ELECTRIC BOILER FOR CENTRAL HEATING AND WARM WATER PREPARATION

TERMO-Kombi

USER'S INSTRUCTIONS

WE ARE NOT LIABLE FOR DAMAGES RESULTING FROM NON-OBSERVING THESE INSTRUCTIONS

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TERMOSTROJ d.o.o.

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1. Introduction

Thank you for the confidence you have shown to us by having purchased our boiler for central heating and sanitary water preparation.

For correct and safe and above all economic use of the product, before assembly and connection, read thoroughly these instructions.

Packing contains the following elements: boiler (1), suspension support (3), user's instructions and letter of guarantee (3), valve for filling and emptying (4), impurities collector (5), plastic pipe for venting the system.

The Termo-Kombi boilers meet any and all national regulations and legal standards. Pursuant to the mentioned before, the certification of the product was done according to the valid EN and HRN standards. You can take insight into the certificates at the point of sale, authorized service or web sites: *http:/www.termostroj.com.*

The firm Termostroj is certified by the quality system pursuant with the standard ISO 9001:2000.

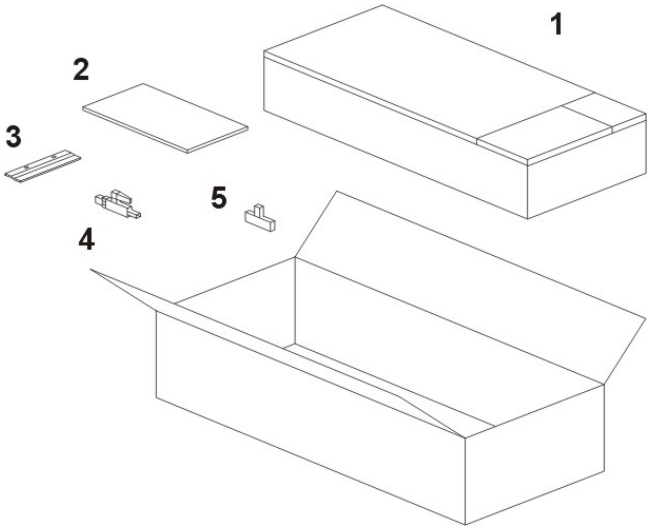


Illustration of unpacked product

2. About the product

TERMO-Kombi is the economic boiler for central heating and sanitary water preparation that may be used as the independent source of heat.

The boiler is operated on the principle of rapid heating smaller water quantities and its energy exploitation is almost 100%

TERMO-Kombi is suitable for using in smaller business premises, flats, smaller catering objects etc., where it is important that it takes up small space.

Temperature range of operation is for sanitary water from 30°C up to 55 °C, for central heating from 30°C up to 90 °C.

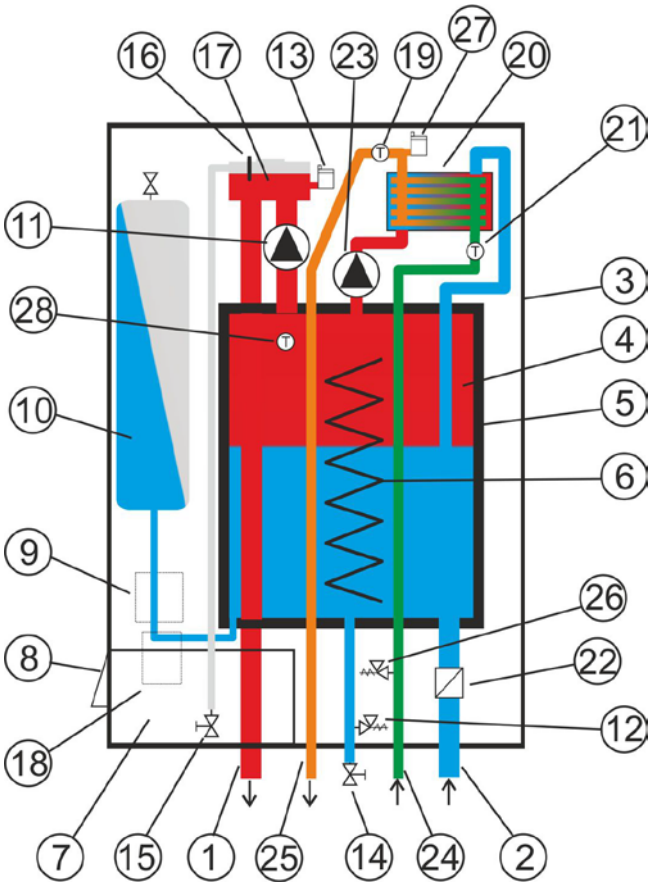
Because of its design and noise free operation, the TERMO-Kombi may easily fit in the living space. The outer metal sheet is protected by powder coating.

2.1. Construction

The electric boiler TERMO-Kombi is made of quality boiler metal sheet. The boiler itself is upon welding sandblasted and protected with quality reactive fundamental color.

At the bottom side of the boiler there are built in electric heaters. From the upper side there is the blind tube for placing the sounding tube of capillary thermostat, temperature, pressure and thermal fuse indicator. The boiler is insulated with 19 mm self-extinguishing insulating material, which is sufficient to direct all the heat only to the heating and sanitary water preparation system.

