IMPORTANT!

HOW TO SECURE YOUR BOILER FOR FIREING WITH SOLID FUEL A LONG OPERATION LIFE!

Alphabet for fireing with solid fuel:

- Connect the system pump with the factory mounted thermostat (it is obligatory to done it with the socket which is placed on the back side of the cover)
- Avoid firing with wet solid fuel.
- Check if lids in the combustion chamber are placed in the right position
- At the first firing (or if the temperature in the boiler is under 50°C) the boiler temperature must be 68°C, as fast as possible.
- Fire the boiler and adjust the draft regulation for an operation temperature with min. 68°C.
- In order to may simply regulate the water temperature in the heating system when firing in such way and to keep it under 68°C it is necessary to mount manual 4- way mixing valve and thermometer behind them to the heating system.
- Clean and maintain the boiler regularly

IT IS OUR GREAT WISH THAT THE BOILER EKO-CK P BRINGS WARMTH IN YOUR HOME FOR A LONG TIME!

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Centrometal HEATING TECHNIQUE

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ENG

TECHNICAL MANUAL

installation, use and maintenance of the
combined boiler for solid fuel fireing
and installation of the additional equipment

EKO-CK P

70 - 110 kW

TUCKPV-02/2011-eng

TECHNICAL DATA

TYPE			EKO-CK P 70	EKO-CK P 90	EKO-CK P 110
Rated thermal output		kW	70	90	110
Dimensions of the boiler body	Lenght (L)	mm	1250	1250	1350
	Width (B)	mm	570	620	620
	Height (H)	mm	1435	1435	1435
Total dimensions of the boiler	Total lenght (L1)	mm	1250	1250	1350
	Total width (B1)	mm	640	690	690
	Total height (H1)	mm	1435	1435	1435
Dim. of the opening of the upper boiler door (L x H)		mm			
Dim. of the opening of the lower boiler door (L x H)		mm			
Boiler body mass		kg	389	422	452
Boiler mass (boiler body, isolation and control pannel)		kg			
Boiler water content		lit			
Max. operation pressure		bar	2,4	2,5	2,5
Boiler connections	In-line and back-line*1	G	6/4"	2"	2"
	Filling and drainage *2	G	1"	1"	1"
Flue gas temperature - (wood pellets) *3		°C			
Flue gas boiler opening diameter		mm	200	200	200
Combustion chamber resistance		Pa			
		mbar			
Depressure in the chimney		Pa	26	29	31
		mbar	0,26	0,29	0,31
Burner opening*4		mm	105	105	105

*1 - Outer thread

*2 - Inner thread

*3 - Wood pellets at the boiler water temperature 75 °C and of the boiler rated thermal output.

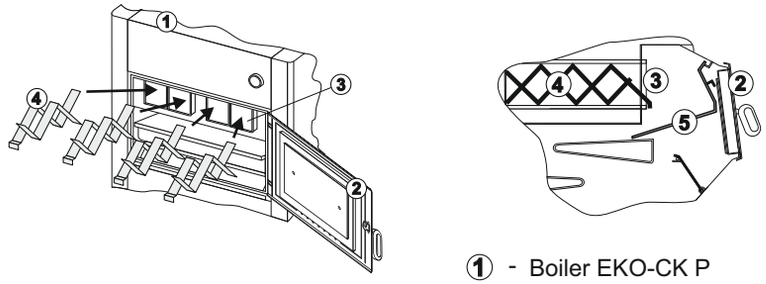
*4 - Pay attention: first remove the safety cover on the lower boiler door.

Notes

9.3. MOUNTING OF THE TURBULATORS

By oil or gas firing turbulators must be mounted in the flue gas pipes. To mounting the turbulators is necessary to open upper boiler door, take out upper lid (position 1) (Figure 9.). Then, insert the turbulators into the flue gas pipes and push to the end. After that, back in upper lid.

