



TOPLING

PRNJAVOR

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Operating instructions for BOILER "TKV"

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1. Notes on these instruction

1.1 Introduction

These Operating instructions contains important information for proper and safe operation of the TKV boiler. Following these instructions means that danger can be avoided, repair costs and breakdowns can be prevented, reliability can be maintained and that the operational life of the heating system can be increased.

These Operating instructions must be read and applied by everyone who operates or works on the TKV boiler.

We continuously develop and improve our boilers. The information in this version was correct at the time of going to press.

All details in these instructions on standards, regulations and worksheets should be checked before use and should be compared with the regulations applying locally at the installation location.

We reserve the right to make changes which may then deviate from the technical details and illustrations in these Operating instructions.

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1.2 Structure of the Operating instructions

Chapter	Here you see, ...
1 Notes on these instructions	... how to use these Operating instructions.
2 Safety notes	... everything on the subject of safety that you should consider when using the heating system.
3 Functional description	... the structure and all of the features of the heating system
4 Instalation of the boiler	... how to install boiler on central heating system.
5 Putting in operation	... Overview of the controls and display components
6 Maintanance of the boiler	...maintanance periods
7 Possible problems in operation	... how you can remedy faults in the heating system.
8 Commissioning the heating system	... how the heating system is to be initially put into operation.
9 Notes on dismantling and disposal	... what has to be considered when dismantling and disposing of the heating system.
10 Guarantee	... what the terms and conditions of the guarantee are.

1.3 Glossary

Term	Explanation
Delivery system	The pellet transport system in the pellet bunker
Display	Display on the TKV control unit
TKV	Boiler to burn the wood or coal
Automatic	Electronic control for the boiler
Sensor	This collects certain parameters (temperature) and passes them on to the control system for analysis

Table 1

2 Safety notes

2.1 Proper use

BASIC PRINCIPLES FOR THE CONSTRUCTION OF THE SYSTEM

The heating system was built using state of the art technology and conforms to recognised safety regulations. However, its use can result in the injury or death of the user or a third party or in impairments to the heating system itself or to other material goods.
Have your specialist heating company provide you with a detailed explanation of the operation of the heating system.

USING THE HEATING SYSTEM

Only use the heating system when it is in perfect condition. Use it properly, as intended, staying aware of safety and of the dangers involved, following the Operation instructions. Have any faults which could impair safety immediately fixed.

RELIABLE AND UNRELIABLE MODES OF OPERATION

The heating system was designed to burn wood pellets.
Any other use is improper. The manufacturer will accept no responsibility for any damage resulting from improper use. The operator will bear sole responsibility. Proper use includes maintaining installation, operation and maintenance conditions specified by the manufacturer.
You may only enter or change the operating values specified in these instructions. Any other entries will affect the heating system's control programme and could lead to malfunction.

PERMISSIBLE FUEL

Only wood and coal are permissible as fuel for the boiler.

2.2 Residual risk

Despite all precautions, the following residual risks remain:



Caution

Hot surface.

Contact with the hot surface of the boiler can lead to burns.

Wait until the boiler has cooled down before touching uninsulated components.



Warning

Danger of asphyxiation due to carbon monoxide.

If the boiler is operating, carbon monoxide can be emitted through the open ash Door.

Do not leave the ash door open any longer than necessary.

2.3 Warnings and safety symbols used

The following warnings and safety symbols are used in these Operating instructions:



Danger!

Danger from electrical current or voltage.

Work on areas marked with this symbol may only be done by a qualified electrician.



Warning!

Warning about a dangerous location. Work on areas marked with this symbol can lead to serious injuries or to extensive material damage.



Caution!

Hand injuries

Work on locations marked with this symbol can lead to hand injuries.



Hot surface

Work on locations marked with this symbol can lead to burns.



Danger of fire

Work on locations marked with this symbol can lead to a fire.



Frost danger

Work on locations marked with this symbol can lead to frost damage.



Notes on disposal.



Additional information for the operator.

2.4 Duty to inform

READING THE OPERATING INSTRUCTIONS

Everyone who works on the system must have read the Operating instructions before starting work and, in particular, have shapter "2 Safety notes"

This holds especially true for persons who only occasionally work on the system e.g. when cleaning or maintaining the heating system.

These Operating instructions must be kept ready to hand at the heating system's installation location.



Pay particular attention to the applicable local standards and guidelines.

3. Functional description

3.1. Overview

The “TKV” boiler has modern construction and design; it has been made of attested high quality materials.

The construction of the boiler complies with European Directives 98/37/EC, 97/23/EC, 73/23/EEG, 89/336/EEG and European standards EN 303-5:1999; EN 60204-1 : 2006; EN 60335-1:2002;EN 60335-2-102; EN 61000-6-3:2001; EN ISO 12100-1:2003 EN ISO 12100-2:2003; EN 1050:1997, EN 287-1: 2004, EN 15614-1:2004+A1:2008;EN 10204:2004; EN ISO 7000 :2004;

Testing of the boiler has been done in accordance with EN 303-5 and EN 304 and it meets all the conditions for being connected to the central heating installation.

The heating boiler is intended for central heating of housing units, family houses, business premises and production units..

Handling of the boiler is very easy and it includes only switching it on via the main switch and adjustment of the desired temperature.

The firebox and convective parts of the boiler have been made of quality boiler thin metal plate by technology of welding.

The boiler is well insulated with hard-pressed mineral wool in a quality and proper thin metal plate paneling.

Assembling and putting the boiler in operation are simple and the connections are of standard type.

The boiler is waterproof tested. The allowed working pressure is 2.5 Bar

The boiler has been attested by the Faculty of Mechanical Engineering in Banja Luka

