERROR

The boiler operation is affected by the operation thermometer to a large degree. In case it is damaged the boiler cannot work properly. If temperature sensor error is detected, the boiler operation is stopped.
This situation is indicated by a sign on the display:

<div align="right">**E.r.r.** TEMP SENSOR ERROR</div>

The boiler stoppage prevents incorrect boiler operation.

Possible causes	Repair
Faulty temperature sensor	Replace sensor.

Boiler reactivation:
After temperature sensor replacement by an authorized service personnel it is possible to switch to automatic boiler operation by pushing the **START** and   **ENTER** button, if the equipment was shut down for a long time, or by pushing the **AUTO/MANUAL** buttons, if the boiler is still burning.

10.9   FLUE GASES TEMPERATURE SENSOR ERROR

The boiler burning check is done by measuring the flue gases temperature. The temperature sensor error is indicated by a flashing error message. This failure does not present danger and the boiler operation is not stopped.

The display message reads:

<div align="right">**FLUE SENSOR ERROR**</div>

If the flue gases temperature measurement mode is on, pushing of the ☐ ∩ **ESC** button will result in this message:

<div align="right">**E.r.r.** **FLUE SENSOR ERROR**</div>

The boiler operation will not be stopped.

Possible causes	Repair
Faulty temperature sensor	Replace sensor.

Reactivation:
After faulty temperature sensor replacement by authorized service, the error indication will automatically disappear.

10.10   STOPPAGE – NOT IGNITED

This is an error message informing that during the electric ignition process the needed flue gases temperature increase did not occur. This situation is evaluated as if the boiler was not working.
This situation is indicated by a display message:

<div align="right">**STOP – NO IGNITION**</div>

Possible causes	Repair
Insufficient fuel volume in the burner	Check fuel supply in the tank
	Check feeders functioning
	Check setting of the parameter Period of adding fuel – extend it
Fuel not ignited in the burner	Time period in parameter Heating period too short – extend it
	Fan output too high – lower it
	Faulty ignition spirals – replace
Error indication even when boiler is burning	Lower the parameter value Control temperature

10.11   FUEL SHORTAGE IN THE TANK

This will cause boiler fire extinction. This is not a dangerous occurrence. This state is not indicated in any way on the boiler control panel. The boiler will assess the fuel shortage with a certain delay. If the water temperature drops because of boiler fire extinction, this situation is assessed as

<div align="right">**STOP STATE2**</div>

If the boiler runs out of fuel before switching to the stand-by mode and the boiler fire becomes extinct in this mode, this is assessed as:

<div align="right">**STOP STATE3**
STOP – NO IGNITION</div>

Possible causes	Repair
Insufficient amount of fuel in the tank	Refill the fuel bin.

Reactivation:
- Fill the F1 feeder with fuel by running the F1 feeder (see MENU 1).
- Ignite the boiler by using the electric ignition routine or ignite the boiler manually.
- After this it is possible to switch to automatic boiler operation by pushing the ☐ **START** and ☐ **ENTER** buttons.

10.12   CLEAN THE BOILER

This is not a true error state. The boiler control unit only points out neglected maintenance.

If the flue gases temperature exceeds the 250ºC temperature for a short time (normal operation temperatures are below 200ºC), the boiler will assess this situation as dirty exchanger. The boiler must be cleaned immediately.

This situation is indicated by a flashing display message:

Clean the boiler

At the same time the control system will lower the boiler output by one degree in order to prevent further increase of the flue gases temperature. If the flue gases temperature reaches high value again, the boiler output will be lowered again.

Possible causes	Repair
Dirty boiler heat exchanger	Complete boiler cleaning – see annual inspection
	Shorten the boiler flue cleaning period – service technician.
Unsuitable fuel type	Complete boiler cleaning – see annual inspection
	Shorten the boiler flue cleaning period – service technician.
High boiler output	Lower fuel dispensing values – service technician.

11 GUARANTEE AND LIABILITY FOR DEFECTS

The manufacturer provides guarantee:
- for the boiler on a period of 24 months from the date of putting into operation, however, not longer than
30 months from the date of shipment from the manufacturing plant
- for the boiler body on a period of 60 months from the date of putting into operation
- ceramic parts are not covered by the warranty.

GUARANTEE CONDITIONS

1) User is obliged to ensure installation of the boiler and putting it into operation only by an
authorized servicing organization which has the manufacturer's accreditation and the user is also
obliged to send the **letter of guarantee number 1** to the manufacturer's address immediately
after the product has been put into operation.

2) The boiler has to be operated only within these Instructions for operation and only prescribed fuel
may be used (wood pellets - ⌐6-8.5 mm), free from any admixtures and foreign object.

3) If the user wants to claim any form of guarantee, he/she has to submit duly filled in **letter of
guarantee number 2**.

4) The user is obliged to demonstrate that the product was maintained in regular intervals which are
described in the chapter "MAINTENANCE". Regualr annual maitenance has to be done by trained pesrson who is
also responsible for the record of it within 14 days (list is part of manual) / service intervention or repaire has to
be correctly recorded and sended to a manufacturer.

5) Every notification of defect has to be done in writing to the address of the manufacturer
immediately after having been ascertained.

6) If the conditions described in the items 1 – 5 have been not met, the above mentioned
guarantee may not be required from the manufacturer.

The manufacturer reserves the right of product innovations, which may not be part of this manual.