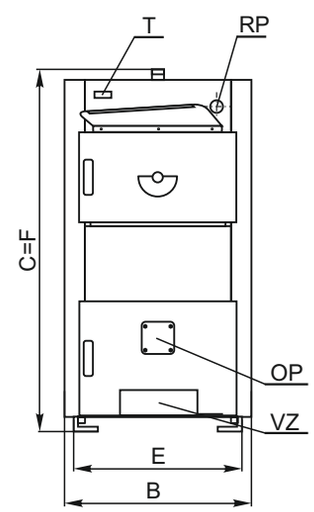
Figure 10. Mounting of turbulators

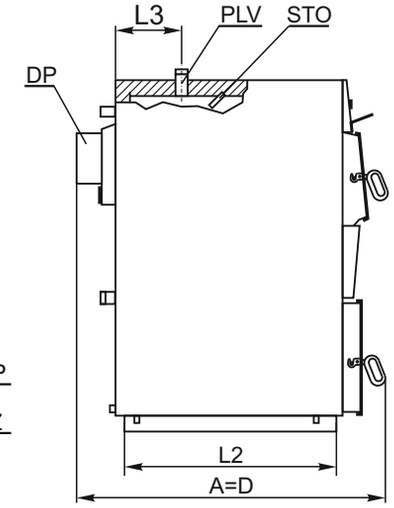


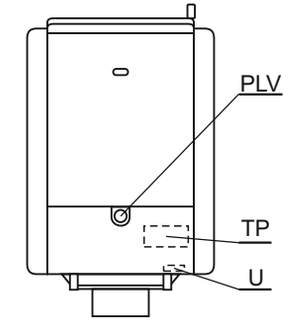
① - Boiler EKO-CK P
② - Upper boiler door
③ - Flue gas pipe
④ - Turbulators
⑤ - Upper lid

Figure 11. Protective gloves

Protective gloves are obligatory!

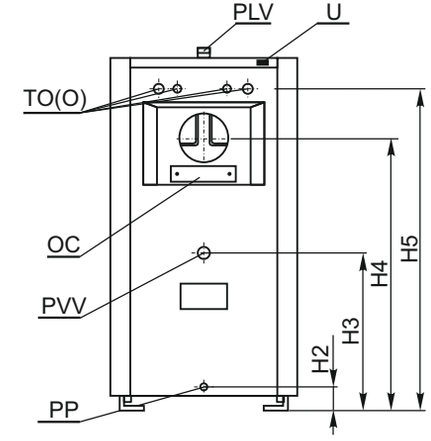






Legend

DP	Flue gas opening
OC	Opening for cleaning
OP	Burner opening
PLV	In - line
PP	Filling / drainage
PVV	Backflow (back - line)
RP	Opening for the draft regulator mounting
STO	Tube for temperature sensors
T	Thermometer
TO(O)	Thermal protection connectors
TP	Pump thermostat
U	Socket
VZ	Primary air door



Dimensions

TYP		EKO-CK P 70	EKO-CK P 90	EKO-CK P 110
H2	mm	160	160	160
H3	mm	630	630	630
H4	mm	1085	1085	1085
H5	mm	1270	1270	1270
L2	mm	815	815	915
L3	mm	410	410	460

1.0. IN GENERAL

The boiler **EKO-CK P** has a modern construction and design and is made out of the controlled materials of high quality, welded with most modern technology and is approved and tested under EN 303 - 5 norm and fulfil all special request for the connection on the installation of a central heating system.

1.1. BOILER DESCRIPTION

The boiler **EKO-CK P** is the combined steel boiler. The combustion chamber has a large heating surface and low combustion chamber resistance. The large door permits fireing with massive solid fuel pieces. Welded steel turbulators stand for the high boiler efficiency and low concentration of harmful components in the flue gases. Boiler cleaning is very simple and it is possible to clean it from the front side.

1.2. DELIVERY STATE

The boiler's body covered by the casing with an thermal insulation, cleaning accessories (accessories holder, scraper and poker).

2.0. MOUNTING AND ASSEMBLY

Mounting and assembly of the boiler must be done by a qualified person who takes the responsibility for correct boiler operation. The boiler EKO-CK P must be placed on a 50 to 100 mm high placement above the ground in the boilerroom. The boilerroom must be safe from freezing and has to be ventilated. The boiler has to be positioned in the position that its connecting with the chimney could be made correctly and to enable supervision during boiler operation, cleaning and maintenance (see point 4.).

3.0. OPENING FOR FRESH AIR (FRESH AIR SUPPLY)

Every boilerroom **must have** an correct calculated opening for fresh air inlet regarding to the boiler power output. The opening must be protected by a net or grate.