3.2. Technical data

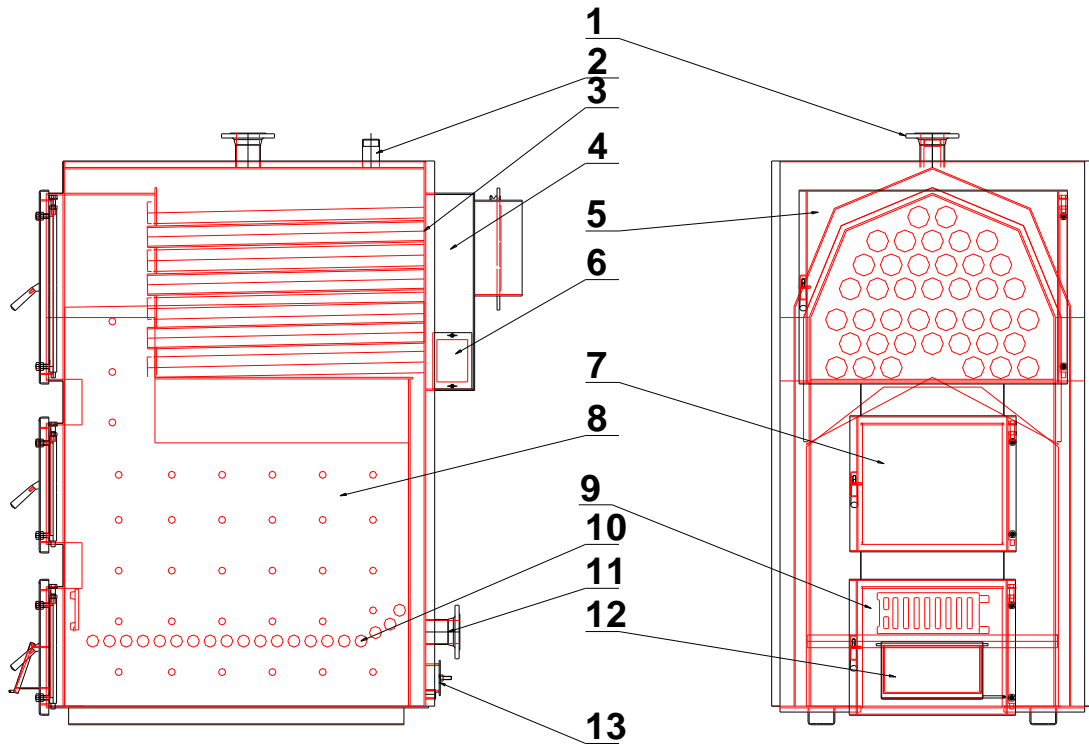


Illustration 1 - boiler TKV

LEGEND

1. Outlet water pipe
2. Safety outlet pipe
3. Convection smoke pipes
4. Furnace flue
5. Upper door
6. Opening for furnace flue cleaning
7. Middle door
8. Fire box
9. Lower door
10. Water cooled grate
11. Inlet water pipe
12. Air flap
13. Flange for ventilator

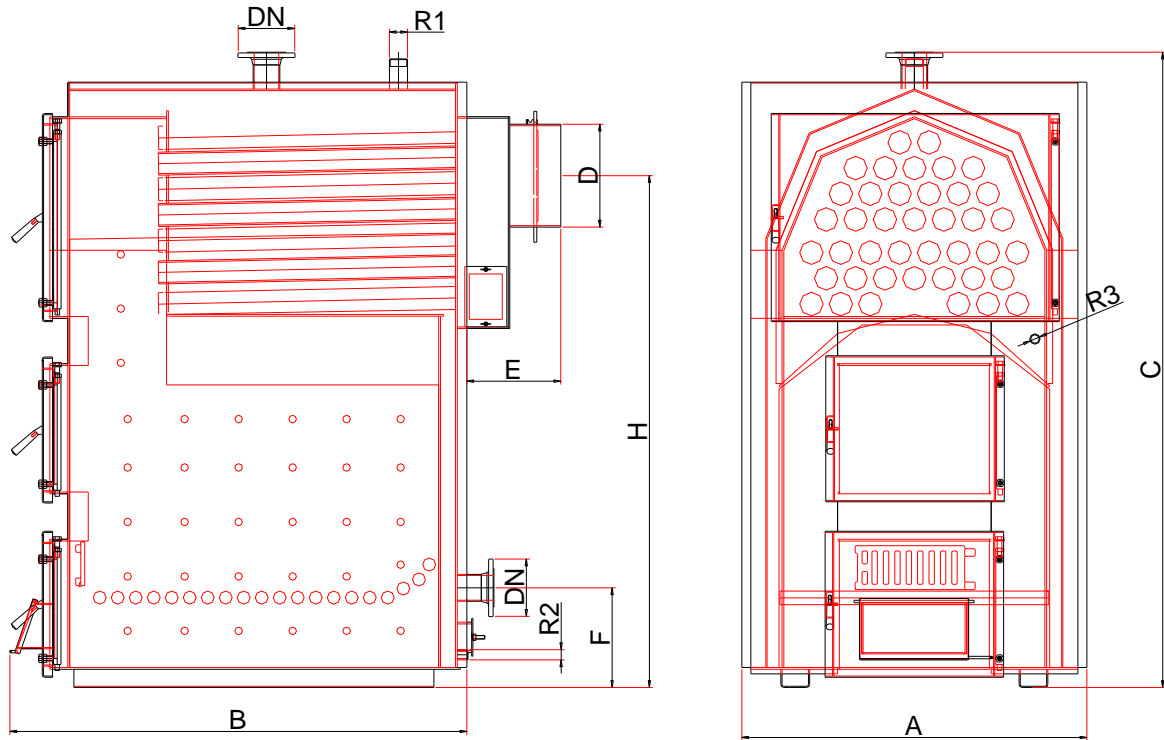


Illustration2

type	power [kW]	DIMENSIONS [mm]								CONNECTIONS [col]			Draft [Pa]	Weight [kg]	Water content [l]
		A	B	C	D	H	E	F	DN	R1	R2	R3			
TKV-65	65	720	1020	1480	200	1200	315	304	40	1	3/4	3/4	30	475	170
TKV-80	80	795	1053	1525	200	1246	315	305	40	1	3/4	3/4	34	550	250
TKV-100	100	890	1060	1633	230	1280	300	360	50	1	3/4	3/4	38	680	358
TKV-125	125	920	1065	1670	230	1360	300	399	65	5/4	3/4	3/4	42	720	405
TKV-150	150	905	1180	1840	250	1450	300	426	65	5/4	3/4	3/4	45	940	482
TKV-175	175	1060	1203	1846	260	1440	300	436	80	6/4	3/4	3/4	47	1040	613
TKV-200	200	1065	1276	1941	300	1490	300	450	80	2	3/4	3/4	50	1170	670
TKV-250	250	1140	1336	2015	330	1600	340	439	80	2	3/4	3/4	53	1260	695
TKV-300	300	1135	1346	2060	330	1650	340	439	80	2	3/4	3/4	53	1360	720
TKV-350	350	1250	1525	2152	350	1680	370	524	80	2	3/4	3/4	53	2120	1090
TKV-450	450	1350	1600	2300	450	1735	400	559	100	2	3/4	3/4	53	2420	1100
TKV-550	550	1450	1757	2410	450	1750	405	565	100	2	3/4	3/4	57	3150	1280

TKV-750	750	1610	1953	2420	500	1830	430	570	100	2 1/2	3/4	3/4	59	3500	1570
TKV-850	850	1650	2100	2460	500	2000	430	580	100	2 1/2	3/4	3/4	65	3780	1680
TKV-1000	1000	1760	2140	2600	500	2050	430	580	100	2 1/2	3/4	3/4	65	4060	1910
TKV-1200	1200	1820	2200	2620	500	2120	430	580	100	2 1/2	3/4	3/4	68	5220	2150
TKV-1500	1500	2020	2620	2735	500	2205	430	580	125	2 1/2	3/4	3/4	70	6450	2350
TKV-2000	2000	2350	2743	2950	500	2350	430	580	125	2 1/2	3/4	3/4	75	8150	2670

parameter	unit	value
Power	100 -2000	kW
Coefficient of efficiency	%	80-84
Smoke temperature at nominal power	°C	max 250
Working pressure	Bar	1.5
Maximum pressure	Bar	2,5
Test pressure	Bar	4
Inlet water temperature	°C	70
Outlet water temperature	°C	90

Table2

4. Installation of the boiler

4.1. Boiler installation on central heating system



The boiler installation on central heating system must be carried out only by a qualified persons.