📖 *Important note: Hydraulic connection schemes as you see are based on actual experiences of Kp
boiler operations. User can use this scheme as it is, or it can modified it to his needs.*
*But that is up to the person who is in charge of the heating system (like project manager or
installation company) - therefore PONAST is not liable for its correct solution and functionality.*
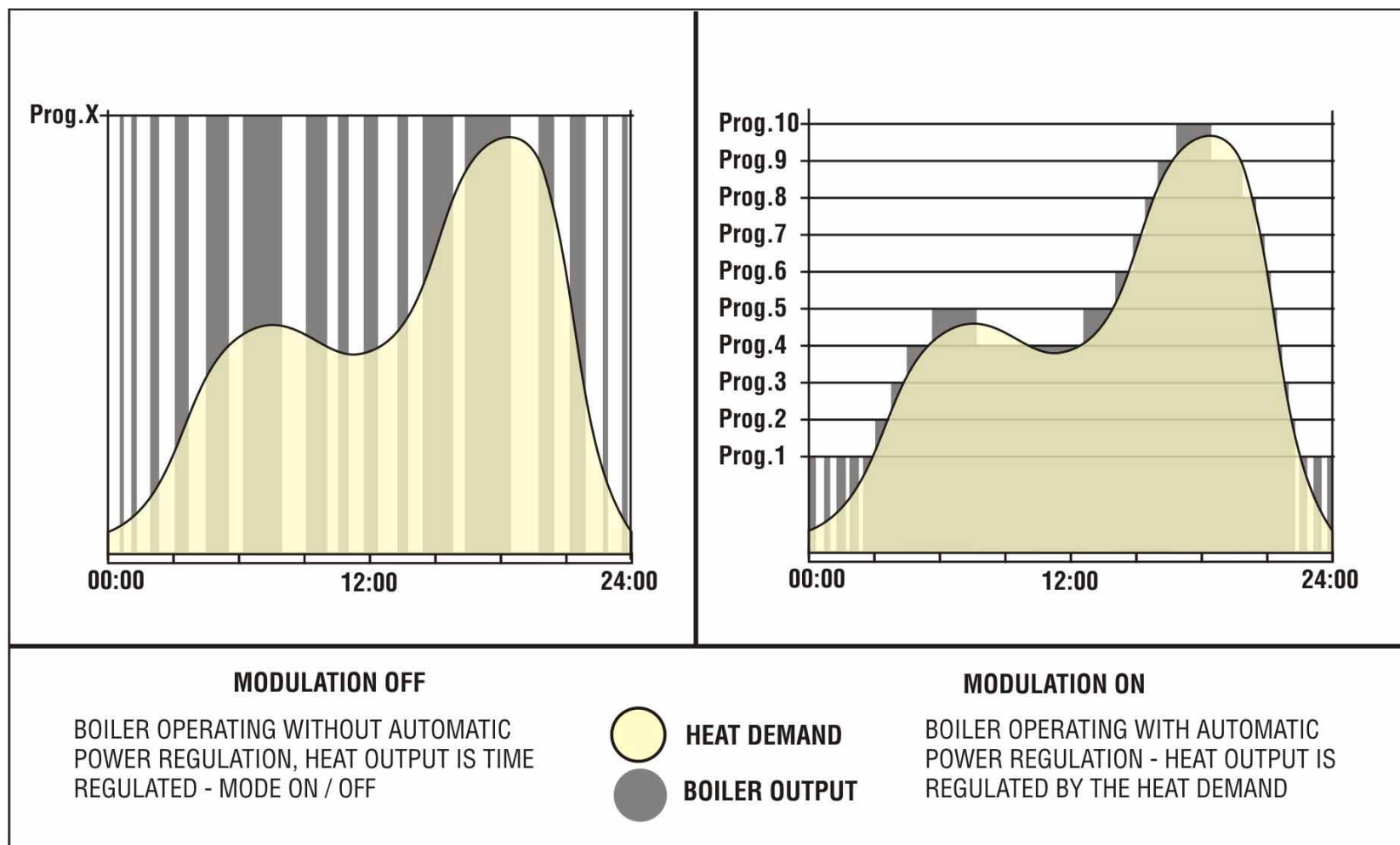
Picture 39   Principle of the modulation

Picture 40   **Hydraulic scheme - 1 x HC + SWH Tank**

XV11B	XV11A	XV5B	XV3A	XV6B	XV13B	XV7B
S1	S2	S3	S4	S5	S6	S7
R SENS 1	R SENS 2	T MIX	T RET W	T EXH GAS	ROOM THER	SWT THERM
3x0,3	3x0,3	2x0,5	2x0,5	2x0,5	SYKFY 2x0,8	SYKFY 2x0,8
12V DC	12V DC	0 V	0 V	0 V	0 V	0 V
MS 02	MS 02	NT 10000	NTC 10000	PT 1000	passive contact	passive contact

N
PE

K 19_2	K 19_1	K 14_2	K 14_1	K 18_2, K 18_1	K 16_1	K 15_2	K 23_1	K 23_2	K 13_2	K 16_2
1	2	3	4	5	6		7	8	9	10
FEEDER 1	FEEDER 2	ASH	SWEEPING	FAN	SERVO		EL.IGNITION	EL.IGNITION	PUMP	SWT PUMP
SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	CYSY 4x0,5		SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1
230 V	230 V	230 V	230 V	230 V	230 V		230 V	230 V	230 V	230 V
90 VA	90 VA	90 VA	90 VA	40-90 VA	4 VA		500 VA	500 VA	45 VA	45 VA

Picture 41   **Electric connection of hydraulic scheme 1 x HC + SWH Tan**
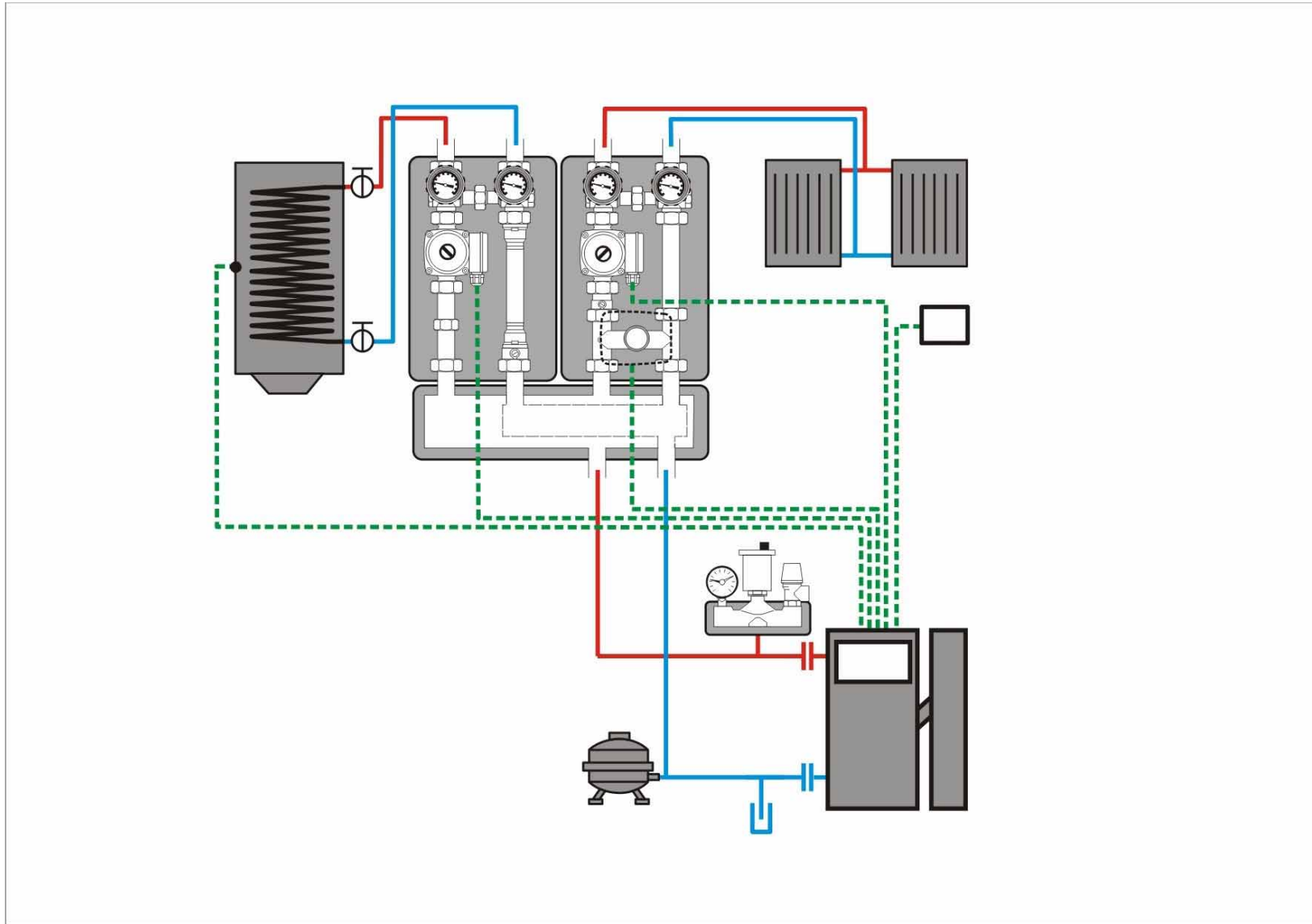
Picture 42   Hydraulic scheme - 1 x HC +SWH Tank