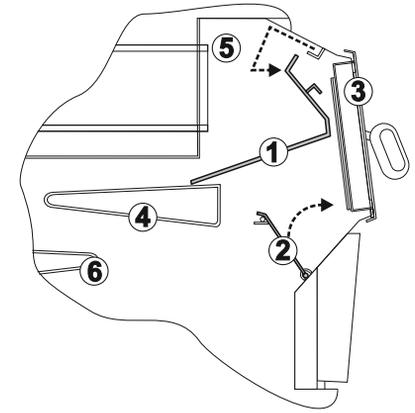
A = 6,02 · Q A - surface of the opening in cm^2 Q - boiler power output in kW

9.0. MAINTENANCE

9.1. FIREING WITH SOLID FUEL

Protective gloves must be used (Figure 11). Surface under the grade, combustion chamber and gas flow tube is recommended to be clean every day. Cleaning of the gas flow tubes is made through the upper boiler door, but first take out the lid placed between the upper register and upper frame of the upper boiler door (Figure 9) (position 1 and position 2). On the back side of the boiler you can find the opening for cleaning (see page 3) but first a cover has to be dismounted (2 nuts M8) and then through it is possible to clean it. Before any fireing we have to place the cover back at its primary position, close the lower gril and check the opening for the primary air flow on the lower boiler door.

Figure 9. - Take of movable lids from combustion chamber



① - Upper lid
② - Lower lid
③ - Upper boiler door
④ - Upper register
⑤ - Flue gas pipe
⑥ - Lower register

9.2. FIREING WITH OIL / GAS

Protective gloves must be used (see Figure 11.).
At least once a year is necessary to thoroughly clean the boiler and inspect the burner by an authorized service.

8.0. START UP

Protective gloves must be used (Figure 11).
Check if the boiler and the whole heating system is filled with water and was air vented. Check if the safety elements are mounted correct and accurate (see back point). Check if the flue gas tube is properly sealed and thermal isolated. Check if the lids in the combustion chamber (Figure 8) are properly placed (one must be placed in the cradle between the upper register and frame of the upper boiler door, second above the upper register, and third, protection of the upper boiler door, must rotate in the combustion chamber to its limiter). Lower grill on the entrance of the combustion chamber through the lower boiler door is obligatory to be placed in their cradle. Check whether the lid on the flue gas opening is opened or by overdimensioned chimney is properly open.

At fireing with soild fuel:

The draft regulator has to be set in the way that temperature in the boiler do not pass beyond the temperature of 85 - 90°C and do not pass below 68°C.

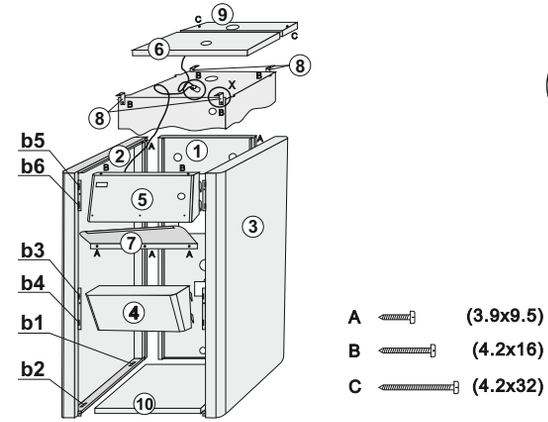
Check if the pump is connected on the pump thermostat which is factory mounted on the boiler and check if it switch on and off the system pump.

When fireing with oil or gas burner:

Check if the boiler is connected to the el. supply. Putting the burner into operation must be done by a qualified and authorized service and maintenance person. For the efficient boiler operation must the burner be properly adjusted with a valid nozzle value and oil pressure concerning an oil burner, or gas flow concerning a gas burner according to rated thermal output. Check if the pump is connected on the pump thermostat which is factory mounted on the boiler and check if it switch on and off the system pump on the adjusted temperature. Check whether turbulators are placed to flue gas tubes (see Figure 10).