2.2. Integral parts of the TERMO-Kombi Boiler



1. Central heating primary flow
2. Central heating return flow
3. External shell of the boiler
4. Boiler
5. Thermal insulation
6. Electric heaters
7. Control panel
8. Boots for el. terminals
9. Contactors
10. Expansion vessel
11. Central heating pump
12. Safety valve at 3 bar
13. Automatic venting valve
14. Filling and emptying valve (in packing, it should be built in at installation)
15. Valve for boiler venting
16. Sounding tube for air appearance control
17. Distributor
18. RCCB switch
19. Temperature sensor of sanitary water outlet line
20. Exchanger
21. Temperature sensor of sanitary water inlet line
22. Non-return valve
23. Pump for sanitary water preparation
24. Sanitary water intake
25. Sanitary water output
26. Safety valve at 8 bar
27. Automatic venting valve
28. Boiler's temperature sensor

3. Installation

3.1. Important warnings

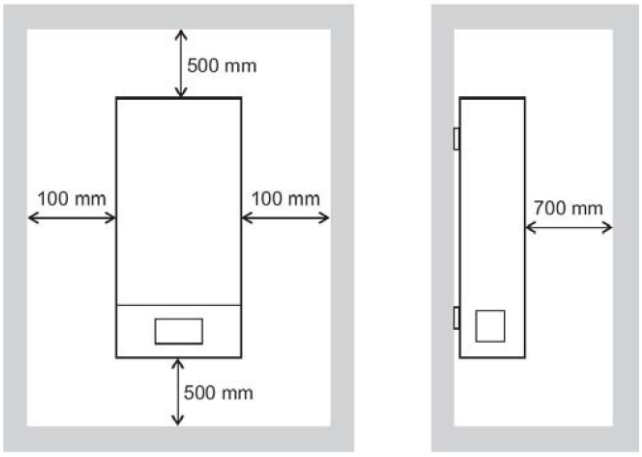
THE GUARANTEE SHALL NOT BE ACCEPTED IF THE FOLLOWING WAS NOT OBSERVED:

- **THE BOILER SHOULD BE PUT INTO OPERATION BY THE AUTHORIZED SERVICE,**
- **THE ENCLOSED IMPURITIES COLLECTOR SHOULD BE BUILT IN ON THE STARTING LINE OF CENTRAL HEATING AND INLET COLD SANITARY WATER,**
- **PRIOR TO CONNECTING THE BOILER TO THE SANITARY WATER LINE, PIPES SHOULD BE CLEANED IN ORDER TO AVOID THE BLOCKAGE OF THE EXCHANGER.**

THE LIST OF AUTHORIZED SERVICES IS ON THE BACK OF THE LETTER OF GUARANTEE

THE BOILER SHOULD NOT BE INSTALLED ON PLACEC WHERE THERE IS A DANGER OF BEING PORING OVER WITH WATER OR A DANGER OF SINKING.

IN AREAS WITH STRONG CONCENTRATION OF LIME IT IS RECOMMENDED TO BUILD IN A MAGNETIC OR ELECTROMAGNETIC LIME BREAKER ON THE INLET LINE OF SANITARY WATER ON THE BOILER.



Minimalne udaljenosti prilikom montaže

Minimum distances at assembly

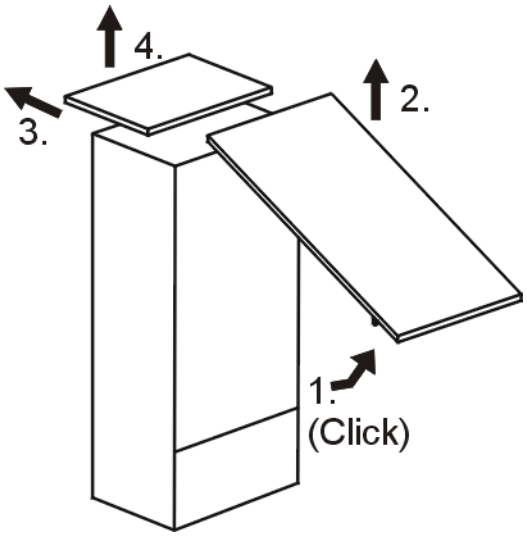
3.2. Assembly

TERMO-Kombi is foreseen for the wall assembly and for the easier assembly, on the backside there is foreseen the suspension support. For the suspension you may use metal wall plugs with the screw M8 or M10 or stronger plastic wall plugs – diana screws.

Precise dimensions of boilers are given in the **7. Technical specification**

Filling and emptying valve is delivered together with the boiler and should be assembled at the installation.

If possible, the boiler should be assembled to the lowest point in relation to installation. In this way we are protecting the boiler from air appearance, which may leave heaters without water that could result in their burning through.