XV11B	XV11A	XV5B	XV3A	XV6B	XV13B	XV7B
S1	S2	S3	S4	S5	S6	S7
R SENS 1	R SENS 2	T MIX	T RET W	T EXH GAS	ROOM THER	SWT THERM
3x0,3	3x0,3	2x0,5	2x0,5	2x0,5	SYKFY 2x0,8	SYKFY 2x0,8
12V DC	12V DC	0 V	0 V	0 V	0 V	0 V
MS 02	MS 02	NT 10000	NTC 10000	PT 1000	passive contact	passive contact

K 19_2	K 19_1	K 14_2	K 14_1	K 18_2, K 18_1	K 16_1 K 15_2	K 23_1	K 23_2	K 13_2	K 16_2
1	2	3	4	5	6	7	8	9	10
FEEDER 1	FEEDER 2	ASH	SWEEPING	FAN	SERVO	EL.IGNITION	EL.IGNITION	PUMP	SWT PUMP
SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	CYSY 4x0,5	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1
230 V	230 V	230 V	230 V	230 V	230 V	230 V	230 V	230 V	230 V
90 VA	90 VA	90 VA	90 VA	40-90 VA	4 VA	500 VA	500 VA	45 VA	45 VA

Picture 43   **Electric connection of hydraulic scheme 1 x HC +SWH Tank**
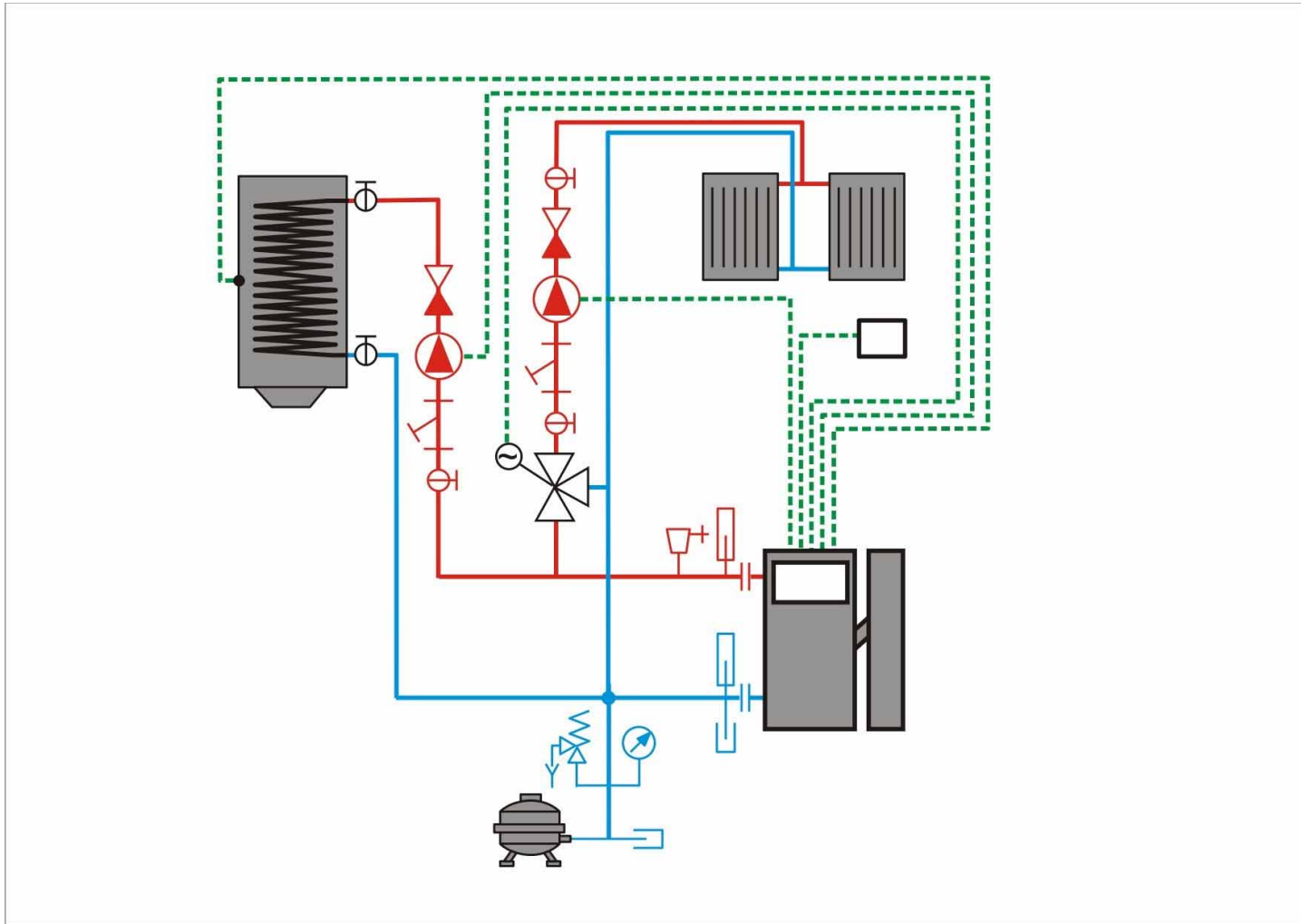
Picture 44   **Hydraulic scheme - 1 x HC +SWH Tank**
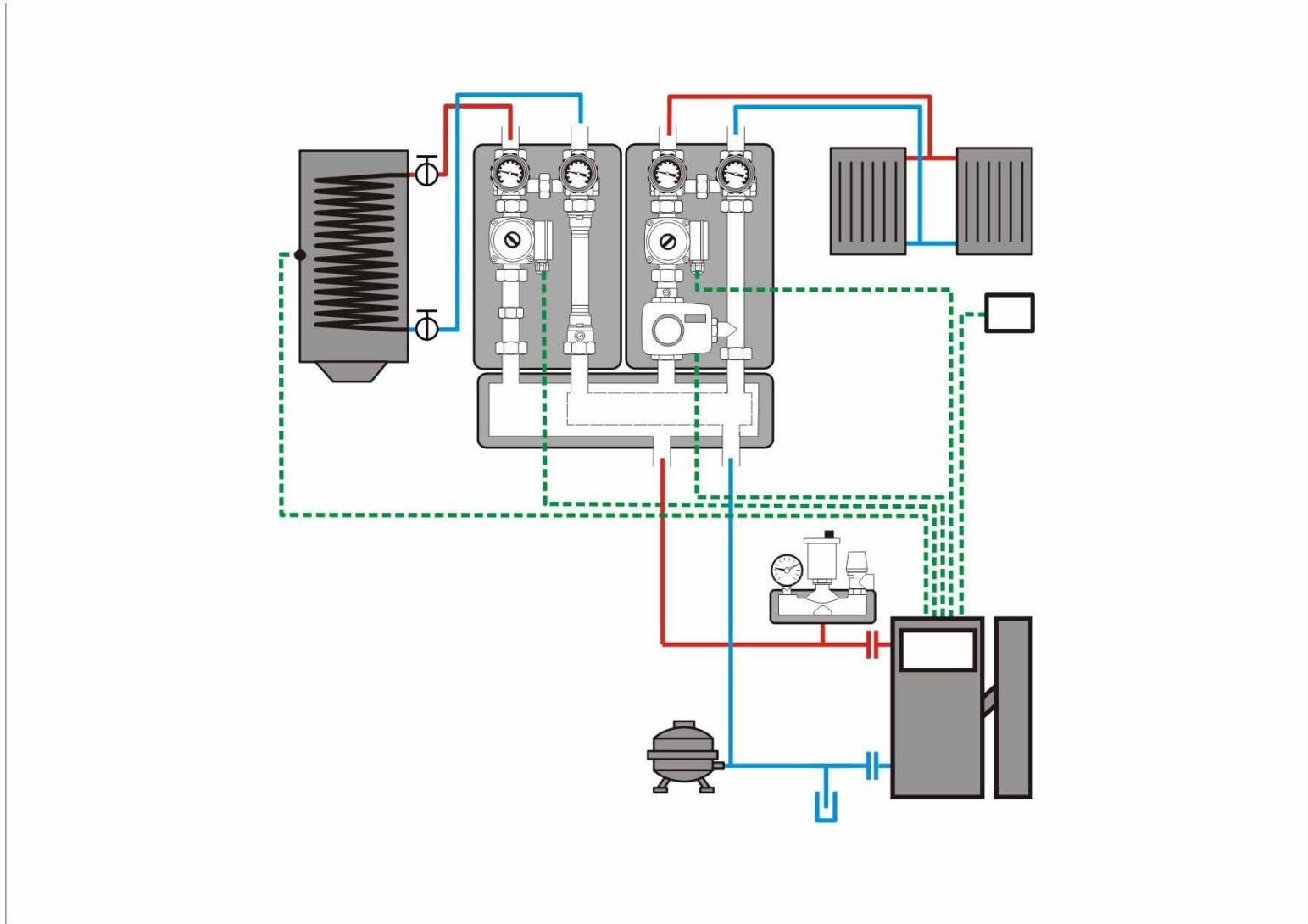
Picture 45   **Hydraulic scheme - 1 x HC +SWH Tank**
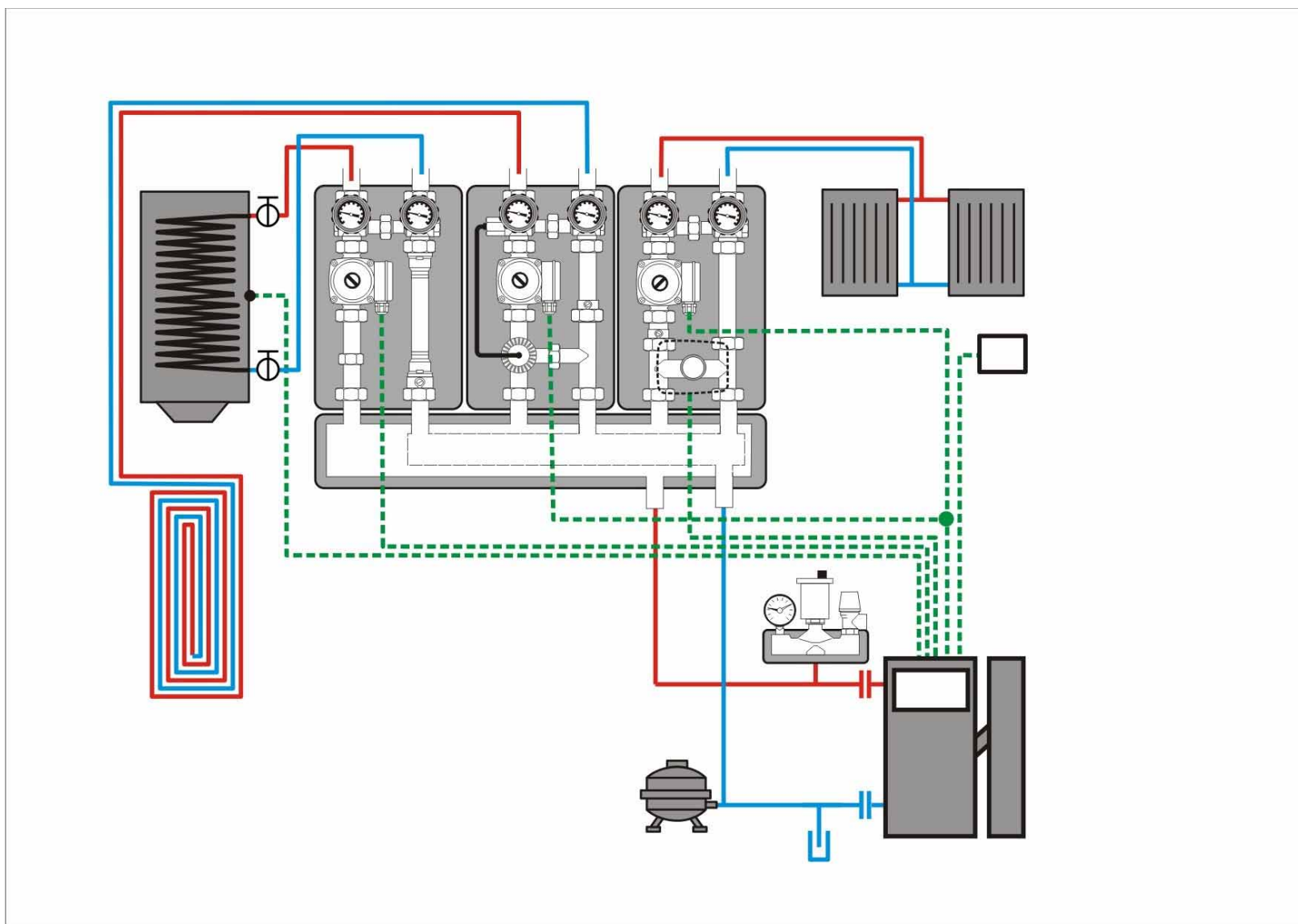
Picture 46   **Hydraulic scheme 2 x HC + SWH Tank**

XV11B	XV11A	XV5B	XV3A	XV6B	XV13B	XV9B	XV7B
S1	S2	S3	S4	S5	S6	S7	S8
R SENS 1	R SENS 2	T MIX	T RET W	T EXH GAS	ROOM TH 1	ROOM TH 2	SWT THERM
3x0,3	3x0,3	2x0,5	2x0,5	2x0,5	SYKFY 2x0,8	SYKFY 2x0,8	SYKFY 2x0,8
12V DC	12V DC	0 V	0 V	0 V	0 V	0 V	0 V
MS 02	MS 02	NTC 10000	NTC 10000	PT 1000	passive contact	passive contact	passive contact