Figure 8. - Moving parts of the boiler

Figure 1. Installation of casing to boiler EKO - CK P

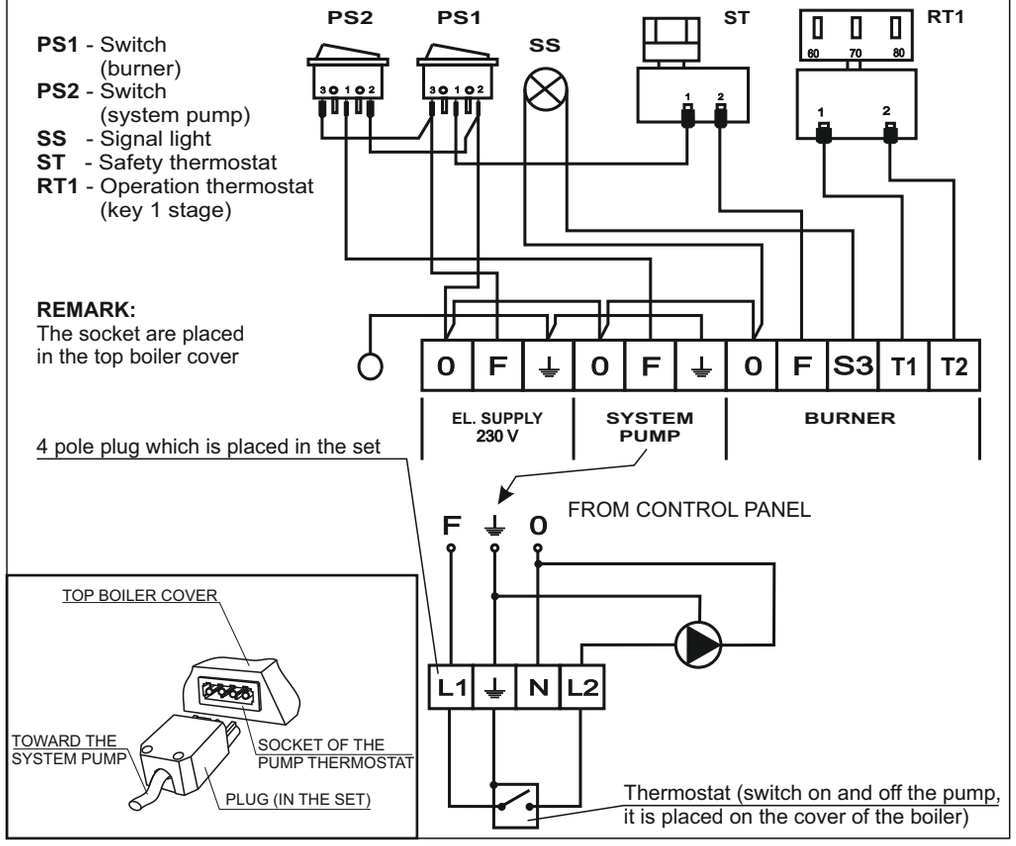


1. Fasten insulation support (8) with screws 4,2 x 16 into wholes at the upper side of the boiler body.
2. Fix the lateral sides (2) and (3) on girders on the lateral sides of the boiler mount into rectangular opening of the casing lateral sides (b1) and (b2), hook them up on casing supports (8), and fix them with two screws on sheet metal 3.9 x 9,5 on the rear casing supports (8).
3. The front upper casing side (5) has to be hooked up with hooks into rectangular openings of the lateral left and lateral right side of the casing (b5) and (b6), and fixed with one screw on sheet metal 4,2 x 16 into the front casing support (8) through the lateral side (2) and with one screw for sheet metal 4,2x16 into the front casing support (8) through the lateral side (3).
4. The front bottom casing side (4) has to be hooked up with hooks into rectangular openings of casing lateral sides (b3) and (b4).
5. We insert the thermometer sensor at the front upper side of the casing (5) and pump thermostat sensor at the rear casing cover (9) into the probe at the upper side of the boiler, and secure the sensors with wire delimiter supplied in the set (Detail Y).
6. We position the front casing cover (6) on the groove of the front upper casing side, and the rear casing cover (9) on the groove of the front casing cover (6).
7. We hook the rear casing side (1) on the connecting pipe and fix it with 2 screws for sheet metal 4,2 x 32 on the lateral side (2) and 2 screws for sheet metal 4,2 x 32 on the lateral side (3).
8. We fix the rear casing cover (6) from the upper side with 2 screws for the sheet metal 4,2 x 32 on lateral casing sides (2) and (3).
9. At the end, we fix the draught regulator protection (7) on the front upper casing side (5) on the prefabricated holes with three sheet metal screws 3,9 x 9,5.
10. Finally, we take the base protection (10) and insert it under the boiler between the supports holding the boiler.