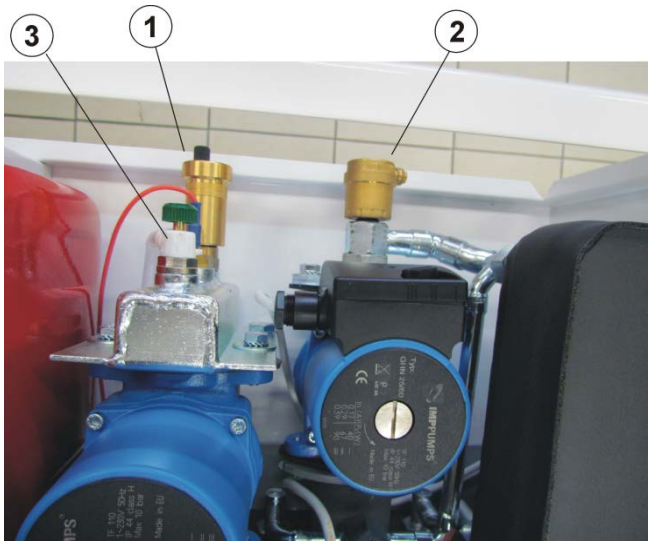


Disassembly schema

3.2. Assembly (Continued)

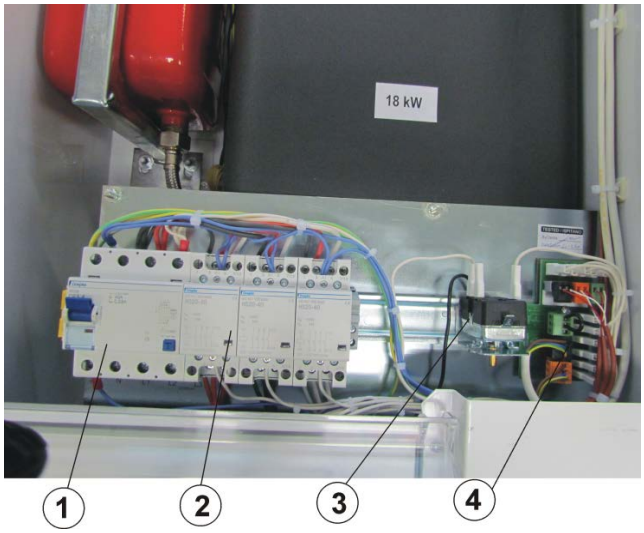
Prior to putting into operation, the system should be vented and that both central heating and sanitary water circle.

Illustration of how to correctly vent the water circle on upper side of Termo-Kombi. Protection cap should be release on automatic venting pots (1 and 2). Plastic pipe should be attached to valve (3) prior venting the water circle.



Upper side of Termo-Kombi

On the illustration you can see RCCG switch (1), contactors (2), capillary thermostat for prevent overheating during prepare sanitary hot water (3) and connection plate (4) for connecting pumps, room ‘stat and all probes.

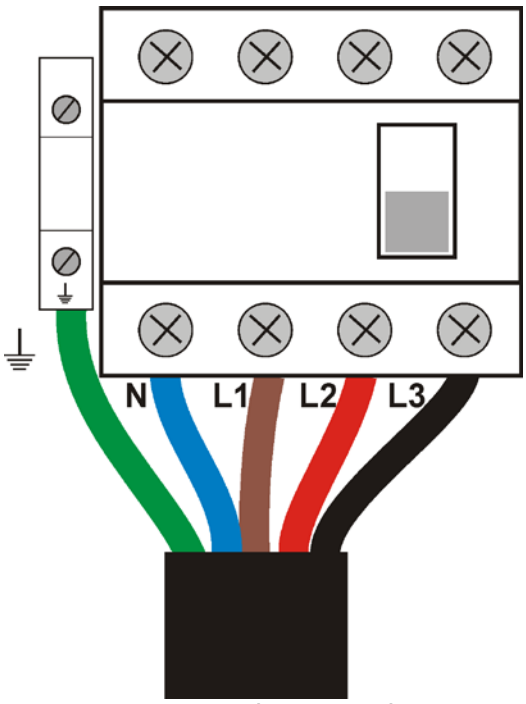


Connection terminals

3.3. Connection to the power network

For power supply connection on all Termo-Kombi boilers, RCCB switch is used, providing same time protection for boiler and connection point for external power cables.

Note:
When connecting power cable please observe live and neutral marks on RCCB inside boiler.

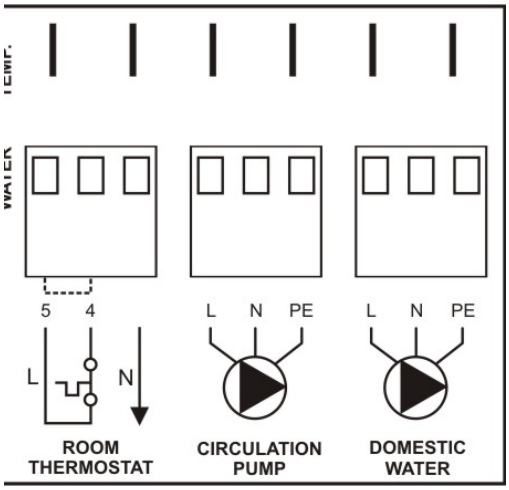


Power supply connection

3.4. Connection of room thermostat

The TERMO-Kombi boiler has foreseen clamps for connecting the room thermostat.
The short circuit is factory installed on the clamps (for cases when the room thermostat is not used) and if we connect it, we have to take account of the fact, which type of a room thermostat is to be connected.
One group of thermostats is connected only serially in the control voltage circuit, resp. on clamps.
The other group of thermostats has built in temperature simulation system and therefore should be constantly under voltage and according to the fixed temperature in the room, on its outlet we have the signal for boiler control. In this case the ZERO-line is connected to the clamp “N”.