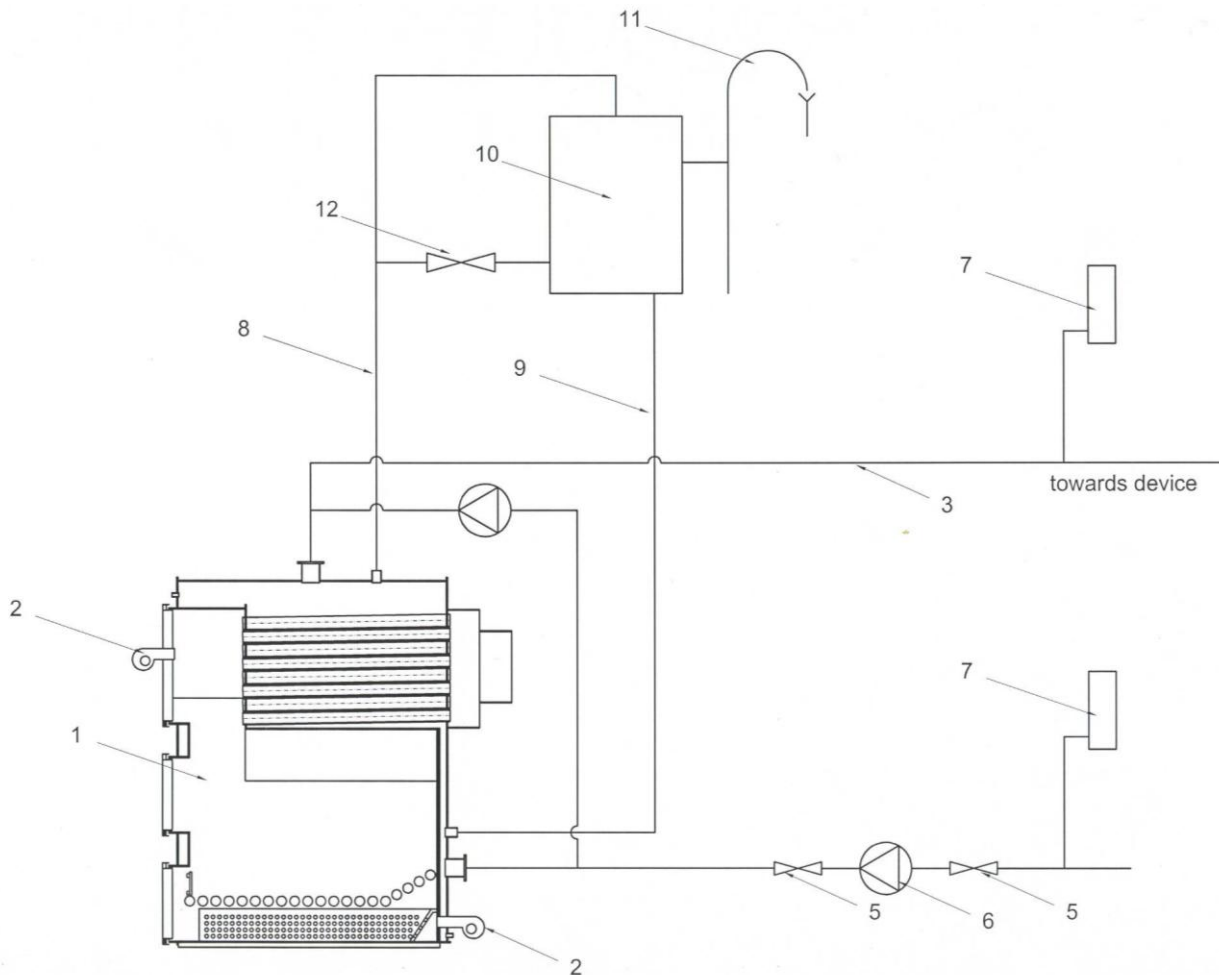


Illustration3 scheme of connecting the boiler to the installation

- 1- Boiler
- 2- Ventilator
- 3- Outlet conection
- 4- Inlet conection
- 5- Block valve
- 6- Circulation pump
- 7- Thermometer
- 8- Safety outlet duct
- 9- Safety inlet duct
- 10- Expansion vessel
- 11- Overflow pipe
- 12- Gate valve

The boiler should be placed as closest to the chimney as possible.

Free supply of air to the boiler should not be closed.



WARNING

- The boiler must be placed on a stable and flat floor. Placement and installation of the boiler must be carried out by a **competent technician**.
- The boiler room must contain connections from water supply network, a connection for possible water outflow, and a connection to power network with **obligatory earthing**.
- It is necessary to have natural airing of the boiler room which would ensure fresh air supply.
- The floor and the inside of the boiler room must be made of fireproof material.

It is recommendable not to have humidity in the room in order to avoid corrosion of metal parts of the boiler so as to ensure its longer lifetime

It is recommended to use softened water for filling the boiler from the system

The circulation pump is to be put in operation only after the heating system is filled with water and it is obligatory to ensure air exhaust of the system

When connecting the boiler with the chimney, the chimney is to be placed with a rise. All the connection must be tightly stuffed/joined.