4.0. CONNECTION WITH THE CHIMNEY

Precisely calculated and performed chimney is a precondition for a safe boiler operation and economic heating results. The chimney must be **well thermal isolated**, gas-impermeable and smooth. On the lower part of the chimney a cleaning door must be installed. A walled chimney must be three-layered with a middle mineral wool isolation layer. The thickness of the isolation should be min. 30 mm for the mounting of the chimney inside the building and 50 mm thick when mounting the chimney outside the building walls. **The inner diameter of the chimney depends upon the actual chimney height and the boiler power output. For the correct assortment of the chimney the dimensination must be made regarding the diagram on the Figure 3.** The flue gas temperature on the chimney exit has to be minimum 30°C higher than the condensation temperature of the combustion flue gases. Please confide the mounting and choosing of the chimney to a qualified person. The regulated maximum distance between boiler and chimney is 600 mm and minimum is 300 mm. The flue gas tube has to be mounted under an inclination between 30 - 45° (Figure 2). To prevent the entering of condensing fluid from the chimney into the boiler it is necessary and important to mount the flue gas tube 10 mm deeper into the chimney. **The connection flue gas tube between the boiler and the chimney have to be thermal isolate**d by mineral wool 30 - 50 mm thick.

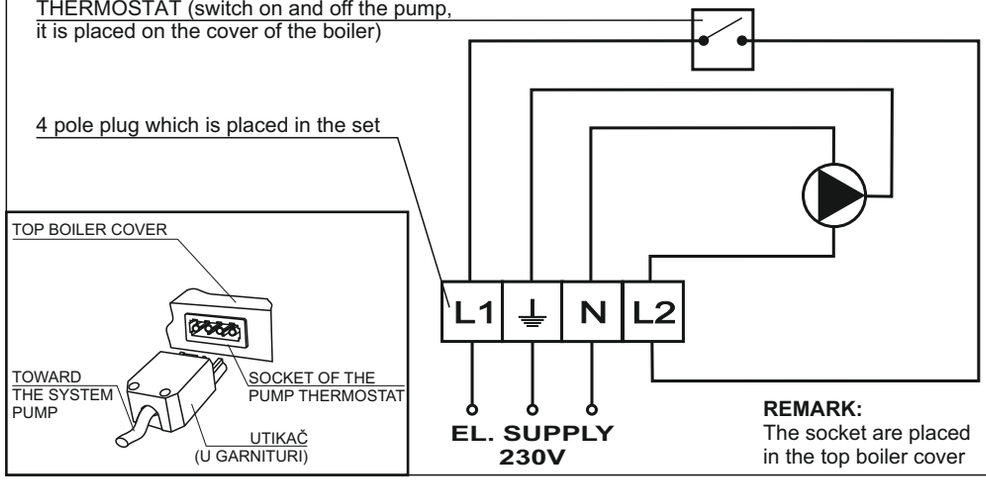
Figure 7. Scheme for el. connection for fireing with oil or gas



7.3. ELECTRIC CONNECTION - FIREING WITH SOLID FUEL

The connection of the system pump for the heating is obligatory to perform with the socked which is placed on the back side of the boiler (page 3.), which is connected on the thermostat of the pump (see the scheme on the Figure 5).

Figure 5. Scheme for el. connection for fireing with solid fuel



7.4. ELECTRIC CONNECTION - FIREING WITH OIL OR GAS

Connection of the boiler EKO-CK P 70/90/110 with control panel for EKO-CK P (fireing with oil or gas) to el. supply is done through the prepared ordinaly terminal which is placed beyond the control panel (see fig. 7.). Scheme for el. connection for fireing with oil or gas is on Figure 7.

Figure 6. Boiler EKO-CK P 70/90/110 fireing with oil or gas

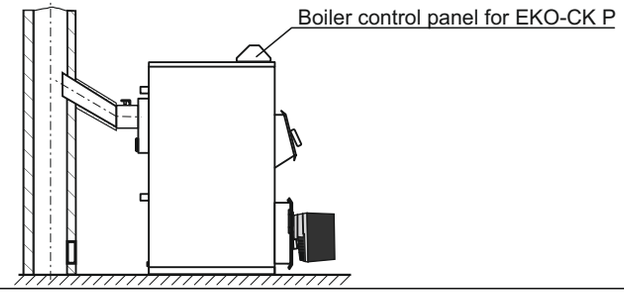
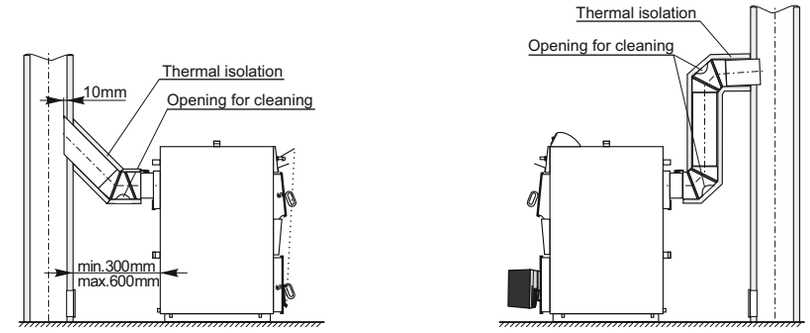