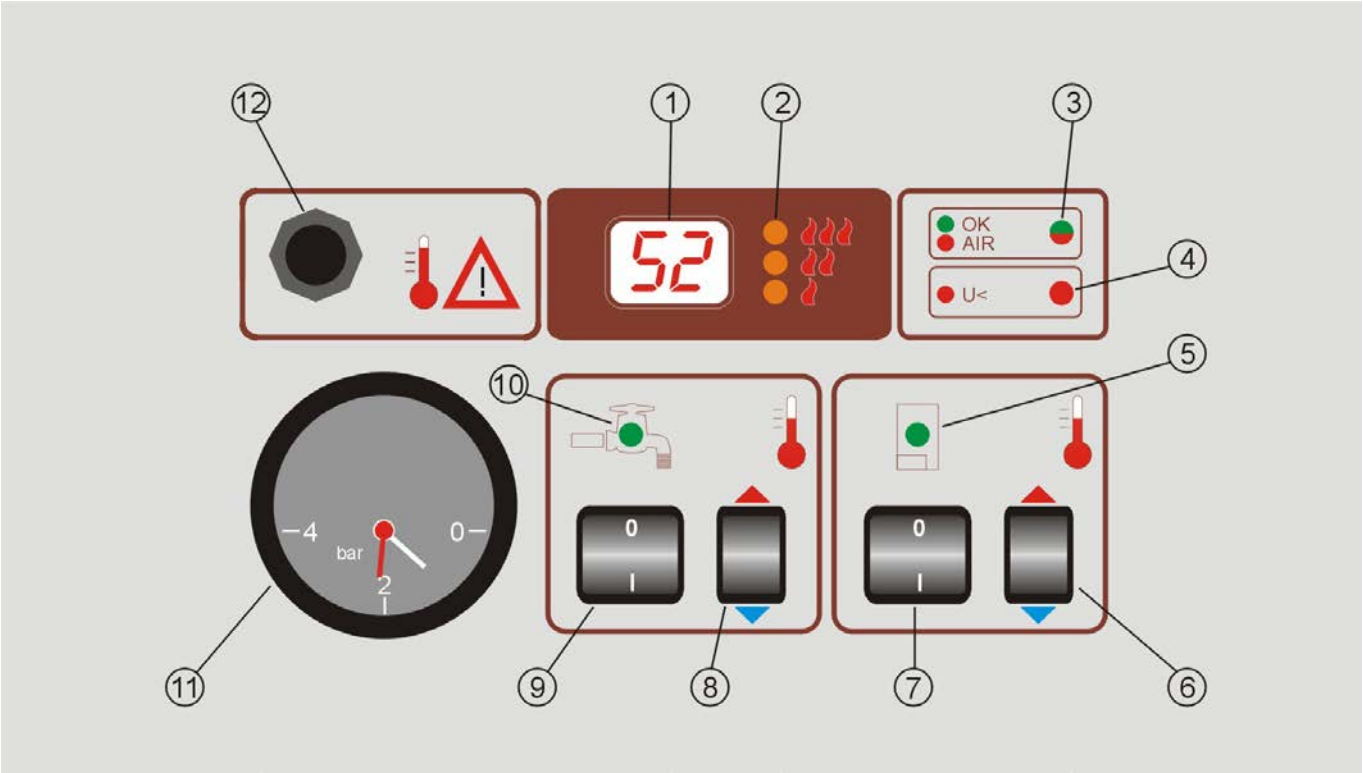
Read instructions for connection of a thermostat, which are enclosed to the thermostat in order to learn which way of connection is laid down by the producer.



Room thermostat terminal

4. Use of the product

Control panel

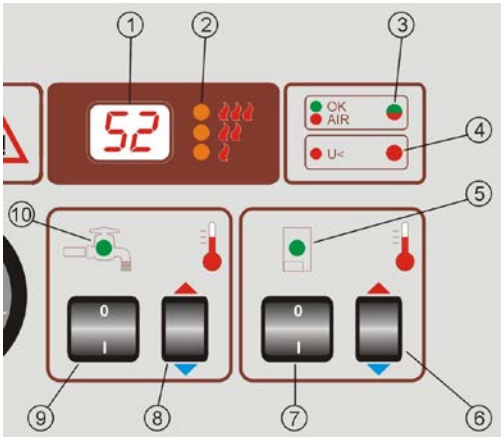


1. Multipurpose – temperature indicator (temperature of boiler, sanitary water, adjustment of temperature)
2. Signalization of operation degree of heaters (1., 2., 3.)
3. Signalization of air appearance in the boiler (red light)
4. Signalization of under voltage protection (red light)
5. Signalization of boiler operation (green light)
6. Adjustment of temperature in boiler
7. Switch for central heating switching on and off
8. Sanitary water temperature adjustment
9. Switch for switching on and off the sanitary water preparation
10. Signalization of sanitary water preparation and consumption
11. Indicator of pressure in a boiler
12. Thermal fuse

4.1. Use of the boiler

First putting on at the beginning of a season
For the first putting on at the beginning of a central heating season, the first step should be to put on the boiler by means of the switch for central heating (7), temperature in the boiler (1) should be adjusted to 30°C (in this was the heaters are disconnected and only circulation pump is in operation).
Warm water preparation is put on by means of the switch for sanitary water (9)

If upon putting on the boiler there is no noise of water or the central heating if warm water pump does not run (during operation, the pump produces slight vibrations) the pump should be manually started. Circulation pumps lubricate bearings with water flowing through the pump and after stoppage it could occur that the bearings “burn”.