N
PE

K 19_2	K 19_1	K 14_2	K 14_1	K 18_2, K 18_1	K 16_1	K 15_2	K 23_1	K 23_2	K 13_2	K 15_1	K 16_2
1	2	3	4	5	6		7	8	9	10	11
FEEDER 1	FEEDER 2	ASH	SWEEPING	FAN	SERVO		EL.IGNITION	EL.IGNITION	PUMP 1	PUMP 2	SWT PUMP
SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	CYSY 4x0,5		SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1	SiFH 3Gx1
230 V	230 V	230 V	230 V	230 V	230 V		230 V	230 V	230 V	230 V	230 V
90 VA	90 VA	90 VA	90 VA	40-90 VA	4 VA		500 VA	500 VA	45 VA	45 VA	45 VA

Picture 47   **Electric connection of hydraulic scheme 2 x HC + SWH Tank**

Picture 48   **Hydraulic scheme Cascade - 2 x HC +SWH Tank**

okruh 1

okruh 2

XV12A

XV4A

K18_2, K18_1

N

PE

RS 232
4 x 0,5

RS 485
4 x 0,8 TWIST

5
FLUE FAN
SiFH 3Gx1

MODEM
MC 35i

EXPANDER
EEX2008

230 V
40-90 VA

4 x 0,8 TWIST
RS 485

EEX X4, X9

Picture 49   Electric connection - others

Picture 50   **Recommended installations of the boiler connection - combine heating**

Picture 51   Block scheme of boiler el. connection Kpx2 – clips description

EXPANDER EEx 2008

L

N

PE

X4   /2   RS 485
X9   /2

L

EXTERNAL PROTECTION

FU 1
16B

XV1   /3   **BINARY INPUTS**
XV2   /3   with support power of 12V
          (openen collector)

X7	N	PE	/3	**RELAY OUTPUT**
X5	N	PE	/3	**OUTPUT 230V / 6A**
X6	N	PE	/3	**OUTPUT 230V / 12A**

Picture 52   Block scheme of EXPANDER connection Kpx2 – clips description

connecting box K1

3+PE+N, 50Hz, 400/250 V, TN-S

FA 1
L7-25/3/B
In=25A

N
PE

Boiler KP xxE

KM1
EP1C2510
230V

CONTROL UNIT

X1
L1,L2,L3

N
PE

0	WL -P	WL 1
number of identification		
type of cable cross-section	CYKY 5Cx2,5(4)	CSSS 5Cx2,5
adapter junction box		
type of cable cross-section		
schematic symbol	switchboard	Boiler KP xxE
equipment identification		
name of equipment	connecting switchboard	boiler
power output	min. 3,2 kW	2,4 (3,0) kW
location of equipment	as per possibilities and location in the building	boiler room as per possibilities of the building

WL 1	CYA 6	WL 2
CSSS 5Cx2,5		CSSS 5Cx2,5
switchboard	central grouding	heating body 1
connecting switchboard	protective bonding	heating body
2,4 (3,0) kW		2,4 (3,0) kW
as per possibilities and location in the building	as per location in the building	as per the customer's requirement

NOTE:
type of version: -
closed protection: IP55
open protection: IP20
dimensions: -
division: -
supply: from the top
outlets: down
operation: by electrically instructed persons

Voltage system:
3+PE+N, 50Hz, 400/250 V, TN-S
Protection against dangerous contact voltage :
via automatic disconnection from the source
Increased protection:
via additional bonding

Picture 53   Electrical installation version for input 3+PE+N, 50 Hz, 400/230 V, TNS

connecting box K1

3+PE+N, 50Hz, 400/250 V, TN-C-S

FA 1
L7-25/3/B
In=25A

N
PE

Boiler KP xxE

KM1
EP1C2510
230V

CONTROL UNIT

X1
L1,L2,L3

N
PE

0	WL -P	WL 1
number of identification		
type of cable cross-section	CYKY 4Bx2,5(4)	CSSS 5Cx2,5
adapter junction box		
type of cable cross-section		
schematic symbol	switchboard	Boiler KP xxE
equipment identification		
name of equipment	connecting switchboard	boiler
power output	min. 3,2 kW	2,4 (3,0) kW
location of equipment	as per possibilities and location in the building	boiler room as per possibilities of the building

WL 1	CYA 6	WL 2
CSSS 5Cx2,5		CSSS 5Cx2,5
switchboard	central grouding	heating body 1
connecting switchboard	protective bonding	heating body
2,4 (3,0) kW		2,4 (3,0) kW
as per possibilities and location in the building	as per location in the building	as per the customer's requirement

NOTE:
type of version: -
closed protection: IP55
open protection: IP20
dimensions: -
division: -
supply: from the top
outlets: down
operation: by electrically instructed persons

Voltage system:
        3+PE+N, 50Hz, 400/250 V, TN-C-S
Protection against dangerous contact voltage :
        via automatic disconnection from the source
Increased protection:
        via additional bonding

Picture 54   Electrical installation version for input 3+PE+N, 50 Hz, 400/230 V, TN-C-S
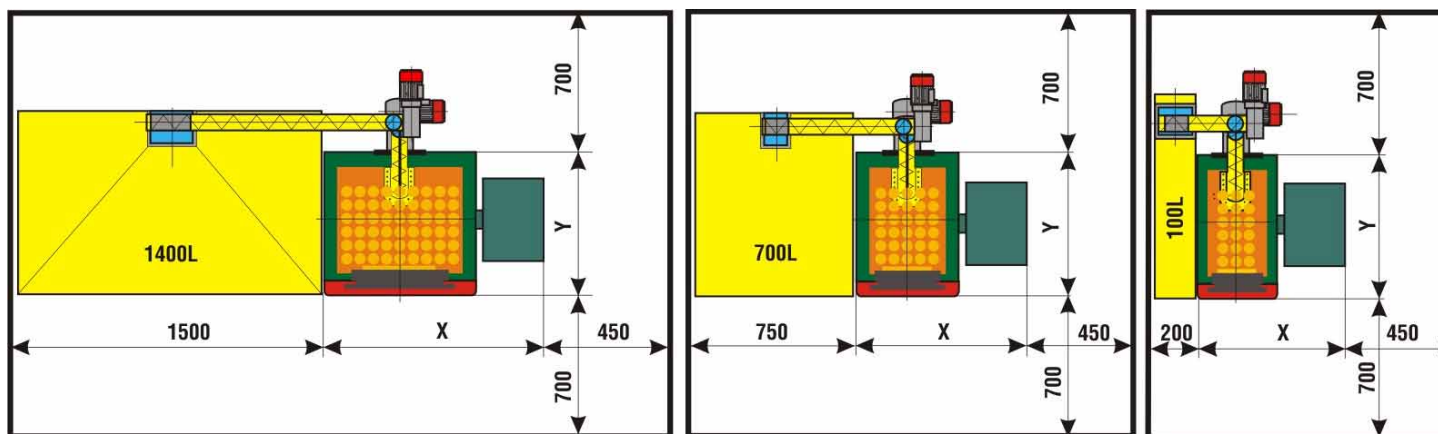
THE SPACE FOR BOILER
WITH ASH CONTAINER