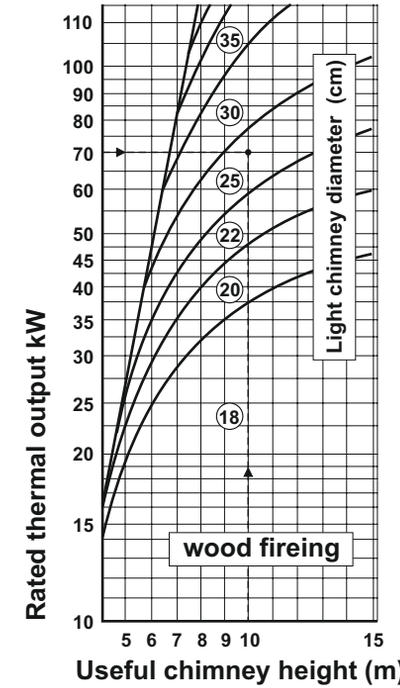
Figure 2. - Possible way for boiler connection **EKO-CK P** to the chimney



Boiler connection EKO-CK P to the chimney (**recomendation**).

Boiler connection EKO-CK P with burner to the chimney.

Figure 3. - Chimney dimension for the boiler EKO-CK P



4.1. EXAMPLE FOR ASSORTMENT OF THE CHIMNEY (see diagram on fig.3)

- BOILER RATED THERMAL OUTPUT - 30 kW
- FUEL - WOOD
- REQUIRED USABLE CHIMNEY HEIGHT: - H= 10 m
- REQUIRED CHIMNEY LIGHT DIAMETER: - 25 cm

- **Usable chimney height** - chimney height from connection spot of smoke pipe to the chimney top.
- **Light chimney diameter** - interior chimney diameter.

5.0. BOILER CONNECTION TO THE HEATING INSTALLATION

The boiler EKO-CK P can be mounted on the closed or open heating systems. In both way the boiler can be fired with solid fuel, oil or gas. The installation must be done according with the technical norms made by certified person who take responsibility for the correct opeartion of the boiler.

6.0. BOILER CONNECTION TO CLOSE HEATING SYSTEM

When having a closed heating system (examples on the scheme 1 and 2) it is **obligatory** to build in a certificated safety valve set on the pressure of 2,5 bar and the expansion vessel. The safety valve and the expansion vessel must be build in according the law regulation and between the valve or the expansion vessel and the boiler may not have any stop elements. The system pump is **obligatory** to be mounted over the socket on the back side of the boiler on the factory mounted thermostat of the pump which is placed on the 68°C. If the boiler is connected on the heating system like in scheme 2. we recommend that the regulation is made by 4 way manual mixing valve. If the boiler is connected on the heating system like in scheme 1., with water accumulators, the regulation of the room temperature can be done by 3 way manual mixing valve, thermostat valves on the radiators or by room thermostat.

By European EN norms for the close heating system it is **obligatory** to mount the thermal safety protection of the boiler.

7.2.1. MAIN BOILER CONTROL PANEL FOR EKO-CK P

1. **BURNER SWITCH**
   Switch with a signal light for turning the burner on and off.

2. **BURNER CONTROL SIGNAL LIGHT**
   If disturbances during operation should appear this control signal lights.

3. **SYSTEM PUMP SWITCH**
   Switch with signal light for turning the system pump on and off.

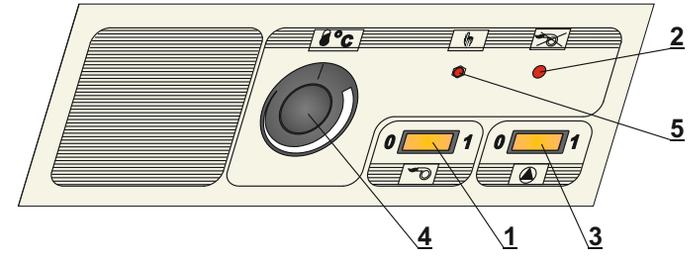
4. **REGULATION BOILER THERMOSTAT**
   Setting of boiler operation temperature (35 - 90°C) is achieved by turning the button

5. **SAFETY BOILER THERMOSTAT**
   Stops the burner operation if the boiler water temperature would cross 98°C and it this way prevents a disaster. When putting the burner into operation again it is necessary to act in following steps:

- wait until the boiler temperature cools and reaches the value under 70°C.
- push the red button (Position 5).