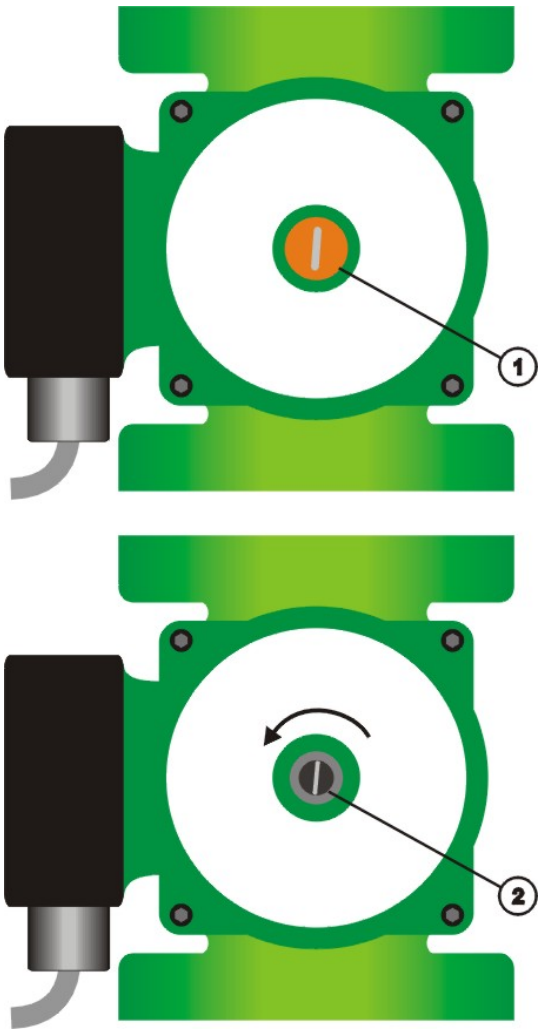


Segment of control panel

Starting the pump
For starting the pump it is necessary to turn off the protection plug on its front side (1) below which there is the axis with the groove for screwdriver. With the screwdriver, the pump (2) should be several times turned in direction of the arrow on the pump head and the boiler should be put on again.

When the pump starts, the operation temperature of water in boiler and temperature of sanitary water should be selected. For central heating the optimal temperature is between 60 and 70°C, whereas for sanitary water optimal temperature ranges from 45 to 48°C.

If to the boiler a room thermostat is connected, a desired room temperature should be adjusted according to the instructions of the producer of room thermostat.



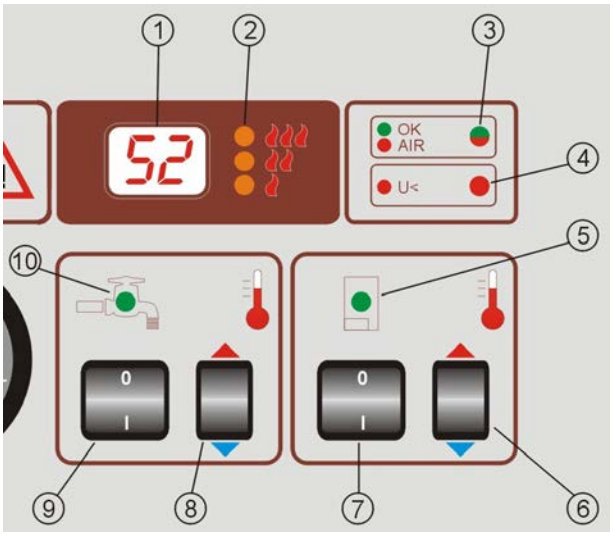
4.2. Manipulation with automatic equipment

Putting on and of the sanitary water preparation
The boiler is switched on by means of the main switch (9), for switching on, the switch should be put in the position 1.
Upon switching on a desired water temperature in boiler is displayed for 5 seconds, signalization of sanitary water preparation is twinkling (10). Upon 5 seconds real temperature of sanitary water outlet is displayed (1); if there is no requirement for sanitary water, the signalization lamp of sanitary water preparation (10) is switched off.

By switching the switch (9) to the position 0, the sanitary water preparation is put off. The entered desired temperature of sanitary water shall be stored.

Adjustment of desired temperature of sanitary water
By pressing the key for temperature adjustment (8) the desired warm water temperature appears, the signalization lamp of sanitary water preparation (10) is twinkling. By repeated pressing upwards or downwards it is possible to increase or decrease the desired sanitary water temperature. When the temperature is adjusted it is sufficient to wait for 5 seconds (signalization lamp of sanitary water preparation (10) does not twinkle) in order that the boiler memorizes a new temperature.

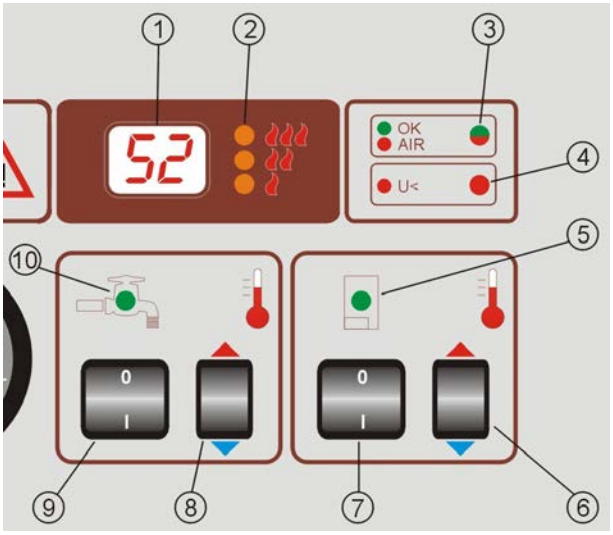
Use of sanitary water
If there is a need for sanitary water, the signalization lamp of sanitary water preparation turns on (10) and the temperature of warm water outlet displays. Signalization of operation degree of heaters (2) displays and by turning on lamps it is shown whether one group of heaters is in operation, two or all three groups.
The boiler automatically controls a heater operation degree.



Segment of control panel

Putting on central heating
By switching the switch (7) to the position 1, the central heating system is switched on. Upon switching on a desired water temperature in boiler is displayed for 5 seconds, signalization of boiler operation is twinkling (5). Upon 5 seconds real temperature in the boiler is displayed (1); if the current temperature in boiler meets the desired one, the signalization lamp of boiler operation (10) is switched off.

Adjustment of desired temperature of central heating
By pressing the key for temperature adjustment (6) the desired temperature in the boiler appears, the signalization lamp of boiler operation (5) is twinkling. By repeated pressing upwards or downwards it is possible to increase or decrease the desired sanitary water temperature. When the temperature is adjusted it is sufficient to wait for 5 seconds (signalization lamp of boiler operation (10) does not twinkle) in order that the boiler memorizes a new temperature.