The chimney must be dimensioned as shown on the diagram in **illustration 4 and 5**

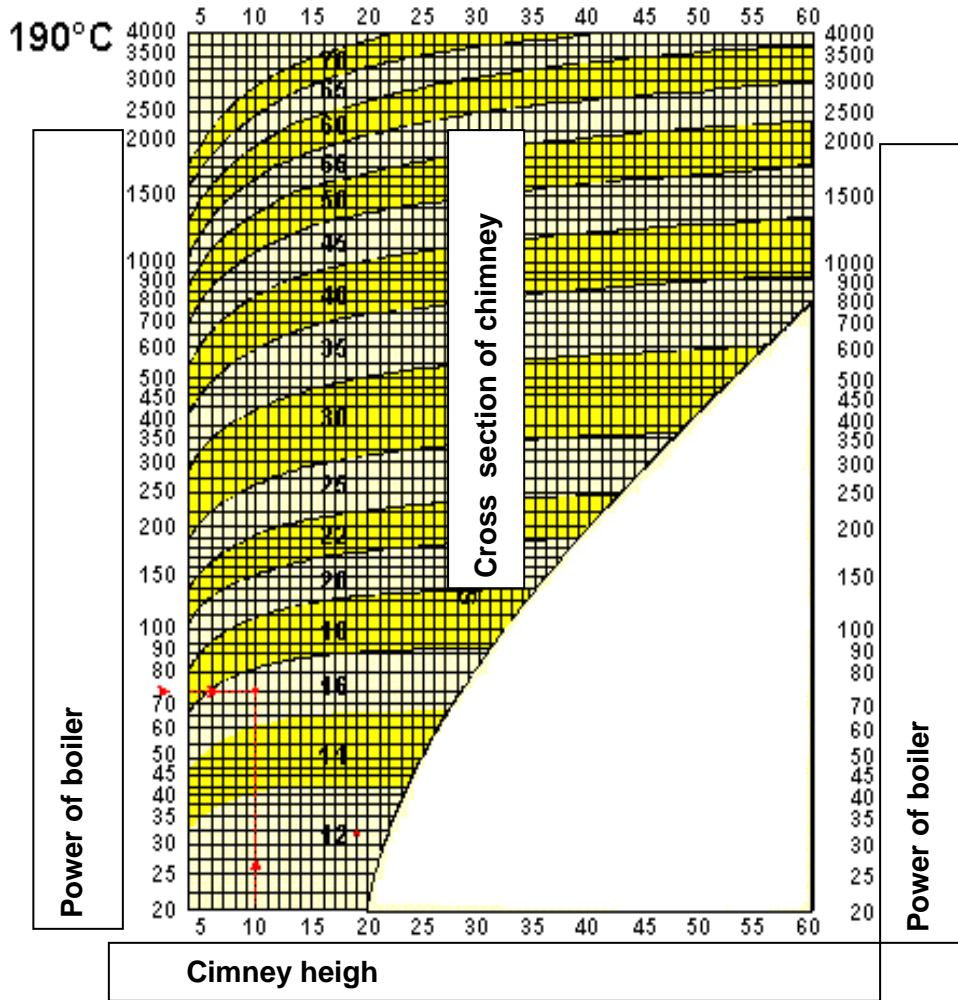


Illustration 4 choice of chimney for forced draft boilers (Schiedel)

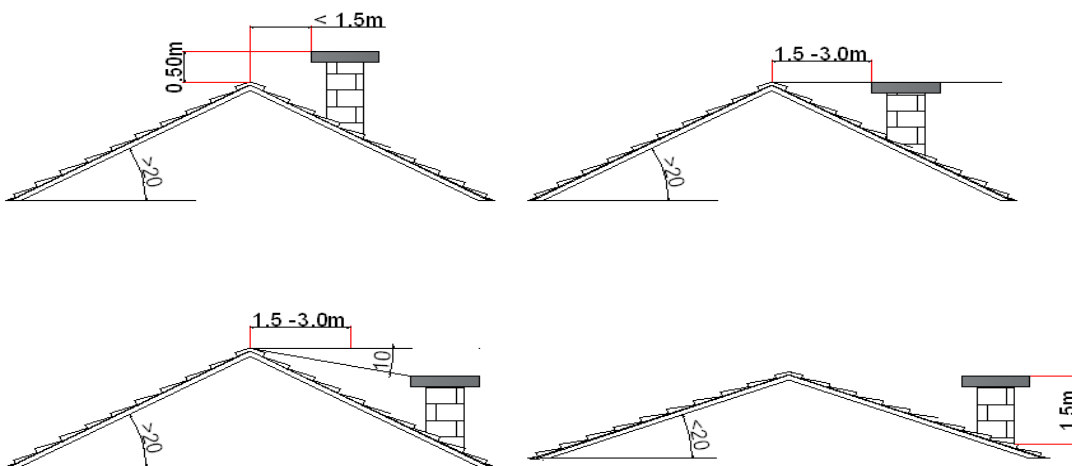


Illustration 5 Examples of appropriately placed and dimensioned chimneys

Before fuelling/lighting the fire it is obligatory to check:

- the pressure in the boiler and the installation
- circulation pump is to be switched on and the water from the boiler is to be released into installation only when the temperature of the water in the boiler reaches 60°C

In a closed heating system it is obligatory to install an attested safety valve with the opening pressure of 2.5 bar as well as to install an expansion tank. It is not allowed to install a hasp element between the safety valve and the expansion tank.

The water temperature in the boiler must not drop below 60°C because condensation will then appear.

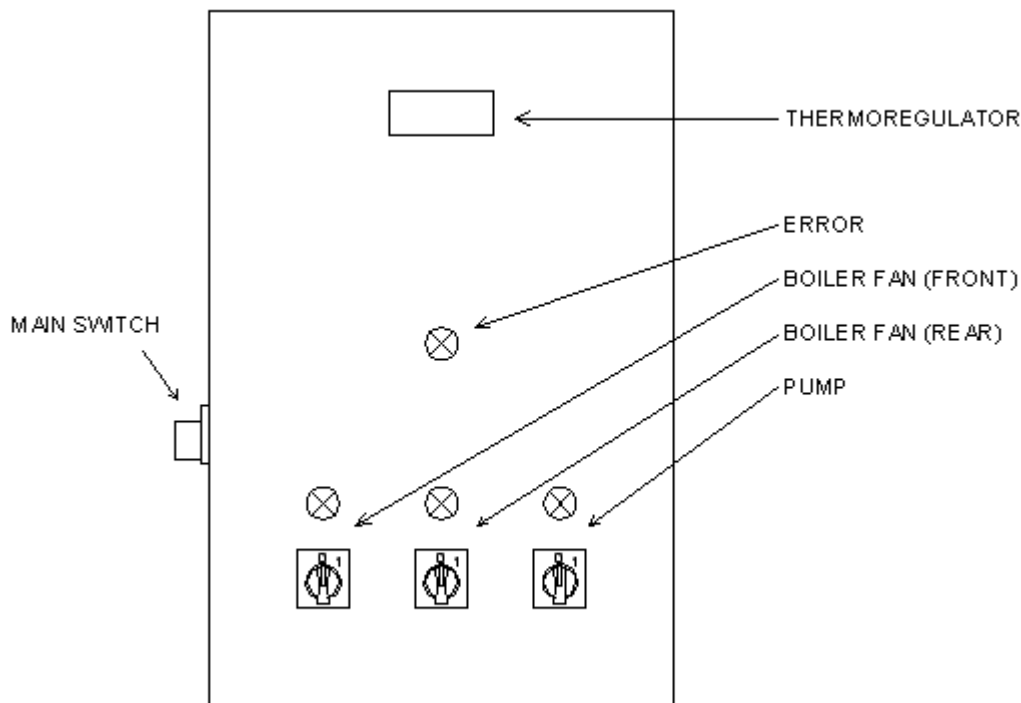


If the boiler is not used during strong winters or low atmospheric temperatures it is necessary to release the water from the system or to fill it with anti-freeze liquid.