If additional operation disturbances and interruptions would take place please call a qualified person for advise.

Figure 4. - Figure of the main boiler control panel



7.0. TEMPERATURE REGULATION / MAIN CONTROL PANEL

7.1. FIREING WITH SOLID FUEL

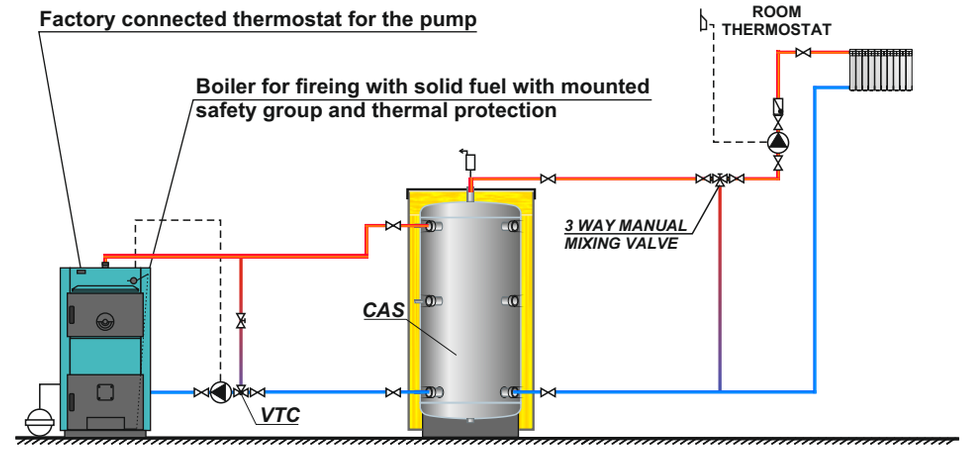
To be convinced to have an accurate boiler temperature regulation there has to be a draft regulator installed in the existing opening in front of the boiler (see page 3). The draft regulator chain has to be set in the way that temperature in the boiler do not pass beyond the temperature of 85 - 90°C (air opening fully closed), and do not pass below 68°C. The draft regulator must be ordered separately. The pump of the system is necessary to connect with pump thermostat which is connected to the boiler which switch on and switch off the system pump and prevent the cooling of the boiler with the back line before the boiler achieve some minimum temperature (see scheme 3.).

7.2. FIREING WITH OIL OR GAS

With the boiler EKO-CK P 70/90/110 for fireing with oil or gas it is needed to additionally mounted the main control panel for EKO-CK P (safety thermostat, regulation thermostat...) on the factory prepared holes on the cover on top of the boiler and this panel can be mounted later on if the boiler was primary fired with solid fuel.

The pump of the system is necessary to connect with pump thermostat which is connected to the boiler which switch on and switch off the system pump and prevent the cooling of the boiler with the back line before the boiler achieve some minimum temperature. If we control the system pump with the room thermostat, it is obligatory that room thermostat is connected with the pump thermostat.

Scheme 1. Example of the boiler connection to the close heating system



Example of the close system for central heating with the boiler with solid fuel fireing, with thermostatic 3 way valve "VTC" (or Laddomat 21) and with water accumulator "CAS". Temperature regulation in the room is performed by 3 way manual mixing valve.

REMARK: If the water accumulator "CAS" is included in the installation of the heating system the regulation of the room temperature is also possible with the thermostatic valves on the radiators or with the room thermostat which control the operation of the system pump of the haeating system, in this case the 3 way mixing valve is not necessary to be install.

6.1. THERMAL SAFETY PROTECTION MOUNTING

By European EN norms for the close heating system it is obligatory to mount the thermal safety protection of the boiler. The boiler is factory made for the installing of the thermal protection (two heat exchangers ① and two thermal valves ②, see scheme 2.). If on the boiler which is mounted on the close heating system damage happens and it have some connection with the overheating of the boiler, and the boiler and the system do not have or have incorrect mounted thermal safety protection, the guarantee is not valid.

IMPORTANT:
The thermal safety protection is obligatory to be connect on the plumbing installation of the building charged from the plumbing, not from the water pressure tank, in situation when the failure of power supply happens there is the possibility of overheating the boiler and the water pressure tank is not in the position to insure the necessary quantity of the water.