	X (mm)	Y (mm)
KP 12	853	770
KP 22	988	770
KP 62	1130	786

SAMPLES OF TRANSPORTATION BY COLLECTING THROUGH SETS
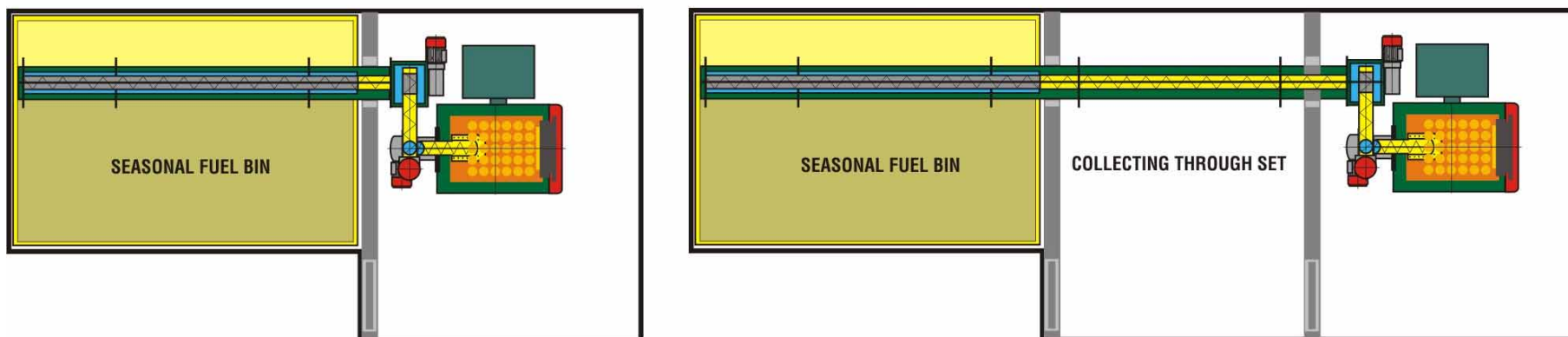
Picture 55   Dim. Req. for the placement of KPx2 in boiler room – exam. of using collecting troughs
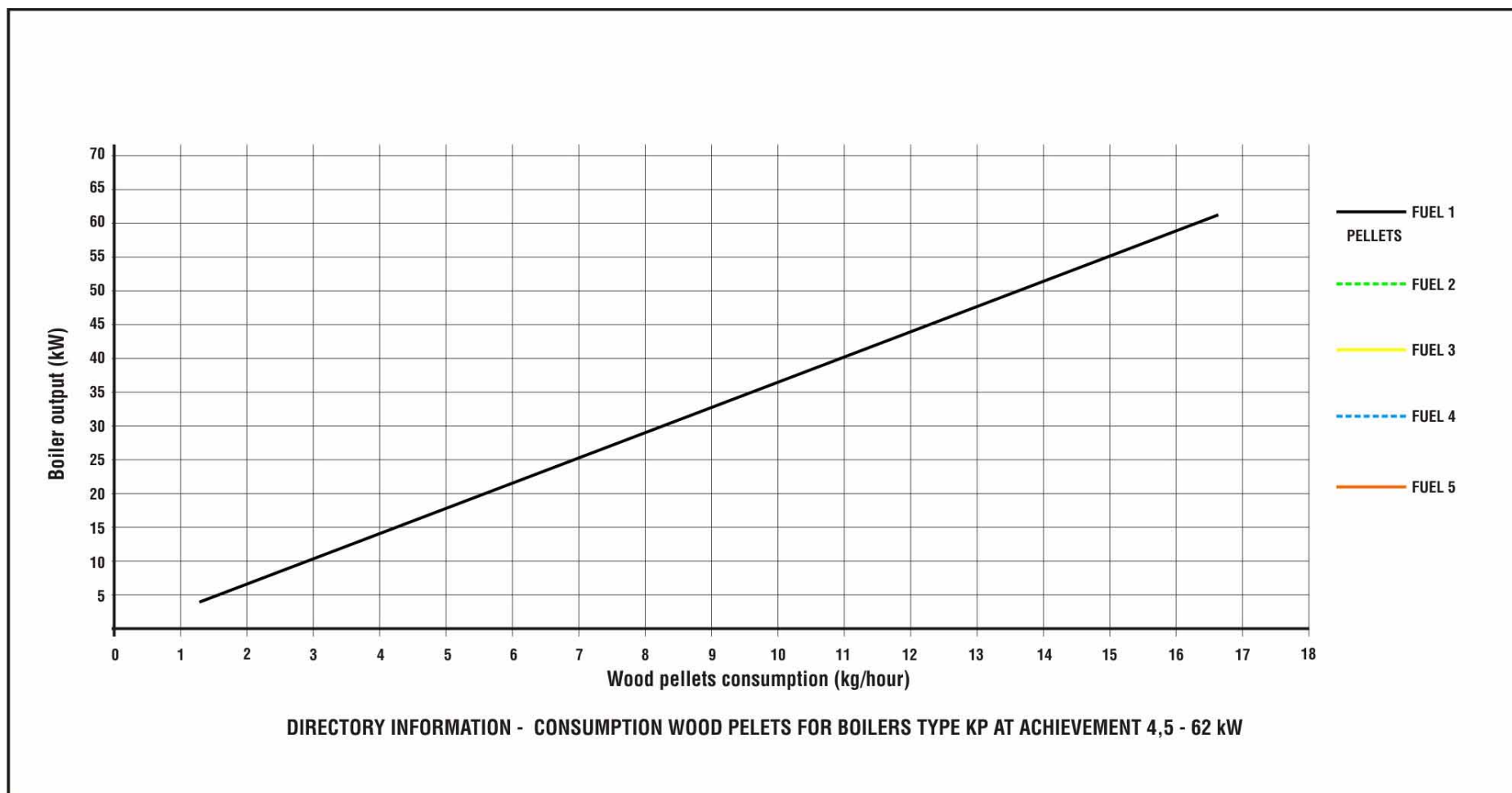
Picture 56   Directory information - consuption wood pellets for boiler family KP