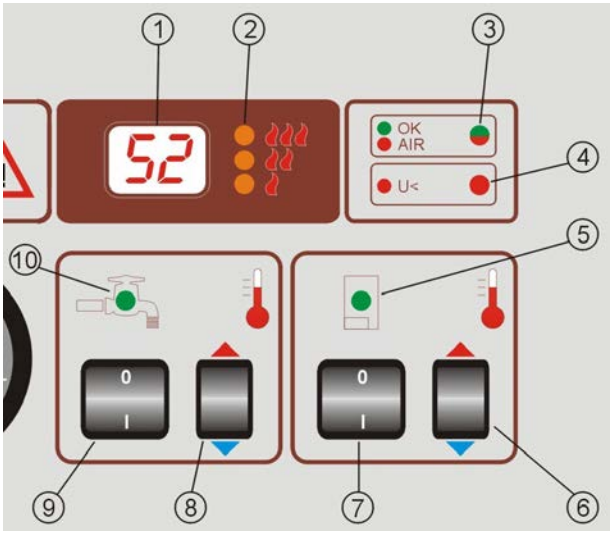
Segment of control panel

Parallel operation of central heating and sanitary water
When both modes of operation are active, central heating and sanitary water preparation, the boiler prefers sanitary water.
If there is a requirement for warm water, the boiler starts with preparation of sanitary water, the lamp (10) turns on, whereas the boiler operation signalization turns off (5); temperature indicator (1) displays the current temperature of warm water outlet.

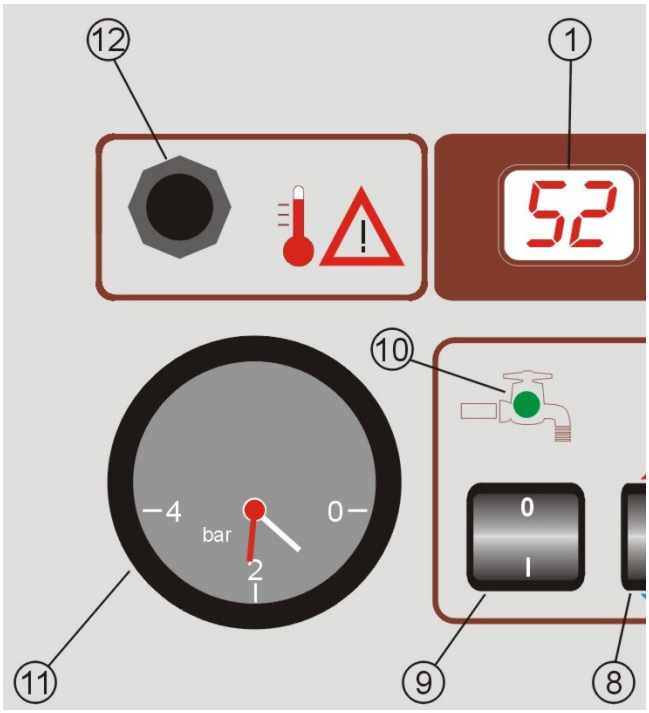
Air in the boiler (3), red light
If in the boiler the air appears, the signalization of air in the boiler turns on (3) and the boiler stops the operation. In this way the boiler is protected against blowing because of appearance of air. For continuation of operation, the boiler should be vented. If the boiler is correctly vented, the operation of boiler continues automatically.

Voltage drop (4), red light
If the voltage in the network line drops below 180V by phase, the signalization of under voltage protection (4) turns on, the boiler automatically switches off in order to protect electronics and contactors inside the boiler. The boiler shall automatically continue the operation when the network voltage reaches values above 180V.

Thermal fuse - turning on
By means of thermal fuse (12) the boiler is protected against rapid increase of temperature above 115°C. The fuse turns off the boiler and ejects the FID-switch. *For continuation of operation it is necessary to take off the protection cover from the thermal fuse and press the red key, upon which the FID-switch should be switched on again.*

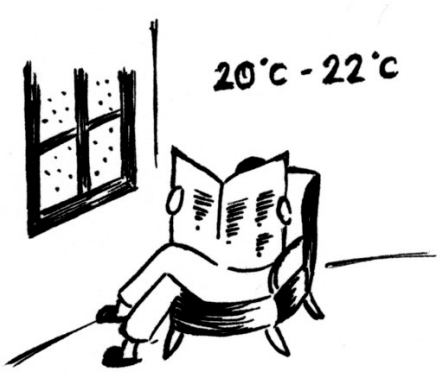


Segment of the control panel



Segment of the control panel

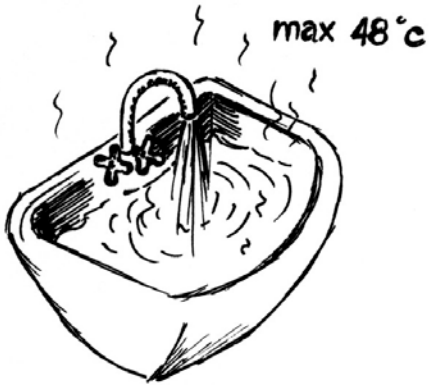
4.4. Recommendations for optimal use



Central heating
For optimal use of the boiler and electric power consumption, we recommend the use of quality room thermostat connected to the boiler.

Daily temperature should be between 20°C i 22°C (for each degree above 22°C the consumed energy is increasing exponentially).
For the night operation we recommend temperature between 15 i 17 °C. In this way energy saving is higher than in case of complete turning off the boiler during the night.
If there is no room thermostat, for night operation the temperature in boiler should be decreased to about 40°C or turned off completely (9. main switch).

In summer period, valves below boiler should not be closed (closing valves disables water circulation in system (10 – 15 seconds) generated by safety thermostat.