5. Putting in operation

5.1. Overview of the controls and display components

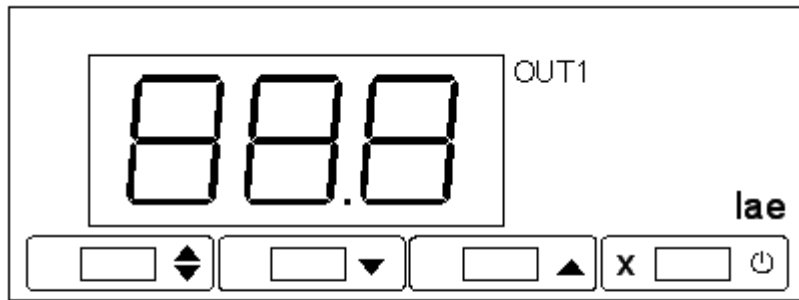
The front side of control unit is shown below.



System starts with main switch on left side of control unit. If switches BOILER FAN (FRONT) and BOILER FAN (REAR) are turned on, these fans start work. Process is carried on by thermoregulator. Thermoregulator measures temperature of water and when temperature reaches preset value, the thermoregulator stops fans to work. When temperature of water falls 3 degrees Celsius below preset temperature on thermoregulator fans again start work and temperature of water will rise.

The pump turns on with switch "PUMP". It is necessary to join protection of the pump on clamps 13 and 14 (see electric scheme). If bimetal protection of the pump responds, ERROR lamp will light.






Below is the explanation of setup proces of the thermoregulator.



-  **Setpoint button**
  **Decrease button**
 **Increase button**
  **Exit button**

During normal operation, the display shows current temperature of water.

To set desire temperature of water do following:

- Press button  for at least half second, to display the setpoint value.
- By keeping button  pressed, use button  or  to set the desire value (from 30 to 92 degree Celsius).
- When button  is realeased, the new value is stored.

6. Maintenance of the boiler

6.1. Maintenance periods

To ensure fault-free operation, certain cleaning and maintenance work is necessary. These avoid expensive repair work, as long as you maintain the recommended intervals



The specified maintenance intervals are guidelines. Depending on the quality of the wood and coal and the power used by the heating system (more frequent on/off operation) the intervals may be extended.



Turn off the control unit of boiler and the main switch before you go to perform operation describe in table below.

interval	component	how to do it
every three days	pipes in convective bundle	Cleaning is very simple and it is carried out by moving the cleaning handle on the mechanism intended for cleaning the convective bundle (illustration 1, position 15) in the front-back direction. The handle needs to be moved 5-6 times.
weekly	fire box	It is necessary to clean the fire-box from ash by pulling out the ash dish through the opening intended for cleaning (illustration 1, position 14). It is necessary to clean the fire-box of the boiler from layers of soot in order to ensure better exchange of heat from the fuel to the water which is circulating through the heating system.
every six months	control unit	perform it with dry cloth
annually	whole boiler	It is necessary to perform a thorough cleaning of the whole boiler

Table3

At first lighting of the fire it is necessary to do that in such a way to reach the temperature of 60°C as soon as possible.

In maintenance of the boiler it is required to install original parts of the manufacturer, this being the only way to keep the factory guarantee.

While lighting the fire in order to simply regulate the water temperature in radiators and to keep it below 60°C it is recommended to install at least the simplest manual three-way mixing valve.

Remark

Upon completion of the heating season make sure to clean the boiler thoroughly in order to increase its lifetime.



When you perform cleaning operation by vacuum cleaner it is important to cooled off the ash to avoid possibility of fire to breik out.



Danger of burns from the hot surfaces

When operating, the boiler surfaces under the cladding are hot.

Even when turned off, they only cool down slowly.

Only touch the hot surfaces with the carrying grip or wait until the surfaces have cooled down before starting with the cleaning and maintenance work.



Danger of asphyxiation due to carbon monoxide.

If the boiler is operating, carbon monoxide can be emitted through the open ash door.

Do not leave the ash door open any longer then necessary.

7. Possible problems in operation

In the case of malfunction, the red lamp is flickering (illustration 9, position 9) and on display will be lay down the inscription.

Problem	Cause	Solution of the problem
Boiler does not achieve working temperature	Filthiness of boiler or suffocated chimney	Necessary to clean the boiler and the chimney
Boiler becomes wet	Temperature of water below 65°C	Necessary to check the chimney and the flue gas canal
		Necessary to check if the chimney dimensions are appropriately determined
There is no voltage in the automatics	No electrical supply	Necessary to check the fuses of electrical network
	Fuse out of order	Necessary to replace the fuse
	Mistake in electrical cable	Necessary to check the connection and the cable
	Automatics out of order	Necessary to ask for assistance of service engineer or to replace the automatics
Ventilator off / does not work*	Safety thermostat has been activated	Necessary to unscrew the cap on the control panel and to deactivate it with a pointed/sharpened device
	No voltage on ventilator	Necessary to check connecting contacts on the automatics and on the ventilator. If the automatics is out of order it is necessary to ask for assistance of service engineer or to replace it.
	Ventilator out of order	Necessary to ask for assistance of service engineer or to replace the ventilator
Ventilator too noisy during its work	Bearing of ventilator out of order	Necessary to ask for assistance of service engineer or to replace the ventilator
	Condenser out of order	Necessary to ask for assistance of service engineer or to replace the condenser
	A foreign object in the casing	Necessary to check and clean it
	Ventilator is not attached appropriately	Necessary to check and attach it
Ventilator works weakly	Dirty vanes/blades	Necessary to check and clean them
	Ventilator's lid dirty	Necessary to ask for assistance of service engineer or to replace it
Pump off/does not work	No voltage on the pump	Necessary to check connecting contacts on the automatics and the pump. If the automatics is out of order it is necessary to ask for assistance of service engineer or to replace it.
	Pump got stuck	Necessary to ask for assistance of service engineer or to replace the pump
	Safety thermostat has been activated	Necessary to unscrew the cap on control panel and to deactivate it with a pointed/sharpened device

Table 4

8. Commissioning the heating system

The heating system will initially be commissioned by specialists from "TOPLING" or from an authorised TOPLING partner.

The commissioning includes an introduction to the operation and maintenance of the heating system as well as the taking of measurements on the system for pollution and heating capacity.