Table 6   **Settings - User - ver. 1.1**

Menu no.	Menu - name	Menu - description - meaning		Settings - values		
	Main menu	**VERSION 6.x gear1:56 , auger 38mm (KP62 auger 55mm)**	**Unit**	**KP12**	**KP22**	**KP 62**
1.	**Direct control**	menu serving to direct control of connected equip. and control of input signals and processes				
1.1.	Feeder 1	start of feeder 1 function	.	off	off	off
1.2.	Feeder 2	start of feeder 2 function	.	off	off	off
1.3.	Fan	start of air of combustion fan function 30-100%	.	off	off	off
1.4.	Flue fan	start of flue fan function 30-100%		off	off	off
1.5.	Pump	start of heating system pump function	.	off	off	off
1.6.	SWTank Pump	start of SW Tank pump system function	.	off	off	off
1.7.	El. Ignition	start of electric ignition of boiler - only for control system EI function	.	off	off	off
1.8.	Heating	start of electric tempering of heating system - only for control system EH function	.	off	off	off
1.9.	Flue sweep	start flue sweep function		off	off	off
1.10.	Ash removing	start ash removing function to external ash container		off	off	off
1.11.	Servo open	start servomotor open function		off	off	off
1.12.	Servo close	start servomotor close function		off	off	off
1.13.	Check out inputs	control of state of input signals - Room Therm. / SWTank Therm. / Rotary Sensors F1 / F2	.			
2.	**Temperature**	setting required value of maximum temperature of boiler output water	°C	80	80	80
3.	**Select language**	setting of language SW version of control unit (CU)	.	czech	czech	czech
4.	**Setup time**	setting of the right time on CU	.	SEČ	SEČ	SEČ
5.	**SW tank activate**	possibility of setting three time periods for heating of hot service water (SWH)	.			
5.1.	Time period 1	setting of 1.time period, in which boiler will heat for heating SWH	.	00,00- 24,00	00,00- 24,00	00,00- 24,00
5.2.	Time period 2	setting of 2.time period, in which boiler will heat for heating SWH	.	00,00-00,00	00,00-00,00	00,00-00,00
5.3.	Time period 3	setting of 3.time period, in which boiler will heat for heating SWH	.	00,00-00,00	00,00-00,00	00,00-00,00
6.	**Electric ignition**	turn on/turn off el.ignition mode including heater coil function	.	on	on	on
7.	**Electric heating**	turn on/turn off el.heating mode / tempering	.	off	off	off
8.	**GSM modem**	for cooperation with GSM Modem, insert of mob.numb. for communication set competent users	.			
8.1.	On/Off	turn on/turn off GSM communication of user with CU	.	off	off	off
8.2.	Mobil No. 1	number with which will CU communicate. This number willl recieve failure SMS info	.	XXX	XXX	XXX
8.3.	Mobil No. 2	second number with vhich CU will communicate, this number will not receive failure SMS info	.	XXX	XXX	XXX
8.4.	Credit No.	operator number for request of credit balance of paid mobile card	.	XXX	XXX	XXX
8.5.	SMS info	allow or prohibit SMS sending when there is contingent equipment failure	.	off	off	off
9.	**Equithermal curve**	Selection of Equithermal curve for the specific object (1-16)	.	7	7	7
10.	**Fuel**	Selection of the fuel type (1-5)		1	1	1

Table 7   **Settings - Service - ver. 1.1**

Menu no	Menu - name	Menu - description - meaning	unit	SETTINGS - VALUES		
		VERSION 6.x gear1:56 , auger 38mm (KP62 auger 55mm)	unit	KP12	KP22	KP 62
11.	SERVICE	menu blocked by PIN, contains a set of commands and settings acessible to service technicians				
11.1.	Programs	for set up time of feeding and rotations of fan, for setting of outputs and optimal burning	.			
11.1.1.	Program 1	settings parameters - F1 off, F1 on, FAN - for 30% of nominal boiler output	.	on5 off90 F030 FlueF0	on5 off60 F030 FlueF0	on5 off61 F030* FlueF100
11.1.2.	Program 2	settings parameters - F1 off, F1 on, FAN - for 40% of nominal boiler output	.	on5 off66 F033 FlueF0	on7 off60 F030 FlueF0	on5 off40 F030* FlueF100
11.1.3.	Program 3	settings parameters - F1 off, F1 on, FAN - for 50% of nominal boiler output	.	on5 off53 F036 FlueF0	on9 off60 F034 FlueF0	on6 off38 F035* FlueF070
11.1.4.	Program 4	settings parameters - F1 off, F1 on, FAN - for 60% of nominal boiler output	.	on5 off45 F040 FlueF0	on9 off48 F037 FlueF0	on7 off35 F045 FlueF080
11.1.5.	Program 5	settings parameters - F1 off, F1 on, FAN - for 70% of nominal boiler output	.	on5 off38 F042 FlueF0	on9 off40 F040 FlueF0	on7 off29 F055 FlueF080
11.1.6.	Program 6	settings parameters - F1 off, F1 on, FAN - for 80% of nominal boiler output		on5 off33 F045 FlueF0	on9 off34 F043 FlueF0	on8 off28 F070 FlueF080
11.1.7.	Program 7	settings parameters - F1 off, F1 on, FAN - for 85% of nominal boiler output		on5 off30 F047 FlueF0	on9 off32 F046 FlueF0	on8 off26 F085 FlueF090
11.1.8.	Program 8	settings parameters - F1 off, F1 on, FAN - for 90% of nominal boiler output		on5 off28 F051 FlueF0	on9 off29 F051 FlueF0	on8 off24 F090 FlueF090
11.1.9.	Program 9	settings parameters - F1 off, F1 on, FAN - for 95% of nominal boiler output		on5 off26 F054 FlueF0	on9 off27 F054 FlueF0	on8 off22 F095 FlueF100
11.1.10.	Program 10	settings parameters - F1 off, F1 on, FAN - for 100% of nominal boiler output		on5 off24 F055 FlueF0	on9 off25 F057 FlueF0	on8 off20 F100 FlueF100
11.1.11.	SWT Tank program	settings parameters - F1 off, F1 on, FAN - for 90% of nominal boiler output for heating HUW	.	on5 off28 F051 FlueF0	on9 off29 F051 FlueF0	on8 off24 F090 FlueF090
11.1.12.	Program chimneyer	settings parameters - F1 off, F1 off, FAN - for 100% of nominal boiler output for temp. of exhaust gas	.	on5 off24 F055 FlueF0	on9 off25 F057 FlueF0	on8 off20 F100 FlueF100
11.2.	Advance	set time period, in which F2 starts before F1	sec	1	1	1
11.3.	Run- in	set time period, in which F2 stops later than F1	sec	3	3	5
11.4.	Standby-time	time period, in which automatic boiler is not actively burning	min	45	45	45
11.5.	Firing parameters	parameters for automatic mode of el. Ignitions	.			
11.5.1.	Red - hot time	time, when heating spirals are working	min	15	15	15 15*
11.5.2.	Feed time	support overthrust of optimal quantity of fuel into burning area for ignition	sec	180	200	200 200*
11.5.3.	Fan	turning on or off of the fan while in ignition		1	1	1 0*
11.5.4.	Fan revolution	set up of quantity of air which is needed for ignition and flare of the boiler	%	40	40	40 XXXX*
11.5.5.	Flue fan	turning on or off of the fan while in ignition		0	0	1 1*
11.5.6.	Fan revolution	turning on or off of the fan while in ignition and flare of the boiler	%	XXX	XXX	60 50*
11.5.7.	Flare time	time set up, in which fuel must be provided to a burner for perfect fire through all surface of burner	min	2	2	4 4*
11.5.8.	Referent temp.	the minimum values of differences between water and flue gas temp. at the end of ignition process	°C	10	10	10 10*
11.5.9.	Check burnt	time out after changeover from STANDBY state, after which CU makes reference temp. measuring	min	7	7	10 10*
11.6.	Pump on	determine value of boiler water temp., when the pum will start to circulate water in the system	°C	55	55	55
11.7.	SWT pump on	determine value of boiler water temp., when the pum will start to circulate water in the system for SWT	°C	60	60	60
11.8.	Change of service PIN	posibility of service PIN change in each boiler	.			
11.9.	Fans	set up of the type of used fan	.			
11.9.1.	Main fan type	Selection of main fan type **control by used fan		TYPE3	TYPE4	TYPE4
11.9.2.	Flue fan type	Selection of flue fan type **control by used fan		TYPE7	TYPE7	TYPE8
11.10.	Boiler output	menu for calculation of output data on display	.			
11.10.1.	Output	rated output of the boiler	kW	19	29	62
11.10.2.	Constant of feeder	weight of the fuel supplied by feedeer F1 per 1 second	g/sec*100	700	700	1300