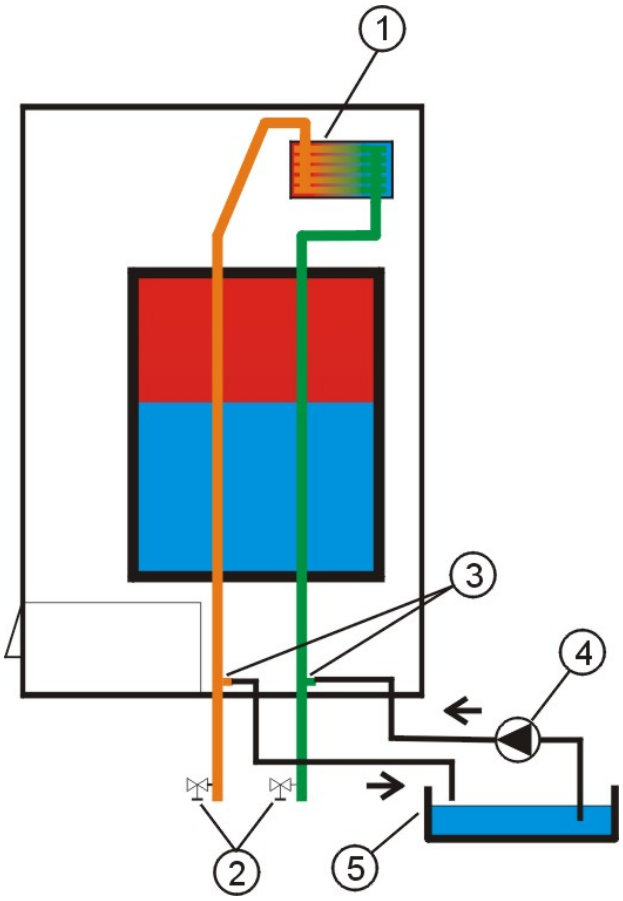
Warm water
Optimal temperature of sanitary water, in boiler, is 42°C up to 45°C (above 48°C it comes to increased lime separation that sticks to the *exchanger*, tubes and pump and may lead to gradual decrease of boiler effect).

5. Maintenance

We recommend the inspection of a device once a year by the authorized service (before heating season). This service is not included in the guarantee. During the inspection all electric and water connections should be tightened, the system should be vented and – if necessary – filled up, valves and general functionality of the device should be checked.

If you notice a reduced effect of warm water it is necessary to remove lime accumulated within the plate exchanger (1).
Only authorized service engineer can do removing lime.
Prior to the beginning of cleaning, valves (2) separating the boiler from the sanitary water installation, should be closed.
Cleaning tubes should be connected to the foreseen 1/2" piping (3) (internal thread).
Cleaning solution (5) may be formic acid 2-3%, nitric acid 3-4% or acetic acid 10%.
The solution should circulate through the system by a pump (4), as long as there is the sludge in the outlet pipe. Thereupon the direction of a circulation should be changed and the process repeated.
Upon finished cleaning the boiler should be washed in the same way with clear water.

For cleaning the product, it is not permitted to use aggressive media as e.g. gasoline, kerosene or solvent. For the external shell and decorative cover media for cleaning plastics or dish washing media may be used. Control panel should be cleaned with dry or moist cloth (not wet).