Danger !

Material damage and injury due to incorrect commissioning.

Commissioning the system requires comprehensive specialist knowledge. If this commissioning is done by an untrained person, the heating system can be damaged. Only allow authorised specialists to do the commissioning.

8.1. Conditions

The following conditions must be met before the system can be commissioned without faults.

SWITCH OFF THE MAIN SUPPLY

- Is the circuit breaker in the main supply to the heating system switched off?

CHECK THE MECHANICAL ASSEMBLY

- Have the system components been correctly installed?
- Have all the mechanical components been firmly screwed together?
- Have the combustion chamber and ignition fan been correctly assembled?

CHECK THE HYDRAULIC CONNECTIONS

- Have the return pump been correctly installed?
- Has the safety equipment been installed to conform to the applicable standards and guidelines?

Check all electrical connections



Danger !

There is a risk from electrical shock

9. Notes on dismantling and disposal

9.1. Dismantling



Danger !

Material damage and injury due to incorrect disassembly. Dismantling the system requires comprehensive specialist knowledge. If the heating system is dismantling by an untrained person, injuries are possible. Only allow authorised specialists to dismantle the system

The heating system can be dismantled as follows

1. Switch the heating system off.
2. Allow the boiler to burn out the wood or coal .
3. Isolate the heating system from the electrical power supply.
4. Whilst maintaining the personal safety regulations, separate the boiler from the heating system.
5. Dimantle the boiler coverings
6. Separate the mineral insulation from bioler

9.2. Lay down the boiler

The following parts are made from steel, and you must deliver it to the company that collect waste material:

- Body of boiler
- Boiler coverings

You must separate electrical component and deliver it to company that colect electrical waste material

Fibre glass and plastic parts should be handed in to the waste disposal centres.



Oily or greasy components and capacitors may only be disposed of via a specialist waste disposal centre..

10. Guarantee

10.1. Scope

You receive a guarantee of one year on the body of the boiler.
For electrical and other component, the guarantee period is one year also

10.2. Conditions

The heating system must be commissioned by our customer service department or by an authorised specialist company.

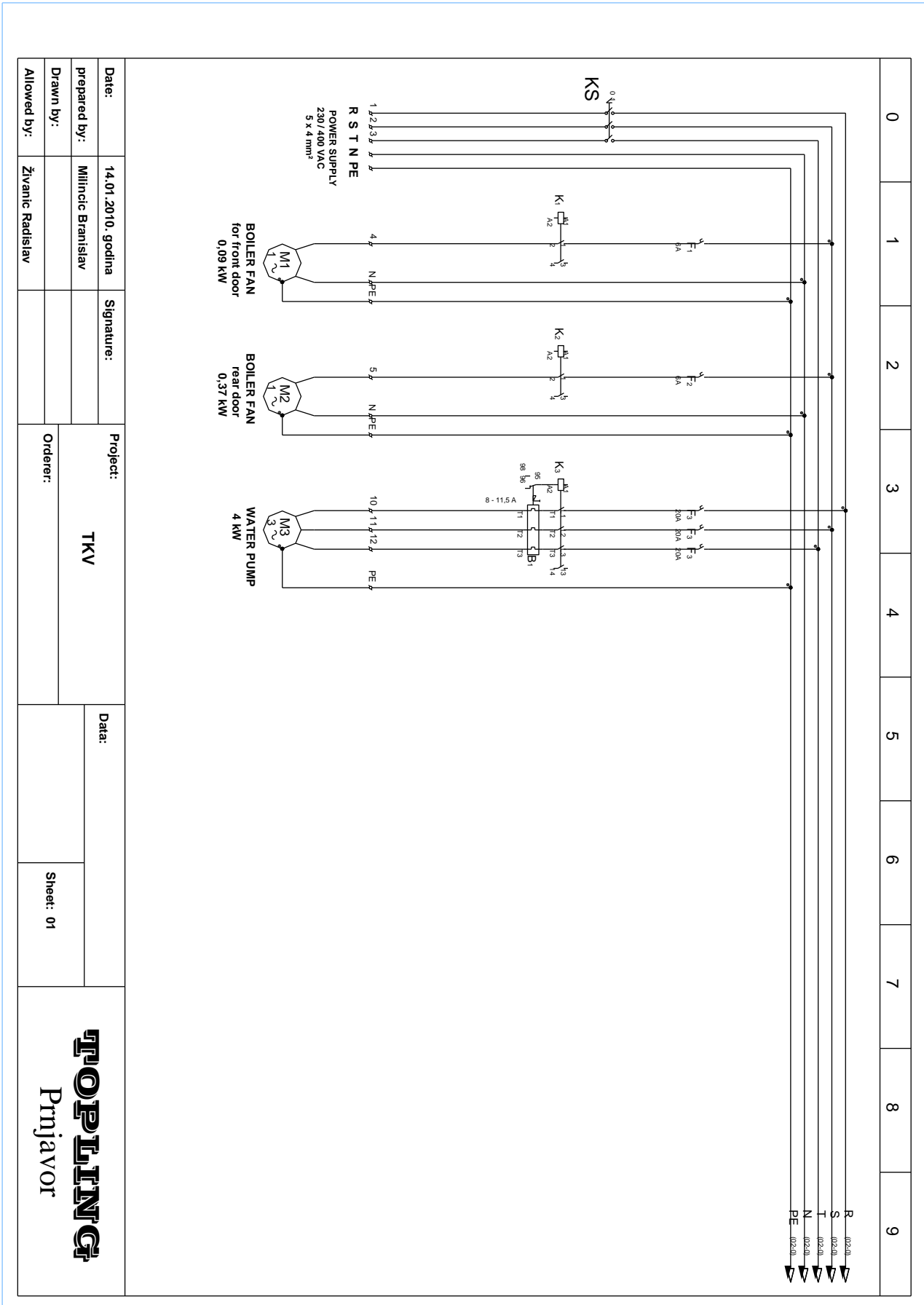
The heating system must be operated as specified in the Operating instructions.