*Without Flue fan

11.11.	**Equithermal regulation**	Parametrs for automatic mode, when CU changes output and temperature of output water	.			
11.11.1.	Starting programs	Program set up, when boiler will start after equitherm regulation turn on.	.	5	5	5
11.11.2.	Gradient low	lower limit of steepness of regulation curve	°C	9	9	9
11.11.3.	Gradient upper	upper limit of steepness of regulation curve	°C	12	12	12
11.11.4.	zone I	temperature interval, during its reaching the output goes down by other output stage	°C	3	3	3
11.11.5.	zone II	temperature interval, during its reaching the output goes down by 1 output stage	°C	5	5	5
11.11.6.	Regulation period	period for evaluation of set up and reached output parameters	min	10	10	10
11.12.	**Modulation**	parameters for auto. mode, during which CU auto. change output according to actuall thermal need	.			
11.12.1.	Starting programs	Program set up, when boiler will start after equitherm regulation turn on.	.	5	5	5
11.12.2.	Gradient low	lower limit of steepness of regulation curve	°C	9	9	9
11.12.3.	Gradient upper	upper limit of steepness of regulation curve	°C	12	12	12
11.12.4.	zone I	temperature interval, during its reaching the output goes down by other output stage	°C	3	3	3
11.12.5.	zone II	temperature interval, during its reaching the output goes down by 1 output stage	°C	5	5	5
11.12.6.	Regulation period	period for evaluation of set up and reached output parameters	min	10	10	10
11.13.	**Sweeping, cleaning**	set up paramenters for cleaning mechanism of the boiler				
11.13.1.	**Cleaning of the burner**	this menu is not used – has to be permanetly disabled.		off !!	off !!	off !!
11.13.2.	**Ash**	set up parametrs for ash removing	.			
11.13.2.1.	ON/OFF	allow or prohibit ash removing	.	on	on	on
11.13.2.2.	Number of feeding	ash removing is repeating, always by the amount of feeder F1 rotations.	.	100	100	75
11.13.2.3.	Feedend time	set up time of the ash removing mechanism	min	3	3	3
11.13.3.	**Flue gas sweeping**	parameters set up for flue sweeping	.			
11.13.3.1	ON/OFF	allow or prohibit flue sweeping	.	on	on	on
11.13.3.2.	Number of feeding	ash removing is repeating, always by the amount of feeder F1 rotations.	.	250	250	150
11.13.3.3.	Feedend time	set up time of the flue gas sweeping mechanism	min	3	3	3
11.13.3.4.	Time zone	time zone set up, where flue gas cleaning is permited	.	8:00-22:00	8:00-22:00	8:00-22:00
11.13.3.5.	Flue fan revolution	set up of the flue fan revolutions while in flue gas cleaning	%	0	0	0
11.14.	**Configuration**	choice of multi-purpose use of force output				
11.14.1.	Config K15-1	set up function output K15-1 (heating/TO2/zkrat.pump		El. Heating	El. Heating	El. Heating
11.14.2.	Config K17-2	set up function output K17-2 (flue fan/TO2/zkrat.pump		Flue fan	Flue fan	Flue fan
11.15.	**Servo**	setting servo time running between the outermost positions				

Table 8   Settings - Producer - ver. 1.1

Menu no	Menu - name	Menu - description - meaning	*SETTINGS - VALUES*		
		VERSION 6.x gear1:56 , auger 38mm (KP62 auger 55mm)	unit	KP12	KP22	KP 62
12.	PRODUCER	producer/service engineer set up limits of particular parameters corresponding to certain product				
12.1.	**Locking**	licence for running of the boiler for limited time				
12.1.1.	Time lock	turn on/turn off time lock function		off	off	off
12.1.2.	Code	code for unlocking of time lock				
12.1.3.	Time to lock	set up time until locking of the automatic running of the boiler				
12.2.	**Temperature limits**	limits of temperatures, in which it is possible to set up parameter Temperature	.			
12.2.1.	Temperature lower limit	lower limit of the temperature for the parameter Temperature	°C	55	55	55
12.2.2.	Temperature upper limit	upper limit of the temperature fot the parameter Temperature	°C	80	80	80
12.2.3.	Number of samples	Set up number of samples for reading and followed by temperature display				
12.3.	**Feeder 1 limits**	time limits for running of the boiler in needed output levels	.			
12.3.1.	Feeder on low limit	lower limit of the parameter F1 turn on	sec	5	5	5
12.3.2.	Feeder on upper limit	upper limit of parameter F1 turn on	sec	5	9	8
12.3.3.	Feeder off low limit	lower limit of parameter F1 turn off	sec	24	25	20
12.3.4.	Feeder off upper limit	upper limit of parameter F1 turn off	sec	90	60	61
12.4.	**Pump limits**	temperature limits for start of circulation pump of the system	.			
12.4.1.	Lower limit	lower limit for temperature range for parameter Pump on Temp	°C	55	55	55
12.4.2.	Upper limit	upper limit for temperature range for parameter Pump on Temp	°C	70	70	70
12.4.3.	Absolut limit	temperature, in which the pump is allways in running aside from other conditions of the boiler running	°C	85	85	85
12.4.4.	Pump run - out	time period, in which is pump in running after changeover of the boiler into STANDBY state	min	3	4	6
12.5.	**SWTank pump limits**	Temperature limits for starting SWTank pump of the system	.			
12.5.1.	Lower limit	lower limit of the temperature range for SWTank pump on	°C	55	55	55
12.5.2.	Upper limit	upper limit of the temperature range for parameter SWTank pump on	°C	70	70	70
12.5.3.	Absolut limit	temperature, during which is allways circulation pump in running aside from other conditions of the boiler running	°C	90	90	90
12.6.	**Fan run - out**	time of running of the fan after changeover of the boiler into STADBY state	min	5	7	10
12.7.	**Flue fan Run in**	time of the flue fan operation after boiler go to STAND BY	min	6	8	12
12.8.	**Rotary sensors**	set up of control parameters for the function of feeders F1 and F2	.			
12.8.1.	RS 1 time	set up of time period, in which CU counts incoming pulses of feeder F1	sec	10	16	16
12.8.2.	RS 1 pulses	set up of number of incoming pulses of feeder F1, which is expected in set time period	ks	6	8	8
12.8.3.	RS 2 time	set up of time period, in which CU counts incoming pulses of fedder F2	sec	10	16	16
12.8.4.	RS 2 pulses	set up of number of incoming pulses of feeder F2, which is expected in set up time period	ks	6	8	8
12.9.	**GSM master**	enables operating, settin up and monitoring of the boiler by the service centre	.	420 604 295 525 plus service number		
12.10.	**Reset service PIN**	set up service PIN on the value 1111	.	1492	1492	1492
12.11.	**PIN change**	enables set up original producer PIN	.			
13.	**SW Version**	information about software version used in CU		RKP2_15	RKP2_15	RKP2_15
14.	**Enter code**	Menu for time lock unblocking, by entring correct pin the boiler will unlock				