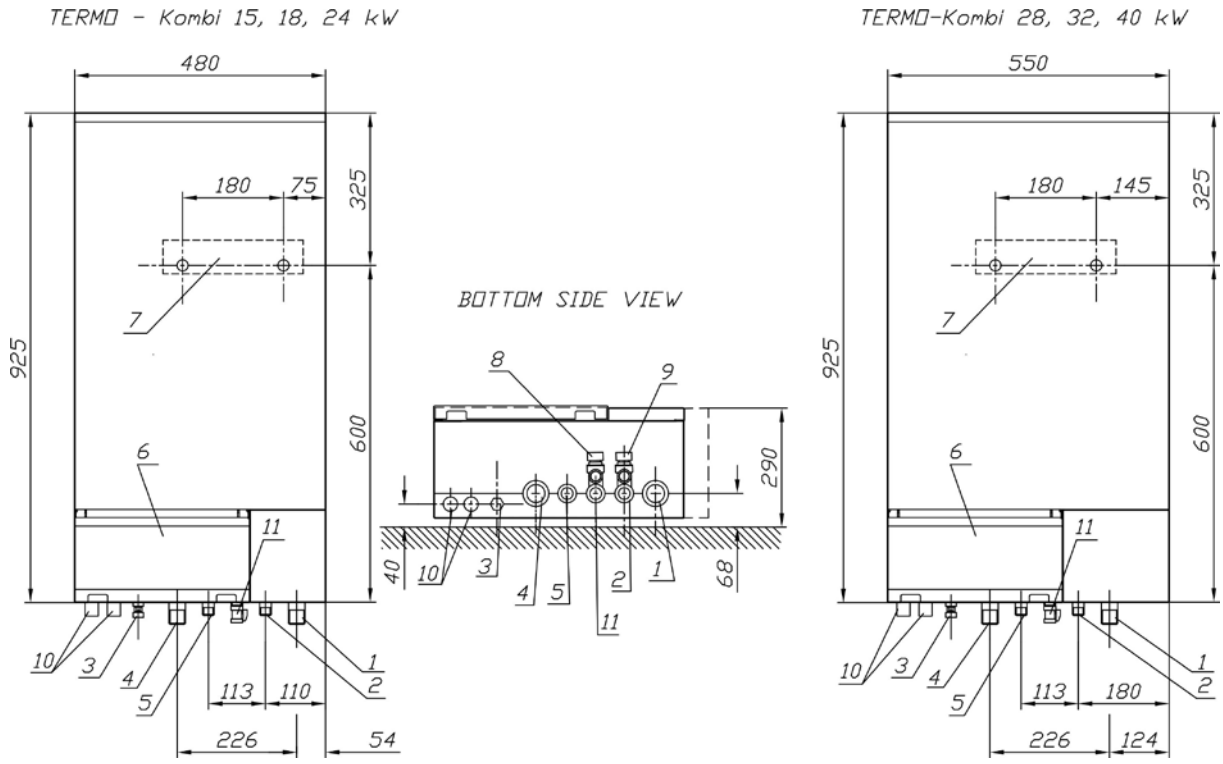
Schematic illustration of lime removal

6. Survey of possible defects and irregularities in operation

DEFECT	***CAUSE***	***ELIMINATION***
- at switching on, no voltage on the control panel	- no feed from net on one or more phases - fuse 2,5A on the control panel blown - RCCB switch ejected	- check on serial clamps of the boiler whether there is feeding - replace the fuse 2,5A and check the cause of its blowing
- at switching on, switches show voltage on the control board, but the boiler does not heat	- check the adjustment of a room thermostat, - limit thermostat was activated, - indicator of air appearance in the boiler blocked the operation, - defective contactor, - defective operation thermostat, - blown heaters	- check the adjusted temperature on a room thermostat, replace its batteries or it is defective, - vent the boiler till the lamp “air in boiler”, turns off
- temperature in boiler is at the desired value, but the radiators are not warm	- circulation pump is not in operation, - air blockage on central heating installation, that prevents the circulation	- start the mechanical pump or replace it with the new one if it is blown (see **4.1.**), - vent the installation
- the boiler heats poorly	- on the feed one phase is missing, - in two-phase thermostats, second phase is not in operation, - second or third phase was not manually turned on, - one contactor defective, - a part of the heater has blown, - in three-phase system to the boiler are not brought three various phases	- check fuses on the main panel, - replace thermostat or, if necessary, contactor, - replace the heater, - measure with the instrument voltage between phases, it should be 380V
- in the operation the contactor can be heard (it is buzzing) and possibly radio and TV-interferences	- poor voltage in the network, - defective contactor	- select with the instrument the best phase for control (on the boiler marked with “R”) - replace the contactor
- at switching on or off the operation thermostat radio and TV-disturbances	- defective operation thermostat, - defective blockade (RC – protection)	- replace the thermostat, - replace the RC – member
- boiler in operation is roaring	- a system is not good vented, - defective heater	- vent the system, - replace heaters

- pressure in heating system is varying	- defective expansion vessel, - too low or too high pressure in the vessel	- if there is water on the valve for pumping the vessel, replace the vessel, - pressure in the vessel should be 0,5 – 0,8 bar
- FID switch is ejecting	- defective heater, - moist on conductors, - safety thermostat activated	- replace the heater, - check leaking, - check the cause of activation
- FID switch can not be reset	- safety thermostat activated	- firstly, reset the safety thermostat and then the FID switch
- sanitary water temperature is varying	- too low pressure or too small flow in plumbing installation	- set the warm water temperature to the desired temperature without mixing with cold water
- boiler does not reach a desired warm water temperature	- check network fuses - warm water flow is higher than boiler capacity	- check in the instructions the maximum warm water flow
- boiler does not warm up a water	- pump for warm water preparation is not in operation - air in warm water system	- start the pump manually according to the instructions in **4.1.** - vent the warm water system

7. Technical specification



1. Central heating return line
2. Sanitary water inlet line (cold water)
3. Valve for venting the boiler
4. Central heating starting line
5. Sanitary water outlet line (warm water)
6. Control panel
7. Wall support for suspension
8. Safety valve at 3 bar
9. Safety valve at 8 bar
10. Power and room thermostat inlet
11. Filling valve

TERMO-Kombi Boilers		Type of the device					
Characteristics	Units	TERMO Kombi 15	TERMO Kombi 18	TERMO Kombi 24	TERMO Kombi 28	TERMO Kombi 32	TERMO Kombi 40
Central heating heat effect	kW	15	18	24	28	32	40
Warm water heat effect	kW	15	18	24	28	32	40
Max. pump supply at 1000 lit/h	m	4,8					
Area of central heating temperature adjustment	°C	40 - 90					
Area of warm water temperature adjustment	°C	30 - 55					
Warm water flow at 2 bar	l/min	6,1	6,8	8,5	9,3	10,2	11,50
Warm water flow at 2 bar and 55°C	l/min	2,85	3,10	4,00	4,62	5,10	5,8
Specific flow (at ΔT - 30 K)	l/min	10,2	11,2	12,80	13,30	13,96	15,6
Permitted overpressure, warm water	bar	8					
Height	mm	930					
Depth	mm	290					
Width	mm	480			550		
Weight	kg	58			65		

SUPPLY CHARACTERISTICS

POWER	Nominal current	Fuse current	Rated short-circuit breaking capacity I_{cn} (EN 60898)	Rated short-circuit breaking capacity I_{cn} (IEC 947-2)	Min. conductor's cross-section	Fuse type	RCCB switch type
400V 3N ~ 50/60 Hz							
15 kW	21,73 A	32 A	10 kA	15 kA	5 x 6 mm^2	B32-3	40 / 0,03 A
18 kW	26,09 A					B40-3	
24 kW	34,78 A	40 A			5 x 10 mm^2		
28 kW	40,58 A	50 A			5 x 10 mm2	B50-3	63 / 0,03 A
32 kW	46,38 A	63 A				B63-3	
40 kW	57,97 A				5 x 16 mm^2		