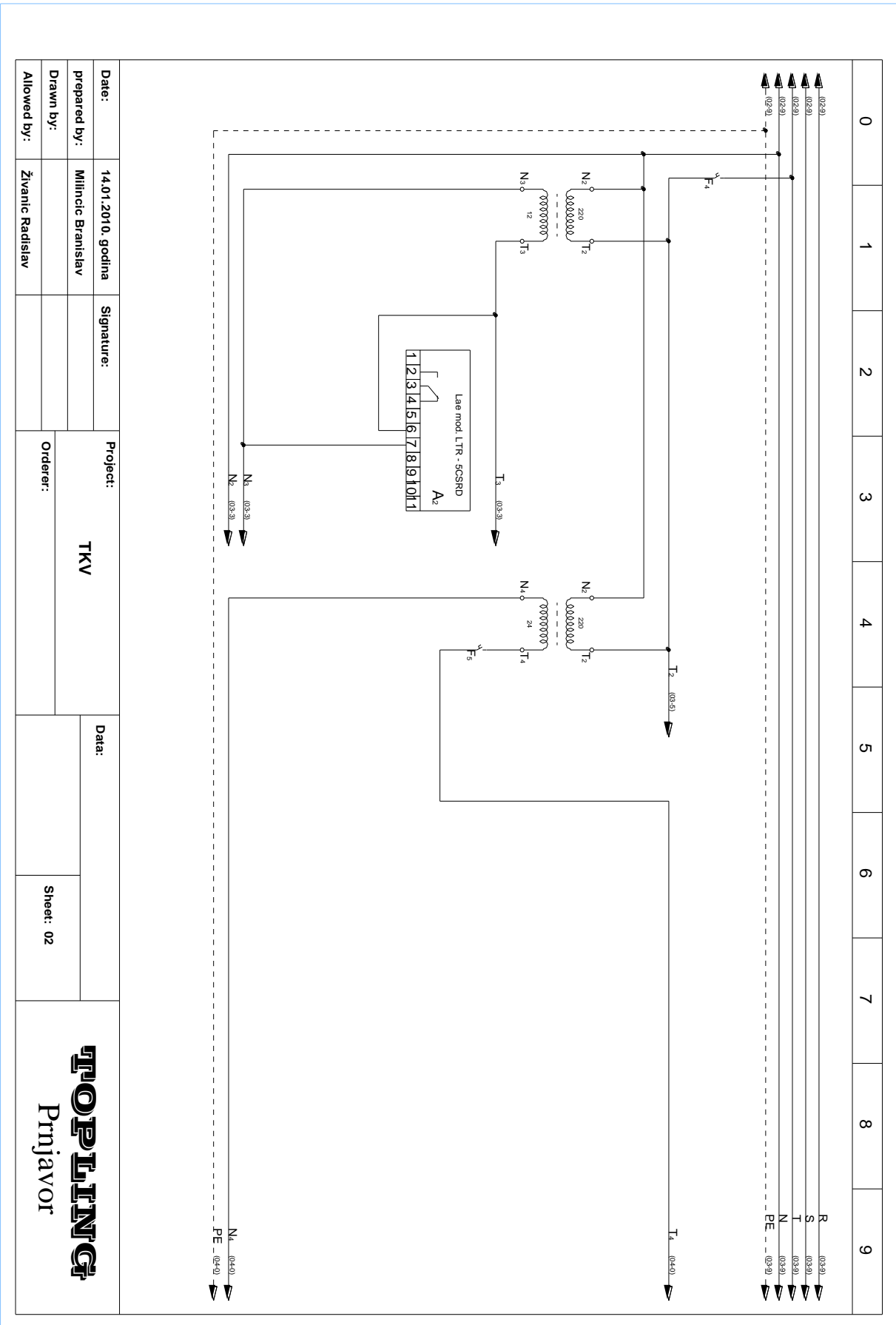
The heating system must be installed to applicable rules, regulations and guidelines.

10.3. Exclusions from the guarantee

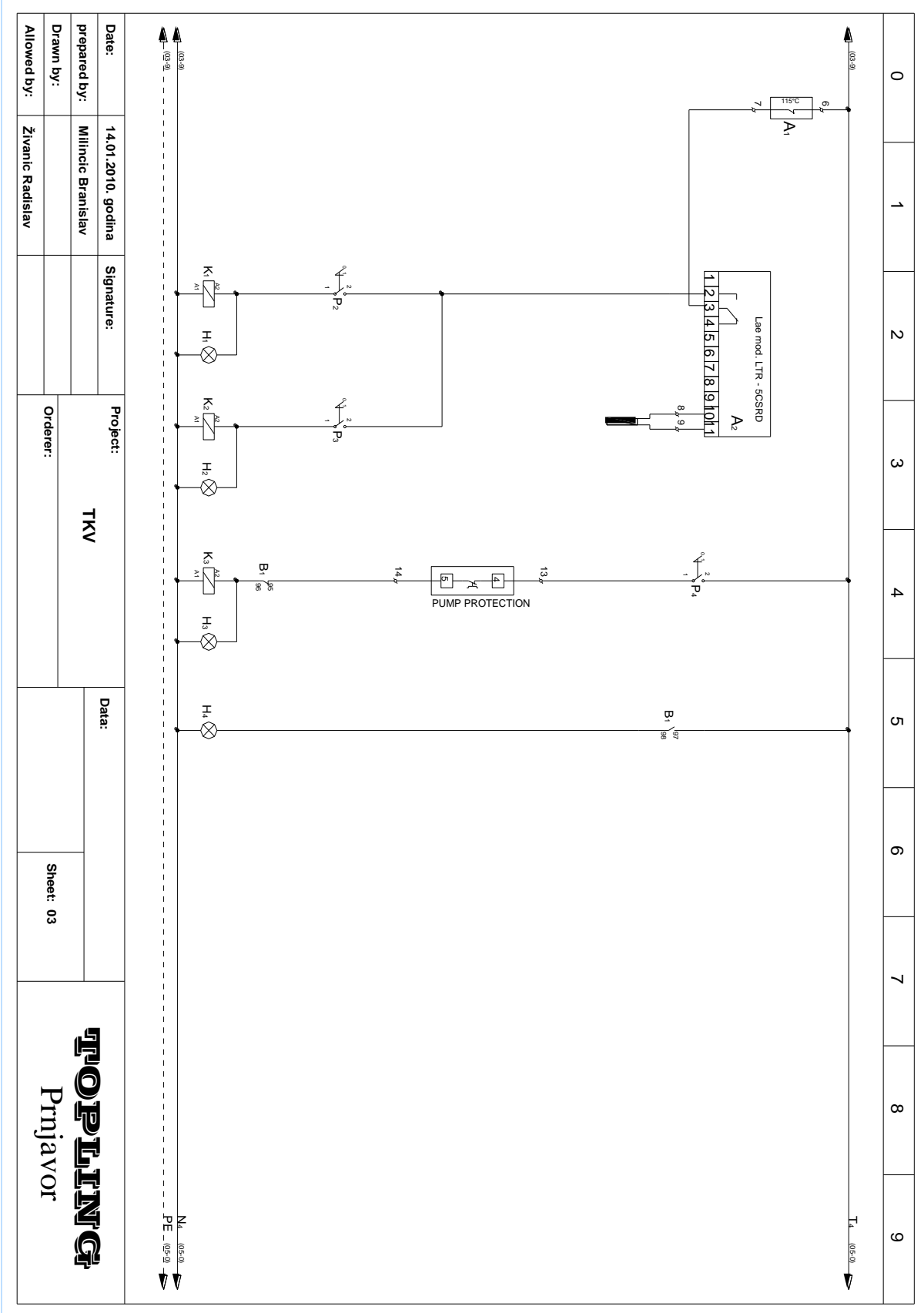
The guarantee does not cover damage due to improper use or installation, nor damage caused by inadequate maintenance or by the operation of the the system and the heating system in an impermissible way.