THERMAL FUSE

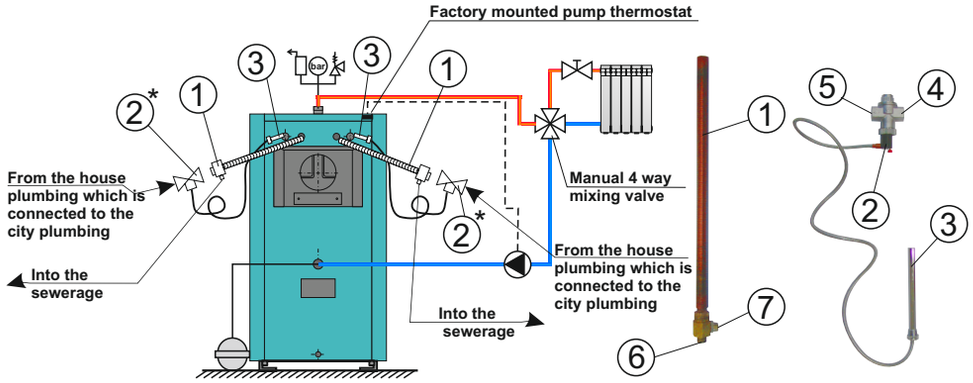
Thermal fuse for the boiler **EKO-CK P** is composed of two HEAT EXCHANGERS (1) and two THERMAL VALVES (2) (see scheme 2.)

The mounting of the parts (1) and (2) is performed on the prepared connections (inner thread 1"), on the upper part of the back side of the boiler.

MOUNTING PROCEDURE (according the scheme 2.)

- Screw in the heat exchanger in the coupling (inner thread 1"), so it is properly sealed.
- Screw in the sensor (3) (outer thread 1/2") of the thermal valve in the coupling (inner thread 1/2"), so it is properly sealed.
- Connection (4) (inner thread 3/4") of the thermal valve connect on the inline of the cold domestic water from the city plumbing, and connection (5) (inner thread 3/4") of the thermal valve connect with the connection (6) (outer thread 1/2") of the heat exchanger.
- Connection (7) (outer thread 1/2") of the heat exchanger connect to the sewerage.

Scheme 2. Description of the mounting procedure of the thermal safety protection for the boiler on the closed heating system.

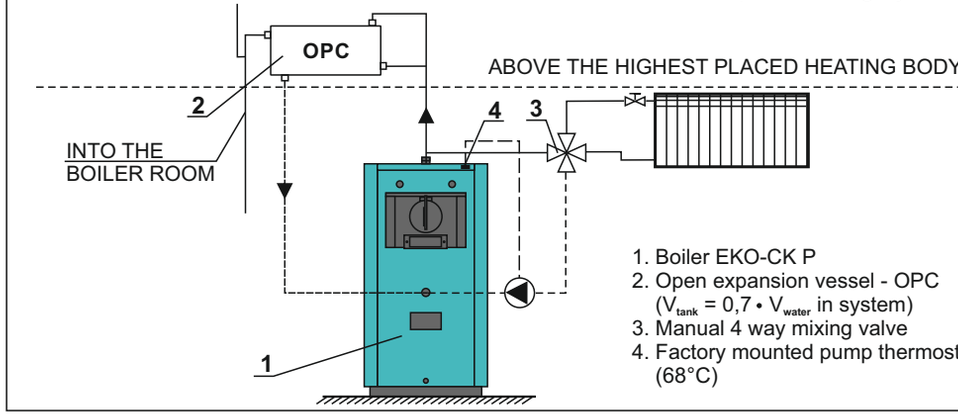


* The position of the thermal safety valve after the connection:

6.2. BOILER CONNECTION TO OPEN HEATING SYSTEM

If boiler is connected to the open heating system our recomendation is that the system is made like in scheme 3. At the open heating system is necessary to mount the open expansion vessel beyond of the highest placed heating body. If the position of the open expansion vessel is in the room which is not heated it has to be isolated. The system pump could be connected on the inline or back line of the boiler. The system pump is **obligatory** to be mounted over the socket on the back side of the boiler on the factory mounted thermostat of the pump which is placed on the 68°C. If the system is made like on scheme 3. temperature regulation in the room is perform with the 4 way manual mixing valve.

Scheme 3. Possible scheme for the boiler connection to the open heating system



1. Boiler EKO-CK P
2. Open expansion vessel - OPC (V_{tank} = 0,7 • V_{water} in system)
3. Manual 4 way mixing valve
4. Factory mounted pump thermostat (68°C)