Damage caused by external influences (such as fire, water, lightning, excess voltage) and normal wear and tear (e.g. of seals etc.) are excluded from the guarantee.





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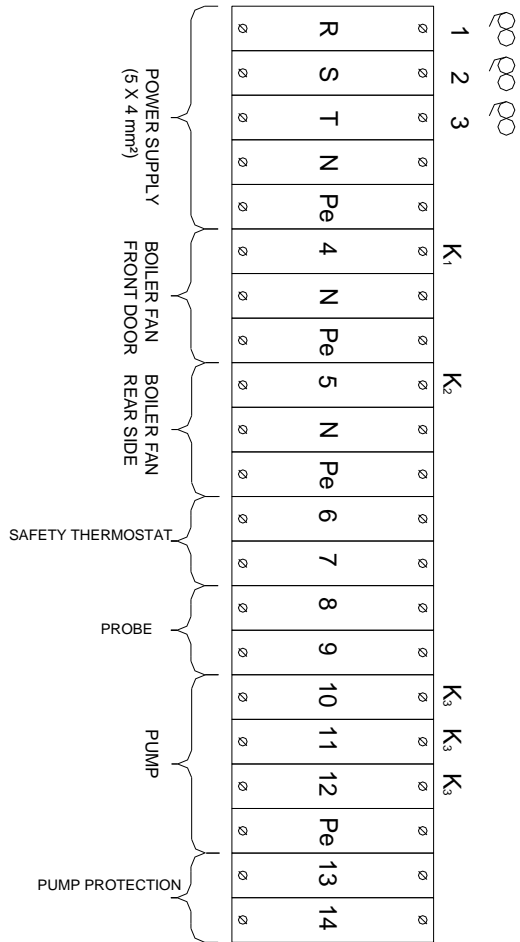
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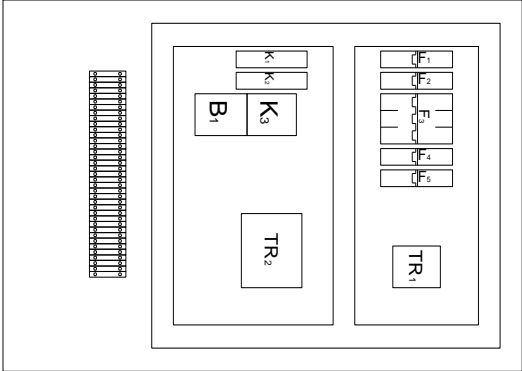

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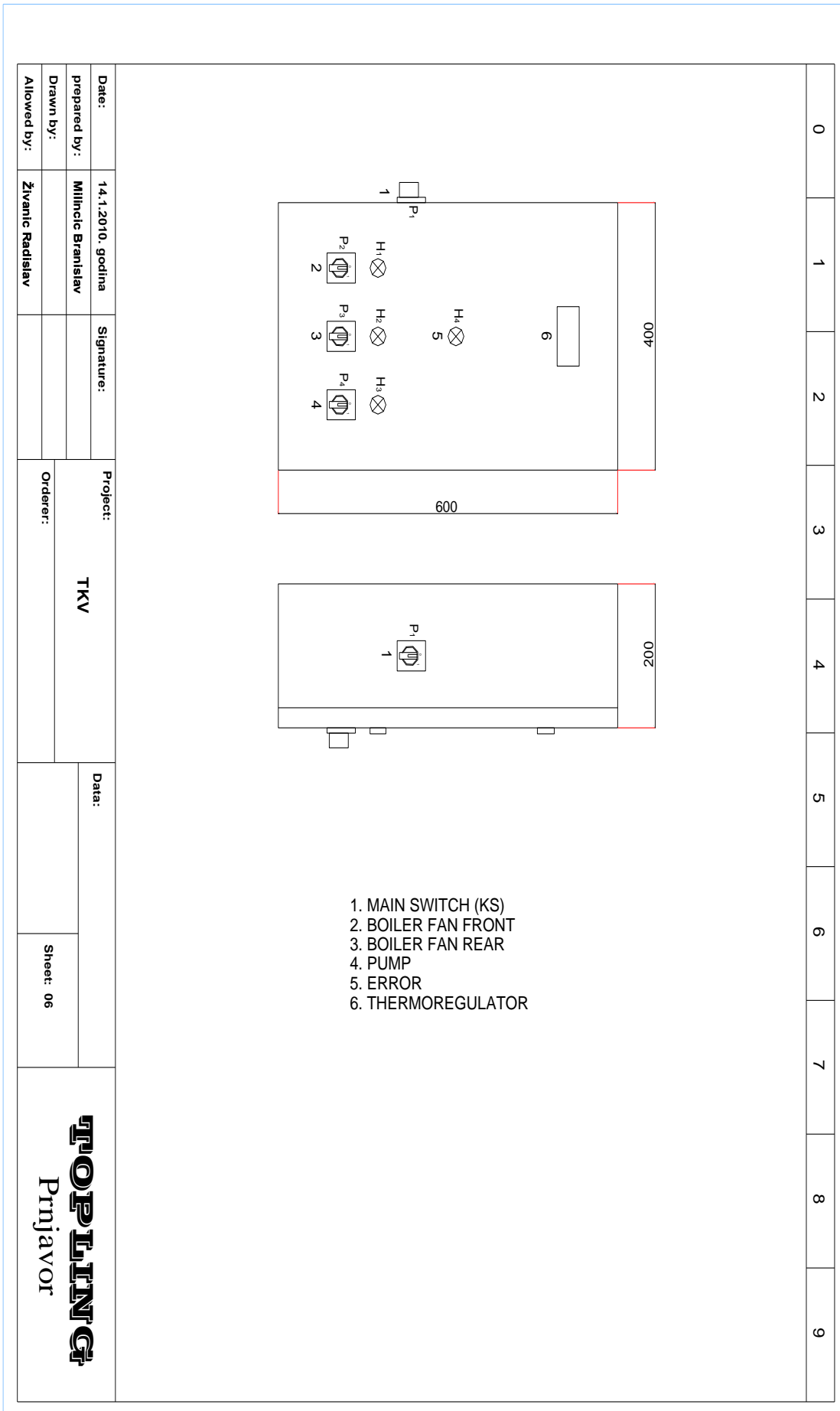
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